RUTGERS

THE STATE UNIVERSITY
OF NEW JERSEY

Rutgers University

# 2025-2026 New Brunswick Undergraduate Catalog

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# Major Programs of Study (NBUG)

## MAJOR PROGRAMS OF STUDY

A wide variety of academic programs are offered at the ten undergraduate schools at Rutgers University-New Brunswick. The following list summarizes the major programs available at one or more of the schools. Students should consult the individual schools' sections for a list of majors offered at each school.

In addition, academic departments offer numerous options and specialized programs of study within these general fields, as well as opportunities for interdisciplinary work. Several dual-degree programs also are available, and in some subjects both liberal arts and professional programs are offered. Thus, the list of majors merely serves to suggest the breadth of academic programs for undergraduate students.

- Accounting
- Actuarial Mathematics
- Aerospace Engineering
- African, Middle Eastern, and South Asian Languages and Literatures
- Africana Studies
- Agriculture and Food Systems
- American Studies
- Animal Science
- Anthropology, Cultural
- Anthropology, Evolutionary
- Applied Sciences in Engineering
- Art
- Art History
- Asian Studies
- Astrophysics
- Biochemistry
- Biological Sciences
- Biomathematics
- Biomedical Engineering
- Biotechnology
- Business Analytics and Information Technology
- Cell Biology and Neuroscience
- Chemical Engineering
- Chemistry
- Chinese
- Cinema Studies
- Civil Engineering
- Classics

- Cognitive Science
- Communication
- Comparative Literature
- Computer Science
- Criminal Justice
- Dance
- Design
- Digital Filmmaking
- Ecology, Evolution, and Natural Resources
- Economics
- Electrical and Computer Engineering
- English
- Entomology
- Environmental and Business Economics
- Environmental Engineering
- Environmental Planning
- Environmental Policy, Institutions, and Behavior
- Environmental Sciences
- Environmental Studies (available as a second major only)
- European Studies
- Exercise Science
- Finance
- Food Science
- French
- Genetics
- Geography
- Geological Sciences
- German
- Global Humanities
- Health Administration
- History
- History/French
- History/Political Science
- Human Resource Management
- Industrial Engineering
- Information Technology and Informatics
- Italian
- Italian Studies
- Jewish Studies
- Journalism and Media Studies
- Korean
- Labor and Employment Relations

- Labor Studies and Employment Relations
- Landscape Architecture
- Latin American Studies
- Latino and Caribbean Studies
- Linguistics
- Management and Global Business
- Marine Sciences
- Marketing
- Materials Science and Engineering
- Mathematics
- Mechanical Engineering
- Medieval Studies
- Meteorology
- Microbiology
- Middle Eastern Studies
- Molecular Biology and Biochemistry
- Music
- Nursing
- Nutritional Sciences
- Pharmacy
- Philosophy
- Physics
- Planning and Public Policy
- Plant Biology
- Political Science
- Portuguese
- Psychology
- Public Health
- Public Policy
- Religion
- Russian
- Social Work
- Sociology
- Spanish
- Sport Management
- Statistics and Biostatistics
- Statistics/Mathematics
- Supply Chain Management
- Theater Arts
- Urban Planning and Design
- Visual Arts
- Women's, Gender, and Sexuality Studies

# Minor Programs of Study (NBUG)

## MINOR PROGRAMS OF STUDY

The minors listed below are offered by various disciplines and interdisciplinary programs at one or more of the schools. Students should consult the individual schools' sections of this catalog for a list of the minors open to students at each school.

- African Area Studies
- African, Middle Eastern, and South Asian Languages and Literature
- Africana Studies
- Agriculture and Food Systems*
- Agroecology*
- American Studies
- Animal Science*
- Anthropology, Cultural
- Anthropology, Evolutionary
- Arabic
- Archaeology
- Architectural Studies
- Art**
- Art History
- Asian Studies
- Astrobiology
- Astronomy
- Biochemistry*
- Biological Sciences
- Business Administration*******
- Business and Technical Writing
- Chemistry
- Chinese
- Cinema Studies
- Classical Humanities
- Cognitive Science
- Community Health Outreach*
- Comparative and Critical Race and Ethnic Studies
- Comparative Literature
- Computer Science
- Creative Writing
- Criminology
- Critical Intelligence Studies
- Culinary Nutrition*

- Dance**
- Developmental Psychology
- Digital Communication, Information, and Media******
- Ecology, Evolution, and Natural Resources*
- Economics
- Education as a Social Science*****
- English
- Entomology*
- Entrepreneurship*******
- Environmental and Business Economics*
- Environmental Geomatics*
- Environmental Planning*
- Environmental Policy, Institutions, and Behavior*
- Environmental Sciences*
- Environmental Studies
- European Studies
- Fisheries Science*
- Food Science*
- French
- Gender and Media********
- Geography
- Geological Sciences
- German
- Greek (Ancient)
- Greek (Modern)
- Green Technology*
- Health Administration****
- Health and Society
- Hebrew Language (Modern)
- Hindi
- History
- Holocaust Studies
- Horticultural Therapy*
- Human Resource Management***
- Hungarian
- International and Global Studies
- Italian
- Italian Studies
- Japanese
- Jewish Studies
- Korean
- Labor Studies***

- Landscape Design*
- Language and Culture of Ancient Israel
- Latin
- Latin American Studies
- Latino and Caribbean Studies
- Law and History
- Leadership Skills*
- Linguistics
- Marine Sciences*
- Mathematics
- Medicinal and Economic Botany*
- Medieval Studies
- Meteorology*
- Microbiology*
- Middle Eastern Studies
- Military Science (Aerospace)
- Military Science (Military)
- Military Science (Naval)
- Military Science (Non-commissioning)
- Music**
- Nonprofit Leadership*
- Nutrition*
- Operations Research
- Organizational Leadership
- Persian
- Philosophy
- Philosophy, Politics, and Economics
- Physics
- Planning and Public Policy****
- Plant Science*
- Political Science
- Portuguese
- Psychology
- Public Administration and Management****
- Public Garden Management*
- Public Health****
- Public Policy****
- Quantitative Economics
- Religion
- Russian
- Science Communication*
- Science Outreach*

- Sexualities Studies
- Social Justice
- Sociology
- South Asian Studies
- Spanish
- Sport Management
- Statistics
- STEM in Society
- Sustainability*
- Sustainable Global Food Systems*
- Theater Arts**
- Turkish
- Urban Forestry*
- Urban Studies****
- Women's, Gender, and Sexuality Studies

Minors without an asterisk are available through the School of Arts and Sciences.

*Available through the School of Environmental and Biological Sciences
**Available through the Mason Gross School of the Arts
***Available through the School of Management and Labor Relations
****Available through the Edward J. Bloustein School of Planning and Public Policy
*****Available through the Graduate School of Education
******Available through the School of Communication and Information
*******Available through the Rutgers Business School: Undergraduate-Newark and New Brunswick
********Available jointly through the School of Arts and Sciences and the School of Communication and Information

# Certificate Programs (NBUG)

## CERTIFICATE PROGRAMS

Certificate programs are available in a number of fields and are open to all undergraduate students at Rutgers University-New Brunswick, regardless of school affiliation.

The certificate programs are designed to allow students to complement their major program with study in either a broad, but well-defined, area or a specialized field. Since the certificate programs are intended to enhance a major program, a certificate may be awarded only in conjunction with the awarding of a baccalaureate degree in a major field.

Academic Spanish for Heritage Speakers

Akan Proficiency

Akan Translation

Ancient Greek Postbaccalaureate Certificate

Arabic Proficiency

Arabic Translation

Asian/Asian American Studies

Behavioral Pharmacology

Bengali Proficiency

Bengali Translation

Cartography/Geospatial Information Science (GIS)

Chemistry Education

Civic Engagement/Public Scholarship Pathway

Community Development****

Community Sustainability****

Computational Economics and Data Analytics

Computational Genetics

Curation and Cultural Programming

Creative Writing

Drama and Performance Studies

Eagleton Undergraduate Associates (American Politics and Public Policy)

Economic Theory

Environmental Geomatics*

Environmental Planning*

Evolutionary Medicine

Financial Economics

Food Systems Education and Administration*

French Basic Knowledge

Genetic Counseling

German Proficiency

Global Economics

Global Politics

Health Disparities****

Hebrew Proficiency

Hebrew Translation

Hindi Proficiency

Hindi Translation

Historic Preservation

Horticultural Therapy*

Hungarian Proficiency

International Geographic Perspectives

International Studies

Italian Proficiency

Korean-English Translation/Interpreting

Latin Postbaccalaureate Certificate

Leadership Scholars Certificate (Institute for Women's Leadership)

Medicinal and Economic Botany*

Paul Robeson Leadership Certificate

Persian Proficiency

Persian Translation

Philosophy, Politics, and Economics

Plant Biosecurity*

Portuguese Major/Global Studies

Professional Writing

Public Health Advocacy/Education****

Public Health Management****

Public Health Preparedness****

Public History

Public Policy Economics

Quantitative Economics

Quantitative Political Science Methods

Real Estate****

Recording Arts**

Russian Proficiency

Rutgers Civic/International Scholars Program

Rutgers International Civic Scholar

Sanskrit Proficiency

Sanskrit Translation

Spanish-English, English-Spanish Translation Proficiency

Spanish-English Translation/Interpreting Proficiency

Spanish Major/Global Studies

Speech and Hearing Sciences in Linguistics

Swahili Proficiency Swahili Translation Teacher Education***

Technical Writing

Turfgrass Science*

Turkish Proficiency

Turkish Translation

Urban/Community Forestry*

Urban Planning****

Urdu Proficiency

Urdu Translation

Women's Global Health Leadership

Youth Mentoring Theory and Practice

*Available through the School of Environmental and Biological Sciences
**Available through the Mason Gross School of the Arts
***The Graduate School of Education administers teacher certification programs in numerous areas. See Education in the Programs of Study for Liberal Arts Students section.
****Available through the Edward J. Bloustein School of Planning and Public Policy

# Honors Programs (NBUG)

## HONORS PROGRAMS

As part of its ongoing commitment to academic excellence, Rutgers University-New Brunswick offers numerous honors programs that provide outstanding students with challenges beyond those found in regular coursework.

The Honors College of Rutgers University-New Brunswick selects top students from among those admitted to the different schools at Rutgers. It provides a living-learning experience in the first year, and prepares engaged, talented students for the challenges of the 21st century with special curricula and opportunities. With its emphasis on interdisciplinary thinking, hands-on research, and creative problem solving, students will work closely with Rutgers' world-renowned faculty in small classes, workshops, and mentorships.

Many of the undergraduate schools offer specially designed honors programs that involve introductory seminars for well-prepared first-year students. Selection into a school honors program is based on SAT or ACT scores and high school record, and is at the invitation of each school.

In addition, exceptional upper-class students who are not in school honors programs may be selected to participate in honors seminars offered by the department of their major. Information on school honors programs may be found in the school sections of this catalog; departmental honors programs are described under each major.

Students who participate in honors programs receive a high degree of individual attention from faculty. Seminars, tutorials, lectures, discussions, and independent research afford an opportunity for sophisticated scholarship and growth in self-understanding and also may assist Rutgers students in pursuing their special interests and professional ambitions after graduation.

# Prizes and Awards (NBUG)

## PRIZES AND AWARDS

Many academic departments offer prizes and awards for outstanding achievement. In some cases, eligibility is based on achievement in specific courses. Information about these awards should be obtained from the departments so that students are aware in advance of the criteria for selection.

# Organization of the Catalog (NBUG)

## ORGANIZATION OF THE CATALOG

This catalog includes all undergraduate education at Rutgers University-New Brunswick.

The catalog begins with the Programs of Study and Courses for Arts and Sciences Students section, a large A-to-Z listing of undergraduate programs and courses offered by several faculties, principally to students at the School of Arts and Sciences. Students should also consult the School of Arts and Sciences section, which includes important information about the school's specific aims, policies, academic programs, and degree requirements.

The professional school sections include similar school information and also include detailed programs of study and course listing chapters covering the academic programs offered by each of their faculties. Professional students also should refer to the large introductory A-to-Z listing both for courses required in their curriculum that are taught by other faculties and for elective courses in the arts and sciences.

In general, individual undergraduate courses offered at Rutgers in New Brunswick are open to students at all the undergraduate schools, subject to prerequisite restrictions and space limitations.

The General Information chapter, later in the catalog, covers university policies and procedures that are relevant for students at all the undergraduate schools in New Brunswick. It is important for students to familiarize themselves with these chapters as well as with their own particular school's section on policy and procedures.

Some courses are cross-listed in more than one department. Students should note that a cross-listed course is the same course listed under two or more subject indexes, and they cannot receive credit for repeating the same course under a different course number.

# Programs, Faculty, and Courses (SAS)

## Programs, Faculty, and Courses

Availability of Majors

Course Notation Information

African Area Studies 016

African, Middle Eastern, and South Asian Languages and Literatures 013

Africana Studies 014

American Studies 050

Anthropology 070

Archaeology 075

Architectural Studies 076

Art 080

Art History 082

Arts and Sciences 090

Asian Studies 098

Astrobiology 101

Astrophysics 105

Chemistry 160

Chinese 165

Cinema Studies 175

Classics

Cognitive Science 185

Comparative Literature 195

Computer Science 198

Criminal Justice 202

Criminology 204

Dance 203

Data Science 219

Economics 220

Education 300

English

Environmental Studies 381

European Studies 360

Exercise Science 377

French 420

Gender and Media 438

Geography 450

Geological Sciences 460

German 470

Greek, Modern Greek Studies 489

Health and Society 502

History

History/French Joint Major 513

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Holocaust Studies 564

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Hungarian 535

Individualized Major 555

Interdisciplinary Studies, SAS 556

International and Global Studies 558

Italian 560

Japanese 565

Jewish Studies 563

Korean 574

Labor Studies and Employment Relations 575

Latin American Studies 590

Latino and Caribbean Studies 595

Law

Life Sciences

Linguistics 615

Mathematics 640

Medicine and Dentistry

Global Medieval Studies 667

Middle Eastern Studies 685

Military Education, Air Force 690

Military Education, Army 691

Military Education, Naval 692

Military Science Minor (Military Science 691N, Naval Science 692N, Aerospace Science 693N, Non-Commissioning 695N)

Music

Nursing

Organizational Leadership 713

Pharmacy

Philosophy 730

Physics 750

Polish 787

Political Science 790

Portuguese 810

Psychology 830

Religion 840

Russian 860

Sexualities Studies 888

Slavic and East European Studies Minor 861

Social Justice 904

Social Work 910

Sociology 920

South Asian Studies 925

Spanish 940

Sport Management 955

Statistics 960

Study Abroad 959

Theater 965

Ukrainian 967

Women's, Gender, and Sexuality Studies 988

World Language Proficiency Certificates

# Availability of Majors (SAS)

## AVAILABILITY OF MAJORS

The programs of study outlined in this section are, in general, available to undergraduate students enrolled in the School of Arts and Sciences. (In addition, a few of the major programs described here are open to School of Environmental and Biological Sciences students.) Therefore, it is important to consult the school sections of this catalog for lists of the majors available to students at each of these schools:

- School of Arts and Sciences
- School of Environmental and Biological Sciences

Individual undergraduate courses offered at the School of Arts and Sciences are, in general, open to students at all the undergraduate schools, subject to prerequisite restrictions and space limitations.

# Course Notation Information (SAS)

## COURSE NOTATION INFORMATION

Course Notation Information (SAS)

## Changes in Course Numbers and/or Titles

## Changes in Course Numbers and/or Titles

It is the student's responsibility to read course descriptions carefully, and, when in doubt, to check with his or her advisor or the appropriate department to avoid registering for a course that the student already may have taken. Credit will not be given twice for the same course, despite a change in number and/or title.

Course Notation Information (SAS)

## Cross-Listed Courses

## Cross-Listed Courses

Some courses are cross-listed in more than one department. Students should note that a cross-listed course is the same course listed under two or more subject indexes. Credit will not be given twice for the same course.

Course Notation Information (SAS)

# Explanation of Three-Part Course Numbers

# Explanation of Three-Part Course Numbers

The number preceding each course title is divided into three parts. The first two digits are the administrative code (standing for a faculty or a school), the next three digits are the subject code, and the final three digits are the course code. (Example: 01:830:101 is SAS:Psychology:General Psychology)

*Administrative Codes*

The following administrative codes are used in this catalog and are positioned as the first two digits in all course numbers.

01 School of Arts and Sciences

03 ROTC

04 School of Communication and Information (undergraduate)

05 Graduate School of Education (undergraduate)

07 Mason Gross School of the Arts (undergraduate)

09 School of Social Work (undergraduate)

10 Edward J. Bloustein School of Planning and Public Policy (undergraduate)

11 School of Environmental and Biological Sciences

14 School of Engineering

16 School of Graduate Studies

19 School of Social Work (graduate)

21 Newark College of Arts and Sciences

30 Ernest Mario School of Pharmacy (undergraduate)

31 Ernest Mario School of Pharmacy (last two years of the doctoral program)

33 Rutgers Business School: Undergraduate-New Brunswick

37 School of Management and Labor Relations

50 Camden College of Arts and Sciences

*Subject Codes*

A subject code comprises the third through fifth digits in all course numbers and indicates the subject matter of the course. Courses with the following subject codes are listed in this section of the catalog. (This list does not constitute a list of majors. See the Major Programs of Study page for a list of majors. This list also does not¿constitute a list of all subjects offered at the university. See the individual professional-school sections of this catalog for further subject and course listings.)

013 African, Middle Eastern, and South Asian Languages and Literatures

014 Africana Studies

016 African Area Studies

050 American Studies

068 Philosophy, Politics, and Economics

070 Anthropology

074 Arabic

078 Armenian

082 Art History

090 Arts and Sciences

098 Asian Studies

105 Astrophysics

119 Biological Sciences

146 Cell Biology and Neuroscience

160 Chemistry

165 Chinese

170 Chinese Studies

175 Cinema Studies

185 Cognitive Science

190 Classics

195 Comparative Literature

198 Computer Science

202 Criminal Justice

205 Critical Intelligence Studies

219 Data Science

220 Economics

351 English: Creative Writing

354 English: Film Studies

355 English: Composition and Writing

356 English For Academic Purposes

358 English: Literature

359 English: Theories and Methods

360 European Studies

377 Exercise Science

381 Environmental Studies

420 French

447 Genetics

450 Geography

460 Geological Sciences

470 German

489 Greek, Modern

490 Greek, Ancient

505 Hindi

506 History: General/Comparative

508 History: African, Asian, and Latin American

510 History: European

512 History: American

535 Hungarian

556 Interdisciplinary Studies, SAS

558 International and Global Studies

560 Italian

563 Jewish Studies

565 Japanese

574 Korean

580 Latin

590 Latin American Studies

595 Latino and Caribbean Studies

607 Leadership Skills

615 Linguistics

617 Literature and Language

640 Mathematics

667 Medieval Studies

685 Middle Eastern Studies

690 Military Education, Air Force

691 Military Education, Army

692 Military Education, Navy

694 Molecular Biology and Biochemistry

713 Organizational Leadership

723 Persian

730 Philosophy

745 Physician Assistant

750 Physics

787 Polish

790 Political Science

793 Government and Business

810 Portuguese

830 Psychology

840 Religion

860 Russian

888 Sexualities Studies

904 Social Justice

920 Sociology

940 Spanish

955 Sport Management

956 Swahili

959 Study Abroad

960 Statistics

973 Turkish

974 Twi

988 Women's, Gender, and Sexuality Studies

991 Language Engagement Project

*Course Codes*

The course code comprises the sixth, seventh, and eighth digits in all course numbers. Course codes from 100 to 299 indicate introductory and intermediate undergraduate courses. Codes from 300 to 499 indicate advanced undergraduate courses. Courses coded from 500 to 799 are graduate courses and are described in the graduate catalogs of the university.

Two course codes separated by a comma indicate that each semester course may be taken independently of the other (example: 01:000:101,202). Two course codes separated by a hyphen indicate that satisfactory completion of the first semester course is a prerequisite to the second semester (example: 01:000:110-111); the first semester may be taken for credit without taking the second, except if a statement is added to indicate that both semester courses must be completed in order to receive credit.

Credits awarded for the successful completion of each course are indicated in parentheses following the course title. The notation BA indicates that the number of credits is determined by arrangement with the department offering the course.

Unless otherwise indicated, a course normally meets each week for a number of lecture hours equal to the number of credits to be earned. Special hours or modes of class, other than lecture, are usually indicated in italics below the course title.

# 010 Accounting (RBS-NB)

## 010 Accounting

Major requirements for students who enter Rutgers Business School: Undergraduate-New Brunswick (RBS) ***in the fall 2018 semester to the fall 2022 semester:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) (junior or senior year)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Accounting Courses**

33:010:325 Intermediate Accounting I (3) (prerequisite: 33:010:272)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:010:326 Intermediate Accounting II (3) (prerequisite: 33:010:325)
33:010:451 Cost Accounting (3) (prerequisite: 33:010:275)
33:010:415 Concepts of Auditing (3) (prerequisite: 33:010:325)
33:010:421 Income Tax Accounting (3) (prerequisite: 33:010:325)
33:010:401 Advanced Accounting (3) (prerequisite: 33:010:326)
33:010:416 Audit Analytics (3) (prerequisite: 33:010:415)

In order to declare Accounting as a major, you must earn a grade of B or better in Intro to Financial Accounting, 33:010:272.

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2022 semester to the fall 2023 semester:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) (junior or senior year)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Accounting Courses**

33:010:325. Intermediate Accounting I (3) (prerequisite: 33:010:272)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:010:326 Intermediate Accounting II (3) (prerequisite: 33:010:325)
33:010:451 Cost Accounting (3) (prerequisite: 33:010:275)
33:010:415 Concepts of Auditing (3) (prerequisite: 33:010:325)
33:010:421 Income Tax Accounting (3) (prerequisite: 33:010:325)
33:010:401 Advanced Accounting (3) (prerequisite: 33:010:326)
33:010:416 Audit Analytics (3) (prerequisite: 33:010:415)
33:010:422 Topics in Income Taxation (3) (prerequisite: 33:010:326 and 33:010:421)

In order to declare Accounting as a major, you must earn a grade of B or better in Intro to Financial Accounting, 33:010:272.

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:***

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Accounting Courses**

33:010:325. Intermediate Accounting I (3) (prerequisite: 33:010:272)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:010:326 Intermediate Accounting II (3) (prerequisite: 33:010:325)
33:010:451 Cost Accounting (3) (prerequisite: 33:010:275)
33:010:415 Concepts of Auditing (3) (prerequisite: 33:010:325)
33:010:421 Income Tax Accounting (3) (prerequisite: 33:010:325)
33:010:401 Advanced Accounting (3) (prerequisite: 33:010:326)
33:010:416 Audit Analytics (3) (prerequisite: 33:010:415)
33:010:422 Topics in Income Taxation (3) (prerequisite: 33:010:421)

In order to declare Accounting as a major, you must earn a grade of B or better in Intro to Financial Accounting, 33:010:272.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.

Students with more than one Business School major may only double count one RBS course between those majors.

# African Area Studies 016 (SAS)

## AFRICAN AREA STUDIES 016

School of Arts and Sciences

**Website:** Here

**Director:** Ousseina Alidou

**Executive Committee:** Ousseina Alidou, Daniel Da Silva, Emily Marker, Zakia Salime, Stéphane Robolin, Jim Simon,

**Center for African Studies Members:**

Akinbiyi Akinlabi, Linguistics; Ph.D., Ibadan (Nigeria)

Ousseina Alidou, African, Middle Eastern and South Asian Languages and Literatures; Ph.D., Indiana

Albert Ayeni, Plant Biology; Ph.D., Cornell, Emeritus

Baba Badji, Comparative Literature, Ph.D. University of Washington

Shanna Jean-Baptiste, French, Ph.D.Yale U

Francis Barchi, Social Work; Ph.D., Pennsylvania

Sarah Brett-Smith, Art History; Ph.D., Yale, Emerita

Carolyn Brown, History; Ph.D., Columbia

Abena Busia, English; D.Phil., Oxford, Emerita

Darren L. Clarke, Education, Ph.D. Rutgers University

Barbara Cooper, History; Ph.D., Boston

Lee Cronk, History; Ph.D., Northwestern

Rebecca Davis, Child Development and Family Relations; Ph.D., North Carolina (Greensboro)

Eric Garfunkel, Chemistry; Ph.D., California (Berkeley)

Keith Green, English; Ph.D., Michigan

Allen Howard, History, Ph.D. Wisconson

Angelique Haugerud, Anthropology; Ph.D., Northwestern, Emerita

Heidi Hausermann, Human Ecology; Ph.D., Arizona

David McDermott Hughes, Human Ecology; Ph.D., California (Berkeley)

Olabode Ibironke, English; Ph.D., Michigan State

Emilia Iwu, Nursing, Ph.D. U Penn School of Nursing

Walton Johnson, Africana Studies; Ph.D., London

Samantha Kelly, History; Ph.D., Northwestern

Yeon-Soo Kim, Spanish and Portuguese; Ph.D., Yale

Renée Larrier, French; Ph.D., Columbia, Emerita

Kevin Lyons, Business; Ph.D., Sunderland

Mukti Lakhi Mangharam, English; Ph.D., Cornell

Susan Martin-Marquez, Spanish and Portuguese; Ph.D., Pennsylvania

Wendall Marsh, Middle Eastern, Asian and African Studies and Comparative Literature, Ph.D. Columbia University

Alamin Mazrui, African, Middle Eastern, and South Asian Languages and Literatures; Ph.D., Stanford

Bonnie J. McCay, Anthropology and Human Ecology; Ph.D., Columbia

Patricia O'Brien-Richardson, Urban Education, Ph.D. Rutgers University

Ifeyinwa Onyenekwu, Education; Ph.D., Illinois (Urbana-Champaign)

Paul O'Keefe, Ph.D.; Geography, West Virginia University

Arthur Powell, Academic Foundations; M.Sc., Michigan

Ron Quincy, Social Sciences, Ph.D. Michigan State University

Edward Ramsamy, Africana Studies; Ph.D., Rutgers

Stéphane Robolin, English; Ph.D., Duke

Mark Robson, Entomology; Ph.D., Rutgers

Zakia Salime, Sociology; Ph.D., Illinois

Samah Selim, African, Middle Eastern, and South Asian Languages and Literatures; Ph.D., Columbia

Richard Serrano, French; Ph.D., California (Berkeley)

James Simon, Plant Biology; Ph.D., Massachusetts

Genese Sodikoff, Anthropology; Ph.D., Michigan

Meredeth Turshen, Urban Studies; Ph.D., Sussex (UK)

Suzanne Willard, Nursing; Ph.D., Drexel; R.N., A.P.N.-c., F.A.A.N.

Abigail Williams-Butler, Social Work, Ph.D. University of Michigan

African Area Studies 016 (SAS)

# Learning Goals

# Learning Goals

Students will demonstrate linguistic exposure to one of the approved African languages. They will demonstrate an interdisciplinary awareness of the diversity of African countries, cultures, histories, geography, literatures, economics, public health, and environmental and sociocultural issues.

African Area Studies 016 (SAS)

# Minor Program

# Minor Program

The curricular program in African area studies is designed to complement major degrees in the applied sciences, fine arts, humanities, social sciences, and professional schools. The field of African area studies emphasizes continental Africa and embraces all the major regions of the continent. The interdisciplinary minor in African area studies requires a minimum of six courses, including two African language courses (8 credits), two core courses (6 credits), and two elective courses chosen from among the core courses and the approved course list (6 credits; 20 credits total).

Students do not have to register under the Center for African Studies number to apply credits toward the minor. Credits earned through relevant honors or topics courses, independent study, internships, and study abroad in Africa can be applied toward the electives requirements and may in some cases, with the approval of the director of the program in African languages, be applied toward the language requirement.

Students must earn a grade of C or better in all courses counted toward the minor. At least three courses must be at the 300 level or above, and at least three courses must be taken outside the student's major. Students are strongly advised to consult with the curriculum director regularly about their programs of study.

African Area Studies 016 (SAS)

# Study Abroad

# Study Abroad

Students may apply toward the minor up to 9 credits earned in courses offered as part of a recognized Rutgers African study abroad program. Rutgers currently has programs in Ghana, Kenya, Morocco, Senegal, and South Africa. Students are encouraged to contact the Center for Global Education office for these and other study abroad opportunities.

African Area Studies 016 (SAS)

# Applied Learning Opportunities

# Applied Learning Opportunities

The Center for African Studies (CAS) values courses with applied learning opportunities, including internships, honors courses, and independent study programs arranged through CAS and through the departments. The appropriate number of credits for these learning experiences and their application toward distribution requirements will be determined in consultation with the curriculum director.

01:016:301,302 Independent Study in African Area Studies (BA,BA)
01:016:303,304 Directed Internship in African Studies (BA,BA)

African Area Studies 016 (SAS)

# Student Research Award

# Student Research Award

The Center for African Studies awards the Claude Ake Prize annually to the best undergraduate student paper in African studies.

African Area Studies 016 (SAS)

# Courses

# Courses

*Core Courses* (Minors must take at least two of the following courses)
01:016:220 Ancient Africa (3)
01:016:222 Modern Africa (3)
01:016:224 Women and Gender in African History (3)
01:016:250 Comparative Approaches to African Literatures (3)
01:016:312 African Feminism (3)

01:016:314 Sub-Saharan African Policies (3)
01:016:321 African Cultural History (3)
01:016:337 Anthropology of Africa (3)
01:016:338 Geography of Africa (3)
01:016:350 Literature and Cultures of Lusophone Africa (3)
01:016:363 African Women Writers (3)
01:016:410 Sub-Saharan African Literature (3)
01:016:411 North African Literature (3)

***Language Courses*** (Minors must take two semesters of a language)

*African Languages and Literatures*
01:013:140-141, 240-241, 340-341 Arabic (Elementary, Intermediate, Advanced) (4,4,4,4,3,3)
01:013:186-187, 286-287 Swahili (Elementary, Intermediate) (4,4,4,4)
01:013:192-193, 292-293 Twi (Elementary, Intermediate) (4,4,4,4)
01:013:194-195, 294-295 Yoruba (Elementary, Intermediate) (4,4,4,4)
***Approved Courses***

*African, Middle Eastern, and South Asian Languages and Literatures (AMESALL)*
01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)
01:013:211 Introduction to the Literatures of Africa (3)
01:013:217 African Immigrant Literature
01:013:226 Rhythm of Resistance: Global Hip Hop
01:013:312 African Folklore and Myth (3)
01:013:313 African Linguistics (3)
01:013:314 Islam and African Literature (3)
01:014:212 Politics and Power in Modern Africa (3)
01:014:330 Contemporary Issues in Southern Africa (3)
01:014:360 Writers of Africa and the New World (3)
01:014:371 The New Scramble for Africa (3)
01:014:376 Pan-African Movement (3)

*Anthropology*
01:070:243 Anthropology of Africa (3)
01:070:326 Life in the Pleistocene (3)
01:070:336 Primatology, Wildlife Ecology, and Conservation in Kenya (3)
01:070:337 Field Methods and Analysis in Primatology in Kenya (3)
01:070:379 or 01:988:379 Gender and Power in Africa (3)
01:070:397 Practicum in Vertebrate Paleontology (4)
01:070:398 Field Study in Paleoanthropology (4)
01:070:412 Topics in African Prehistory and Paleoanthropology (3)
01:070:426 South African Archaeology (3)

*Art History*
01:082:250 Introduction to Oceanic, African, and Pre-Columbian Art (3)
01:082:371 Arts of West Africa (3)
01:082:376 Arts of Central Africa (3)
01:082:420 African Architecture (3)

*Biology*
01:146:328 Human Parasitology (3)

*Comparative Literature*
01:195:250 Comparative Approaches to African Literatures (3)
01:195:363 or 01:013:311 Women Writers of Africa (3)

*Criminal Justice*
01:202:312 Crimes Against Humanity (3)

*Economics*
01:220:350 Economics of Africa (3)

*French*
01:420:251 France in the World/The World in France
01:420:281 French and Francophone Text(s) and Image(s)
01:420:409 Studies in Cultures of the Francophone World (3)
01:420:410 or 01:016:410 Sub-Saharan African Literature (3)
01:420:411 North African Literature (3)
01:420:413 Caribbean Literature (3)

*Geography*
01:450:338 Africa (3)

*History*
01:508:220 Ancient Africa (3)
01:508:221 West Africa (3)
01:508:222 Modern Africa (3)
01:508:224 or 01:016:224 or 01:988:224. Women and Gender in African History (3)
01:508:318 Nationalism in Modern Africa (3)
01:508:320 History of Southern Africa (3)
01:508:321 African Cultural History (3)
01:508:325 Africa from the 15th to the 19th Centuries (3)
01:508:326 Islam in African History (3)
01:508:327 World War II and Africa (3)
01:508:420 or 01:014:367 African Labor History (3)
01:508:424 African Cities Past and Present (3)
01:508:429 Research in African Historical Studies (3)

*Political Science*
01:790:314 or 01:016:314 Sub-Saharan African Policies (3)
01:790:389 Topics in Comparative Politics (3)
01:790:495 Honors in Political Science (3)

*Religion*
01:840:332 or 01:014:332 African Religions (3)

*Spanish and Portuguese*
01:810:241-242 The Portuguese-Speaking World: A Literary Introduction for English-Speakers (3,3)
01:810:309 Africa and Portugal: An Introduction (3)
01:810:350 or 01:016:350 Literature and Cultures of Lusophone Africa (3)
01:810:440 Portuguese-Speaking World: Multiple Perspectives (3)
01:940:465 Spain in Africa/Africa in Spain: Cultural Representations and Historical Legacy (3)

*Study Abroad*

*01:016:100 Study Abroad Benin: History Culture and Memory (3)*
*This interdisciplinary cross-cultural study abroad program explores the African side of the Atlantic World. Students spend two weeks in Benin based at our sister institution, the Ecole du Patrimoine Africaine in Porto Novo. In partnership with our Beninois colleagues, faculty and students will explore how trans-Atlantic connections have shaped religion, language, and identity; the relationship between tourism and historical memory; and the dynamism of the contemporary art scene.*
*Credit not given for both this course and 01:508:100.*

01:959:400,401 Study Abroad in South Africa (variable credit)
See the Center for Global Education office for other opportunities.
*Women's, Gender, and Sexuality Studies*
01:988:224 or 01:016:224 Women and Gender in African History (3)
01:988:312 or 01:016:312 African Feminism (3)

**01:016:220** ***Ancient Africa (3)***
Precolonial African societies and kingdoms: family life, cities, Islam, growth and decline of states, impact of the slave trade, African culture in the Americas.
***Credit not given for both this course and 01:508:220.***

**01:016:222** ***Modern Africa (3)***
Nineteenth-, 20th-, and 21st-century Africa: resistance and accommodation to colonialism, impact of Christianity, African workers and new elites, changing roles of women, nationalism, revolution.
***Credit not given for both this course and 01:508:222.***

**01:016:224** ***Women and Gender in African History (3)***
Issues in the history of gender in Africa: female slavery, women and power formations, women in production and trade, family and community, gender and protest.
***Credit not given for both this course and 01:508:224 or 01:988:224.***

**01:016:250** *Comparative Approaches to African Literatures (3)*
Reading and discussion of literature in translation from different geographic, linguistic, and cultural areas of Africa.
*Credit not given for both this course and 01:195:250.*

**01:016:301,302** *Independent Study in African Area Studies (1-3,1-3)*
Independent work on an issue in African area studies under the supervision and guidance of African studies faculty.

**01:016:303,304** *Directed Internship in African Studies (1-3,1-3)*
Learning about Africa in applied settings through internships.
*Prerequisites: Permission of Center for African Studies curriculum coordinator, learning contract, and approval of internship site supervisor.*

**01:016:312** *African Feminism (3)*
What feminism means to Africa; how gender affects female socialization; women as state subjects; how diverse African feminist strategies differ from and/or parallel other feminisms.
*Credit not given for both this course and 01:988:312.*

**01:016:314** *Sub-Saharan African Policies (3)*
Patterns of political change and political development in Africa south of the Sahara.
*Credit not given for both this course and 01:790:314.*

**01:016:321** *African Cultural History (3)*
History of African music, art, religion, and other cultural practices in social and political context.
*Credit not given for both this course and 01:508:321.*

**01:016:337** *Anthropology of Africa (3)*
Precolonial, colonial, and postcolonial African cultures and societies. Gender, ethnicity, and class. Representations and realities of Africa in a global context, including issues of development, conservation, tourism. Popular culture, contemporary rural and urban experiences.
*Credit not given for both this course and 01:070:338.*

**01:016:338** *Geography of Africa (3)*
Regional associations of peoples and nation states; analysis of resource endowment, economic development, and Africa's changing position in the world.
*Credit not given for both this course and 01:450:338.*

**01:016:350** *Literature and Cultures of Lusophone Africa (3)*
Study of the literatures from African countries whose official language is Portuguese. Emphasis on 20th-century colonial and postindependence literature and theory.
*Prerequisite: 01:810:315 or 01:810:316 or permission of Portuguese department. Credit not given for both this course and 01:810:350.*

**01:016:363** *African Women Writers (3)*
Reading and discussion of recent writings by women from a variety of cultural, linguistic, and regional areas of Africa.
*Credit not given for both this course and 01:195:363.*

**01:016:410** ***Sub-Saharan African Literature (3)***
Study of literature in French by writers in or from Sub-Saharan Africa.
***Credit not given for both this course and 01:420:410. Course conducted in French.***

**01:016:411** ***North African Literature (3)***
Study of literature in French by writers in or from North Africa.
***Credit not given for both this course and 01:420:411. Course conducted in French.***

# African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

## AFRICAN, MIDDLE EASTERN, AND SOUTH ASIAN LANGUAGES AND LITERATURES 013

Department of African, Middle Eastern, and South Asian Languages and Literatures, School of Arts and Sciences

**Website:** Here

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**Undergraduate Director:** Benjamin Koerber

**Professors:**

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Charles G. Häberl, B.A., Brown; M.A., Ph.D., Harvard

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The Department of African, Middle Eastern, and South Asian Languages and Literatures offers a major program (013) with two options: regional concentration and global humanities. The department currently offers six minor programs:

- African Languages (013A)
- Arabic (074)
- Hindi (505)
- Languages and Literatures (013)
- Persian (723)
- Turkish (973)

For more information on these minor programs, please read the descriptions below.



# Learning Objectives for the Major

# Learning Objectives for the Major

**Regional Option (013J)**

As an African, Middle Eastern, and South Asian languages and literatures (AMESALL) major with the regional major option, you will demonstrate:

1. listening, speaking, writing, and reading proficiency in one of the languages taught through AMESALL at a level of advanced-low or higher according to the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL);

2. familiarity with a cross-section of the classical literatures of all three regions; and
3. a broad understanding of the literatures of one of the three regions.

**Global Humanities Option (013G)**

As an AMESALL major with the global humanities option, you will demonstrate:

1. appreciation of major global issues as articulated in Africa, the Middle East, and South Asia and from the perspective of these three regions;
2. understanding of a variety of epistemologies rooted in the cultures of Africa, the Middle East, and South Asia; and
3. proficiency in critical, theoretical, and research-oriented skills in global and comparative cultural studies.



# Major Requirements

# Major Requirements

**Regional Option**

The regional option in the African, Middle Eastern, and South Asian languages and literatures (AMESALL) major requires the successful completion of at least 33 credits, with the first two years of language study/proficiency as a prerequisite.

This option is designed to allow students to explore in depth one of the literatures offered by AMESALL, within a regional context. All majors must take the following two courses to complete this major option:

- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3) and
- 01:013:401 Senior Seminar in Literature and Society (3)

Students enrolling in this option must complete at least 6 credits of language courses at the advanced 300 level or higher.

Students must also take one of the following courses, as appropriate to their region of study:

- 01:013:211 Introduction to the Literatures of Africa (3) or
- 01:013:221 Introduction to the Literatures of the Middle East (3) or
- 01:013:231 Introduction to the Literatures of South Asia (3)

Finally, students must complete 18 credits of additional literature, sociolinguistics, or linguistics courses on the region of their concentration. Of these, 9 credits must be upper-level courses at the 300 level or above. These courses must either be taught in AMESALL, cross-listed with AMESALL, or approved by the department chair.

**Global Humanities Option**

The global humanities option in African, Middle Eastern, and South Asian languages and literatures requires the successful completion of at least 36 credits.

This is an interdisciplinary program of study that provides opportunities to view the world from multiple perspectives, and a framework for understanding and negotiating global realities and challenges in the 21st century.

All majors must take the following three courses to complete this major option:

- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)
- 01:013:205 Cultural Forces in International Politics (3)
- 01:013:401 Senior Seminar in Literature and Society (3)

Students enrolling in this option must also take two courses from each of the following categories:

*Transregional Sociolinguistics Courses*

- 01:013:115 History of the Alphabet (1.5)
- 01:013:203 Language and Society in Africa, the Middle East, and South Asia (3)
- 01:013:204 Introduction to Discourse Analysis (3)
- 01:013:225 Global Arabic
- 01:013:285 Language and Globalization (3)
- 01:013:305 Languages in Peril (3)
- 01:013:409 Introduction to Semitic Languages (3)

*Transregional Culture Courses*

- 01:013:202 Cinemas of Africa and Asia (3)
- 01:013:206 Banned Books (4)
- 01:013:210 World Literature and Social Change (3)
- 01:013:304 Introduction to Translation Studies (3)
- 01:013:307 Introduction to Postcolonial Literature and Theory (3)
- 01:013:365 Bollywood (3)
- 01:013:324 Ottoman Africa (3)
- 01:013:412 Literature and Religion
- 01:013:445 Storytelling in the Muslim World (3)

Majors must also take at least three courses (a total of 9 credits) in any combination of their choice, from the following departmental courses:

- African literature/cinema courses
- Middle Eastern literature/cinema courses
- South Asian literature/cinema courses

In addition, majors will take at least 6 credits, in any combination of their choice, from the following:

- AMESALL's literature/sociolinguistics/cinema/culture courses
- AMESALL's language courses at the intermediate level or above
- Study Abroad program courses
- Approved courses from other units with significant AMESALL content

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Learning Objectives and Requirements for African Languages Minor (013A)

# Learning Objectives and Requirements for African Languages Minor (013A)

**Learning Objectives**

The objective of the African languages minor is to develop listening, speaking, writing, and reading skills in an African language to the intermediate mid level, as based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The minor program in African languages consists of 20-22 credits, which must be completed with a grade of C or better in each course.

Minors must take four courses in one African language (Akan/Twi, Arabic, Swahili, or Yoruba) (14-16 credits). They must also take EITHER:

- Two 300-level courses in the language (6 credits), OR
- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3) and *either* 01:013:312 African Folklore and Myth (3) *or* 01:013:211 Introduction to the Literatures of Africa (3)

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Learning Objectives and Requirements for Arabic Minor (074)

# Learning Objectives and Requirements for Arabic Minor (074)

**Learning Objectives**

The objective of the Arabic minor is to develop listening, speaking, writing, and reading skills in Modern Standard Arabic to the advanced level, as based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The minor program in Arabic consists of 20 credits, which must be completed with a grade of C or better in each course.

The minor in Arabic consists of four courses in Arabic language beyond the elementary level plus two additional courses:

- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)
- 01:013:221 Introduction to the Literatures of the Middle East (3)

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Learning Objectives and Requirements for Hindi Minor (505)

# Learning Objectives and Requirements for Hindi Minor (505)

**Learning Objectives**

The objective of the Hindi minor is to develop listening, speaking, writing, and reading skills in Hindi to the advanced level, as based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The minor program in Hindi consists of 20 credits, which must be completed with a grade of C or better in each course.

The minor in Hindi consists of four courses in Hindi language beyond the elementary level plus two additional courses:

- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)
- 01:013:221 Introduction to the Literatures of the Middle East (3)

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Learning Objectives and Requirements for Languages and Literatures Minor (013)

# Learning Objectives and Requirements for Languages and Literatures Minor (013)

**Learning Objectives**

Students in the languages and literatures minor will demonstrate familiarity with a cross-section of the classical literatures of Africa, the Middle East, and South Asia, and a broad understanding of the modern literatures of one of the three regions. They will also develop listening, speaking, writing, and reading skills in one of the languages of their chosen region of study (Africa/the Middle East/South Asia) at a proficiency level of intermediate-low or higher, based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The languages and literatures minor consists of 18-20 credits, which must be completed with a grade of C or better in each course.

- Two courses beyond the elementary 100 level in one of the languages offered by the department.
- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)
- One of the following three courses, as appropriate to the chosen language of study:
  01:013:211 Introduction to the Literatures of Africa (3) or
  01:013:221 Introduction to the Literatures of the Middle East (3) or
  01:013:231 Introduction to the Literatures of South Asia (3)
- Six elective credits of additional literature, sociolinguistics, or linguistics courses at the 300 level or above, offered through AMESALL, by cross-listing through other departments, or with the approval of the department chair.

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Learning Objectives and Requirements for Persian Minor (013P or 723)

# Learning Objectives and Requirements for Persian Minor (013P or 723)

**Learning Objectives**

The objective of the Persian minor is to develop listening, speaking, writing, and reading skills in Persian language to the intermediate mid level, as based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The minor in Persian consists of 20-22 credits hours, which must be completed with a minimum grade of C.

Minors must take four Persian language courses (14-16 credits). They must also take EITHER:

- Two 300-level Persian language courses (6 credits), OR
- 01:013:201: Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3), and *either* 01:013:203 Language and Society (3), *or* 01:013:221 Introduction to the Literatures of the Middle East (3)

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Learning Objectives and Requirements for Turkish Minor (013T or 973)

# Learning Objectives and Requirements for Turkish Minor (013T or 973)

**Learning Objectives**

The objective of the Turkish minor is to develop listening, speaking, writing, and reading skills in Turkish language to the intermediate mid level, as based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The minor in Turkish consists of 20-22 credits, which must be completed with a minimum grade of C.

Minors must take four Turkish language courses (14-16 credits). They must also take EITHER:

- Two 300 level Turkish language (6 credits), OR
- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3), and *either* 01:013:203 Language and Society (3), *or* 01:013:221 Introduction to the Literatures of the Middle East (3)



# Certificate in Translation

# Certificate in Translation

The translation certificate in African, Middle Eastern, and South Asian languages and literatures (AMESALL) consists of 18 credits, completed with a grade of B or better in each course. The requirements for the translation certificate program are:

1. Two courses beyond the intermediate level in any of the languages offered through AMESALL or the equivalent level as determined by placement testing
2. 01:013:203 Language and Society in Africa, the Middle East, and South Asia (3)
3. 01:013:304 Introduction to Translation Studies (3)
4. 01:013:403 Translation Practicum I (3), or equivalent
    a. 403a: Arabic
    b. 403b: Hindi
    c. 403c: Swahili
    d. 403d: Persian
    e. 321: Independent Language Practicum

5. 01:013:404 Translation Practicum II (3), or equivalent
    a. 404a: Arabic
    b. 404b: Hindi
    c. 404c: Swahili
    d. 404d: Persian
    e. 321: Independent Language Practicum

Credits earned in any of the above courses can also be used to fulfill the requirements of the minor or major in African, Middle Eastern, and South Asian languages and literatures. 01:013:203 Language in Society in Africa, the Middle East, and South Asia (3) is regularly offered in the fall semester, and 01:013:304 Introduction to Translation Studies (3) is regularly offered in the spring semester. The language practicum courses are offered according to student interest. If you are interested in pursuing the translation certificate, but a practicum course if not being offered in the language of your choice, please contact one of our full-time faculty members about taking 01:013:321 Independent Study: Language Practicum (3) to fulfill the certificate requirements.

In order to enroll in the translation certificate program, please contact the AMESALL department administrator, Michele Frishberg (mf532@amesall.rutgers.edu), with your name, RUID, and anticipated year of graduation (class). The translation certificate program is also available to nonmatriculating students (i.e., those not enrolled in a degree program).

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Courses

# Courses

**01:013:110** ***Introduction to Aramaic (3)***
Introduces students to study of Aramaic, including Aramaic portions of the Bible, by developing reading comprehension and vocabulary.
***Credit not given for both this course and 01:563:145 or 01:685:145.***

**01:013:111** ***The Bible in Aramaic (3)***
Introduction to Aramaic through biblical literature, including Aramaic Bible passages and vernacular translations into various Aramaic dialects, with a focus on Syriac version.
***In English. Credit not given for this course an 01:53:146 or 01:840:123.***

**01:013:120** ***Literary Egypt (3)***
Introduction to the works of Egypt's Nobel Laureate Naguib Mahfouz (1911-2006) dealing with conflict between tradition and modernity, faith and freedom, ambition and social mobility, and existential crisis of individuals in a corrupt and suffocating society.
***Credit not be given for this course and 01:074:120.***

**01:013:130** ***Comics in the Middle East (3)***
Introduction to the study of comics and graphic narratives in the Middle East. Genres and media include the comic strip, graphic novel, satirical cartoon, graffiti, and internet memes. We will also look at parallels between modern sequential art and premodern graphic narratives, such as illuminated manuscripts, and examine connections with

American and Japanese comics. No previous knowledge of Middle Eastern literatures or languages required. All readings are in English.
*Credit not given for both this course and 01:685:130.*

**01:013:140-141** *Elementary Arabic I,II (4,4)*
Introductory course in Modern Standard Arabic (MSA) for beginner students. Course emphasizes development of oral and written proficiency.
*Prerequisite for 141: 01:013:140, 01:074:140, or placement test. Credit not given for both this course and 01:013:145, 01:013:148-149, 01:074:140-141, or 01:074:148-149.*

**01:013:143-144** *Arabic Lab I,II (1,1)*
Instructor-guided laboratory practicum for improving oral proficiency practice in aural/oral skills and communication styles. Evaluation of pronunciation and fluency.
*Corequisite: 01:013:140-141. Not open to students with any level of prior knowledge of spoken and/or written Arabic.*

**01:013:145** *Accelerated Arabic (4)*
Introductory Arabic course designed for heritage learners, meaning those who have some proficiency in written or spoken Arabic. Covers all material in 01:013:140-141 Elementary Arabic I and II (4,4).
*Credit not given for both this course and 01:013:140, 01:013:141, 01:013:148, 01:013:149, 01:074:140, 01:074:141, 01:074:145, 01:074:148, or 01:074:149.*

**01:013:148-149** *Elementary Arabic for Arabic Speakers I,II (4,4)*
Introduction to Modern Standard Arabic (MSA) for students who have prior knowledge of Arabic script and spoken dialects, but not enough competencies to speak, read, or write MSA.
*Credit not given for both this course and 01:013:140-141, 01:013:145, or 01:074:140-141.*

**01:013:152-153** *Elementary Modern Hebrew I,II (4,4)*
Speaking, reading, and writing; oral-aural and written exercises.
*Prerequisite: Placement test to determine level of language competence. Not open for credit to students who have had two or more years of secondary school Hebrew. Credit not given for both these courses and 01:563:101-102 or 01:685:101-102.*

**01:013:154-155** *Biblical Hebrew I,II (3,3)*
Introduction to Biblical Hebrew, with a focus on basic grammar and lexicon, leading to reading ability and comprehension of simple narrative prose texts.
*Credit not given for both this course and 01:563:141-142.*

**01:013:156** *Hebrew Review and Continuation (4)*
Development of primary language skills.
*Prerequisites: Previous exposure to Hebrew and placement into Hebrew 121. Credit not given for both this course and 01:563:121. Prerequisite: 01:013:152.*

**01:013:160-161** *Elementary Hindi I,II (4,4)*
Introduction to sound, grammar, and writing system of Hindi; practice and exercises in speaking, reading, and writing. Continuation of Elementary Hindi I; practice and exercises in speaking, reading, and writing.
*Prerequisite for 161: 01:013:160. 01:505:160, or placement. Credit not given for both this course and 01:505:160-161.*

**01:013:162-163** *Elementary Urdu I,II (4,4)*
Introduction to Urdu, focusing on development of elementary-level proficiency in all four language skills.

**01:013:176** ***Elementary Persian I (4)***
Introduction to Persian, focusing on development of elementary-level proficiency in all four language skills.
***Credit not given for both this course and 01:723:176.***

**01:013:177** ***Elementary Persian II (4)***
Builds on skills acquired in Elementary Persian I. Focus on Persian orthography, spelling, grammar, vocabulary, and the four language skills. Emphasis on actively using the language for interpersonal, interpretive, and presentational modes of communication.
***Prerequisite: 01:013:176 or 01:723:176 or placement exam. Credit not given for this course and 01:723:177.***

**01:013:186-187** ***Elementary Swahili I,II (4,4)***
Introduction to Swahili, focusing on development of elementary-level proficiency in all four language skills.

**01:013:188** ***Introduction to Syriac (3)***
Introduction to reading and writing in Classical Syriac (Aramaic), with focus on understanding basic Syrian grammar and writing simple short texts in Syriac.

**01:013:190-191** ***Elementary Turkish I,II (4,4)***
Introduction to Turkish, focusing on development of elementary-level proficiency in all four language skills.
***Credit not given for both this course and 01:973:190-191.***

**01:013:192-193** ***Elementary Twi I,II (4,4)***
Introduction to Twi, focusing on development of elementary-level proficiency in all four language skills.
***Credit not given for both this course and 01:974:192-193.***

**01:013:201** ***Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)***
Survey of classical literary traditions of Africa, the Middle East, and South Asia in comparative context.
***Credit not given for both this course and 01:685:204.***

**01:013:202** ***Cinemas of Africa and Asia (3)***
Survey of the cinemas of Africa, the Middle East, and South Asia.

**01:013:203** ***Language and Society in Africa, the Middle East, and South Asia (3)***
This course is about language in society. It introduces language within its social context with special reference to African, Middle Eastern, and South Asian speech communities. It examines the interaction and inter-sectionality of language and variables such as power, class, ethnicity, gender, and education. It also looks at the range of articulations of politico-linguistic problems and challenges, including language conflicts, linguistic inequalities, and minority language rights.

**01:013:204** ***Introduction to Discourse Analysis (3)***
Introduction to theories, approaches, and methodologies for the study of socially situated language use. Multidisciplinary examination of written and spoken languages/texts to understand the linguistic qualities of language use and the impact of discourse on people's beliefs, attitudes, assumptions, actions, interactions, and social behaviors.

**01:013:205** ***Cultural Forces in International Politics (3)***
Exploration of cultural forces in world politics, with a focus on language and literature as important factors in the shaping of political relations across cultures and nations.

**01:013:206** *Banned Books (4)*
Global history of censorship with a focus on the political and cultural contexts of countries like the USA, Niger, Egypt, and India. How ideas in great books have been suppressed through debates about sedition, blasphemy, obscenity, and sexuality and strategies that people used to undermine that suppression, such as book smuggling, underground markets, exile, and translation.
*Credit not given for this course and 01:195:206.*

**01:013:208** *Jewish-Muslim Relations: History and Culture (3)*
Surveys the cultural history of Jewish-Muslim relations from the seventh century up to our present. Analyzes this important and unique aspect of Jewish and Muslim pasts and the place of the Jews in the cultural history of Islam. Course taught in English.
*Credit not given for both this course and 01:508:208 or 01:563:208.*

**01:013:210** *World Literature and Social Change (3)*
Critical investigation of diverse fiction from a global perspective with a particular ficus on social change in Africa, the Middle East, and South Asia.

**01:013:211** *Introduction to the Literatures of Africa (3)*
Literatures of Africa from their origins to the present.

**01:013:217** *African Immigrant Literature (3)*
A historical survey of the literary works of several writers from various parts of Africa living in Europe and the USA.
*Taught in English.*

**01:013:220** *Introduction to the Qur'an (3)*
Academic study of the Qur'an including the origin of the Qur'an, its role as a cultural and historical phenomenon; various controversies and disputes that have revolved around the Qur'an; different schools of thought regarding interpretation of the Qur'an; and development interpretative schools over time as the needs and understandings of any given society have developed. Taught in English. No prior knowledge of the Arabic or of the Qur'an is required.
*Credit not given for both this course and 01:840:229.*

**01:013:221** *Introduction to the Literatures of the Middle East (3)*
Literatures of the Middle East from their origins to the present.
*Credit not given for both this course and 01:195:221 or 01:685:221.*

**01:013:225** *Global Arabic (3)*
Traces the historical development of Arabic as a global language, the various meaning Arabic has come to acquire in various parts of the world, and the functions it has come to serve in different periods and different global spaces. Arabic's iterations with other languages and their sociolinguistic implications.
*Taught in English. Credit not given for this course and 01:685:225.*

**01:013:226** *Rhythms of Resistance: Global Hip Hop (3)*
Explores how hip hop is used across different cultural, linguistic, and geographical localities as an artistic technology for framing issues of racial, gender, sexual, political, economic, health, and philosophical concern.

**01:013:229** ***War and Literature in the Arab World (3)***
Examines war and literature through a multifaceted approach, exposing diverse experiences and perspectives that shape creative process of writing during times of high conflict and crisis. No previous knowledge of Middle Eastern languages or literatures assumed.

**01:013:231** ***Introduction to the Literatures of South Asia (3)***
Literatures of South Asia from their origins to the present.
***Credit not given for both this course and 01:195:243. All works studied in translation.***

**01:013:232** ***Women Writers of South Asia (3)***
Survey of recent writings by women from a variety of cultural, linguistic, and regional areas of South Asia.
***Credit not given for both this course and 01:195:232 or 01:988:232.***

**01:013:240-241** ***Intermediate Arabic I,II (4,4)***
Continued development of oral and written proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisites: 01:013:141, 01:013:145, 01:074:141, 01:074:145, or placement. Credit not given for both this course and 01:074:240-241.***

**01:013:243** ***Classical Arabic (3)***
Introduction to classical and Qur'anic Arabic.
***Prerequisites: 01:013:141 or 01:074:141 or equivalent.***

**01:013:244** ***Egyptian Arabic I (3)***
Introduction to Egyptian Arabic or masri, most widely spoken of Arabic vernaculars, with focus in speaking, listening, writing, and reading, with an eye to future study in Egypt.
***Credit not given for both this course and 01:074:244.***

**01:013:245** ***Arabic Graphic Narratives (3)***
Introduction to Arabic graphic narratives (comics, graphic novels, newspaper cartoons, graffiti, and internet memes) in global context in translation. No previous knowledge of Middle Eastern languages or literatures assumed.

**01:013:252-253** ***Intermediate Modern Hebrew I,II (4,4)***
Development of language skills; selected readings.
***Prerequisite: 01:013:152, 01:685:102, 01:563:102, or placement. Credit not given for both these courses and 01:563:131-132 or 01:685:131-132.***

**01:013:260-261** ***Intermediate Hindi I,II (4,4)***
Continued development of oral and written proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisite: 01:505:161 or 01:013:161 or placement. Credit not given for both this course and 01:505:260-261.***

**01:013:266** ***Ancient Egypt (1.5)***
Introduction into ancient Egypt. Topics include a historical overview, religion, art, interconnections between ancient Egypt and ancient Israel, and Hieroglyphic Egyptian language and literature.
***Credit not given for both this course and 01:563:266.***

**01:013:276-277** ***Intermediate Persian I,II (4,4)***
Continued development of oral and written proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisite: 01:013:177 or 01:723:177 or placement. Credit not given for both this course and 01:723:276-277.***

**01:013:280-281** ***Intermediate Sanskrit I,II (4,4)***
Reading of intermediate-level Sanskrit technical literature: grammar, logic, and textual exegesis.
***Prerequisite: 01:013:181 or permission of instructor.***

**01:013:285** ***Language and Globalization (3)***
Linguistic and sociolinguistic dimensions of globalization and current debates surrounding language and globalization.

**01:013:286-287** ***Intermediate Swahili I,II (4,4)***
Continued development of oral and written proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisite: 01:013:187.***

**01:013:290-291** ***Intermediate Turkish I,II (4,4)***
Continued development of oral and written proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisite: 01:013:191 or 01:973:191 or placement. Credit not given for both this course and 01:973:290-291.***

**01:013:292-293** ***Intermediate Twi I,II (4,4)***
Continued development of oral and written proficiency. Elementary literacy material. Detailed exploration underlying linguistic structures of the language.
***Prerequisite: 01:013:193 or placement.***

**01:013:294-295** ***Intermediate Yoruba I,II (4,4)***
Continued development of written and oral proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisite: 01:013:134 or 01:013:195.***

**01:013:301** ***Topics in African, Middle Eastern, and South Asian Languages and Literatures (3)***
Variable content. Studies in particular ideas, themes, forms, and historic units in literature, linguistics, or sociolinguistics in one or more regions covered by AMESALL.

**01:013:302** ***Topics in African, Middle Eastern, and South Asian Languages and Literatures (1.5)***
Variable content. Studies in particular ideas, themes, forms, and historic units in literature, linguistics, or sociolinguistics in one or more regions covered by AMESALL.

**01:013:304** ***Introduction to Translation Studies (3)***
Introduction to the main themes and issues in contemporary translation studies.

**01:013:305** ***Languages in Peril: African, Middle Eastern, and South Asian (3)***
Introduction to local languages, their scientific and cultural value, and the threat posed by their extinction, with a focus upon the endangered languages of Africa and Asia.

**01:013:307** ***Introduction to Postcolonial Literatures and Theories (3)***
Study of novels, poetry, essays, and films from regions of the world deemed postcolonial, which may include Africa, Latin America, South and Southeast Asia, and the Caribbean, among others. Discussion of major issues in postcolonial theory and criticism.
***Credit not given for both this course and 01:195:307.***

**01:013:308** ***Minorities in the Middle East (3)***
Examination of various ethno-linguistic and religious minority groups, their origins, their oral and written literatures, their recent history (from 1798 onwards), their current status, and their future prospects, and how these factors influence their experiences of and perspectives on the world.
***Credit not given for both this course and either 01:685:306 or 01:840:306.***

**01:013:311** ***Women Writers of Africa (3)***
Survey of recent writings by women from a variety of cultural, linguistic, and regional areas of Africa.
***Credit not given for both this course and 01:195:363.***

**01:013:312** ***African Folklore and Myth (3)***
Survey of the folklore of Africa and the African diaspora.

**01:013:314** ***Islam and African Literature (3)***
Impact of Islam on African literature, and Islam as a theme of literary expression.
***Credit not given for both this course and 01:840:377.***

**01:013:315** ***Political Thought in African Literatures (3)***
Literatures of Africa as an instrument of political thought and political activism.

**01:013:316** ***African Literature of the South Asian Diaspora (3)***
Imaginative works of writers of the South Asian diaspora in East Africa and Southern Africa.

**01:013:320** ***The Ottoman Middle East: Politics, Culture, Literature (3)***
A study of the sociocultural atmosphere of the Middle East in the late 19th-early 20th century under Ottoman rule.

**01:013:322** ***Middle Eastern Folklore and Myth (3)***
A survey of the folklore of the Middle East, with a focus upon Jewish, Christian, Mandaean, and Muslim folktales from Iraq and the Levant.
***Credit not given for both this course and 01:685:323.***

**01:013:324** ***Ottoman Africa (3)***
Cultural legacy of Ottoman-Turkish rule in Africa during 19th century in context of radical political and cultural shifts, through historical narratives, novels, short stories, essays, articles, and poetry.

**01:013:325** ***Women Writers of the Middle East (3)***
Survey of recent writings by women from a variety of cultural, linguistic, and regional areas of the Middle East.

**01:013:326** ***Orhan Pamuk (3)***
Introduction to Turkish Nobel Prize laureate Orhan Pamuk through novels, essays and articles, interviews and autobiographical narratives, offering practical instruction in literary and cultural criticism.

**01:013:331** *Modern Literatures of South Asia (3)*
Literary works from modern South Asia.
*Credit not given for both this course and 01:195:249. All works studied in translation.*

**01:013:334** *The Modern Indian Woman (3)*
Course focuses on how representations of women have shaped ideas of modern Indian citizenship and belonging in colonial and postcolonial periods.

**01:013:335** *Caribbean Pluralities and Indo-Caribbean Literature (3)*
A study of some of the major canonical works of the Anglophone Caribbean and Indo-Caribbean writers.
*Credit not given for both this course and 01:195:335 or 01:195:338.*

**01:013:337** *Film and Literature in South Asia (3)*
A critical study of a wide range of South Asian films and the literary works they are based on/inspired by.

**01:013:340-341** *Advanced Arabic I,II (3,3)*
Reinforcement of oral and written proficiency developed within a cultural context. Comprehensive understanding of linguistic structures. Readings in literature.
*Prerequisite: 01:013:241 or 01:074:241 or permission of instructor. Credit not given for both this course and 01:074:340-341.*

**01:013:342** *Modern Arabic Literatures (3)*
Survey of representative works of modern Arabic literature in translation, including poetry, the novel, the short story, and plays.
*Credit not given for both this course and 01:195:365.*

**01:013:343** *Arabic Classical Literatures (3)*
Survey of a wide selection of Arabic literary texts in translation, dating from the sixth to the 12th centuries, including poetry and prose in both classical and colloquial Arabic.
*Credit not given for both this course and 01:195:237. All works studied in translation.*

**01:013:346** *Literature and Memory in the Arab World (3)*
The course explores the interconnections between memory and literature through close readings of memoirs, novels, poems, short stories, films, and graphic art.
*Credit not given for both this course and 01:195:337 or 01:685:347.*

**01:013:352-353** *Advanced Modern Hebrew I,II (3,3)*
Intensive training in Hebrew grammar and reinforcement of already acquired higher-level language skills: speaking, listening, comprehension, reading, and writing. Text analysis includes newspaper articles and essays.
*Prerequisite: 01:563:132, 01:685:132, 01:103:253, or placement. Credit not given for both these courses and 01:563:210-211 or 01:685:210-211.*

**01:013:354** *Contemporary Hebrew Literature and Media (3)*
Addresses current issues facing Israeli society as reflected in Israeli literature and press. Texts include poetry, songs, essays, newspaper articles, and films.
*Prerequisite: 01:563:211 or 01:013:353 or placement. Credit not given for both this course and 01:563:371.*

**01:013:355** ***Introduction to Modern Israeli Literature (3)***
Introduces students to major writers of modern Hebrew literature with the goal of developing their own critical reading and writing skills. Readings include modern Hebrew poetry, prose, and plays.
***Credit not given for both this course and 01:563:372.***

**01:013:360-361** ***Advanced Hindi I,II (3,3)***
Reading, textual analysis, and content discussion of selected short essays from Hindi newspapers, fictional works, and ethnographic material. Introduction to Hindi discourse structure.
***Prerequisite: 01:013:261 or 01:505:261. Credit not given for both this course and 01:505:360-361.***

**01:013:365** ***Bollywood (3)***
A broad overview of the Bollywood industry and its cinematic productions over the years.
***Credit not given for both this course and 01:175:365.***

**01:013:372** ***Islamic Mystical Literatures (3)***
Examines literary output of mystics in Islamic world. Main focus will be on mystical teachings, although attention will be also paid to literary genres, including not only poetry of various forms and from diverse regions and periods, but also biography and modern novels, all in English translation.
***Credit not given for both this course and 01:840:372.***

**01:013:376-377** ***Advanced Persian I,II (3,3)***
Reinforcement of oral and written proficiency developed within a cultural context. Comprehensive understanding of linguistic structures. Readings in literature.
***Prerequisite: 01:013:277 or placement. Credit not given for both this course and 01:723:376-377.***

**01:013:386-387** ***Advanced Swahili I,II (3,3)***
Reinforcement of oral and written proficiency developed within a cultural context. Comprehensive understanding of linguistic structures. Readings in literature.
***Prerequisite: 01:013:287 or 01:956:287 or placement.***

**01:013:390-391** ***Advanced Turkish I,II (3,3)***
Reinforcement of oral and written proficiency developed within a cultural context. Comprehensive understanding of linguistic structures. Readings in literature.
***Prerequisite: 01:013:291 or placement. Credit not given for both this course and 01:973:390-391***

**01:013:392-393** ***Advanced Twi I,II (3,3)***
Develop advanced-level proficiency in all four language skills: writing, speaking, listening, and reading Twi (Akan).
***Prerequisite: 01:013:293 or placement.***

**01:013:401** ***Senior Seminar in Literature and Society (3)***
Advanced seminar on critical theories and methods of analysis related to modern and contemporary literatures of Africa, Middle East, and South Asia.
***Prerequisites: 01:013:201. Open only to students with senior standing or by permission of instructor.***

**01:013:402** ***Advanced Topics in African, Middle Eastern, and South Asian Languages and Literatures (3)***
Variable content. Advanced studies in particular ideas, themes, forms, and historic units in literature, linguistics, or sociolinguistics in one or more regions covered by AMESALL.

**01:013:403-404** ***Translation Practicum I,II (3,3)***
Practical course in translation into English.***Prerequisites: 01:013:304.***

**01:013:409** ***Introduction to the Semitic Languages (3)***
Survey of the Semitic languages and their history from a comparative perspective.
***Prerequisite: One year of a Semitic language (such as Hebrew or Arabic) or permission of instructor. Credit not given for both this course and 01:563:409.***

**01:013:410** ***African Immigrant Voices (3)***
An examination of the literary works of African immigrant writers in the United States and Europe.

**01:013:412** ***Literature and Religion (3)***
Addresses relationship between literature and religion through close reading of select literary works and survey of major schools of interpretation within contemporary literary and cultural criticism.

**01:013:430** ***Gender, Nation, and Literature in South Asia (3)***
Course focuses on how representations of women have shaped ideas of modern Indian citizenship and belonging in colonial and postcolonial periods.
***Credit not given for both this course and 01:195:430 or 01:988:431.***

**01:013:432** ***Readings in Modern Hindi Literature (3)***
Introduces students to modern Hindi literature and its various genres. Course conducted entirely in Hindi.
***Prerequisite: 01:013:261 or 01:505:261. Credit not given for both this course and 01:505:432.***

**01:013:433** ***Modern Urdu Literature and Popular Culture (3)***
Introduces students to modern Urdu literature and popular culture in various genres and cultural contexts. Provides overview of diverse manifestations of South Asian culture and history in Urdu literature. Conducted entirely in Urdu.

**01:013:442** ***Readings in Modern Arabic Literature (3)***
Critical readings of selected short stories from the modern Arab world.
***Prerequisite: Advanced Arabic 01:013:341, near-native proficiency in Arabic, or permission of instructor. Credit not given for both this course and 01:074:442.***

**01:013:445** ***Storytelling in the Muslim World (3)***
Exploration of storytelling traditions from culturally diverse communities of the Muslim world, from medieval times to present.

**01:013:452** ***Readings in Modern Hebrew Literature (3)***
Reading and analysis of modern Hebrew poetry and short prose, with an emphasis on major Israeli authors.
***Prerequisite: 01:563:372 or 01:013:355 or placement. Credit not given for both this course and 01:563:471.***

**01:013:453** ***The Hebrew Novel (3)***
Reading and analysis of the modern Hebrew novel, with an emphasis on major Israeli authors.
***Prerequisite: 01:563:372, 01:013:355, or placement. Course taught in Hebrew. Credit not given for both this course and 01:563:472.***

**01:013:454** ***Love and Desire in Hebrew Prose and Poetry (3)***
Explores the themes of love and desire in modern Hebrew prose, poetry, and film. Special attention paid to how the literature and films handle the issues of love, desire, and personal relationships in contemporary Israeli culture.
***Prerequisite: 01:563:372, 01:013:355, or placement. Course taught in Hebrew. Credit not given for both this course and 01:563:484.***

**01:013:455** ***Hebrew Literature and Israeli Society (3)***
Traces the development of modern Israeli literature, from the establishment of the state of Israel in 1948 to the present day. Of special interest will be the manner in which these stories define the quintessential Israeli hero and contend with the question of Israeli identity.
***Prerequisite: 01:563:372, 01:013:355, or placement. Course taught in Hebrew. Credit not given for both this course and 01:563:485.***

# Africana Studies 014 (SAS)

## AFRICANA STUDIES 014

Department of Africana Studies, School of Arts and Sciences

**Website:** Here

**Chair:** Alex Zamalin

**Undergraduate Director:** Walton Johnson

**Professor:**

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Walton R. Johnson, B.A., Oberlin College; M.A., Ph.D., London

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Edward Ramsamy, B.A. (Hons), Durban-Westville (South Africa); M.C.R.P., Ph.D., Rutgers

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**Assistant Professors:**

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JT Roane, B.A., University of Virginia; M.A and MPhil, Columbia; Ph.D. Columbia

**Assistant /Teaching Professor:**

Kavitha Ramsamy, B.A., M.A., Ph.D., Rutgers

**Professor Emeritus:**

Leonard L. Bethel, B.A., Lincoln (Pennsylvania); M.A., New Brunswick Theological Seminary; M.Div., Johnson C. Smith; Ed.D., Rutgers

Africana Studies 014 (SAS)

# Learning Goals

# Learning Goals

To develop students' knowledge of African-American, African, and Caribbean cultural, social, political, and economic experiences; to teach students the value of multidisciplinary scholarship; to equip students with intellectual and interpersonal skills that will enable them to function in a variety of professional careers; to produce graduates who use scholarship in the service of social justice. Majors will be able to demonstrate knowledge of the interrelated experiences of African people in Africa, America, and in other parts of the African diaspora, including their history, philosophy, cultures, and contemporary issues; apply the research methodologies appropriate to Africana studies; and employ critical and analytical skills with respect to Africa and its diaspora.

Africana Studies 014 (SAS)

# Major Requirements

# Major Requirements

The major in Africana studies requires the satisfactory completion of 11 courses (3 credits each) in the department, with a grade of C or better. These 11 courses are comprised of four required courses and seven elective courses. At least six of the courses credited toward the major must be at the 300 or 400 level. Students are encouraged to take courses offered by other departments pertaining to their area of concentration or interest. Two of those courses may be applied toward the major. Study abroad is strongly recommended for Africana studies majors. The department offers assistance in long-term curriculum planning and in securing financial aid. Students participating in one- or two-semester study abroad programs in countries of the African diaspora--Brazil, Costa Rica, Ghana, Kenya, Morocco, Namibia, and South Africa--can receive course credit (in consultation with the chair) toward the Africana studies major or minor.

The compulsory core courses are:

01:014:103 Introduction to Africana Studies (3)

01:014:203 or 204 The Black Experience in America (3)

01:014:233 Introduction to the Methodology of Africana Studies (3)

01:014:490 Seminar in Africana Studies (3)

Africana Studies 014 (SAS)

# Minor Requirements

# Minor Requirements

The minor in Africana studies consists of six semester courses (of at least 3 credits each) offered by the department, including 01:014:103 Introduction to Africana Studies, 01:014:203 or 204 The Black Experience in America, and 01:014:490 Seminar in Africana Studies. At least three of these six courses must be at the 300 level or above. Students must earn a grade of C or better in all courses counted toward the minor.

Africana Studies 014 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify for departmental honors, an Africana studies major must have a cumulative grade-point average of 3.0 or better and a cumulative grade-point average of 3.4 or better in Africana studies. The department awards a Paul Robeson Africana Prize to students graduating with honors. In order to graduate with highest honors, a student must participate in the departmental honors project, or, upon petition and with the approval of the faculty, a student may participate in the School of Arts and Sciences Honors Program.

Africana Studies 014 (SAS)

# The Africana Studies Scholars Project

# The Africana Studies Scholars Project

The department sponsors the Africana Studies Scholars Project, a two-semester, 12-credit (01:014:497-498) senior-year course for honors majors in the discipline. To be eligible, students must have a cumulative grade-point average of 3.0 or better and a cumulative grade-point average of 3.4 or better in Africana studies by the end of the junior year. They also must have completed 01:014:103 Introduction to Africana Studies, 01:014:203 or 204 The Black Experience in America, 01:014:233 Introduction to the Methodology of Africana Studies, and three electives at the 300 or 400 level.

Africana Studies 014 (SAS)

# African Diaspora Field Study

# African Diaspora Field Study

The Department of Africana Studies sponsors a course 01:014:495 African Diaspora Field Study, which allows students to study, firsthand, the cultures of the African diaspora through collaborations with foreign institutions and university study abroad programs.

Africana Studies 014 (SAS)

# Courses

# Courses

**01:014:101** ***Topics in Africana Studies (1.5)***
Analysis of special topics in Africana studies from an interdisciplinary perspective. Course focuses on issues affecting people of African descent in continental Africa, the United States, and throughout the global African diaspora.

**01:014:103** ***Introduction to Africana Studies (3)***
Interdisciplinary survey of the social, economic, political, and historical aspects of the black experience in America and abroad.

**01:014:107** ***African-American Folklore (3)***
Introductory course on the forms and applications of African-American folklore.

**01:014:130** ***African-American Literature (3)***
Contemporary African-American expressive literatures--poetry, critical essays, novels, films, folklores, plays--analyzed for cosmology, style, structure, and content.

**01:014:132** ***Black Experience and Film Medium (3)***
Critical evaluation of images of blacks in films. Screening of films.

**01:014:140** ***Introduction to American Cultures (1.5)***
Develops an understanding of the historical, social, and political factors that distinguish the diverse cultures of present-day America.
***Credit not given for both this course and 01:512:140.***

**01:014:201** ***African Belief Systems and the Latino Community (3)***
Historical examination of ancestor worship, Santeria (Cuba), Vodun (Santa Domingo), Espiritismo (Puerto Rico), and other African-based belief systems. Formation from African to slave societies and use in contemporary period.
***Credit not given for both this course and 01:595:201.***

**01:014:202** ***What Everyone Should Know about "Race" (3)***
Race is a powerful social construct that is central to understanding life in the 21st century, both in the United States and abroad. Through analysis of the historical, biological, political, social, psychological, and economic dimensions of race, from multiple theoretical perspectives, this course provides a solid grasp of a complex and frequently bewildering phenomenon.

**01:014:203,204** ***The Black Experience in America (3,3)***
Interdisciplinary examination of African Americans within the context of American political economy, special conditions of oppression, responses to exploitation, and resultant social changes.
***Credit not given for both 01:014:203 and 01:050:246.***

**01:014:205** ***Islamic Civilization (3)***
Survey of Islamic societies from seventh-century Arabia to modern times. Religious, political, military, social, economic, and cultural institutions and organizational patterns.
***Credit not given for both this course and 01:508:201.***

**01:014:206** ***The Black Woman (3)***
Role of black women in survival and evolution of the black race as presented in fictional and nonfictional literature.
***Credit not given for both this course and 01:988:206.***

**01:014:207** ***Black Male Identity in the United States (3)***
Examines historical, sociological, psychological, and political factors that influence the identity of black men in the United States.

**01:014:208** ***The Sociology of Black Economic Development (3)***
Socioeconomic, spatial, and political development of alternatives to minority or black capitalism within the local, regional, and national development strategies of the United States.

**01:014:209** ***Mentoring and Civic Responsibility (1.5)***
Introduces prospective mentors to competencies that will aid them to serve as peer mentors with a focus on mentoring students who are first-generation, low-income, and/or underrepresented in higher education.
***Prerequisite: By special permission.***

**01:014:210** ***Africa: Continent of the Future? (3)***
Introduction to the history, culture, politics, and development of Africa. Corrects some dominant myths and stereotypes about the continent that abound in the American mainstream.

**01:014:211** ***Experimental Blackness (3)***
Introduction to the use of experiments in social science research through an exploration of how experiments have been used to investigate a variety of social phenomena such as how Black Americans encounter housing and employment discrimination; the impact of neighborhood change on poverty; and how bias underpins police behavior. Analysis of how these experiments are designed and implemented, and how the data they produce are analyzed.

**01:014:212** ***Politics and Power in Modern Africa (3)***
Social and political changes in 20th-century Africa, with an emphasis on South Africa since 1950.

**01:014:213** ***Blacks in History (3)***
Roles played by Africans and people of African descent in world history. An African-centric approach to historical inquiry.

**01:014:214** ***Feeling Race: The Emotional Politics of Race (3)***
Analysis of the role of emotions in understanding racism and racial politics, using the fields of psychology, biology, sociology, political science, law and Black studies.

**01:014:215** ***Contemporary Issues and Their Background (3)***
Key controversial issues important to understanding the contemporary black experience. Primary focus on three basic dimensions: double-consciousness, decolonization and neocolonialism, and cultural control. Systematic conceptual analysis.

**01:014:222** ***The Black Elite (3)***
Emergence of a black elite; social relationships with the white community and the black masses.

**01:014:223,224** ***Independent Study (1-4,1-4)***
***Prerequisites: 01:014:103, a minimum of 9 credits in department or approved equivalent, and good academic standing. Faculty proctor required. Registration by permission only.***

**01:014:230** ***Psychology of the Black Experience (3)***
Evaluation of psychological principles, theories, and assessment techniques in relation to the personality and behavioral development of African Americans.

**01:014:233** ***Introduction to the Methodology of Africana Studies (3)***
Introduction to Africana studies through lectures, multidisciplinary approaches to the study of Africana materials, original research projects, and introduction to major archival resources.

**01:014:235** ***Global Black Asian Encounters (3)***
General introduction to encounters and intersections between Blacks and Asians in a global context, exploring identities, solidarities, conflicts, and social movements.

**01:014:237** ***Decolonizing God: Religion and Resistance in the African Diaspora (3)***
Role of religion and spiritual practices in African and African-descended communities in strategies for both survival and liberation. Role of religious traditions such as Rastafari in Jamaica, Vodou in Haiti, Lucumí/Santeriá in Cuba, and the Black Church and Islam in the United States in the identities, cultures and liberation struggles of Black people and their resistance to the oppressive structures that defined their lives throughout the diaspora.

**01:014:240** ***Third-World Creative Writing (3)***
Third-world contemporary prose classics as models of creative expression and as a basis for creative writing exercises, geared to meet individual aptitudes, needs, and interests.

**01:014:250** ***African Diaspora Cultural History (3)***
Introductory survey of the African roots of American and world cultures, focusing on their history and processes of culture change. Survey of African-based arts and cultural expressions in the diaspora.

**01:014:255** ***History of Black Education in the United States (3)***
Principles and policies underlying the educational process among blacks; social and political impact.

**01:014:258** ***Intellectual Thought in the African Diaspora (3)***
Basic social and political ideas in the history of black ideology.

**01:014:264** ***Black Lives Matter (3)***
Explores the development of the #BlackLivesMatter movement beginning with the colonial era and ending with the contemporary moment.

**01:014:265** ***Afro-Brazilian History (3)***
Overview of history of largest African diaspora community in world. Encourages critical analysis of major issues in African-Atlantic diaspora studies. Principal scholarship supplemented with selected readings in literature, oral history, Afro-Brazilian movement documents, and iconography.
***Credit not given for both this course and 01:508:265 or 01:590:265.***

**01:014:269** ***Black Religion (3)***
Social, philosophical, historical, and sociopsychological understanding of black America's oldest and largest institution. Influence in economic, political, social, and spiritual life of the black community.

**01:014:274** ***Black Civilizations (3)***
Introduction to ancient and medieval black African civilizations with emphasis on the political and religious thought and technological achievement of African empires.

**01:014:276** ***Black Social and Political Development (3)***
Survey of the recent trends regarding health, unemployment, poverty, economics, electoral politics, and international relations.

**01:014:285** ***African-American Narrative Analysis (3)***
Collection and analysis of African-American narrative material. Evaluation based on various analytical structures and approaches.

**01:014:286** ***Mentoring as Public Service I (3)***
Introduces students to the Rutgers Future Scholars (RFS) program and the basic skills, practices, and ethics of mentoring. Examines contemporary inequalities and barriers to access higher education and initiatives to address educational access. Required weekly meetings with RFS high school students.
***Prerequisite: By special permission.***

**01:014:301,302** ***Topics in Africana Studies (3,3)***
Analysis of special topics in Africana studies from an interdisciplinary perspective. Course focuses on issues affecting people of African descent in continental Africa, the United States, and throughout the global African diaspora.
***May be repeated for credit when topic differs.***

**01:014:303** ***Seminar in Black Diasporic Media (3)***
Examines a range of visual media by black cultural producers. Offers a diasporic framework as an opportunity to trace how technologies, genres, styles, and issues circulate through various historical moments, media, conceptualizations of blackness, and locations.
***Credit not given for both this course and 01:050:311.***

**01:014:304** ***Afromusicology (3)***
Various forms of African-American music: spiritual, gospel, blues, folk, and jazz. African and Western influences: role, development patterns, and function in sociocultural context.

**01:014:305** ***Race, International Law & Empire (3)***
Critical examination of the role of international law establishing racial regimes in a global order using TWAIL (Third World Approaches to International Law). Topics may include laws of armed conflict, international criminal law, sovereignty, self-determination, and human rights using an interdisciplinary approach combining law, history, anthropology, geography, and political science. Credit not given for this course and 01:202:315.

**01:014:306** ***The Black Woman in Political Context (3)***
Takes political-historical approach from precolonial traditional African women to contemporary black feminism and liberation; emphasis on the black woman's distinct consciousness, family relationships, organizations, institutions, political activities, and revolutionary ideologies.

**01:014:307** ***Africana Community Health Care Experience: Perspectives from Patients and Physicians (3)***
Admission by special permission only. Mentoring and "shadowing" a physician or another health care provider including weekly observation, reflection, and study of factors impacting African American health.
***Prerequisite: 01:014:347***

**01:014:316** ***Caribbean Society in Literature (3)***
Introduction to the political, social, and historical life of the Caribbean (Jamaica, Trinidad, Barbados, Guyana, and St. Lucia) through the novels, poems, and essays of its writers.

**01:014:317** ***Black Profiles (3)***
Portrayal of the movements and events of Africa and dispersion through studies of black leaders--their lives, works, and writings.

**01:014:318** ***Bigotry, Prejudice, and Racism: Psychological Foundations (3)***
Basic conscious and unconscious psychological factors in racist behavior and attitudes. Evaluation of explanatory theories and empirical data as presented by contemporary psychiatrists and psychologists.

**01:014:321** ***African Presence in American Cultures (3)***
Examination of African influence on black life and culture in the New World--on language, art, music, and cuisine.

**01:014:323** ***Seminar in the Philosophy of Africana Studies (3)***
Disciplinary problems involved in constructing a paradigm for the philosophy of the discipline.

**01:014:330** ***Contemporary Issues in Southern Africa (3)***
Examines contemporary events in Southern Africa with particular focus on the transition in South Africa from apartheid to democracy.

**01:014:340** ***Third-World Writing and Criticism (3)***
Essays in literary criticism with third-world prose classics as a basis for critiques. Study of the short story and exercises in short-story writing.

**01:014:341,342** ***Supervised Community Placement (3,3)***
Supervised study and experience in a black community of the United States, the Caribbean, South America, or Africa.

**01:014:347** ***Health Issues in the African-American Community (3)***
Health problems affecting black communities and their relevance to understanding black political, social, and psychological attitudes.

**01:014:349** ***Topics in American Politics (3)***
Special topics in American politics that vary with the instructor.
***Prerequisite: Special permission. Credit not given for both this course and 01:790:349.***

**01:014:350** ***African-American Linguistics (3)***
Historical and varying manifestations of black English in the Western hemisphere.

**01:014:353** ***Black Community Law and Social Change (3)***
Origins of racism in the judicial process and its effects on the black community since slavery.

**01:014:355** ***Blacks and Economic Structures (3)***
Scope and organization of economic activity in the black community; investments, ownership of capital, exploitation of the consumer and wage earner.

**01:014:356** ***Muslims and Islamic Institutions in America (3)***
Explores the bonds of the Muslim community, the meaning of Muslim-American identity, how immigrant groups are assimilating into American society, and how institutional frameworks are adopted for national integration.
***Credit not given for both this course and 01:685:355.***

**01:014:357** ***Islam in the Global Black Experience (3)***
Examination of the sociopolitical dimensions of Islam in Africa and the African diaspora, and the interactions between Islam and such ideologies as nationalism and race consciousness in black communities internationally.

**01:014:359** ***Race, Culture, and Politics: Blacks and Jews in America (3)***
How Black and Jewish identities have evolved in relationship to one another through an examination of social and political history, literature, and film.
***Credit not given for both this course and 01:050:359 or 01:512:359 or 01:563:359.***

**01:014:360** ***Writers of Africa and the New World (3)***
Comparison of black writers of Africa, the United States, and the Caribbean, with focus on areas of commonality and divergence.

**01:014:362** ***Black Identity, Religion, and Politics (3)***
Analysis of social, psychological, and institutional forces shaping group and individual identity of blacks.

**01:014:363** ***Race, Class, Gender, and Schooling (3)***
Examines racial and gender differences in adolescents' school performance. Structural, historical, and cultural foci. Ethnographic and autobiographical cases of black students and other students of color.
***Pre- or corequisite: 01:070:101 or permission of instructor. Credit not given for both this course and 01:070:363 or 01:988:363.***

**01:014:365** ***Black Migration and Urbanization (3)***
Black migration to industrial-urban centers; problems of urbanization. Present interrelationships among racial demography, ecology, social psychology, and the planning process within cities.
***Credit not given for both this course and 01:050:371.***

**01:014:366** ***The History of Race and Sex in America (3)***
Examines how race and gender have independently and jointly determined life chances throughout American history.
***Credit not given for both this course and 01:512:366 or 01:988:329.***

**01:014:367** ***African Labor History (3)***
Precolonial and colonial labor mobilization, control, and resistance; working class formation; the labor process and worker consciousness.
***Credit not given for both this course and 01:508:420.***

**01:014:369** ***Black Theology (3)***
Exploration into theological concepts, terms, and expressions as they relate to the African and the African American.
***Pre- or corequisite: 01:014:269.***

**01:014:370** ***The Afro-Atlantic Diaspora (3)***
Introduction to history of African diaspora in the Americas and the Caribbean. Traces origins and development of the Atlantic slave trade and the creation of new African-based cultures in the Americas.

**01:014:371** ***The New Scramble for Africa (3)***
Analysis of the historical, political, demographic, economic, and sociocultural problems of African underdevelopment within world spatial structure and the contemporary scene.
***Prerequisite: 01:014:212.***

**01:014:376** ***Pan-African Movement (3)***
Pan-Africanism and its development among the black elite on both sides of the Atlantic from the early 19th century to the present.

**01:014:380** ***Blacks in Science: Ancient and Modern (3)***
Lost sciences of inner Africa; African contributions to early dynastic Egyptian science and, with Arabs, to medieval Moorish science; African-American science and invention.
***Pre- or corequisite: 01:014:274 or 321.***

**01:014:381** ***Politics of Black America (3)***
Political perspectives and strategies of black Americans and the responsiveness of the American political system to the interests and demands of the black community.
***Credit not given for both this course and 01:790:334.***

**01:014:382** ***Politics of Minority Coalitions (3)***
Exploration of the politics surrounding the efforts to build viable coalitions among various minority groups within the United States.

**01:014:383** *Everyday Forms of Resistance (3)*
How ordinary citizens forge ways to address the political system when, for various reasons, "normal" channels are unavailable. Activities include social movements and everyday forms of resistance.

**01:014:384** *The Black Community and Social Issues (3)*
Examines a variety of social issues that impact the life chances of African Americans in the United States.
*Credit not given for both this course and 01:050:370.*

**01:014:385** *Mentoring as Public Service II (3)*
Part two of the Rutgers Future Scholars (RFS) mentoring course. In-depth analysis of mentoring and practical experience. Topics include urban education, youth activism and advocacy, school-to-prison pipeline, and other issues affecting historically underserved communities. Required weekly meetings with RFS high school students.
*Prerequisites: 01:014:286. By special permission.*

**01:014:386** *African Americans and Sports (3)*
The role that sports have played in African Americans' quest for freedom and equality in American society. The notion that African Americans' success on sports fields translates into success in the larger American society is critically examined.

**01:014:404** *Race in Today's World (3)*
Theoretical analysis of the structure of race relations, and evaluation of its relevance to research in today's world.

**01:014:413** *Colonialism and Neocolonialism (3)*
Political and economic aspects of colonialism. Colonized mind and behavior as portrayed by such authors as Mannoni, Balandier, Memmi, and Fanon. Neocolonialism as a technique of control.

**01:014:418** *Major African-American Writers (3)*
Study of one to three major African-American writers, such as Richard Wright, Ralph Ellison, James Baldwin, Langston Hughes, and Imamu Baraka; social implications of their creative work.

**01:014:423** *Black Thought: A Philosophical Inquiry (3)*
Investigation into a notion of a black philosophy as various philosophical terminologies are explored.
*Prerequisite: 01:014:323.*

**01:014:436** *Segregation and Health (3)*
The connection between black-white health disparities and black-white residential segregation.
*Credit not given for both this course and 11:374:436.*

**01:014:460** *Methodologies in Africana Studies Research (3)*
Techniques of research. Historical and contemporary research models used. Methodologies and theories of research.

**01:014:461** *African Political Economy (3)*
Examination of the explanation for the contradictions between Africa's wealth and apparent poverty. Analysis of various national development paths, such as capitalism, African socialism, Ujamaa, and communism.

**01:014:481** ***The Black Family (3)***
Consideration of the black family in historical and contemporary contexts: nuclear versus extended families; two-parent and female-headed households; rural and urban environmental effects.
***Prerequisite: Junior, senior, or graduate standing. Recommended: Previous seminar coursework.***

**01:014:490** ***Seminar in Africana Studies (3)***
Independent research under faculty guidance, or classroom orientation focusing on a major topic exploring the black experience.

**01:014:491,492** ***Independent Study (1-4,1-4)***
***Prerequisites: 01:014:233, a minimum of 18 credits in department or approved equivalent, and good academic standing. Faculty proctor required. Registration by permission only.***

**01:014:495** ***African Diaspora Field Study (3)***
Social and cultural study of selected communities of the African diaspora including African heritage, historical development, and analysis of contemporary issues.
***Prerequisite: Appropriate foreign language competency for non-English speaking locations.***

**01:014:497-498** ***Africana Studies Scholars Project (6,6)***
To graduate with highest honors, students must participate in this departmental honors project or, with approval, substitute the School of Arts and Sciences (SAS) Honors Program.
***Both semesters must be completed to receive credit.***

# Agriculture and Food Systems 020 (SEBS)

## AGRICULTURE AND FOOD SYSTEMS 020

**Degree:** B.S.

**Director:** -

**Program Website:** Here

*(Sunsetting curriculum)* Agriculture and food systems aim to appeal to those who are interested in an entrepreneurial and innovative education in the agricultural sciences, spanning the entire range from production to table. The A&FS major targets students who seek careers in agribusiness, government service, and agricultural education and extension, as well as those preparing to be owners/operators of farming enterprises.
Students interested in agricultural education can enroll in the Agricultural Education option within the Agriculture and Food Systems major. This option must be combined in a 4 + 1 program with the Graduate School of Education.

# Graduation Requirements for the Major

# Graduation Requirements for the Major

Students matriculating prior to the fall semester of 2015 in the School of Environmental and Biological Sciences (SEBS) must complete the SEBS general education requirements. In addition, students majoring in agriculture and food systems must complete the major requirements described below.

Students matriculating fall 2015 or after and transfer students matriculating in 2016 and after must complete a goal-based Core Curriculum in place of general education requirements. The goal-based core is described here. Courses are certified for the Core Curriculum by a faculty committee. A current list of certified courses can be found here.

Agriculture and food systems major requirements are as described below. The program has flexibility so academic advising is provided to ensure that students choose courses that support their career goals.

For an up-to-date description of agriculture and food systems major requirements, courses, and course sequences please refer to the program website here.

Total Credits: 60 to 63 credits

**A. Required Courses:**

**i. Science Requirements:**

- At least one introductory biology course (01:119:101 or 103 or 119 or 199)
- At least one introductory chemistry course (01:160:126 or 127 or 128 or 134 or 140 or 159 or 161 or 163)
- At least one introductory earth science, ecology, or geological sciences course (01:460:100 or 101; or 11:216:101 or 217 or 351; or 11:374:101; or 11:375:101; or 11:573:445)

**ii. Agriculture and Food Systems Requirements:**

11:020:210 Introduction to Agriculture and Food Systems
11:020:215 Applied Practical Applications in Agriculture and Food Systems

**iii. Soils Requirement (choose one course):**

11:216:422 Soil Organismal Diversity
11:375:360 Soils and Water
11:375:453 Soil Ecology
11:776:102 Soils and Society
11:776:440 Soil Fertility

**iv. Economics Requirement (choose one course):**

01:220:102 Introduction to Microeconomics
01:220:103 Introduction to Macroeconomics
11:373:101 Economics, People, and Environment
11:373:121 Principles and Applications of Microeconomics
11:373:122 Principles and Applications of Microeconomics

**v. Quantitative Requirements (2 courses):**

01:640:026 Intermediate Algebra or place into Pre-calculus (01:640:111)

and

One quantitative skills course (Pre-calculus I or II; or calculus; or statistics or applied statistics)

**vi. Experiential Learning (choose one course):**

11:020:490 Agriculture and Food Systems Practicum
11:020:495 or 495 Special Problems in Agriculture and Food Systems
11:067:201, 202, 203, 205, or 207 Animal Science Practicum
11:554:488 G. H. Cook Scholars Program
11:776:350 Agroecology Practicum
11:776:495 or 496 Special Problems in Plant Science
11:902:301 or 302 or 400 School of Environmental and Biological Sciences (SEBS) Internship

**B. Foundational Courses for Agriculture and Food Systems (3 courses from):**

01:830:101 General Psychology (NB)
01:920:101 Introduction to Sociology (NB)
11:020:305 Starting and Managing A Small Farm (NB)
11:020:315 Direct Farm Marketing and Agritourism (NB)
11:067:142 Animal Science (NB)
11:216:101 Introduction to Ecology and Evolution (NB)
11:216:217 Principles of Natural Resource Management (NB)
11:216:272 Dendrology (NB)
11:216:332 Plant Ecology (NB)
11:216:351 Principles of Ecology (NB)
11:370:226 Pesticide Impacts on Humans and Environmental Health (NB)
11:370:308 Apiculture (NB)
11:370:350 Agricultural Entomology and Pest Management (NB)
11:370:381 Insect Biology (NB)
11:374:101 Introduction to Human Ecology (NB)
11:375:101 Intro to Environmental Sciences (NB)
11:400:103 Science of Food (NB)
11:400:104 Food and Health (NB)
11:400:106 Food as Medicine (NB)

11:400:201 Principles of Food Science (NB)
11:628:120 Introduction to Oceanography (NB)
11:709:201 Culinary Nutrition (NB)
11:709:255 Nutrition and Health (NB)
11:776:210 Principles of Botany (NB)
11:776:211 Introduction to Horticulture (NB)
11:776:231 Commercial Floral Design (NB)
11:776:242 Plant Science (NB)

**C. Additional course selected in consultation with an advisor:**
A total of 30 credits from {Area of Inquiry 1: Agricultural Sciences, Area of Inquiry 2: Agribusiness and Entrepreneurship, Area of Inquiry 3: Food Systems; Culture; Community Food Justice and Advocacy; Nutrition & Health, Area of Inquiry 4: Policy, Politics, Economics, Ethics and Law, Area of Inquiry 5: Education, Communication, Leadership, Foundational Course Taught by the School of Arts and Sciences}

- with at least 3 credits from {Area of Inquiry 1: Agricultural Sciences, Foundational Course Taught by the School of Arts and Sciences}
- and at least 3 credits from {Area of Inquiry 2: Agribusiness and Entrepreneurship}
- and at least 3 credits from {Area of Inquiry 3: Food Systems; Culture; Community Food Justice and Advocacy; Nutrition & Health}
- and at least 3 credits from {Area of Inquiry 4: Policy, Politics, Economics, Ethics, and Law}
- and at least 3 credits from {Area of Inquiry 5: Education, Communication, Leadership}

Agriculture and Food Systems 020 (SEBS)

# Agriculture and Food Systems Teacher Education Track

# Agriculture and Food Systems Teacher Education Track

The B.S. in Agriculture and Food Systems Teacher Education Track is designed for preparation to become a certified K-12 Teacher of Agriculture. It also prepares students for agricultural extension and outreach work.

This program provides agricultural science, subject area preparation toward teacher certification at the Rutgers Graduate School of Education (Five Year, 4+1 Agricultural Science Education, teacher education program). However, graduates will also be prepared to pursue teacher certification at other graduate schools or the Alternative Route teaching certificate. Successful completion of N. J. Teacher Certification is required to qualify as a K-12 Teacher of Agriculture. Students apply to the 5-year program at GSE by February 1, ideally in their Junior year.

For more information, contact Dr. Xenia Morin or Dr. Thomas Leustek.

**Graduation Requirements**

A minimum of 120 earned credits are required to graduate with a B.S. in Agriculture and Food Systems, Teacher Education Track. Students must fulfill the SEBS Core graduation requirements and the following Agriculture and Food Systems Education Option requirements.

**R1: Science Requirements (all AFS majors) (9 credits)**
A total of 3 courses, one in each of the following categories:

- One chemistry course
- One biology course*
- One ecology, earth science, or geology class

*Note: These are minimum science requirements. Students are encouraged to take the biology course sequence 01:119:115, 01:119:116 and 01:119:117 if they intend to become certified to also teach biological sciences or if these biology classes are pre-requisites for other classes.

**R2: Agriculture and Food Systems Required Foundation Courses for the Education Track (15 credits)**

A total of 5 courses as agriculture and food systems foundational classes (for all AFS Majors)(6 credits)

- 11:020:210 Introduction to Agriculture and Food Systems
- 11:020:215 Applied Practical Applications in Agriculture and Food Systems

And two of these three classes (6 credits):

- 11:067:142 Animal Science
- 11:776:211 Introduction to Horticulture
- 11:776:242 Plant Science

One of these (3 credits):

- 11:776:391 Weeds, Diseases, and Insects of Plants (3)
- 11:776:105 Stories of Plant Diseases (3)
- 11:776:402 Weeds: Impact and Management (3)
- 11:067:330 Animal Nutrition (3) along with 11:067:331 Animal Nutrition Laboratory (1)

**R3: Educational Foundation Courses specific to the Education Track (18 credits)**
Five classes from this list:

*Pre-admission to the 5-year program and taken in Sophomore or Junior Year*

- 05:300:200 Introduction to Education (3) 05:300:201
- Introduction to Education Field Based Lab - Clinical Experience (0.5)
- 05:300:306 Educational Psychology: Principles of Classroom Learning (3)
- 11:374:416 Environmental Education in the School (3)

*SEBS Senior Year, Fall Semester (also Year 1 of 2 of GSE requirements)*

- 05:300:498 Clinical Experience Phase I (0.5)
- 05:300:450 Urban Education 1 (1.5)
- 05:300:307 Human Development: Infancy through Early Adulthood (3)
- 11:020:425 Developing Ideas in Agricultural Education (3) or 11:300:425 Developing Ideas in Agriculture (3)

*Senior year, Spring semester (also Year 1 of 2 of GSE requirements)*

- 05:300:498 Clinical Experience Phase 2 (0.5)
- 11:020:426 Teaching Agriculture and Food Systems (3) or 11:300:426 Teaching Agriculture (3)

*Note: The 11:300:425/426 will be replaced by 11:020:425/426 starting in Fall 2019.*

**R4: Soils Requirement (all AFS Majors) (3 credits)**
A total of 1 class from a list of soils classes:

- 11:776:102 Soil and Society (3)
- 11:776:440 Soil Fertility (3).

*Note: Soils and Water or Soils and Organisms can be taken if you have the prerequisites.*

**R5: Economics Requirement (all AFS Majors) (3 Credits)**
A total of 1 class:

- 11:373:121 Microeconomics

**R6: Quantitative Skills (all AFS Majors*)(3 credits)**
Complete one of the following:

- Placement into pre-calculus or complete Intermediate Algebra (01:640:026) or equivalent transfer credit.
- Total of 1 quantitative course which meet the QQ and QR requirements for the SEBS Core. (3 credits): (*New expanded list!)

**R7 Experiential Learning (6 credits)**
6 credits from an approved experiential learning course(s) (one course, or a combination of courses to make 3 credits):

- 11:300:417 Supervised Ag Educational Experience Practicum (3)
- 11:020:255 Special Topics in Agriculture and Food Systems (3) Subtopics: Ag Tech

*Acceptable alternatives if related to agriculture and food systems or education:*

- 11:067:200-207 Animal Practicums (1-3 credits)
- 11:020:490 Agriculture and Food Systems Practicum (1-3 credits)
- 11:902:300 SEBS Internship I (3)
- 11:902:301 SEBS Internship II (3)

**R8 Approved electives for the Agriculture and Food Systems Education Track (minimum 21 credits; at least 12 credits should be at, or above, 300 level)**
A minimum of 12 credits in agricultural sciences, food science, ecology, and natural resource management, landscape architecture with 6 credits coming from agriculture and food systems or plant science:

At least 12 credits from:

- 11:020:296 Honors Seminar in Agriculture and Food Systems
- 11:020:321 Principles and Practices of Small Organic Farming (summer farm course)

- 11:020:340 Indoor Cultivation of High Value Crops
- 11:020:455 Special Topics in Agriculture and Food Systems
- 11:020:436 Sustainable Agriculture

*Any of the following 200 or higher:*

- 11:776:202 Applied Physiology of Horticultural Crops (3)
- 11:776:205 Intro to Ethnobotany (3)
- 11:776:242 Plant Science (3)*
- 11:776:221 Principles of Organic Crop Production (3)
- 11:776:257 Edible and Poisonous Fungi (3)
- 11:776:390 Hemp and Medical Cannabis (3)
- 11:776:302 General Plant Pathology (3)
- 11:776:310 Plant Propagation (3)
- 11:776:321 Greenhouse Systems Management (3)
- 11:776:341 Fruit Production (3)
- 11:776:391 Weeds, Diseases and Insects of Plants (3)
- 11:776:439 Nursery Crop Production (3)
- 11:776:440 Soil Fertility (3)
- 11:776:442 Agroecology

**Other approved elective courses:**

Approved Animal Science Courses

- 11:067:200-207 Animal Practicum, Cattle; Sheep; Swine; Lab Animal; Horse (2);
- 11:067:330 Animal Nutrition (3) with 11:067:331 Animal Nutrition Laboratory (1)

Approved Entomology Courses

- 11:370:226 Pesticide Impacts on Human and Environmental Health (3)
- 11:370:350 Agricultural Entomology and Pest Management (3)
- 11:370:308 Apiculture (3)

Approved Food Science Courses

One of:

- 11:400:103 Science of Food (3)
- 11:400:106 Food as Medicine (3)
- 11:400:107 Foods: From Field to Table (3)

Approved Landscape Agriculture Courses (035) such as

- 11:550:271 Agriculture and the Landscape (3)

Approved Agriculture and Natural Resource Courses

- 11:035:268 Environmental Pollution - Issues in Agriculture, Industry, and Communities (2)
- 11:035:272 River and Stream Ecology (1)
- 11:035:274 Organic Farming and Gardening (2)
- 11:035:280 American Lawns and Turfgrass (1.5)
- 11:035:288 Edible Gardening for Enrichment and Education (2)

Approved Urban Forestry Courses

- 11:216:332 Plant Ecology (4)
- 11:216:365 Arboriculture (4)
- 11:216:377 Practicum in Forest Management (1-12)
- 11:216:403 Urban Forestry (3)
- 11:770:391 Diseases of Urban and Forest Trees (1.5)

Approved Marine Science Courses

- 11:628:309 Fishery Science (3)
- 11:628:317 Aquaculture (3)

Approved Microbiology Course

- 11:680:103 Microbiology of Agricultural Products in New Jersey (3)

Note: Other courses approved with permission of the undergraduate program director for agriculture and food systems. At least 3 credits in agribusiness or entrepreneurship.

- 11:020:305 Starting and Managing a Small Farm (3)
- 11:020:340 Indoor Cultivation of High Value Crops (4)
- 11:020:442 Entrepreneurial Agriculture (3)
- 11:373:231 Introduction to Marketing (3)
- 11:373:241 Introduction to Management (3)
- 11:373:331 Economics of the Food Marketing System (3)
- 11:035:300 Agricultural Commodities and Markets

A least 3 credits in food systems, policy, economics, ethics, or law:

- 11:020:333 Community Food Justice and Advocacy
- 11:020:337 Sustainability: Tackling Food Waste\
- 11:020:465 Feeding America's Cities
- 11:374:279 Politics of Environmental Issues (3) (also a SEBS core class)
- 11:374:289 Sustainable Food: Politics, Policy and Ethics (3)
- 11:374:313 U.S. Environmental Policy (3)
- 11:373:218 Sustainable Food Policy for Developing Countries (3)
- 11:373:323 Agriculture and Food Policy (3)
- 11:373:362 Natural Resource Economics

- 11:373:371 Food, Nutrition and Health Policy (3)
- 11:373:XXX Food Policy and other approved 11:373:XXX approved courses

Optional credits in education, communication, leadership, and youth development.

- 11:374:227 Agriculture in Society and Mass Media (3)
- 11:607:200 Principles of Leadership (3)
- 11:607:202 Leadership and Civic Engagement (3)
- 11:607:203 Foundations of Volunteer Management (3)
- 11:607:401 Foundations of Program Planning (3)
- 11:607:402 Building Community Partnerships (3)
- 11:607:484 Practical Leadership Applications in Agricultural Science (4)

# History (SAS)

## HISTORY

(General/Comparative History 506; African, Asian, and Latin American History 508; European History 510; American History 512)

Department of History, School of Arts and Sciences

**Website:** Here

**Chair:** Melissa Feinberg

**Associate Chairs:** Jennifer Jones and Samantha Kelly

**Undergraduate Vice Chair:** James Delbourgo

**Distinguished Professors:**

James Delbourgo, B.A., East Anglia (UK); M.Phil., Cambridge; Ph.D., Columbia

Erica Armstrong Dunbar, B.A., Pennsylvania, M.A., Ph.D., Columbia

Jochen Hellbeck, B.A., Free University of Berlin; M.A., Ph.D., Columbia

Seth Koven, B.A., Swarthmore; A.M., Ph.D., Harvard

T.J. Jackson Lears, B.A., Virginia; M.A., North Carolina (Chapel Hill); M.A., Ph.D., Yale

Louis Masur, B.A., SUNY (Buffalo); M.A., Ph.D., Princeton

Richard L. McCormick, B.A., Amherst College; Ph.D., Yale

Gary A. Rendsburg, B.A., North Carolina (Chapel Hill); M.A., Ph.D., New York

Camilla Townsend, B.A., Bryn Mawr College; M.A., Ph.D., Rutgers

**Professors:**

Leslie Alexander, B.A., Stanford; M.A., Ph.D., Cornell

Alastair J. Bellany, B.A., Oxford; M.A., Ph.D., Princeton

Paul G.E. Clemens, B.S., Maryland; Ph.D., Wisconsin

Barbara Cooper, B.A., St. John's (Maryland); M.A., Ph.D., Boston

Belinda Davis, B.A., Wesleyan; M.A., Ph.D., Michigan

Rachel Devlin, B.A., Barnard College; M.A., Ph.D., Yale

Leah DeVun, B.A., Washington; M.A., M.Phil, Ph.D., Columbia

Melissa Feinberg, B.A., Stanford; M.A., Ph.D., Chicago

David S. Foglesong, B.A., Amherst College; M.A., Ph.D., California (Berkeley)

David Greenberg, B.A., Yale; M.A., M.Phil., Ph.D., Columbia

Paul Hanebrink, B.A., Columbia; M.A., Ph.D., Chicago

Samantha Kelly, B.A., Yale; M.A., Ph.D., Northwestern

Aldo A. Lauria-Santiago, B.A., Princeton; M.A., New York; Ph.D., Chicago

James P. Masschaele, B.A., Western Ontario; M.A., Ph.D., Toronto

Matt K. Matsuda, B.A., M.A., Ph.D., California (Los Angeles)

Jennifer Mittelstadt, B.A., Wesleyan; M.A., Ph.D., Michigan

Johanna Schoen, B.A., Universität Hamburg (Germany); M.A., Ph.D., North Carolina

Nancy Sinkoff, B.A., Harvard; M.A., Columbia and Jewish Theological Seminary of America; Ph.D., Columbia

Judith Surkis, B.A., Brown; Ph.D., Cornell

Paola Tartakoff, B.A., Harvard; Ph.D., Columbia

**Associate Professors:**

Yesenia Barragan, B.A., Brown; Ph.D., Columbia

Kim D. Butler, B.A., Sarah Lawrence College; M.A., Howard; M.A., Ph.D., Johns Hopkins

Marissa J. Fuentes, B.A., California (Santa Cruz); Ph.D., California (Berkeley)

Tiffany Gill, B.A., Georgetown; Ph.D., Rutgers

Chie Ikeya, B.A., Ph.D., Cornell

Jennifer M. Jones, B.A., Grinnell College; M.A., Ph.D., Princeton

Toby C. Jones, B.A., M.A., Auburn; Ph.D., Stanford

Sukhee Lee, B.A., M.A., Yonsei (Korea); Ph.D., Harvard

Xun Liu, B.A., Huazhong Normal (China); M.A., California (Long Beach); Ph.D., Southern California

Kathleen López, B.A., Virginia; M.A., Cornell; Ph.D., Michigan

Norman Markowitz, B.A., CUNY (City College); A.M., Ph.D., Michigan

Johan Mathew, B.A., Princeton; Ph.D., Harvard

Donna Murch, B.A., Williams College; M.A., Ph.D., California (Berkeley)

Jamie Pietruska, B.A., Brown; Ph.D., Massachusetts Institute of Technology

Tatiana Seijas, B.A., M.A., Columbia; Ph.D., Yale

Peter Silver, B.A., Harvard; M.A., Ph.D., Yale

Julia Stephens, B.A., Harvard; M.Phil., Cambridge; Ph.D., Harvard

Andrew T. Urban, B.A., Middlebury; M.A., Ph.D., Minnesota

**Assistant Professors:**

Jack Bouchard, B.A., Brandeis; M.A. McGill; Ph.D., Pittsburgh

Nicole Burrowes, B.A., NYU; M.A., Ph.D., CUNY Graduate Center

Elaine LaFay, B.A., Michigan; Ph.D., Pennsylvania

Kristin O'Brassill-Kulfan, B.A., Millersville; M.A., Queen's (UK); Ph.D., Leicester (UK)

**Research Professor:**

Paul Israel, B.A., California Polytechnic (San Luis Obispo); Ph.D., Rutgers

**Associate Teaching Professor:**

Sandra Russell-Jones, B.A., Dickinson College; Ph.D., Pennsylvania

**Assistant Teaching Professors:**

Mark Bray, B.A. Wesleyan; Ph.D., Rutgers

**Faculty Emeriti:**

Michael Adas

Samuel Baily

Carolyn A. Brown

Jack Cargill

John Chambers

Dorothy Sue Cobble

Ann Fabian

Ziva Galili

Lloyd Gardner

William Gillette

Ann Gordon

Douglas Greenberg

Philip Grevin

Nancy Hewitt

Allen Howard

Reese Jenkins

Temma Kaplan

Donald Kelley

Steven Lawson

Suzanne Lebsock

James Livingston

Phyllis Mack

Karl Morrison

James Reed

Stephen Reinert

Donald Roden

Bonnie Smith

Gail Triner

Mark Wasserman

Deborah Gray White

Virginia Yans

Yael Zerubavel

The study of history allows students to understand the past as well as the present--how and why our world became the way it is today. The Department of History offers an array of two hundred course offerings and many research opportunities. The courses are designed to (1) provide the student with an understanding of the social, political, and cultural forces that have shaped the course of history and our present world; and (2) teach the student the important skills of critical reading and research, logical analysis, and effective written and oral communication.

Students should begin with introductory-level courses (100 or 200), proceed to the upper-level courses that are at the center of the history major (300), and finally to the advanced courses (400), which usually require significant research.
The history major is designed to expose students to the histories of various civilizations over time and place. However, it also affords specialization in one area, time, or theme (e.g., African history, medieval Europe, or women in history, etc.) to interested students, in consultation with departmental advisers.

For additional information, visit the department's website.

History (SAS)

# Learning Goals

# Learning Goals

**Conceptual Learning Goals.** Students who study history at Rutgers University can expect to develop an understanding of the following concepts:

1) The role of human agency in bringing about change in society and institutions. This includes:

- understanding how individuals are shaped by their own past and by the past of their society and institutions
- the role of diversity and difference in shaping human experience

2) The operation of large-scale forces responsible for causing change over time, such as politics, economics, and religion

**Practical Learning Goals.** Students who study history at Rutgers University can expect to develop the following practical skills:

1. The ability to understand a variety of historical primary sources such as archival documents, diplomatic correspondence, journalistic reports, and private papers

2. The ability to read and understand secondary sources written in academic prose and to understand the substance of debates
3. The ability to analyze information effectively and to use different kinds of historical sources to a historical argument
4. The ability to write persuasively and communicate effectively
5. The ability to work independently and to conduct independent research

History (SAS)

# Major Requirements

# Major Requirements

History majors must complete 12 courses in history (36 credits) with a grade of C or better in each course. A minimum of eight courses for the major must be taken at Rutgers University-New Brunswick. All history majors must fulfill the following requirements:

1. At least five courses at the 300 or 400 level

2. At least eight courses at the 200 through 400 level

3. History Workshop, 01:506:299, taken by the end of the sophomore year; transfer students must take 01:506:299 in their first semester at Rutgers

4. A History Seminar, either 01:506:401 or 402,or Public History Internship (01:506:451), or History Honors Thesis (01: 506:495 and 496) usually taken in the junior year, or senior year

5. Of the 12 history courses, at least two must be in each of the following three areas:

a. Global, African, Asian, Latin American, or Native American history (selected 506 courses and all 508 courses)

b. European history (510)

c. United States history (512)

6. At least one course focusing on the period before 1500 C.E.

7. History majors shall not count more than two overlapping courses between history and any other majors or minors.

*Ancient History and Classics Option*

The ancient history and classics option in the history major requires 15, 3-credit courses (of which at least three must be history department courses and at least three must be classics department courses), apportioned as follows:

1. At least two courses in ancient languages (at least two languages: Latin, Greek, and/or other ancient languages offered at the university, e.g., Sanskrit and Hebrew). One of the courses must be a Greek or Latin course at the 200 level or above. Advanced placement can substitute for either or both of the courses, if at the appropriate level. Suggested intermediate courses are 01:490:207 Classical Greek Prose (3) and 01:580:203 Intermediate Latin Prose (3).

2. Three ancient history or classics survey courses at the 200 level, from among:

01:190:205 Greek Civilization (3)
01:190:206 Roman Civilization (3)
01:508:200 Ancient Near East (3)
01:510:201 Ancient Greece (3)
01:510:202/01:190:209 Ancient Rome (3)
01:510:205 History of the Byzantine Empire (3)
01:510:207 Byzantine Civilization (3)

In consultation with an adviser, appropriate higher-level courses or courses from other departments may be substituted for any of the 200-level courses mentioned above.

3. Six ancient history or classics lecture courses at the 300 level, from among:

01:190:310 Augustan Rome (3)
01:190:320 Women in Antiquity (3)
01:190:322 Greek Political Philosophy (3)
01:190:325 Cults, Magic, and Witchcraft (3)
01:190:350/01:510:350 Greek Society (3)
01:190:355 Ancient Mythology and Society (3)
01:190:372 Cities of the Classical World (3)
01:190:373 Pompeii: The Life and Death of a Roman Town (3)
01:490:306 From Athens to Alexandria (3)
01:490:391 Readings in Greek Prose (historical topic/author) (3)
01:510:301 Early Greece (3)
01:510:302 Classical Greece (3)
01:510:303 Hellenistic World (3)
01:510:304 The Rise of the Roman Republic (3)
01:510:305 The Crisis of the Roman Republic (3)
01:510:306/01:190:306 Roman Empire (3)
01:510:307 The Roman World in Late Antiquity (3)
01:510:308 Creating Culture and History in the Ancient World (3)
01:510:403 Ancient Warfare and Diplomacy (3)
01:580:304 Cicero: Orations (3)
01:580:325 The History of Livy (3)
01:580:329 Tacitus (3)

4. One ancient history or classics course at the 300 or 400 level focusing on research and writing such as:

01:490:391 Readings in Greek Prose (historical readings) (3)
01:506:401,402 History Seminar (ancient topic) (3,3)
01:506:471,472 Research in History (ancient topic) (3,3)
01:510:407 Rome in the Age of Augustus (3)
01:580:369,370 The Seminar in Latin (historical readings) (3,3), college honors, or departmental project (appropriate topic)

5. Three additional courses in history, classics, Latin, or Greek (in any combination, but no more than two of them at the 100 level)

History (SAS)

# Minor Programs and Requirements

# Minor Programs and Requirements

*General History Minor*

The minor in history consists of six 3-credit courses, passed with a grade of C or better, including three courses at the 300 to 400 level. A minimum of four courses for the minor must be taken at Rutgers University. No more than two courses used to complete a major or minor in another department can be used to fulfill the requirements of the history minor.

*Law and History Minor*

The minor in law and history provides an interdisciplinary introduction to the study of law, with a particular focus on the role of history in examining law and legal culture in their social contexts. The minor in law and history consists of six 3-credit courses, passed with a grade of C or better, from the following list. No more than one course used to complete a major or minor in another department can be used to fulfill the requirements of the law and history minor.

01:506:216 Law and History (required introductory course)

Four of the following history courses:
01:506:210 Sex and Power
01:506:220 Piracy: A Global History
01:506:236 Poverty in World History
01:506:255 Science, Nature, and Empire
01:506:260 Wars, Wayfarers, and the Wall: A History of the U.S.-Mexican Border
01:508:110 Political Islam: Present and Past
01:508:367 The Afro-Latin American Experience
01:510:245 The Arts of Power
01:510:261 History of the Holocaust
01:510:268 Fascism
01:510:335 Modern France
01:510:345 English Constitutional History to 1688
01:510:394 Human Rights

01:512:215 American Legal History
01:512:216 Famous Trials
01:512:221 Abortion: The Collision of History, Law, Religion, Medicine, and Human Rights
01:512:229 History of Medical Ethics
01:512:238 History of Homelessness
01:512:250 Natives and Newcomers: Immigration and Migration in U.S. History
01:512:253 Asian American History
01:512:264 Black Lives Matter
01:512:308 History and Asylum Law
01:512:317 Murder in American History
01:512:318 Political Corruption in America
01:512:322 Drugs: A Social History
01:512:342 Policing in Black Communities: From Slavery to Mass Incarceration (3)
01:512:368 History of Civil Rights, 1900-1980
01:512:383 Women's Rights in America, 1800-1930
01:512:385 Women Behaving Badly
01:512:402 American Constitutional History to 1865
01:512:404 American Constitutional History from 1865
One of the following electives from outside of the Department of History:

*Africana Studies*
01:014:353 Black Community Law and Social Change
*Anthropology*
01:070:360 Law, Justice, Rights
*Criminal Justice*
(Special permission numbers are required for the following courses):
01:202:201 Introduction to Criminal Justice (recommended)
01:202:202 Police
01:202:203 Prisons and Prisoners
01:202:204 Crime and Public Policy
01:202:205 Criminal Procedure
*Economics*
01:220:395 Law and Economics
(01:220:102 and 01:220:103 are prerequisites for 01:220:395, and precalculus math is a prerequisite for 01:220:102 and 01:220:103)
*Latino and Caribbean Studies*
01:595:370 Law and the Latino Community
*Middle Eastern Studies*
01:685:457 Islamic Law and Jurisprudence
*Philosophy*
01:730:345 Philosophy and the Law
01:730:358 Philosophy of Law
01:730:341 Ethics through History
01:730:342 Seventeenth- and Eighteenth-Century Social and Political Philosophy
*Political Science*

01:790:340 Law and Society
01:790:373 Legal Philosophy, Rights, and Justice
01:790:401 American Constitutional Law I
01:790:404 Politics of Criminal Justice
01:790:406 Civil Liberties and Civil Rights
01:790:426 Gender, Public Policy, and the Law
*Religion*
01:840:425 Seminar on Law and Religion
*Sociology*
01:920:349 Law and Society
01:920:222 Criminology
01:920:304 Sociology of Deviant Behavior
01:920:361 Sociology of Drug Use
*Women's, Gender, and Sexuality Studies*
01:988:307 Women and the Law

***STEM in Society Minor***

The minor in STEM in society examines science, technology and engineering, environment, medicine, and quantification in their historical contexts from the ancient world to the 21st century. The minor in STEM in society consists of six 3-credit courses, passed with a grade of C or better, from the following list:

01:506:226 Contemporary Challenges in International Health
01:506:227 Health, Culture, and Society
01:506:233 History of the Future
01:506:247 The Seas Around Us: Ocean History in Global Perspective
01:506:249 Climate Politics: A Deep History
01:506:250 Science, Collecting, and Power
01:506:251 History of Science and Society
01:506:252 History of Technology and Society I
01:506:253 History of Technology and Society II
01:506:254 History of Oil
01:506:255 Science, Nature, and Empire
01:506:321 Disease in History
01:506:322 Black Death to Obesity Epidemic: History of Public Health in the West
01:506:324 History of AIDS Pandemic
01:506:325 Living on the Edge: Human Societies in Extreme Environments
01:508:255 Global Environmental History
01:508:328 History of Health and Healing in Africa
01:508:364 Environmental History of Latin America
01:510:248 The Last Climate Crisis: Histories of ¿The Little Ice Age¿ c. 1300-1800
01:512:121 Health and Environment in America
01:512:210 Food in the United States and the World
01:512:221 Abortion: The Collision of History, Law, Religion, Medicine, and Human Rights
01:512:229 History of Medical Ethics
01:512:230 History of Medicine in Film

01:512:235 Accidents and Disasters in the United States and the World
01:512:237 Data: A Social History
01:512:321 Health Care and Society in America
01:512:322 Drugs: A Social History
01:512:323, 324 History of the North American Environment
01:512:328 Science in American Culture
01:512:329 Technology and Nature in American History
01:880:210 The Edison Effect: Technological Innovation in American Culture
01:880:212 Science and Dollars: The Business of Innovation Since the Age of Edison

History (SAS)

# Certificate Programs and Requirements

# Certificate Programs and Requirements

*Law and History Certificate*

The certificate in law and history provides an interdisciplinary introduction to the study of law, with a particular focus on the role of history in examining law and legal culture in their social contexts. The certificate in law and history consists of five 3-credit courses, passed with a grade of C or better, from the following list. No more than one course used to complete a major or minor in another department can be used to fulfill the requirements of the law and history certificate.

01:506:216 Law and History (required introductory course)

Four of the following history courses:

01:506:210 Sex and Power
01:506:220 Piracy: A Global History
01:506:236¿Poverty in World History
01:506:255 Science, Nature, and Empire
01:506:260 Wars, Wayfarers, and the Wall: A History of the U.S.-Mexican Border
01:508:110 Political Islam: Present and Past
01:508:367 The Afro-Latin American Experience
01:510:245 The Arts of Power
01:510:261 History of the Holocaust
01:510:268 Fascism
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01:512:229 History of Medical Ethics
01:512:238 History of Homelessness

01:512:250 Natives and Newcomers: Immigration and Migration in U.S. History
01:512:253 Asian American History
01:512:264 Black Lives Matter
01:512:308 History and Asylum Law
01:512:317 Murder in American History
01:512:318 Political Corruption in America
01:512:322 Drugs: A Social History
01:512:342 Policing in Black Communities: From Slavery to Mass Incarceration (3)
01:512:368 History of Civil Rights, 1900-1980
01:512:383 Women's Rights in America, 1800-1930
01:512:385 Women Behaving Badly
01:512:402 American Constitutional History to 1865
01:512:404 American Constitutional History from 186

One of the following electives from outside of the Department of History:

*Africana Studies*
01:014:353 Black Community Law and Social Change
*Anthropology*
01:070:360 Law, Justice, Rights
*Criminal Justice*
(Special permission numbers are required for the following courses):
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01:220:395 Law and Economics
(01:220:102 and 01:220:103 are prerequisites for 01:220:395, and precalculus math is a prerequisite for 01:220:102 and 01:220:103)
*Latino and Caribbean Studies*
01:595:370 Law and the Latino Community
*Middle Eastern Studies*
01:685:457 Islamic Law and Jurisprudence
*Philosophy*
01:730:345 Philosophy and the Law
01:730:358 Philosophy of Law
01:730:341 Ethics through History
01:730:342 Seventeenth- and Eighteenth-Century Social and Political Philosophy
*Political Science*
01:790:340 Law and Society
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01:790:409 Courts and Public Policy
01:790:426 Gender, Public Policy, and the Law
*Religion*
01:840:425 Seminar on Law and Religion
*Sociology*
01:920:349 Law and Society
01:920:222 Criminology
01:920:304 Sociology of Deviant Behavior
01:920:361 Sociology of Drug Use
*Women's, Gender, and Sexuality Studies*
01:988:307 Women and the Law

***Public History Certificate***

Public history explores interpretations of the past produced for the general public in a variety of different settings such as museums, archives, historical preservation, monuments, etc. The certificate in public history consists of the following five courses:

1. History Workshop 01:506:299
2. Public History: Theory, Method, and Practice 01:506:301
3. Introduction to Oral History 01:506:302 or Digital History 01:506:303 or a class on digital humanities (01:506:299 and 01:506:301 should be prerequisites for coursework in oral history or digital history)
4. One elective. See history department's website for approved electives: Here
5. Public History Internship 01:506:451

***STEM in Society Certificate***

The certificate in STEM and society examines science, technology and engineering, environment, medicine, and quantification in their historical contexts from the ancient world to the 21st century. The certificate in STEM and society consists of five 3-credit courses, passed with a grade of C or better, from the following list:

01:506:226 Contemporary Challenges in International Health
01:506:227 Health, Culture, and Society
01:506:233 History of the Future
01:506:247 The Seas Around Us: Ocean History in Global Perspective
01:506:249 Climate Politics: ADeep History01:506:250 Science, Collecting, and Power01:506:251 History of Science and Society
01:506:250 Science, Collecting, and Power
01:506:251 Science and Society
01:506:252 History of Technology and Society I
01:506:253 History of Technology and Society II
01:506:254 History of Oil
01:506:255 Science, Nature, and Empire
01:506:321 Disease in History
01:506:322 Black Death to Obesity Epidemic: History of Public Health in the West
01:506:324 History of AIDS Pandemic

01:506:325 Living on the Edge: Human Societies in Extreme Environments
01:508:255 Global Environmental History
01:508:328 History of Health and Healing in Africa
01:508:364 Environmental History of Latin America
01:510:248 The Last Climate Crisis: Histories of `The Little Ice Age¿ c. 1300-1800
01:512:121 Health and Environment in America
01:512:210 Food in the United States and the World
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01:512:235 Accidents and Disasters in the United States and the World
01:512:237 Data: A Social History
01:512:321 Health Care and Society in America
01:512:322 Drugs: A Social History
01:512:323, 324 History of the North American Environment
01:512:328 Science in American Culture
01:512:329 Technology and Nature in American History
01:880:210 The Edison Effect: Technological Innovation in American Culture
01:880:212 Science and Dollars: The Business of Innovation Since the Age of Edison

History (SAS)

# Teacher Certification

# Teacher Certification

History majors interested in entering the five-year program in social studies education should contact advisers in the Department of History and in the Graduate School of Education in their first year or as soon as possible thereafter.

History (SAS)

# Departmental Honors Program

# Departmental Honors Program

The departmental honors program enables students to pursue their individual interests in history and helps prepare them for future research work or graduate study. Qualified students take a two-semester honors thesis seminar (in the spring of the junior year and fall of the senior year) and work with a faculty adviser to conduct original historical research and write a thesis. Interested students should read the program description available on the department website and discuss their plans thoroughly and well in advance with a faculty adviser. Approval of the proposed thesis topic by a faculty member who will serve as thesis adviser is required for acceptance to the program.

For more information, see the department website: Here.

History (SAS)

# General/Comparative History Courses (506)

# General/Comparative History Courses (506)

**01:506:101** ***World History I (3)***
Traces human history from the development of modern humans to the beginning of the first era of globalization with the voyage of Columbus to the Americas.

**01:506:102** ***World History II (3)***
World history since the late 15th century.

**01:506:105** ***Honors Colloquium (3)***
Study of a contemporary social issue from the perspective of the discipline of history. Specific title available at time of registration through the School of Arts and Sciences honors programs.
***By permission of the department. Open to students in school honors.***

**01:506:110** ***Age of European Global Expansion (3)***
Traces the rise of Europe to global dominance beginning with early explorers and empire builders, and focuses on Europe's impact on Africa, Asia, and the Americas.

**01:506:112** ***Patterns in Civilization: Love (3)***
Love and its literary expression in Japan and Europe since the Middle Ages. Comparative analysis of culture and society, political and economic transformations, and religion.

**01:506:113** ***Patterns in Civilization: Death (3)***
Individual and societal responses to death in Japan, Europe, and the United States. Comparative analysis of culture and society, political and economic transformation, and religion.

**01:506:114** ***World Civilizations: Europe, Africa, and America (3)***
Family, economy, government, and religion in major civilizations of West Africa, Europe, and North America. Interaction of these three geographical areas through the slave trade, colonialism, and the movement of ideas and culture.

**01:506:115** ***World War II in World History (3)***
Examines the political, military, economic, social, and cultural dimensions of World War II from the perspectives of its different combatants. Considers the war from the perspective of states, soldiers, and civilians around the world.

**01:506:118** ***Looking at 21st-Century World History (3)***
Interdisciplinary examination of the role of the visual in both our daily lives and in the way we remember the past. Taught through a series of topics ranging from war and violence to gender, work, and play.
***Credit not given for both this course and 01:082:118.***

**01:506:151** ***History and the News (3)***
Analysis of the historical background to events in the current week's news; emphasis on how historical knowledge deepens understanding of contemporary issues.

**01:506:201** ***Twentieth-Century Global History to 1945 (3)***
Emphasis on themes in political-military and social-cultural history worldwide, including imperialism, origins and impact of two world wars, revolutions, fascism, Nazism, and race and gender issues.

**01:506:202** ***Twentieth-Century Global History from 1945 (3)***
Focus on critical themes from Hiroshima to September 11, 2001, including the atomic age, superpower rivalries, decolonization, population growth and development, globalization, environmental degradation, and terrorism.

**01:506:203** ***Histories of the Pacific (3)***
Survey of Pacific island peoples and cultures from early navigators and settlers to the colonial and postcolonial eras of the 19th and 20th centuries.

**01:506:205** ***Paris/Tokyo: 1700-Present (3)***
Comparative study of French and Japanese cultures from 1700 to the present, drawing on literary and visual representations from both traditions.

**01:506:210** ***Sex and Power (3)***
Investigates how gender relations have changed over time and place by considering different moments in world history. Examines how states, religions, families, and other social or political institutions have created and enforced sex and gender norms.

**01:506:211** ***Women in Europe and the Americas until 1800 (3)***
Survey of women's roles in Western society and culture--covering Europe and the New World up to about 1800.
***Credit not given for both this course and 01:988:211***

**01:506:212** ***Women in Europe and the United States since 1800 (3)***
Survey of women's roles in Western society and culture--covering the 19th and 20th centuries.
***Credit not given for both this course and 01:988:212.***

**01:506:215** ***The Modern Girl (3)***
Examines the so-called "modern girl" of the 1920s and 1930s. Representations in fiction, film, and advertisements. Concentrates on the West, with comparative evidence from Asia and Africa.
***Credit not given for both this course and 01:988:260.***

**01:506:216** ***Law and History (3)***
Explores the law through historical and contemporary cases, including disputes about legalization of drugs, religious freedom, and immigration controls, from U.S. and global perspectives.
***Required for the Law and History Minor/Certificate.***

**01:506:218** ***Terrorism (3)***
Global historical survey of the development and importance of terrorism from the eighteenth century to the present.

**01:506:220** ***Piracy: A Global History (3)***
Examines piracy in world history from Ancient Egypt until the 21st century. Considers its social, political, and economic meanings in different societies.

**01:506:221** ***History of Exploration (3)***
Exploring expeditions from Columbus to the moon flights. Experiences of explorers; political, economic, and cultural motives for exploration; effects of exploration on society and on views of the world.

**01:506:224** ***Slavery in World History (3)***
Historical survey of the institution of slavery from antiquity to the present day, with particular attention to the relationship of human bondage to broader progress of social and economic change.

**01:506:225** ***The Black Atlantic World (3)***
Black Atlantic World (Europe, Atlantic Africa, and the Americas) from the 16th century to the present. Historical, cultural, sociopolitical, and intellectual formations, movements, and connections crisscrossing the Atlantic.

**01:506:226** ***Contemporary Challenges in International Health (3)***
Examines the history of Western efforts to promote health and nutrition in the developing world, including Africa, Asia, Latin America, and the former Soviet Republics. Emphasizes the economic, political, and cultural assumptions associated with international health and development.

**01:506:233** ***History of the Future (3)***
Examines the global history of human attempts to predict the future from antiquity to the present, with an emphasis on the 19-21st century. Engages with topics and concepts from disciplines including meteorology, economics, statistics, computer science, behavioral economics, psychology, and literature to look at attempts to anticipate the future, from fortune telling to sports picks to weather forecasting.

**01:506:227** ***Health, Culture, and Society (3)***
Integrates perspectives from sociology, history, public health, medicine, and the humanities to define health, understand the diverse ways scholars study health, and identify factors that influence the prevalence, distribution, and experience of four health conditions: obesity; depression; cancer; and HIV/AIDS. Implications of research for medical practice, ethics, and policies to enhance health worldwide.
***Credit not given for both this course and 01:920:220.***

**01:506:236** ***Poverty in World History (3)***
Explores poverty as people have experienced and understood it in various times, places, and circumstances through world history.

**01:506:241** ***Film and History (3)***
Presentation of films relating to history and culture, combined with readings and discussions of standard history accounts.

**01:506:247** ***The Seas Around Us: Ocean History in Global Perspective (3)***
Explores maritime history in a global context from antiquity to the modern period, with a special focus on Polynesian, Malay, Dutch, and Greek mariners, among others.

**01:506:249** ***Climate Politics: A Deep History (3)***
Studies climate change in the past and present; explores the legitimacy and manipulation of scientific knowledge; analyzes the connections between climate and imperialism in a global context.

**01:506:250** ***Science, Collecting, and Power (3)***
Explores scientific collections from the ancient world to the present in a global context. Examines the relationship between collecting and science, and how science derives its power from making and using collections.
***Credit not given for both this course and 16:082:594.***

**01:506:251** ***History of Science and Society (3)***
Science and its social context from 1500 to the present. Development of ideas; interaction with philosophy, religion, and art; science as a profession.

**01:506:252** ***History of Technology and Society I (3)***
Global perspective on the history of materials, energy, manufacturing, transportation, and communication technologies from earliest times to the Industrial Revolution. Central themes include interplay between technology and the pursuits of material wealth, political power, and military, as well as the relationship between early science and burgeoning technology.

**01:506:253** ***History of Technology and Society II (3)***
History of production, transportation, and communication technologies worldwide from the Industrial Revolution to the present. Integration of science and technology, rise of consumer technologies, and emergence of the United States as a center for technological, economic, military, and political power.
***Special Notation: Does not fulfill global requirement for majors.***

**01:506:254** ***History of Oil (3)***
Political and economic history of oil over the 20th and into the 21st century. Oil's impact on the rise and fall of empires, the fates of nation-states, its role in war, as well as its varied impact on social and cultural life.

**01:506:255** ***Science, Nature, and Empire (3)***
Explores key episodes in the history of science, imperialism, and colonialism in a global context from the 15th to the 21st century.

**01:506:260** ***Wars, Wayfarers, and the Wall: A History of the U.S.-Mexican Border (3)***
The history of the U.S.-Mexican border from the colonial era to the present and its contemporary significance for national well-being and national identities in the United States and Mexico. Emphasis on this history's influence on contemporary debates regarding immigration, national borders, and the United States' relationship with Mexico and Mexicans.

**01:506:271** ***Jewish History I: Ancient and Medieval (3)***
Social, economic, religious, and political experiences of the Jewish people from the Biblical world of the ancient Near East until the Middle Ages.
***Credit not given for both this course and 01:563:201 or 01:685:208.***

**01:506:272** ***Jewish History II: Modern (3)***
Jewish life from the breakdown of traditional society in Europe in the 1700s until the rise of the modern state of Israel in the 20th century.
***Credit not given for both this course and 01:563:202.***

**01:506:291,292** ***Topics in History (3,3)***
Study of special topics in history at the intermediate level.

**01:506:299** ***History Workshop (3)***
Introduction to historical research, analysis, and interpretation. Topical lectures and hands-on workshops.
***Required for all history majors.***

**01:506:301** ***Public History: Theory, Method, and Practice (3)***
Introduction to theory, methods, practice, and politics of public history, exploring production and dissemination of histories in nonacademic settings. Includes workshops conducted by professionals in the field, site visits.

**01:506:302** ***Introduction to Oral History (3)***
Introduction to oral history and its methods. How to design an oral history project and how to integrate technology into that design.

**01:506:303** ***Digital History (3)***
History of the United States through space and geography. Focus on three key topics: colonial North America, the American Civil War, and the racial landscape of the modern US.

**01:506:305** ***Special Topics in Politics, History, and Heritage (3)***
Special topics emphasizing politics, history, and cultural heritage and preservation studies. Special studies in particular theoretical and practical aspects of historic preservation and conservation. Designed by individual instructor.
***Credit not given for both this course and 01:082:441.***

**01:506:313** ***Women and Social Movements to 1945 (3)***
In-depth analysis of different ways women have organized for change. Focus on three or four case studies using cross-cultural perspectives to illustrate various themes of gender and collective action by women.
***Credit not given for both this course and 01:988:371.***

**01:506:314** ***Women and Social Movements since 1945 (3)***
Twentieth-century autonomous women's movements, emphasizing the second wave of feminism from cross-cultural perspectives. Selected case studies to illustrate themes of gender and collective action.
***Credit not given for both this course and 01:988:372.***

**01:506:321** ***Disease in History (3)***
Human disease on a global scale from the Paleolithic period to the present, with emphasis on infectious disease and diet.

**01:506:322** ***Black Death to Obesity Epidemic: History of Public Health in the West (3)***
Surveys attempts to protect the health of human populations from the Black Death in Europe to rising concern about obesity in the United States. Explores shifting patterns of disease and illness, and emergence and growth of public health as a domain of expert knowledge and policy in the United States and Europe.

**01:506:324** ***History of AIDS Pandemic (3)***
Explores the AIDS epidemic from a range of historical vantage points: science, health care, and social and cultural life in a variety of local, national, international, and institutional contexts. Focuses on United States, Haiti, and Africa.

**01:506:325** ***Living on the Edge : Human Societies in Extreme Environments (3)***
Focuses on important changes in human history and their origins in extreme environments. Looks closely at environments such as deserts, mountains, and icescapes, from antiquity to the present day, and in a global context.

**01:506:328** ***Atlantic Cultures 1500-1800 (3)***
Encounters between peoples of Europe, Africa, and the Americas from the 16th through the 18th centuries. Team-taught, interdisciplinary course with an emphasis on the interpretation of texts and visual images from the era.

**01:506:329** ***Jamestown, 1607, and the Atlantic World (3)***
The original permanent English New World settlement at Jamestown in 1607, from the perspective of the larger Atlantic World of which it was a part. Course approaches topic through history and other fields such as archaeology, art history, and literature, and is taught from an interdisciplinary perspective.

**01:506:330** ***African Diaspora Liberation Movements (3)***
Examines liberation movements in Africa and the African diaspora in Europe and the Americas, focusing on common intellectual, political, and social currents. Concentrates on abolitionism, Pan-Africanism, and nationalism, investigating the relationship between elite and mass movements in each case.

**01:506:361** ***History of Socialism and Communism (3)***
History of movements for socialism and communism, their diverse development on the world scene, and impact on modern history.

**01:506:362** ***Capitalism: The History (3)***
Explores the nature of capitalism, the relationship between capitalism and history, questions about the relation between capitalism and ideas or events of the modern age.

**01:506:363** ***Imperialism (3)***
Causes of colonial expansion by European powers, Russia, Japan, and the United States; the nature of colonial empires; and the impact of imperialism on Africa and Asia.

**01:506:364** ***Colonialism to Globalism (3)***
Differences and similarities of the major European encounters with non-Europeans in modern history.

**01:506:373** ***History of Jewish Women (3)***
Jewish women's history; examines the religious, social, intellectual, and cultural environments of Jewish women from the biblical period through the 20th century.
***Credit not given for both this course and 01:563:373 or 01:988:373.***

**01:506:375** ***Jewish Immigrant Experience (3)***
Modern Jewish immigrant experience, focusing on European and Middle Eastern communities resettled in America, Israel, and Europe.
***Credit not given for both this course and 01:563:375 or 01:685:375.***

**01:506:388** ***Touching History: The World of Medieval Manuscripts (3)***
An introduction to medieval manuscripts and to book culture from before the age of printing, with particular attention to the scribal transmission of ancient and classical texts (Bible, Homer, Qur¿an, Beowulf, etc.).

Credit not given for both this course and 01:563:387 or 01:677:387 or 01:840:388

**01:506:390** ***Historiography: The History of History (3)***
Explores the history of writing history and the philosophy of history over time.

**01:506:391,392** ***Historical Studies (3,3)***
Separate sections focusing on different topics at different times and in different areas. Specific titles available at time of registration.

**01:506:393** ***Advanced Topics in the History of Women (3)***
Advanced course on specialized topic in the history of women.

**01:506:401,402** ***History Seminar (3,3)***
Introduction to skills and techniques of historical research, including writing a research paper based on primary sources. Specific topics of sections available at time of registration.

**01:506:424** ***Reading and Writing about Nature (3)***
Exploration of political, philosophical, fictional, and visual texts on relationship between humans and nature in Anglo-North America, late-16th century to present.
***Prerequisite: Permission of instructor.***

**01:506:451** ***Public History Internship (3)***
Professional, supervised work for historical society, site, archives, museum, legislative office, or equivalent; 112 hours required. Faculty coordinator evaluates student's paper/product and agency's assessment.
***Open only to junior and senior history majors.***

**01:506:452** ***General History Internship (3)***
Includes internships in the fields of law, politics, and government. In addition, includes other internships that do not meet the criteria for the Public History Internship Program; 112 hours required. Faculty coordinator evaluates student's paper/product and agency's assessment.
***Open only to junior and senior history majors. Not eligible for major credit without special permission of undergraduate adviser.***

**01:506:471,472** ***Research in History (BA, BA)***
One-semester independent study projects.
***Not open to honors candidates.***

**01:506:473,474** ***Readings in History (BA, BA)***
Independent readings under supervision of a member of the department.

**01:506:495-496** ***Honors Program in History (BA,BA)***
Focus on writing of a major research paper working with an individual professor. A seminar guides students through stages of writing, using short papers as the vehicle for the exploration; includes outlines, rough drafts, etc.
***Both semesters must be completed to receive degree credit.***

# African, Asian, and Latin American History Courses (508)

# African, Asian, and Latin American History Courses (508)

**01:508:100** ***Study Abroad Benin: History Culture and Memory (3)***
This interdisciplinary cross-cultural study abroad program explores the African side of the Atlantic World. Students spend two weeks in Benin based at our sister institution, the Ecole du Patrimoine Africaine in Porto Novo. In partnership with our Beninois colleagues, faculty and students will explore how trans-Atlantic connections have shaped religion, language, and identity; the relationship between tourism and historical memory; and the dynamism of the contemporary art scene.

Credit not given for both this course and 01:016:100.

**01:508:110** ***Political Islam: Present and Past (3)***
Introduction to Islamic political thought and practice. Emphasis on how historical knowledge can help us to understand contemporary debates over the place of Islam in the modern world.
***Credit not given for both this course and 01:685:110 and 01:840:125.***

**01:508:191,192** ***Global Topics (3,3)***
Study of special topics in global history at the introductory level.

**01:508:200** ***Ancient Near East (3)***
Origins and development of the societies of Mesopotamia, Egypt, Asia Minor, and the Levant, through the period of the Persian Empire.
***Credit not given for both this course and 01:190:200, 01:563:200, or 01:685:200.***

**01:508:201** ***Islamic Civilization (3)***
Survey of Islamic societies from seventh-century Arabia to modern times. Religious, political, military, social, economic, and cultural institutions and organizational patterns.
***Credit not given for both this course and 01:014:205 or 01:685:201***

**01:508:203** ***History of Islamophobia (3)***
This course surveys the history of Western anxiety about Islam from its origins to the present, exploring the theological, political, and cultural forces behind it. It examines how Islamophobia has been institutionalized through discrimination, exclusion and violence against Muslims and those perceived as Muslim. The term ¿Islamophobia¿ is analyzed through engaging with multidisciplinary debates that interrogate the term and its limitations, and its complex relation to religious bias and racism.

Credit not given for both this course and 01:685:241 or 01:840:228

**01:508:205** ***History of the Modern Middle East (3)***
Shaping of Middle Eastern politics and society since 1800 out of the Islamic/Ottoman legacies and under the impact of modernity and Western encroachment.
***Credit not given for both this course and 01:563:205 or 01:685:203.***

**01:508:208** ***Jewish-Muslim Relations: History and Culture (3)***
Surveys the cultural history of Jewish-Muslim relations from the seventh century up to our present. Analyzes this important and unique aspect of Jewish and Muslim pasts and the place of the Jews in the cultural history of Islam. Course taught in English. Credit not given for both this course and 01:013:208 or 01:563:208.

**01:508:209** ***Jerusalem Contested: A City's History from Jewish, Christian, and Muslim Perspectives (3)***
Introduces students to the history of Jerusalem. Causes for and evolution of the profound attachment of Judaism, Christianity, and Islam.
***Credit not given for both this course and 01:563:280 or 01:685:280.***

**01:508:211** ***Modern Israeli Culture (3)***
Approaches modern Israel as a case study in creating a new national culture in relation to ancient history and traditions and a longstanding diaspora. Explores the evolution of Israeli culture between 1940s and the 1990s from an interdisciplinary perspective.
***Credit not given for both this course and 01:508:310, 01:563:310, 01:563:281, 01:685:310, or 01:685:281.***

**01:508:212** ***Israeli-Palestinian Conflict (3)***
Overview of the hundred-year-old Arab-Israeli conflict, the controversies it has generated, the attempts to resolve it, and how outsiders to the conflict learn about it and experience it.
***Credit not given for both this course and 01:508:300; 01:563:282; 01:563:300; 01:685:282 or 01:685:300.***

**01:508:220** ***Ancient Africa (3)***
Precolonial African societies and kingdoms: family life, cities, Islam, growth and decline of states, impact of the slave trade, and African culture in the Americas.
***Credit not given for both this course and 01:016:220.***

**01:508:221** ***West Africa (3)***
Politics in past and present states, rise of new social and economic groups, various reactions to the West during precolonial and colonial eras.

**01:508:222** ***Modern Africa (3)***
Nineteenth-, 20th-, and 21st-century Africa: resistance and accommodation to colonialism; impact of Christianity; African workers and new elites; changing roles of women, nationalism, and revolution.
***Credit not given for both this course and 01:016:222.***

**01:508:224** ***Women and Gender in African History (3)***
Issues in the history of gender in Africa: female slavery; women and power formations; women in production and trade; family and community; and gender and protest.
***Credit not given for both this course and 01:016:224 or 01:988:224.***

**01:508:226** ***War and Violence in Africa (3)***
Explores the history of warfare and violence in Africa with a view toward understanding how war has shaped African states, societies, and economies. Topics include different patterns of military organization over time; evolution of weaponry, tactics, and strategy; and increasing prevalence of warfare and militarism in African political and economic systems.

**01:508:230** ***The Making of Modern India and Pakistan (3)***
Introduction to the history of the Indian subcontinent from the advent of the Mughal Empire to the creation of the modern states of India, Pakistan, and Bangladesh.
***Credit not given for both this course and 01:925:230.***

**01:508:231** ***South Asian Civilization: The First Five Millennia (3)***
History and culture of South Asia from protohistoric beginnings in the Indus Valley to the late first millennium CE. Emphasizes processes of sociocultural change such as social organization and ideology, religious institutions and patronage, and the evolution of classical culture.

**01:508:235** ***Business and Society in Historical and Contemporary India (3)***
Introduction to the long history of commerce and society in the Indian subcontinent up to the present. Includes study of the sociology of economic activity and its representation in popular culture.

**01:508:240** ***Classical Asia (3)***
Introduction to the three great civilizations of Asia: India, China, and Japan. Emphasis on traditional family life, art, literature, and the spread of Buddhism.

**01:508:242** ***Modern East Asia (3)***
Development of China and Japan in the 19th and 20th centuries: the response to Western imperialism; the rise of Chinese communism and Japanese fascism.

**01:508:243** ***War and Society in Early Modern East Asia: Hideyoshi Invasions (3)***
Examination of background, unfolding, and consequences of Hideyoshi Invasions of Korea (1592-1598) as a major international war. Considers the war's influence on Korea, Japan, and China and the political, military, socioeconomic, and cultural history of early modern East Asia more broadly. Transcends the boundary of national history to reach a comprehensive understanding of the "international" connectedness of East Asia.

**01:508:244** ***China and the United States (3)***
History of contacts between the two peoples since 1784. Concentrates on period from 1941 to present. Includes all aspects of cultural, economic, and political relations.

**01:508:246** ***History of Chinese Civilization (3)***
Introduction to foundational elements of Chinese civilization and society from a historical perspective. Evolution of main Chinese intellectual, political, social, economic, and religious traditions and institutions from the Neolithic to the present period.

**01:508:247** ***China, 1800 to the Present (3)***
Continuity and change in Chinese society, politics, culture, international relations, and the economy. Industrialization, rural life, nationalism, socialism, the party-state, gender issues, democracy movements.
***Credit not given for both this course and 01:508:342.***

**01:508:250** ***Southeast Asia and the World (3)***
Introduction to Southeast Asia--one of the crossroads of the world--from ancient civilizations until the end of the 20th century. Includes the histories of Brunei, Burma/Myanmar, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Timore Leste, and Vietnam.

**01:508:260** ***Colonial Latin America (3)***
Study of formation of culture and society in Latin America through intermingling and merger of Native Americans, Iberians, and Africans.

**01:508:262** ***War and Politics in Latin America (3)***
Examines the causes and political consequences of war and revolution in Latin America (including the Wars of Independence in the 19th century, Cuban Revolution in the 20th century, and US intervention in the region). Special emphasis on international geo-politics and US-Latin American relations.
***Credit not given for both this course and 01:590:262.***

**01:508:264** ***Latin America and the United States (3)***
Survey of the relations between the United States and Latin American nations from the 1780s to the present.

**01:508:265** ***Afro-Brazilian History (3)***
Overview of the history of the largest African diaspora community in the world from the pre-history of slavery through the present day. Critical analysis of major issues in Afro-Brazilian and African diaspora studies.
***Credit not given for both this course and 01:014:265 or 01:590:265.***

**01:508:271** ***History of the Caribbean to 1898 (3)***
History of the Caribbean from before the Spanish conquest until the consolidation of the US Imperial sphere in 1898. Emphasis on Spanish, English, and French colonialism and the formation of Jamaica, Saint Domingue/Haiti, Puerto Rico, Cuba, and Española/Dominican Republic.
***Credit not given for both this course and 01:595:204.***

**01:508:272** ***History of teh Caribbean since 1898 (3)***
Overview of the history of the Caribbean since the formation of the US sphere of influence in 1898. Emphasis on the Hispanic Caribbean and Haiti with consideration of the English-speaking nations.
***Credit not given for both this course and 01:595:205.***

**01:508:280** ***Early Native American History (3)***
Examines the images and realities of Native American cultures and histories from America before Columbus through the early period of European-Native American interaction.
***(Formerly 01:508:379)***

**01:508:282** ***Modern Native American History (3)***
Examines the images and realities of Native American cultures and histories from the colonial period through the present day.

**01:508:291,292** ***Topics in History (3,3)***
Study of special topics in global history at the intermediate level.

**01:508:303** ***The Classical Age of Islam (3)***
Rise and expansion of Islam and formation of Islamic civilization in the Middle East from 600 to the demise of the Abbasid Caliphate ca. 1250.
***Credit not given for both this course and 01:685:303.***

**01:508:304** ***Ottoman Empire (3)***
Political, socioeconomic, and cultural history of the Ottoman Empire, 1300-1900, from frontier principality, to world empire, to post-Suleymanic crisis and change.
***Credit not given for both this course and 01:685:304.***

**01:508:305** ***Modern Turkey (3)***
Introduction to the political, social, and cultural history of modern Turkey, from its late Ottoman origins to the recent past.

**01:508:306** ***War and Revolution in Iran and Iraq (3)***
Examines key episodes of conflict between Iran and Iraq in the 20th century, including Iran's Islamic revolution, the Iran-Iraq war, and the two U.S. led wars on Iraq. Investigates the longer-term roots of conflict and its social, political, and ideological consequences.

**01:508:307** ***Women and Society in the Islamic Middle East (3)***
History of women and gender relations in the Islamic Middle East: origins of gender inequalities; women's functioning within society; reality versus literary depictions; and recent transformations.
***Credit not given for both this course and 01:988:308 or 01:685:307.***

**01:508:316** ***Israeli Women: Historical and Literary Perspectives (3)***
Impact of socialism, nationalism, ethnicity, religion, and feminism on Israeli women's roles within the family, labor force, army, kibbutz, and politics.
***Credit not given for both this course and 01:563:316 or 01:685:316 or 01:988:316.***

**01:508:318** ***Nationalism in Modern Africa (3)***
Development of African political thought from the 18th century to the modern period with a focus on nationalism. Topics will include African responses to European conquest and colonization; efforts to situate Africa in world history; the emergence of African independence movements; and the influence of race, class, and gender on nationalist thought.

**01:508:320** ***History of Southern Africa (3)***
Precolonial African societies and kingdoms, family life, religion, European colonialism, and African nationalist and revolutionary movements. Emphasis on South Africa, apartheid, and the freedom struggle.

**01:508:321** ***African Cultural History (3)***
History of African music, art, religion, and other cultural practices in social and political context.
***Credit not given for both this course and 01:016:321.***

**01:508:324** ***Africans in the Americas (3)***
Africans in the Americas: Latin America, the Anglophone and Francophone Caribbean, and the United States. Focus on the African background, slavery, and race relations.

**01:508:325** ***Africa from the 15th to the 19th Centuries (3)***
Explores the history of Africa between the 15th and 19th centuries. Focuses on themes such as state formation, economic development, and the imperial conquest.

**01:508:326** ***Islam in African History (3)***
Relation of Islam to the history of long distance trade, the rise of urban centers, shifting identity formations, gender dynamics, and religious conflict.

**01:508:327** ***World War II and Africa (3)***
Focuses on the history of Africa's involvement in World War II and the impact of this involvement on African political and economic history, with special emphasis on the war's role in nationalist movements.

**01:508:328** ***History of Health and Healing in Africa (3)***
Impact of colonial and postcolonial history on patterns of health and health care in sub-Saharan Africa. Focus on African responses to changing new medical technologies and cultures, and emerging patterns of disease.

**01:508:330** ***Early Modern South Asia, 1500-1800 (3)***
The Mughal Empire between the 16th and 19th centuries and the making of modernity in the region.

**01:508:331** ***Women in South Asian History (3)***
Origins and development of modern Indian feminist struggles in their historical contexts between the late-18th and late-20th centuries.
***Not open to first-year students.***

**01:508:332** ***Slavery in South Asian History (3)***
Covers military, monastic, and household forms of slave employment in the economy of the region between the 12th and 19th centuries. Also traces changes in the legal and economic statuses of slaves in the latter half of the period.

**01:508:333** ***Culture and Power in South Asia (3)***
Explores connections between sacred power, "sciences," courts, nation-building and developments in music, dance, drama, and cinema.

**01:508:334** ***Passages to India: South Asia through Travel Narratives (3)***
Introduces students to South Asian and comparative history through reading of travelogues by visitors from other civilizations, seventh century to 20th century.

**01:508:335** ***Modern South Asia (3)***
Modern history of South Asia; focuses on the transition to and through colonialism.

**01:508:336** ***South Asia, 1947 to the Present (3)***
Follows social and political development of South Asia after decolonization, assessing the developmental agendas and international relations of the new regimes.

**01:508:337** ***Pirates, Pilgrims, and Poets: Globalization in Indian Ocean History (3)***
Examines the history of globalization by looking at the Indian Ocean as a space of economic and cultural exchange. Themes include technology and exchange, politics and space, people and mobility, and culture and representation.

**01:508:338** ***Asian Migrations (3)***
Traces the modern history and contemporary cultures of Asian migration, from approximately 1850 to the present. Explores how global historical trends, including overseas exploration, colonialism, capitalism, nation-building, and war, have shaped patterns of Asian migration.

**01:508:340** ***Late Imperial Chinese Culture and Society (3)***
Chinese history from the 16th to the 19th centuries. Focus on power, gender, and ethnicity in a comparative framework of analysis.

**01:508:341** ***Chinese Renaissance, 1000 to 1400 (3)***
History of China from 1000 CE to 1400 CE, exploring the social, cultural, and intellectual changes in the period beginning with the transition from the Tang to Song dynasties.

**01:508:344** ***China's Socialist Revolution (3)***
History of socialism and revolution in China, emphasizing rise of Chinese Communist Party, its victory in 1949, and post-1949 People's Republic of China.

**01:508:346** ***TransAsia: A Transnational History of Gender and Sexuality in Asia (3)***
Transnational history of Asia; how (trans)regional movements in peoples, ideas, commodities, technologies, and capital have shaped and been shaped by gender/sexuality.

**01:508:348** ***Chinese Intellectual History (3)***
Key topics and themes of Chinese intellectual history from antiquity to the modern period.

**01:508:349** ***Modern China through Film and Fiction (3)***
Use of film and fiction to examine selected topics in modern Chinese history: origins and rise of Chinese nationalism; geneses and development of Chinese social revolutions and political movements; trajectories of China's rise and transformation from a declining empire to a global power and evolving modern society.

**01:508:352** ***Japan's Rise to World Power (3)***
Japan's emergence from 1800 to present. The path to industrialization, military expansion, and postwar recovery. Emphasis on changing lifestyles depicted in literature and film.

**01:508:360** ***The History of Brazil (3)***
Social, economic, and political developments of the Colonial Period, the Independence Movement, the Empire, the First Republic, the era of Getulio Vargas, and the Second Republic.

**01:508:362** ***Mexico (3)***
Surveys Mexican history from pre-Columbian times to the present with special emphasis on the 20th century and the Mexican Revolution.

**01:508:364** ***Environmental History of Latin America (3)***
Mutual reshaping of physical environment and human society in Latin America, from pre-Colombian through contemporary times.
***Credit not given for both this course and 01:590:364.***

**01:508:365** ***Revolution in Latin America (3)***
Compares and contrasts the causes and effects of major revolutionary movements in 20th-century Latin America: Mexico, Bolivia, Cuba, and Central America.

**01:508:366** ***Central American Revolutions (3)***
Central America since independence. Topics include revolt and revolution; formation of repressive states and labor-repressive capitalism; emergence of reformist and revolutionary movements.
***Credit not given for both this course and 01:595:391.***

**01:508:367** ***The Afro-Latin American Experience (3)***
Examines profound impact of African diaspora on Latin American societies where persons of African descent represent significant minorities and numerical majorities. Explores how Afro-Latin Americans remember the past and experience the present.
***Credit not given for both this course and 01:590:367 or 01:595:367.***

**01:508:369** ***Gender in Latin American History (3)***
Study of the position of men and women in Latin American society from pre-European times to the present.

**01:508:370** ***The History of Cuba (3)***
Study of Cuba from pre-Columbian times to the present day. Deals with the long battle for freedom during the 19th and 20th centuries.
***Credit not given for both this course and 01:595:390.***

**01:508:371** ***History of Puerto Rico (3)***
Examination from pre-Columbian to present times. Focus on Spanish colonial policy, slavery and land tenure systems, emergence of national identity, U.S. invasion and rapid economic changes, and population control and migration.
***Credit not given for both this course and 01:595:371.***

**01:508:372** ***History of the Dominican Republic (3)***
From French invasion of Hispaniola to present. Role in Spanish Empire, U.S. control in transition to sugar economy, Trujillismo, U.S. invasion in 1965, and impact of migration on society.
***Credit not given for both this course and 01:595:372.***

**01:508:374** ***Slavery in the Caribbean (3)***
Analysis of different institutions of slavery in the Caribbean and the rise of the plantation societies. Investigating the effects on Europe and the Western Hemisphere and its legacy.
***Credit not given for both this course and 01:595:300.***

**01:508:381** ***Ancient Kingdoms: A History of the Aztecs, Incas and Mayas (3)***
This course treats the history of the three most powerful Native American states: the Aztecs, Incas and Mayas. It begins long before contact with Europeans and ends about two generations after the arrival of the newcomers. Students will learn what scholars have been able to uncover, now that we are relying more on sources written by Indigenous people and less on those produced by Europeans.

Credit not given for both this course and 01:590:381.

**01:508:383** ***History of Native American Women (3)***
Explores the lives and experiences of Native American women from 16th-century contact with Europeans through the present-day United States.
***Credit not given for both this course and 01:988:387.***

**01:508:391,392** *Historical Studies (3,3)*
Separate sections focusing on different topics at different times and in different areas. Specific titles available at time of registration.

**01:508:393** *Global Diasporas in Caribbean History (3)*
Intraregional migrations of Caribbean since 18th century. Theories and concepts of migration; slavery; Asian indentured workers; European and American presence; labor migration; Panama Canal; export economies; race; citizenship; transnational dynamics.
*Credit not given for both this course and 01:595:393.*

**01:508:410** *Medieval Turkey, 1071-1481 (3)*
Origins and development of Turkish states in Asia Minor including Seljuk Sultanate of Rum, its successor beyliks, and early Ottoman Empire.
*Credit not given for both this course and 01:685:410.*

**01:508:420** *African Labor History (3)*
African labor history: precolonial labor mobilization, control, and resistance; working-class formation; the labor process and worker consciousness.
*Credit not given for both this course and 01:014:367.*

**01:508:424** *African Cities Past and Present (3)*
Social, cultural, economic, and political history of African cities with focus on student-led comparative research.
*Not open to first-year students. Prerequisite recommended: One course on Africa.*

**01:508:429** *Research in African Historical Studies (3)*
Construction of the African past through extended study of sources for one region or theme. Requires research paper based on primary sources.

**01:508:450** *Society and Culture in Japan (3)*
Topical approach to traditional Japanese history. Focus on social institutions, the courtly and martial arts, and the endurance of traditional values in postindustrial Japan.

History (SAS)

# European History Courses (510)

# European History Courses (510)

**01:510:101** *Ancient and Medieval Europe (3)*
Introductory survey of European history from ancient times to the early modern period. Introduction to historical interpretation and historical inquiry.

**01:510:102** *Europe in the Global Age (3)*
Introductory survey of European history from the early modern period to the present. Introduction to historical interpretation and historical inquiry.

**01:510:191,192** ***Topics in History (3,3)***
Study of special topics in European history at the introductory level.

**01:510:201** ***Ancient Greece (3)***
Civilization of the eastern Mediterranean world in ancient times, with emphasis on the origins of Western civilization and the Greek contribution to Western culture.
***Credit not given for both this course and 01:190:201.***

**01:510:202** ***Ancient Rome (3)***
The Roman Republic and the Empire, with emphasis on the rise and decline of a Mediterranean world civilization under Roman leadership.
***Credit not given for both this course and 01:190:209.***

**01:510:205** ***History of the Byzantine Empire (3)***
Survey of political, military, religious, and socioeconomic development of the eastern Roman Empire, centered at Constantinople, from late third century to Ottoman conquest in 1453.
***Credit not given for both this course and 01:489:205 or 01:685:205.***

**01:510:207** ***Byzantine Civilization (3)***
History of Byzantine culture and civilization, including political ideology and statecraft, orthodox Christianity, transmitting classical traditions of science and literature, art and architecture, and laying foundations of modern Greek culture.
***Credit not given for both this course and 01:489:207 or 01:685:207.***

**01:510:209** ***Emergence of Medieval Europe, 400-1150 (3)***
Europe from the fall of Rome through the Dark Ages and into the feudal age--the era of Charlemagne, the Vikings, and the Crusades.
***Credit not given for both this course and 01:667:281.***

**01:510:211** ***Harvest of the Middle Ages, 1150-1520 (3)***
From feudalism to the Protestant Reformation, with emphasis on social and economic developments. Religious, political, institutional, and cultural changes.
***Credit not given for both this course and 01:667:282.***

**01:510:213** ***The Crusades (3)***
Ideology and expressions of the crusades, 11th to 14th centuries, including crusades against Muslims, heretics, and other papal enemies. Extensive use of film.
***Credit not given for both this course and 01:685:213.***

**01:510:217** ***From Byzantium to the Ottomans: 1204-1460 (3)***
Development of Byzantine society and culture from the Latin crisis (1204-1261) through the Ottoman conquest (1453), including the Byzantine impact on West European, Slavic, and Ottoman cultures.
***Credit not given for both this course and 01:489:217 and 01:685:217.***

**01:510:222** ***Greek Food from Antiquity to Today (3)***
Food and foodways of Greek-speaking peoples from ancient times to the present, with special emphasis on problems of continuity and change.
***Credit not given for this course and 01:489:220, 01:685:220, 01:667:220, or 01:190:220.***

**01:510:224** ***Europe: Gender, Sex, and Society (3)***
Explores the varieties of gendered experience in Europe from the Enlightenment to the 20th century, including the relationship between gender, class, ethnicity, and sexual orientation. Course material will emphasize interdisciplinary and comparative approaches.

**01:510:231** ***A History of the Britannic Isles: From the Beginnings to the 18th Century (3)***
Explores the histories of the Britannic Isles--modern England, Ireland, Scotland, and Wales--from the beginnings until the Act of Union of 1707; emphasis on history of migration, invasion, and cultural exchange.

**01:510:232** ***Fashion & Design in Europe: Between the West and the World (3)***
Focuses on a series of "moments" in European history when aesthetic styles in clothing became a flashpoint for cultural change. Explores the history and culture of clothing and fashion through a range of disciplinary and interdisciplinary perspectives from the European Renaissance to the 20th century.

**01:510:245** ***The Arts of Power: Ritual, Myth, and Propaganda (3)***
Investigates how paintings, movies, poems, and ceremonies have been manipulated to bolster the political authority of rulers, including Louis XIV, Lincoln, Hitler, and Elizabeth II.

**01:510:248** ***The Last Climate Crisis: Histories of the "Little Ice Age", c.1300-1800 (3)***
Analyzes the social, environmental, political, and cultural impact of the centuries-long climatic cooling often known as the ¿Little Ice Age¿ (c.1300-1800). Students consider what the historical study of the last climate crisis can teach us about what awaits us in the current crisis of anthropogenic climate change.

**01:510:253** ***History of Witchcraft and Magic (3)***
Witchcraft in relation to the history of religion; the phenomena of crime, deviance, and demographic change; and the history of women in Europe and America.

**01:510:255** ***Dracula: Facts and Fictions (3)***
History of Dracula in context of early modern Balkan and Ottoman political and military history. Historical and literary legacies of Dracula from the 15th century to the late 19th century.

**01:510:260** ***Remembering the Shtetl (3)***
How Jewish life in eastern European small towns has been documented and recalled from 19th century to present in fiction, art, ethnography, film, and memoir.
***Credit not given for both this course and 01:563:260.***

**01:510:261** ***History of the Holocaust (3)***
Development of anti-Semitism in modern European history culminating in the "Final Solution"; special emphasis on Jewish responses and resistance.
***Credit not given for both this course and 01:563:261.***

**01:510:263** ***Between Nazism and Communism (3)***
Explores the experiences of Poles and Polish Jews under Nazi and Communist rule through history, travel writing, memoir, poetry, and film.
***Credit not given for both this course and 01:563:270.***

**01:510:265** ***Jewish-Christian Relations through the Ages (3)***
Jewish-Christian relations from the first century CE to the start of the 21st century. Focuses both on the history of interactions between Jews and Christians--persecutions, collaborations, conversions, etc.--and the history of theological stances and popular attitudes.
***Credit not given for both this course and 01:563:240.***

**01:510:268** ***Fascism (3)***
Examines connections between alt-right, white power, and neo-Nazi groups today to the historical fascist movements and regimes of the 1930s and 1940s. Historical perspective on what fascism is, what fascists believe, and they want to do. Considers the historical conditions that have produced fascism, the legacies of the fascist movements of the 1930s for our own time, and the relevance of fascism's history to the challenges of the present day.

**01:510:269** ***Antisemitism (3)***
History of negative attitudes toward Jews and Judaism from the ancient and medieval world to modern Europe, the United States, and the Middle East. Explores continuities and turning points in the history of antisemitism as well as the significance of antisemitism as an analytic category. Focus on contemporary discourses and media representations of antisemitism in light of their historical precedents and resonances.
***Credit not given for both this course and 01:563:269.***

**01:510:271** ***Russia and the West (3)***
Formation of traditional Russian society in isolation from the West; the impact of the West on Russia from Peter the Great to the present.

**01:510:277** ***Russia: Between Empire and Nation (3)***
Study of Russia's imperial culture, history, and politics from the 19th to the 21st century as a window onto geopolitical shifts in contemporary Russia's relations to the wider world.
***Credit not given for both this course and 01:195:272 or 01:860:272.***

**01:510:291,292** ***Topics in History (3,3)***
Study of special topics in European history at the intermediate level.

**01:510:300** ***Greek and Roman Slavery (3)***
Social, economic, legal, and political aspects of slavery in Ancient Greece and Rome. The sources and numbers of slaves, forms of servitude, manumission, and slave labor.
***Credit not given for both this course and 01:190:300.***

**01:510:301** ***Early Greece (3)***
History of the Greek world from Minoan Crete through the Persian War. Readings (in translation) range from Homer through Herodotus.

**01:510:302** ***Classical Greece (3)***
Greek history from the Persian War to the Macedonian conquest of Greece. Readings (in translation) from Thucydides, Xenophon, Demosthenes, Plutarch, and others.

**01:510:303** ***Hellenistic World (3)***
Expansion and development of Greek culture from Alexander through the successor kingdoms in Greece, Egypt, Syria-Palestine, and Asia Minor.
***Credit not given for both this course and 01:190:303.***

**01:510:304** ***The Rise of the Roman Republic (3)***
Roman political, social, and cultural history from the beginning of urban settlement through the emergence of the Roman state as the dominant power in the Mediterranean basin to the end of the second century BC.

**01:510:305** ***The Crisis of the Roman Republic (3)***
Roman political, social, and cultural history during the crisis of the late republic from 133 BC, the tribunate of Tiberius Gracchus, through the establishment of the principate by the Emperor Augustus.
***Credit not given for both this course and 01:190:305.***

**01:510:306** ***Roman Empire (3)***
Political, social, and intellectual developments of the imperial period until the age of Constantine, with emphasis on the first two centuries AD.
***(Formerly 01:510:305) Credit not given for both this course and 01:190:306.***

**01:510:307** ***The Roman World in Late Antiquity (3)***
Development of the Roman state and society from the late third through early seventh centuries. The transformation of the late classical world, and the origins of Byzantium and the medieval West.
***(Formerly 01:510:306)***

**01:510:308** ***Creating Culture and History in the Ancient World (3)***
Aspects of cultural, religious, and intellectual developments in the classical world.
***(Formerly 01:510:307)***

**01:510:309** ***A History of Western Morals: Antiquity and Middle Ages (3)***
Examines the formative period of moral ideas in Western civilization in ancient Greek, Roman, and Hebrew societies, then traces the evolution of those ideas through the Middle Ages.

**01:510:310** ***Pompeii: The Life and Death of a Roman Town (3)***
Pompeii and Herculaneum, as laboratories for the study of Roman life: the economy and society; public and private architecture, art, and inscriptions; and the birth of archaeology.
***Prerequisites: One course in Roman history or culture, Latin or ancient art, or permission of instructor. Credit not given for both this course and 01:190:373.***

**01:510:311** ***Cities of the Classical World (3)***
Study of urban development in antiquity, focusing on Athens and Rome, and synthesizing the evidence of literary, historical, and archaeological sources.
***Credit not given for both this course and 01:190:372.***

**01:510:312** ***Cleopatra (3)***
Examines the historical Cleopatra and the reception of her image from antiquity to the present in literature, art, and film. Issues considered include female power in a man's world, east versus west, and politics and propaganda.
***Credit not given for both this course and 01:190:318 or 01:988:321.***

**01:510:313** ***Muslims, Christians, and Jews in Medieval Spain (3)***
History of medieval Spain with a focus on cultural, religious, and political diversity.
***Credit not given for both this course and 01:563:307.***

**01:510:314** ***Jews, Heretics, and the Inquisition (3)***
Survey of the Medieval, Spanish, and Roman inquisitions focusing on these institutions' attitudes toward--and treatment of--heretics, Jews, and conversos. Examines how these inquisitions operated and their legal precedents as well as their relations to the social, political, and religious tensions of their day, in the context of broader historical questions about forms of intolerance and modes of persecution.
***Credit not given for both this course and 01:563:314.***

**01:510:315** ***Reform and Dissent in the Middle Ages (3)***
Christian unity and its implementation, church structure, canon law, monastic reform, conciliar movement, academic and popular heresy, and church-state relations, with emphasis on Italy and Germany. Integrated, interdisciplinary study of the age of the Renaissance in Italy and northern Europe from 1300 to 1550.
***(Formerly 01:510:417)***

**01:510:316** ***Food and Drink in Medieval Europe (3)***
Food history at the crossroads of environmental, economic, agricultural, dietary, social, gender, ethnic, everyday life, religious, and political-diplomatic investigations. Examination of these themes within the millennial trajectory of medieval Europe and the Mediterranean from ca. 450 CE to ca. 1450 CE.

**01:510:317** ***The Renaissance (3)***
Integrated, interdisciplinary study of the age of the Renaissance in Italy and northern Europe from 1300 to 1550.

**01:510:318** ***Era of World War I (3)***
Causes, course, and consequences of World War I in the light of political, social, and military forces.
***(Formerly 01:510:417)***

**01:510:319** ***The Age of Reformation, 1500-1648 (3)***
The Protestant and Catholic reformations and their significance for European society.

**01:510:320** ***Women in Antiquity (3)***
Women in the ancient societies of Greece and Rome. Their roles and images in the social, legal, political, domestic, philosophical, and artistic spheres examined using primary sources.
***(Formerly 01:510:251). Credit not given for both this course and 01:190:320.***

**01:510:321** ***The Age of Enlightenment (3)***
Eighteenth-century European philosophy and philosophers examined within their historical contexts. The role of ideas in movements for social, moral, and political change.

**01:510:325** ***Nineteenth-Century Europe (3)***
Examination of the formative period of modern Europe, including the industrial and democratic revolutions, nationalism, imperialism, and the crises culminating in World War I.

**01:510:327** ***Twentieth-Century Europe (3)***
Major economic and social forces shaping life in 20th-century Europe, and efforts of major social groups to cope with and shape these forces.

**01:510:329** ***World War II in Europe (3)***
Exploration of causes, events, and consequences of WW II in Europe. Focus on political, military, economic, social, and cultural history dimensions.

**01:510:330** ***The Spanish Civil War (3)***
Analysis of the historical factors that led to war in twentieth-century Spain, how major powers influenced the conflict's outcome, and the war's impact on European and global politics.

**01:510:333** ***France, Old Regime, and Revolution (3)***
French history from Louis XIV to the fall of Napoleon. The absolutist state and the impact of revolution, stressing the interplay of political, social, cultural, and economic history.

**01:510:335** ***Modern France (3)***
History of France from the fall of Napoleon to the present, with particular emphasis on the relation of political developments to social, intellectual, and economic change.

**01:510:337** ***Medieval Kings and Queens (3)***
Rulership in theory and practice, from Germanic chieftains to divine-right monarchs, with attention to royal rivals, myths and rituals, marriage, and gender.

**01:510:338** ***England in the Middle Ages (3)***
Political development of England from William the Conqueror to the War of the Roses.

**01:510:340** ***British Atlantic World (3)***
Explores the forms of knowledge and networks of communication that shaped British colonization in the early modern Atlantic. Themes include early contact with Native Americans; commerce, piracy, and slavery; political communications and the American Revolution; and the campaign to abolish the slave trade.

**01:510:343** ***A Century of Revolution: Politics and Culture in England 1588-1720 (3)***
Explores the tumultuous political history of England during the "long seventeenth century," focusing on the long-term origins and consequences of the revolutions of 1640-60 and 1688-89, the impact of religion on politics, and the operations and transformations of monarchical and popular political culture.

**01:510:344** ***The Social History of England, 1580-1780: The First Modern Society? (3)***
Explores the socioeconomic and cultural history of early modern England. Topics include popular culture; religion; sex and gender; urbanization; and the rise of consumerism, industrialism, and capitalism.

**01:510:345** ***English Constitutional History to 1688 (3)***
Developments of English governments to 1688, with emphasis on those institutions and political and legal ideas that form the background for American constitutional development.

**01:510:346** ***The English Revolution, 1640-1660 (3)***
Explores the most tumultuous period in English history. Topics include causes and revolution, the Civil War, regicide and republicanism, radical politics and religion, and Oliver Cromwell.

**01:510:347** ***The British Empire and the British Isles, 1485-1763 (3)***
History of British overseas enterprise from opening phases of Atlantic exploration through the end of the Seven Years' War. Special attention to impact of empire on British Isles.

**01:510:348** *Great Britain, 1685-1815 (3)*
Explores Great Britain's rise to dominant global power. Focuses on internal developments as well as colonial experiences.

**01:510:349** *Modern Britain (3)*
Developments since the 18th century that have shaped the character of contemporary Britain, including parliamentary democracy, industrialization, rise and fall of empire, and cultural change.

**01:510:350** *Greek Society (3)*
Social and economic life of the Greeks from the Mycenaean period through the Hellenistic age. Written and material evidence employed.
***Prerequisite: Recommended: 01:510:201. Credit not given for both this course and 01:190:350.***

**01:510:351** *Medieval Italy, 476-1300 (3)*
The Italian peninsula from the fall of the empire in the west to the age of the communes; social, political, and religious history.

**01:510:354** *History of Italy's People (3)*
Topical approach. Etruscans to present. Emphasis on culture, geography, religion, philosophy, family structures, agricultural systems, urban development, and universities.

**01:510:357** *Medieval Germany (3)*
Survey of German history from the late Roman Empire to the threshold of the Reformation, ca 300 to ca 1500.

**01:510:360** *Society and Culture in Germany 1750-1870 (3)*
Introduction to the classical period of German culture, including study of Kant, Fichte, Lessing, Goethe, and Shiller in historical context.

**01:510:363** *Germany from 1871 to Present (3)*
Analysis of the collapse of imperial Germany, the failure of democracy in the Weimar Republic, Hitler's Third Reich, the Holocaust, and restructuring of Germany since 1945.

**01:510:368** *Jews of Germany and Austria-Hungary, 1780-Present (3)*
Jewish history in modern Central Europe. Focus on Germany, Austria, Hungary, and Czechoslovakia (now the Czech Republic and Slovakia) from the late 1700s until the present day.
***Credit not given for both this course and 01:563:368.***

**01:510:370** *Remembering the Holocaust (3)*
Holocaust remembrance in contemporary social and cultural practices in the United States and globally considered as a paradigm for deriving lessons from the past in order to respond to traumatic losses, address present social injustices, and prevent future acts of intolerance.
***Credit not given for both this course and 01:563:360 and 01:470:369.***

**01:510:372** *Armenian Genocide in Comparative Perspective (3)*
Overview of the Armenian Genocide in comparative perspective, drawing from a wide spectrum of cases of mass violence and genocide, the development of the concept of genocide in International Law, genocide denial, responsibility to protect, reparations, and reconciliation; organization and implementation of the genocide, humanitarian and armed resistance to it, and the aftermath of genocide.

**01:510:373** *State and Society in Imperial Russia (3)*
Autocratic government as a dynamic force in the 18th century and a conservative one in the 19th century in the face of intellectual and socioeconomic development.

**01:510:375** *Revolutionary Russia and the Soviet Union (3)*
Crisis of the old regime; revolution; building socialism in an underdeveloped country; Stalin's terror; expansion and the Cold War; the post-Stalin attempts at reform; and the breakup of the Soviet Union.

**01:510:377** *Russia in War and Peace (3)*
History of Russia from the war against Japan in 1904 to post-Soviet wars in Chechnya. Focus on how international conflicts affected Russian politics, culture, and society: Revolution of 1905, turmoil in First World War, revolutions of 1917, Russian Civil War, "socialism in one country," mythology of Great Patriotic War, xenophobia in Cold War, war in Afghanistan, and collapse of communism.

**01:510:378** *Jews and Revolution (3)*
Jewish experience in modern Russia, with special focus on the involvement of Jews in the Russian Revolution and socialism and nationalism during the Soviet Union, and the challenges to Russian-Jewish relations in the post-Soviet era.
*Credit not given for both this course and 01:563:331.*

**01:510:379** *St. Petersburg (3)*
Intensive study of the historical development of St. Petersburg and its role in Russian and European history. Variable topics; specific topics will be available at time of registration.
*No knowledge of Russian required. Offered only as part of summer program in St. Petersburg.*

**01:510:381** *Eastern Europe, 1800-1948 (3)*
Emergence of national movements and independent states in Poland, Czechoslovakia, Hungary, Yugoslavia, Romania, and Bulgaria. Problem of national minorities in nation-states, and solutions offered by nationalist, fascist, and communist regimes.

**01:510:382** *History of Modern Greece (3)*
Greek experience under Ottoman rule; revolution and independence; development of national state and society 1830s to present.
*Credit not given for both this course and 01:489:382 or 01:685:382.*

**01:510:383** *Eastern Europe, 1945-Present (3)*
Impact of communism and neoliberalism on Eastern Europe. Collapse of the Soviet Bloc, transition to liberal market capitalism, and its social consequences.

**01:510:384** *Cyprus: A Global History (3)*
History of Cyprus from the 16th to the 21st century.
*Credit not given for both this course and 01:489:381 or 01:685:384.*

**01:510:385** *The History of East European Jewry (3)*
Economic, legal, and political conditions of Jewish life from the 16th century to World War II. Forms of Jewish response: autonomism, messianism, Hasidism, emigration, and socialism.
*Credit not given for both this course and 01:563:385.*

**01:510:386** *Zionism: Meanings and Challenges (3)*
Origins of Zionism in the mid-19th century and its development to the present day. Topics addressed include Zionism¿s political and social contexts, how other ideologies shaped Zionism, critics of Zionism, and the effect of Zionism on Jews¿ relationship to each other and to their surrounding societies.

*Credit not given for both this course and 01:563:343*

**01:510:389** *Jewish Politics, Jewish Power (3)*
Political relationship of the Jewish community to the Gentile authorities among whom they lived, from Rome in 70 CE to the contemporary period. Continuities and discontinuities of traditional conceptions of Jewish political behavior; rebellion and accommodation to structures of power in varying historical contexts.
*Prerequisite: At least one course in Jewish or European history after 1500. Credit not given for both this course and 01:563:389 and 01:790:384.*

**01:510:390** *Jewish Memory (3)*
Course explores various forms of Jewish memory shaped in response to major events, including myths, holidays, monuments, pilgrimages, testimonies, museums, literature, and film.
*Credit not given for both this course and 01:563:390.*

**01:510:391,392** *Historical Studies (3,3)*
Separate sections focusing on different topics at different times and in different areas. Specific titles available at time of registration.

**01:510:393** *Jewish Historical Fiction (1.5)*
Explores a variety of Jewish historical novels and their relationship to the historical periods they purport to represent, from late antiquity to the modern period. Special emphasis is given to comparing works of history with works of fiction. Topics include: Second Temple sectarianism, medieval Jewish marriage law and customs, mysticism, sabbatianism, and revolution in the Soviet Union.
*Credit not given for both this course and 01:563:336.*

**01:510:394** *Human Rights (3)*
Examines the history of human rights as a set of ideas and as a motivation for social action. Special emphasis on the role of human rights in Europe, but includes comparisons with rights-based activism in other parts of the world.

**01:510:401** *The Idea of Europe: 18th Century to the Present (3)*
Exploration of the concepts "Europe" and "Europeans" from 1700 to the present.
*Prerequisite: 01:510:101-102 or permission of instructor. Credit not given for both this course and 01:360:401.*

**01:510:403** *Ancient Warfare and Diplomacy (3)*
International politics and military history in the Greek and Roman world. Readings include ancient sources (in translation) and modern interpretations.

**01:510:407** *Rome in the Age of Augustus (3)*
Examination of the career of Augustus and the developments in the Roman world during this period. Treatment of the problems of change and continuity through revival and innovation in political, social, and intellectual spheres, with emphases on growth of imperial system and on the literary works and social legislation.

**01:510:419** ***Europe in the Contemporary World (3)***
Europe from 1930s to present, focusing on European responses to challenges of American power, Soviet revolution, and anticolonial movements.

**01:510:425** ***Intellectual History of Early Modern Europe (3)***
Study of major currents of thought (religious, scientific, political, and social) from the end of the Middle Ages to the 18th century.

**01:510:441** ***The Social History of Medieval England (3)***
Concentrates on the interaction between individual and society in medieval England with special emphasis on the life experiences of the common people.

**01:510:484** ***Russia after Stalin: Literature, History, Theory (3)***
Recent past of Russian culture and politics. Study of how the Stalinist past influenced late Soviet Russian culture, contributed to the collapse of the USSR, and shaped post-Soviet Russia through examination of powerful fiction texts and films that defined the post-Stalin era, from 1950s onward, as well as nonfiction and theoretical texts on Stalinism and its aftermath.
***Taught in English. Credit not given for both this course and 01:86:484 and 01:195:484.***

History (SAS)

# American History Courses (512)

# American History Courses (512)

**01:512:103** ***Making of America: Colonization to Civil War (3)***
Political, economic, and social history of the United States from colonial times to the Civil War.

**01:512:104** ***Making of America: Gilded Age to Global Power (3)***
Political, economic, and social history of the United States from the Civil War to the present.

**01:512:107** ***Gateway to Making of America: Colonization to Civil War (4)***
U.S. history to 1877, with weekly recitation section.
***Registration through school dean.***

**01:512:108** ***Gateway to Making of America: Gilded Age to Global Power (4)***
U.S. history since 1877, with weekly recitation section.
***Registration through school dean.***

**01:512:111** ***Race, Place, and Space in American History (3)***
Explores the interplay of social, historical, and spatial forces in configuring American racial formations and identities--white, black, Indian, and Asia--from the colonial period to the present. Situates race in geographical context and assesses how modern America has been influenced by the historical development of racialized spaces and places.

**01:512:121** ***Health and Environment in America (3)***
Changing manner in which Americans perceived and responded to health-related problems involving both the individual and the physical and social environment from the 17th to the 20th century.

**01:512:191,192** ***American Topics (3,3)***
Study of special topics in American history at the introductory level.

**01:512:205** ***The American Presidency (3)***
Examines the American presidency in historical perspective, including the powers of the office, its place in the American imagination, and the substantive achievement of the most significant presidents.

**01:512:210** ***Food in the United States and the World (3)***
Examines the histories of food production and consumption in the United States and the world from the colonial era to the 21st century, with particular emphasis on the 19th and 20th centuries. Considers how political and economic power relations, social norms, and cultural traditions regarding food production and consumption have changed over time.

**01:512:212** ***Cowboys and Indians on the Western Frontier (3)***
Introduction to the history of the west and tensions between native people and settlers.

**01:512:215** ***American Legal History (3)***
American legal history from the 18th century to the contemporary era. Focus on specific case studies in the history of American law.

**01:512:216** ***Famous Trials (3)***
Examines famous American trials (Sacco and Vanzetti, Scopes, Scottsboro, Hiss) with comparative trials from world history (Galileo, Dreyfus, Oscar Wilde). Includes film portrayals and 21st-century parallels.

**01:512:220** ***Your Family in History (3)***
American history from the perspective of a student's own family or ethnic group. Impact of social, cultural, economic, and religious changes on the family.

**01:512:221** ***Abortion: The Collision of History, Law, Religion, Medicine, and Human Rights in the 20th and 21st Centuries (3)***
Abortion is one of the most socially contested issue of our time. Using a historical and

sociological lens, this course seeks to understand the issues in more contextual and less polemic manner. This course will explore the history of abortion, key legal and public health aspects, the anti-abortion social movement, the realities of abortion provision, abortion in popular culture and public opinion, and abortion in the international arena.

Credit not given for both this course and 01:840:220.

**01:512:225** ***Sexuality in America (3)***
The history of sexuality in American history from early colonization to contemporary America. Explores the factors that shaped people's sexual lives and introduces students to the historical study of sexuality.

**01:512:229** ***History of Medical Ethics (3)***
Overview of medical ethics in 19th and 20th century United States and the historical milestones that led to our current system of research oversight. Traces history of research with human subjects prior to the establishment of bioethics as a field and examines discussion and practice surrounding human subjects research in late 19th and 20th centuries. Topics include Tuskegee Syphilis Experiment, ethical issues in human reproduction, ethics of death and dying, ethics of commodification of medical care.

**01:512:230** ***History of Medicine in Film (3)***
Portrayals of medicine and medical care in American film over the past 80 years. What popular films can tell us about the cultural images of physicians, technology, and medicine in American society.

**01:512:231** ***American Jewish History (3)***
History of the Jews in the New World, beginning in the middle of the 17th century, and then focusing on the United States until the present.
***Credit not given for both this course and 01:563:231.***

**01:512:235** ***Accidents and Disasters in the United States and the World (3)***
Examines the histories of accidents and disasters in the United States and the world from the 17th to the 21st centuries, with particular emphasis on the 19th and 20th centuries.

**01:512:236** ***Edison and His Era (3)***
Work of Thomas Edison as a vehicle for understanding the transformation of the American economy and culture from 1880-1930.

**01:512:237** ***Data: A Social History (3)***
Explores data in American society. How and why data became central to government, business, and daily life in the United States, from the nineteenth century to the present day.

**01:512:238** ***History of Homelessness: Unhoused Populations in US History (3)***
Examines social and legal history of homelessness and unhoused populations in the United States, from the colonial period to the present.

**01:512:240** ***World War I (3)***
Study of the causes, course, and consequences of World War I, with particular emphasis on American culture and foreign policy within Western civilization.

**01:512:242** ***World War II (3)***
Study of the causes, course, and aftermath of World War II, with particular emphasis on the place of American culture and foreign policy within world politics.

**01:512:250** ***Natives and Newcomers: Immigration and Migration in U.S. History (3)***
Immigration and migration in U.S. history from precolonial societies to the present. Critical examination of the dynamics of immigration over several centuries, challenging common fundamental views. Considers immigration from the perspective of natives or "the nation" and from the view of newcomers.

**01:512:253** ***Asian American History (3)***
Introduction to the political, economic, and sociocultural aspects of immigrants from Asia and their descendants in the United States from the 16th to the 21st century.
***Credit not given for both this course and 01:050:253.***

**01:512:260** ***American Slavery (3)***
Examines the institution of slavery from 1619 through the Civil War. Considers how slavery changed over time and how it was experienced in different regions.

**01:512:262** ***African-American History to 1877 (3)***
African-American history from origins in Atlantic Africa to the end of the Civil War. Focal points include the Atlantic African background, the Atlantic slave trade, Antebellum slavery, slave culture, and the Civil War. Explores forces which have converged to create African-American peoples and shape their lives, communities, and cultures in early North America.

**01:512:263** ***African-American History, 1877 to Present (3)***
African-American history from defeat of Reconstruction to present. Topics covered include the post-Reconstruction period, Jim Crow, urbanization, and migration, as well as African-Americans' experiences with education, housing, and justice in the U.S. legal system. Examines key social justice movements such as the Civil Rights Movement and Black Power.

**01:512:264** ***Black Lives Matter (3)***
Explores the development of the #BlackLivesMatter movement beginning with the colonial era and ending with the contemporary moment.
***Credit not given for this course and 01:014:264.***

**01:512:266** ***History of the Black American (3)***
Survey of the history of the black American from the colonial era to the present. Includes such topics as slavery, the Reconstruction era, the Washington-DuBois controversy, the Harlem Renaissance, and the Civil Rights movement.

**01:512:267** ***History of Black Travel and Migration (3)***
Examines the various travels taken by African Americans. From the forced migration of African peoples in the transatlantic slave trade to contemporary heritage tours to Africa, this class explores the meaning of travel for African Americans.

**01:512:268** ***Plantation to White House (3)***
Exploration of the history of blackness in America, from colonial times to the present, with key questions focusing on slavery, citizenship, gender, and racial identity.

**01:512:278** ***Popular Music in American History (3)***
Popular music examined within the broader social and cultural context of America's past. Significant historical changes in musical expression.

**01:512:280** ***News Media and Government in American History (3)***
Examines relationship between media and institutions, and the processes through which people and societies make political choices.
***Credit not given for both this course and 04:567:278.***

**01:512:282** ***Sport in History (3)***
Role of sport in ancient and preindustrial societies; modernization of sport following the Industrial Revolution; social functions and aesthetics of sport; women in sport; sport in contemporary society.

**01:512:291,292** ***Topics in History (3,3)***
Study of special topics in American history at the intermediate level.

**01:512:300** ***History of Colonial America (3)***
From the Age of Discovery through the American Revolution, with particular emphasis on political, economic, and social history.

**01:512:301** ***The American Revolution (3)***
Coming of the American Revolution seen in its world setting; various interpretations of the causes: ideological, constitutional, social, economic, political, diplomatic, and military perspectives.

**01:512:302** ***The United States: The Young Republic (3)***
Examination of the principal political, economic, and social forces that were responsible for the development of the new nation.

**01:512:303** ***American Civil War and Reconstruction, 1848-1880 (3)***
Analysis of major forces 1848 to 1880. Emphasis on the more immediate background to the war; how the war began; how it was fought; and why Reconstruction developed and collapsed.

**01:512:304** ***The Forging of Modern America, 1880-1920 (3)***
Political reform movements against the background of industrial development, urbanization, and immigration in the United States from 1880 to 1920.

**01:512:305** ***U.S. History, 1914-1945 (3)***
U.S. history from World War I through World War II, emphasizing major themes in U.S. politics, society, culture, and diplomacy.

**01:512:306** ***U.S. History, 1945 to the Present (3)***
U.S. history emphasizing the cold war, McCarthyism, and the major political, social, and economic trends of the 1960s and 1970s.

**01:512:308** ***History and Asylum Law in the United Stats (3)***
Advanced research seminar and practicum; explores the history of asylum in the United States; shows how historical research can be applied to the practice of asylum law.

**01:512:310** ***New Jersey History (3)***
New Jersey from its proprietorial beginnings to the present. Emphasis on those factors that have been most influential in determining the character of the state today.

**01:512:311** ***History of American Education (3)***
A historical survey of American education from the colonial period to the present. Topics considered will include the following: 1) colonial American education; 2) the origins of common schools; 3) the development of a public school system; and 4) 20th- and 21st-century educational reform.
***Credit not given for both this course and 05:300:364.***

**01:512:313** ***Childhood in America (3)***
Introduction to childhood as a subject of historical inquiry, exploring both childhood as a cultural expression and children as historical subjects over the course of 400 years of American experience in psychological, religious, social, educational, economic, and political terms.

**01:512:314** ***The City in American History (3)***
Urbanization from the colonial city to the 20th-century metropolis; urban population, institutions, problems, and planning; urbanism in American culture.

**01:512:315** ***Famous Trials in Modern America (3)***
Civil liberties and civil rights trials in 20th-century America: Abrams, Sacco and Vanzetti, Scopes, Scottsboro, Rosenbergs, Hiss, *Roe v. Wade*.

**01:512:316** ***Radicalism in America (3)***
Ideas of the outstanding radicals in American history (18th century to the present), the areas of discontent, and an analysis of the response of the American community.

**01:512:317** ***Murder in American History (3)***
Famous murders (and other capital crimes) illustrating major cultural and political trends in American life. May include Salem witchcraft, the Boston Massacre, Sacco and Vanzetti, Lindbergh, Leopold and Loeb, and Emmett Till.

**01:512:318** ***History of Political Corruption and Reform in America (3)***
The long history of political corruption in America, and the reform movements designed to combat corruption. From colonial America to the present.

**01:512:319** ***Nineteenth-Century Architecture and Society in the United States (3)***
Overview of the social and intellectual history of architecture in the United States to 1900. Role of architecture in societal transformations (the development of nationhood, industrialization, and urbanization). Emphasis on the invention of new building types, including universities, government buildings, prisons, hospitals, railroad stations, and the architecture of World's Fairs.
***Credit not given for both this course and 01:082:391.***

**01:512:320** ***American Frontier History (3)***
Mythology, theory, and reality of the frontier in American social, cultural, and environmental development from discovery to the present.

**01:512:321** ***Health Care and Society in America (3)***
History of disease in America from the age of smallpox and scarlet fever to the era of AIDS; and history of health and health care from the colonial era to present.

**01:512:322** ***Drugs: A Social History (3)***
History of drug use in modern America, drugs in the underground and informal economy, drug epidemics, and government response in the United States after World War II.

**01:512:323,324** ***History of the North American Environment (3,3)***
Comparative study of the interplay of culture, society, and environment in Canadian, U.S., and Mexican history.

**01:512:328** ***Science in American Culture (3)***
Place of science in U.S. history. Science and exploration, war, the economy, and social problems; growth of research and educational institutions; popular science and antiscience.

**01:512:329** ***Technology and Nature in American History (3)***
Historical exploration of the shaping of American history by technological and natural forces. From colonial America to the 21st century; from Walden Pond to Yosemite National Park, an exploration of land-use patterns, transportation networks, suburbanization, ideas about wilderness, environmental politics, and other topics.

**01:512:332** ***American Economic Growth since 1860 (3)***
Main currents and major factors in American economic growth, welfare, and decision making, 1860 to the present. Critical evaluation and interpretation of economic issues.

**01:512:335** ***History on Film (3)***
Examination of films that interpret the American past and engage major historical issues.

**01:512:342** ***Policing in Black Communities: From Slavery to Mass Incarceration (3)***
This course examines the history of policing in Black communities from its origins in colonial slavery to the present. It reveals how Black people's desire for freedom from slavery led fearful local, state, and federal authorities to establish a complex web of laws, policies and social practices that monitored and governed Black people's lives, laying a durable foundation for systems of racial and social control that continue to exist in modified forms in contemporary society.

**01:512:347** ***War, Peace, and the Military of the United States to 1877 (3)***
Survey of American attitudes toward and developments in regard to war, peace, and the military from colonial times through the Civil War and the end of Reconstruction.

**01:512:348** ***War, Peace, and the Military of the United States since 1877 (3)***
Survey of American attitudes toward and developments in regard to war, peace, and the military from modernization of the army and navy beginning in the late 19th century through the Spanish-American War, two world wars, the Korean and Vietnam wars, to the present military situation.

**01:512:350** ***From Colonies to Empire: American Foreign Relations to 1898 (3)***
American foreign relations from the colonists' conflicts with Native Americans to the Spanish-American War. Territorial expansion, diplomatic principles, economic expansion, and rise of the "New Empire."

**01:512:351** ***Mexican-American History (3)***
Examination of major themes in Mexican American/Chicano history since the 19th century. Topics include Spanish empire, Anglo-American conquest, racial hierarchies, labor migration, politics, popular culture, gender, sexuality, and social movements.
***Credit not given for both this course and 01:595:351.***

**01:512:352** ***U.S. Foreign Relations since 1898 (3)***
American foreign relations from the Spanish-American War to the end of the cold war: Imperialism, Wilsonian interventionism, World War II, cold war, and détente.

**01:512:354** ***America, Russia, and the Cold War (3)***
Examines the shift from friendship to antipathy between Russia and America in the late 19th century and early 20th century; the roots of Soviet-American ideological rivalry; superpower competition and global conflicts after 1945; détente; the ending of the Cold War; and the question of a "new Cold War" in the 21st century.

**01:512:355** ***America's Rise to Global Power (3)***
Technology as the key source of U.S. identity and projection of power and culture overseas. Focus on the interaction of United States and Asian and African societies.

**01:512:356** ***The Thirty Years' War: America in Vietnam (3)***
Examination of the causes and effects of the war in Vietnam with special emphasis on the United States and its role.

**01:512:359** ***Race, Culture, and Politics: Blacks and Jews in America (3)***
How black and Jewish identities have evolved in relationship to one another through an examination of social and political history, literature, and film.
***Credit not given for both this course and 01:563:359 or 01:014:359 or 01:050:339.***

**01:512:360** ***Latino History (3)***
History of people of Latin American and Hispanic Caribbean descent in the United States over the last two centuries. Experiences of exile, labor migrants, refugees, and colonial subjects. Formation of communities, political and labor struggles, and racial/ethnic identities.
***Special Notation: Not open to first-year students. Credit not given for both this course and 01:595:369.***

**01:512:361** ***History of the South (3)***
Development of southern society from the settlements of Virginia to the present. Aspects of life in the South that distinguish this region from others in the United States.

**01:512:362** ***Black Family in American History (3)***
Defines and interprets the black family at different points in American history. Also explores such contemporary topics as the rise of the "underclass" black family, and the tendency toward "singleness" in black America.

**01:512:363** ***African-American Women's History (3)***
Examines the diversity of African-American women's lives and the development of women, work, and culture from the colonial era through the late 20th century.

**01:512:364** ***History of Blacks in Urban America (3)***
Explores aspects of black urban life from the early years of the nation to the present. Migration. Examination of contemporary black urban America.

**01:512:365** ***African-American History Since 1945 (3)***
Social history, politics, and culture of African-American life in the United States from 1945 to the present.

**01:512:366** ***History of Race and Sex in America (3)***
Examines how race and gender have independently and jointly determined life chances throughout American history.
***Credit not given for both this course and 01:014:366 and 01:988:329.***

**01:512:368** ***History of Civil Rights, 1900-1980 (3)***
Politico-economic, demographic, cultural, and legal forces generating and shaping the struggle for racial justice in the United States from the beginning of the 20th century.

**01:512:370** ***History of American Thought to 1850 (3)***
Principal ideas about humanity, God, nature, and society in American history from Puritan America to 1850.

**01:512:372** ***History of American Thought since 1850 (3)***
Principal ideas about humanity, God, nature, and society in American history from 1850 to present.

**01:512:373** ***African Americans in a Revolutionary World, 1910-1940 (3)***
History of black migration to the urban South and North, Harlem Renaissance and the New Negro movement, the entrance of black people into industrial employment, the establishment of black urban communities, the development of black political activism and artistic production, pan-Africanism and the connection of black activists to global networks of activists and intellectuals in the Caribbean and Europe.

**01:512:374** ***Cultural History of the United States: 20th Century (3)***
Nature of American culture by study of folk, popular, and elite cultural products, verbal and nonverbal, in a world of mass production and consumption.

**01:512:375** ***Gay and Lesbian History in the United States (3)***
Introduction to gay and lesbian history in the United States; explores same-sex desire, queer identities, community formation, and social movements from the colonial period to present. Particular emphasis on queer history's place in the larger context of U.S. political, social, and cultural movements in history.

**01:512:376** ***American Culture in the 1950s (3)***
Survey of major cultural and political developments of the 1950s. Growth of advertising, consumerism, television, popular music, the "Ike Age," and McCarthy; perceptions of race and sex.

**01:512:377** ***The 1960s (3)***
Examines the political culture of the 1960s, centering on conflicts between the forces of order, consensus, and containment, and the social forces of protest, resistance, and liberation.

**01:512:379** ***African-American History, 1877 to Present (3)***
African-American history from defeat of Reconstruction to present.

**01:512:380** ***Women in American History I (3)***
Changing status of women from settlement to Reconstruction, including the study of work, family, religion, sexuality, organizations, and feminism.
***Credit not given for both this course and 01:988:380.***

**01:512:381** ***Women in American History II (3)***
Changing status of women from Reconstruction to the present, including the study of work, family, religion, sexuality, organizations, and feminism.
***Credit not given for both this course and 01:988:390.***

**01:512:383** ***Women's Rights in America, 1800-1930 (3)***
Explores women's rights movements in the United States from 1800-1930 in the context of larger developments in the Atlantic World. Movements studied include abolition of slavery, legal rights, labor organizing, peace, suffrage, and sex radicalism.

**01:512:385** ***Women Behaving Badly (3)***
History of women behaving badly in the late 19th- and early 20th-century United States. Examines histories of women criminals as well as experiences of women who transgressed racial, gendered, and sexual boundaries. Analysis of crime and female sexual deviance as well as efforts to curtail and reform disorderly women. Emphasis on social constructions of morality, delinquency, and womanhood.

**01:512:388** ***Religion, Law, and the American Constitution (3)***
A course that studies Religion in American Constitutional Law, focusing especially on Supreme Court cases related to religion from the 19th century to the present. Interpretation of the establishment and free exercise of religion clauses in the First Amendment has been and remains a vital issue for American democracy and civil rights. This course seeks to provide context and analytical tools for understanding religion's role in American law, and vice versa.

Credit not given for both this course and 01:840:381.

**01:512:391,392** ***Historical Studies (3,3)***
Separate sections focusing on different topics at different times and in different areas. Specific titles available at time of registration.

**01:512:395** ***The Electronic Century: Technology and Popular Culture Description (3)***
Shaping of American social and cultural life in the 20th century by electrical, electronic, communications, and computer technologies.

**01:512:400** ***History of American Politics (3)***
Conduct of politics in the United States, including the origin and development of political parties, characteristic forms of political behavior, and relationship of parties to democratic government.

**01:512:402** ***American Constitutional History to 1865 (3)***
Study of the origins of the American Constitutional system: American Revolution; Constitutional Convention of 1787; Bill of Rights; Marshall and Taney courts; slavery, racism, and the Civil War.

**01:512:404** ***American Constitutional History from 1865 (3)***
Supreme Court's role in interpreting the Constitution from the Civil War and Reconstruction (and passage of the 14th Amendment) to the present. Regulation of the economy and the "right to work"; free speech in war and peace; the New Deal; the due process "revolution"; abortion; affirmative action; and freedom of and from religion.

**01:512:432** ***History of Business in America (3)***
Historical view of the growth and change of business institutions in the United States from the colonial era to the present.

**01:512:434** ***History of Labor Movement (3)***
Impact of industrialization on the workforce of the United States. Economic pressures, technological developments, and ethnic subcultures as related to the social history of the working class.

**01:512:438** ***Oral History Fieldwork (3)***
Problems, theories, and methods of conducting field interviews and transcribing, editing, and analyzing oral sources. Students document New Jersey families; ethnic communities; and labor, business, religious, and political groups.

# English (SAS)

## ENGLISH

(English: Creative Writing 351, English: Film Studies 354, English: Literature 358, English: Theories and Methods 359, English: Composition and Writing 355; English: As a Second Language 356)

Department of English, School of Arts and Sciences

**English Department Website:** Here

**Writing Program Website:** Here

**Chair:** Brad Evans

**Undergraduate Director:** Sean Silver

**Director of Writing Program:** Abigail Zitin

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Lauren Goodlad, B.A., Cornell; M.A., New York; Ph.D., Columbia

Leah Price, A.B., Harvard; Ph.D., Yale

Jonah Siegel, B.A., Middlebury College; Ph.D., Columbia

Evie Shockley, B.A., Northwestern; J.D., Michigan; M.A., Ph.D., Duke

Carolyn Williams, B.A., Wellesley College; M.A., Ph.D., Virginia

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**Professors:**

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Carter Mathes, B.A., Virginia; Ph.D., California (Berkeley)

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**Teaching Professors:**

Doaa Rashed, B.A. Alexandria, Egypt, Ph. D. Univ. Maryland Baltimore County

**Associate Teaching Professors:**

Jonathan Bass, B.A., Columbia; Ph.D., Rutgers

Brian Becker, B.A., George Washington; M.A., Chicago; Ph.D., Rutgers

Paul Bielecki, B.A., Temple; M.A., Ohio

Paul Blaney, B.A. New College, Oxford; M.F.A., Oregon

Lynda Dexheimer, B.A., Rutgers; M.Sc., London School of Economics, Ed.D., Rutgers

Mark DiGiacomo, B.A., George Washington; M.A., Sussex (UK); M.A., Ph.D., Rutgers

Donald Dow, B.A., College of William and Mary; M.A., George Mason; M.A., Ph.D., Rutgers

Miriam Jaffe, B.A., M.A., Ph.D., Rutgers

Erin Kelly, B.A., Yale; M.A., Ph.D., Rutgers

Annie King, B.A., St. Mary's College; Ph.D., Saint Louis

Jacqueline Loeb, B.A., SUNY (Binghamton); M.A., Ph.D., Rutgers

William Magrino, B.A., SUNY (Albany); M.A., College of Staten Island; Ph.D., Indiana (Pennsylvania)

Regina Masiello, B.A., M.A., Rutgers, Ph.D. Rutgers

Joann Messina, B.A., J.D., Rutgers

Susan Miller, B.A., Virginia; M.F.A., New York

Peter Molin, B.A., Virginia; M.A., California (Berkeley); Ph.D., Indiana

Carl Nelson, B.A., M.A., Ph.D., Rutgers

Joshua November, B.A., Binghamton; M.F.A., Pittsburgh

Alison Powell, B.A., Indiana University, Ph.D., CUNY Graduate Center in New York,

Brendon Votipka, B.A., Muhlenberg; M.F.A., Rutgers

**Assistant Teaching Professors:**

Haemee Ahn, B.S., M.A., Western Michigan; M.Ed., College of New Jersey

Deborah Allen, B.A., Toronto; Ph.D., Rutgers

Anthony Alms, B.A., Wisconsin; M.M., Boston; Ph.D., CUNY

Janet Ansine, B.A., Kean; M.S., Purdue Global

Brie Ashley, B.A., M.F.A., Michigan

Alanna Beroiza, B.A. Bowdoin, M.A. Rice, Ph.D. Rice

Ian Bignall, B.A., Sara Lawrence College; M.A., Oxford; M.A., Rutgers

Sara Blomquist, B.A., Rutgers; M.F.A., Temple¿

Arete Bouhlas, B.A., Monmouth; M.C.I.S., Rutgers

Jennifer Bryan, B.A., Nebraska (Lincoln); M.F.A., Bowling Green State; Ph.D., Nebraska (Lincoln)

Mark Buchan, B.A., Cambridge; Ph.D., Michigan

Tracy Budd, B.A., M.A., Rutgers

Alexander Buzick, B.A. Dickinson, PH.D Fordham

Mihaela Carla Caponegro, B.A., Rutgers; M.A., Ph.D., Princeton

Claire Celi, B.A. Ramapo, M.A. Carnegie Mellon

Adam Dalva, B.A., Swarthmore College, M.F.A., New York University

Alex Dawson, B.A., Rutgers; M.F.A., Bennington

Elizabeth Decker ,B.A. Notre Dame, M.A. Saint Louis, Ph.D. The Graduate Center, CUNY

Natalie DeSorbo, B.A., Rutgers; M.Ed., College of New Jersey

Michael Duffy, B.A., DuPauw; M.F.A., Rutgers

Patricia Egbert, B.A. Rutgers, M.S. Texas A & M, Ph.D. Rowan

Hebatalla Elkhateeb, B.A., Cairo University (Egypt); M.Ed., Ed.D., Tennessee State

Joanna Fuhrman, B.A. University of Texas, M.F.A., University of Washington

Julie Flynn, B.A., Rutgers; M.A., Drew

Agnieszka Goeller, B.S., B.A., Wayne State; M.A., Rutgers

Michael Goeller, B.A. Rutgers, M.A. Rutgers

Timothy Hedges, B.S. Cornell, M.A.Ohio, M.F.A. Michigan

David Howland, B.A. Penn State, M.S. New Hampshire, Ph.D New Hampshire

Fiona Hu, B.A., Ed.M., Rutgers

Paul Hufker, B.F.A., Webster; M.F.A., Brooklyn College

Jordanco Jovanoski, B.A., Rutgers; M.A., Ph.D., New School

Madhav Kafle B.Ed. Mehaendra Ratna, M.A Tribhuvan, M.A. Delaware, Ph.D. Penn State

Debra Keates, B.A., Yale; M.A., Johns Hopkins

Demetri Lallas, B.A., Iowa; M.A., Ph.D., Wisconsin (Madison)

Snow Lee-Jones, B.A Oberlin, M.A Columbia, M.A. Rutgers, Ph.D. Rutgers

Dawn Lilley, B.A., Oakland; M.A., Rutgers

Reagan Lothes, B.A. Wittenberg, M.Phil., Ph.D., City University of New Jersey

John Maerhofer, B.A. SUNY Stony Brook, M.A. CUNY Queens College, Ph. D. CUNY Graduate School

Tara Malanga, B.A. Rutgers, M.Ed. Rutgers, Ph.D. Rutgers

Nancy Martin, B.A. Memorial Univ. Newfoundland, M.A Carleton, M.W.S Memorial Univ. Newfoundland, Ph.D Oxford

Michael Masiello, B.A., M.A., Ph.D., Rutgers

Jacqueline McDaniel, B.A., Rutgers; M.A., Seton Hall¿

Michael Mendonez, B.A. College of New Jersey, M.F.A. NYU

Michael Monescalchi, B.A.SUNY Albany, M.A., Ph.D Rutgers

Peter Morrone, B.A., Colgate; M.A., Brooklyn College; Ph.D., Mississippi

Raluca Musat, B.B.A., CUNY (Baruch College); M.A., Ph.D., CUNY

Kathryn Narramore, B.A., James Madison; M.A., Alabama; Ph.D., CUNY

Nela Navarroo-LaPointe, B.A. Rutgers, M.A.,Teachers College Columbia, M.A. Univ. of the Andes

Mary- Jane Oltarzewski, B.A., Rutgers; J.D., New York Law School

Francesco Pascuzzi, B.A., Universita Roma Tre (Italy); Ph.D., Rutgers

Sara Perryman, B.A., California (Berkeley); M.A., Rutgers

Emily Renaud, B.S., M.S., Southern Oregon State College; M.S., Rutgers

Robinson, A.B Davidson, J.D, Georgia, M.A. Mississippi, Ph.D. Emory

Puja Sahney, B.A.,,M.A.Univ of Pune, M.A. Utah State, Ph.D, Indiana Univ

George Schroepfer, B.A., M.L.S., Kean

William Schwartz, B.A. NYU, M.F.A Illinois

Elif Sendur, B.A. Bogazici Univ, M.A. Binghamton, Ph.D. Binghamton

Alexander Solomon, B.A., Rice; M.A., Ph.D., Rutgers

Ben Tam, B.A. Univ of Hoing Kong, M.A. Georgetown, Ph.D. Cornell

Willow Erin Tanner, B.A. California-Irvine, M.A., Ph.D. Rutgers

The Friend, B.A., Boston College, M.A. Boston University, M.F.A. Columbia University

Sarbani Vengadasalam, M.Phil., Madras (India); Ph.D., Poona (India)

Howaida Wahby E-Eraky, B.A. Alexandria Univ., M.A. American Univ, Cairo, PH.D. Alexandria Univ.

Daniel Walsh, B.A., Muhlenberg College; M.F.A., Columbia¿

Shelby Wardlaw, B.A. Vassar, M.A. Colorado, M.F.A Columbia

Brendon Votipka, B.A., Muhlenberg; M.F.A., Rutgers

John Warren, B.A., M.A., Rutgers

Simon Wickhamsmith, B.A., London; M.A., Ph.D., Washington

RAsheda Young, B.A. Hampton, M.A. CUNY,

Madeline Zehala, B.A., Caldwell College; M.A., Seton Hall

Qisi Zhang, B.A., Shenyang Normal (China); M.A., Liaoning (China); M.Ed., Bloomsburg; Ph.D., Indiana (Pennsylvania)

**Teaching Instructors:**

Chazarrae Freeman, B.A. Geneva, M.A. Southern New Hampshire

Lauren Kimball, B.A. Cornell, Ph.D. Rutgers

Lauren Fanelli -Teague, B.A. Cornell, M.F.A American, M.A. Rutgers

Lauren McConnell, B.A. Rider, M.A. Rutgers

**Executive Director of the Writing Program:**

Lynda Dexheimer, B.A., Rutgers; M.Sc., London School of Economics and Political Science, Ed.D. Rutgers

**Associate Executive Director of the Writing Program:**

Mark DiGiacomo, B.A., George Washington; M.A., Sussex (UK); M.A., Ph.D., Rutgers

**Faculty Emeriti:**

John Belton, B.A., Columbia; A.M., Ph.D., Harvard

Wesley Brown, B.A., City University of New York; MA., SUNY (Oswego)

Abena Busia, B.A., M.A., St. Anne's College (Oxford); Ph.D., St. Anthony's College (Oxford)

Harriet Davidson, B.A., Texas (Austin); M.A., Ph.D., Vanderbilt

Marianne DeKoven, B.A., Radcliffe; M.A., Ph.D., Stanford

Elin Diamond, B.A., Brandeis; M.A., Ph.D., California (Davis)

Richard Dienst, A.B., California (Berkeley); Ph.D., Duke

William C. Dowling, B.A., Dartmouth; M.A., Ph.D., Harvard

Mark Doty, B.A., Drake; M.F.A., Goddard

Kate Ellis

William Galperin, A.B., Chicago; A.M., Ph.D., Brown

Marcia Ian, B.A. Wellesley College; M.A., Ph.D, Virginia

Myra Jehlen, B.A., The City University of New York; Ph.D., Berkeley

Richard Koszarski, B.A., Hofstra; Ph.D., New York

John Kucich, B.A., California (Santa Cruz); M.A., Ph.D., SUNY (Buffalo)

Robert Kusch, B.A., Valparaiso; M.A., Ph.D., Northwestern

George Levine

John A. McClure, B.A., Tufts; M.A., Ph.D., Stanford

Michael McKeon, B.A., Chicago; M.A., Ph.D., Columbia

Jacqueline T. Miller, B.A., Rochester; M.A., Ph.D., Johns Hopkins

Alicia S. Ostriker, B.A., Brandeis; M.A., Ph.D., Wisconsin

Barry V. Qualls, B.A., Florida State; M.A., Ph.D., Northwestern

Dianne F. Sadoff, B.A., Oberlin College; M.A., Oregon State; Ph.D., Rochester (MA)

Carol H. Smith, B.A., Ohio Wesleyan; M.A., Ph.D., Michigan

English (SAS)

# Student Responsibility to Keep Informed

# Student Responsibility to Keep Informed

Before registering for the semester, students should consult the English department website. Students can also consult with advisers in the undergraduate office (Murray Hall, Room 102, 104, or 106, College Avenue campus). All English department information can be found online here.

English (SAS)

# Learning Goals

# Learning Goals

Students who major in English will demonstrate

1) knowledge of literatures in English: their historical, cultural, and formal dimensions and diversity;

2) strategies of textual interpretation, including an ability to use critical and theoretical terms, concepts, and methods;

3) the ability to write persuasively and precisely, in scholarly or creative forms; and

4) the ability to engage with the work of other critics and writers, using and citing such sources effectively.

English (SAS)

# Major Requirements

# Major Requirements

The major consists of a minimum of 36 credits in English above the 100 level, including at least 18 credits at or above the 300 level. All majors must fulfill the following requirements:

1. Principles of Literary Study, 01:359:201, which should be taken early in the major.

2. Four courses in different historical periods, taken at the 300 or 400 level: one each in four of the following five categories:

   a. Medieval

   b. Renaissance

   c. Restoration/18th century

   d. Nineteenth century

   e. Twentieth century and contemporary

3. One course in African-American Literature, taken at the 300 or 400 level.

4. One course in Literature's of the Global South

5. One course in literary theory

6. One 400-level seminar

A course taken to fulfill a period requirement may also be used to fulfill the African-American, Ethnic American, or Global Anglophone literature or the seminar requirement, if it is so designated on the departmental webpage. Likewise, a seminar may be used to meet the literary theory or African-American, Ethnic American, or Global Anglophone literature requirement, if it is so designated. However, no course may be used to fulfill more than two requirements.

Courses that may count as credits toward the major and minor are listed under the subject codes 351 (English: Creative Writing), 354 (English: Film Studies), 355 (Writing Program only at the 300 level), 358 (English: Literature), and 359 (English: Theories and Methods).

A maximum of four English courses taken outside the Department of English at Rutgers University-New Brunswick may be applied toward the major. Students who participate in Study Abroad may apply a total of six courses from outside toward the major. Transfer students who wish to apply transfer courses toward the major must first obtain approval from the undergraduate director. Enrolled English majors who wish to take English courses outside Rutgers-New Brunswick must have prior approval from the undergraduate director. Students are urged to consult the English department for further information.

Grades of C or better must be earned in all courses used to fulfill the requirements of the major.

English (SAS)

# Minor Requirements

# Minor Requirements

The minor consists of 18 credits in English above the 100 level, including at least 12 credits at or above the 300 level. All minors are required to take at least one 300- or 400-level course designated as medieval, Renaissance, or Restoration/18th century (period a, b, or c, as indicated on the major requirements page). A maximum of 6 credits total in creative writing and in film may be counted toward the minor. A maximum of one 01:355:300-level Writing Program course may be counted toward the minor. Grades of C or better must be earned in all courses used to fulfill the requirement of the minor.

English (SAS)

# Minor in Creative Writing

# Minor in Creative Writing

The minor in creative writing gives students a rigorous background in the fundamentals of creative work by providing them with the opportunity to study with established poets, prose writers, and dramatists. At the same time, the minor also ensures that students pursue creative work within the larger context of academic study. The curriculum (21 credits) begins with a foundational course in creative writing, followed by a series of electives in a variety of genres and media, culminating in an advanced workshop. Concurrently with their course work in creative writing, students are also required to elect a total of two courses from the English department's offerings in literature (358), theory and methods (359), or film (354), thus further coordinating their creative pursuits with critical study.

**Creative Writing Minor** Program Learning Goals

Students who minor in creative writing will demonstrate

1) knowledge of the traditions and conventions of literary expression in a variety of genres and media;

2) the ability to engage deeply with the process of composition, and with the work of other writers and critics; and

3) the ability to write persuasively and precisely in creative and scholarly forms.

If English majors would like to minor in creative writing, NO creative writing minor courses can count toward the English major. There can, however, be overlap for literature classes.

In addition, if a student double-minors in creative writing and English, NO creative writing minor courses can count toward the English minor. There can, however, be overlap for literature classes.

Students also cannot complete the creative writing minor and the creative writing certificate at the same time. They must choose one or the other.

**Minor Requirements**

The minor consists of 21 course credits (seven courses). Grades of C or better must be earned in all courses used to fulfill the minor requirements:

*One (1) required introductory course:*

351:211 or 351:212 Introduction to Creative Writing

*Any three (3) of the following courses:*

351:209 Introduction to Multimedia Composition

351:220 Experimental Filmmaking

351:303 Screenwriting for Film

351:304 Screenwriting for Television

351:305 Creative Nonfiction

351:306 Form and Technique in Poetry

351:307 Form and Technique in Fiction

351:308 Form and Technique in Playwriting

351:309 Digital Composition (Digital Storytelling)

351:314 Documentary Filmmaking for Writers

*Any one (1) of the following courses:*

351:405 Advanced Workshop: Multi-Genre

351:406 Advanced Workshop: Poetry

351:407 Advanced Workshop: Fiction

*Any two (2) courses in literature (358) and/or theory (359)*

English (SAS)

# Minor in Business and Technical Writing

# Minor in Business and Technical Writing

The Writing Program offers a minor in business and technical writing to all interested undergraduates in the School of Arts and Sciences.

The primary goal of the business and technical writing minor is to enhance students' writing proficiency in order to increase their eligibility for employment in business and technical professions that require advanced writing competency. The minor provides students with writing training, research practice, computer knowledge, and an internship experience designed to give students professional writing experience. Students must complete a minimum of 18 credits for the minor and any one course cannot be used in more than one skill area. Twelve out of the 18 required credits must be completed from Writing Program (01:355) courses.

**Requirements**

The minor requires six courses (for a total of 18 credits) in four key skill areas. Students must achieve a grade of C or better in each of these courses in order to qualify for the minor.

**1. Writing Training (6 credits)** Since writing competence is at the heart of the minor, students must complete two writing courses intended to improve writing, editing, collaboration, and general communication skills. Electives may be chosen from among the following writing courses:

01:351:209 Introduction to Multimedia (3)

01:355:202 Technical Writing Essentials (3)

01:355:203 Business Writing Essentials (3)

01:355:315 Grant Writing (3)

01:355:342 Science Writing (3)

01:355:352 Writing as a Naturalist (3)

01:355:355 Writing in the Professions (3)

01:355:365 Technical Editing (3)

04:192:315 Professional Writing and Communication (3)

04:192:380 Public Speaking (3)

11:374:325 Environmental Communication

11:374:435 Advanced Communication in the Sciences

**2. Research Writing (3 credits)** In the information and technology economy, the ability to conduct research and use information to develop viable plans of action is essential to success and advancement. Students therefore must complete a research writing course in business or technical writing. These courses will also fulfill most students' second-level writing requirements (consult with your school's academic advising office for specific requirements in your program). Research writing courses include:

01:355:302 Scientific and Technical Writing (3)

01:355:303 Writing for Business and the Professions (3)

01:355:312 Writing for Biology (3)

01:355:315 Writing Grant Proposals (3)

01:355:322 Writing for Engineers (3)

**3. Digital Image Fundamentals (6 credits)** Basic computer knowledge and the ability to learn new programs quickly are essential to success in business and technical writing environments. Students in the program will be introduced to general and advanced writing software in many classes and they will be required to pass an introductory course in computer science.

a) Though several courses will expect students to learn relatively simple programs (such as Microsoft Word and PowerPoint), students are also required to take one of the following courses, which teach advanced writing software, covered in our upper-level workshop courses. These include:

01:351:312 Digital Literary Studies (3)

01:355:375 Collaborative Writing Practices (3)

01:355:402 Advanced Writing Workshop (3)

01:355:410 Composing Graphic Narratives (3)

01:355:415 Information Design (3)

01:355:425 Web Authoring (3)

11:374:240 Visualizing Information: Storytelling with Data (3)

b) Students will also need to pass one of the following introductory computer science courses:

01:198:107 Computing for Math and the Sciences (3)

01:198:110 Principles of Computer Science (3)

01:198:111 Introduction to Computer Science (4)

01:198:170 Computer Applications for Business (3)

04:189:103 Information Technology and Informatics (3)

04:547:220 Retrieving and Evaluating Electronic Information (3)

14:440:127 Introduction to Computers for Engineers (3)

**4. Internship Experience (3 credits)** Hands-on training in work environments offers an invaluable, practical component to the minor, providing students with useful experience while encouraging professional attitudes toward work. As part of the minor program, students must complete an independent internship in one of the following options:

01:355:395/396 Internship (3,3)

01:355:397/398 Writing Internship for Business and Technical Writing Minor (3, 3)

Please see the internships course webpage for more information.

**5. In addition, a minimum of 12 out of the 18 required credits are to be selected from Writing Program (01:355) courses.**

The Writing Program also offers Professional Writing and Technical Writing Certificates. Please see Certificates for more information. Please speak with your academic advising office regarding declaration of majors and minors. Students graduating with the minor may want to consider pursuing a Master of Business and Science degree in the field of User Experience Design-UDX.

There is also a BS/MS (4+!) for Rutgers undergraduate students.

English (SAS)

# Departmental Honors Program 350

# Departmental Honors Program 350

Departmental Honors Program

English Honors provides an opportunity for students to pursue an independent project under the guidance of Department faculty. Students choose one of two options: a critical/research thesis or a creative writing thesis. The program begins in the second half of spring semester junior year and runs through senior year.

Candidates for honors in English must have a cumulative grade point average of 3.0 or better and an average of 3.6 or better in English at the end of junior year. They will also have completed 359:201 and at least one 400-level course in either the 358 or 359 subject codes for a critical/research thesis or 351 subject codes for a creative writing thesis. (Note that students, especially transfer students, with strong records of achievement who have not fulfilled these requirements will be reviewed on a case-by-case basis.)

Interested students should register for the Junior Honors Seminar (359:496), a 1.5-credit mini course running in the second half of spring semester. Students who are studying abroad or have other obligations that take them off campus in the spring of junior year will be able to join the course remotely. Upon completion of the course, students continuing with departmental honors will have secured the approval of a faculty advisor for their thesis proposal.

Completion of English Honors entails a total of 9 credits of coursework: the Junior Honors Seminar (359:496, 1.5 credits); the Senior Honors Seminar (359:497, 1.5 credits); and two semesters of independent study, the Senior Honors Tutorials (359:498 and 359:499, 3 credits each). The completed thesis will be evaluated by the advisor and a second reader. A grade of B+ or better will be required in order to earn the honors designation.

Students wishing to complete an English honors project in conjunction with the Honors College, SAS Honors, or other College Honors Programs will also be required to secure the approval of the appropriate College Dean by the end of the spring semester of the junior year.

Consult the departmental website for more detailed information: https://english.rutgers.edu/.

English (SAS)

# Certificate Programs

# Certificate Programs

**Certificate in Drama and Performance Studies (16 credits)**

The certificate in drama and performance studies offers the opportunity for students pursuing the English major or minor to develop a specialized concentration in the study of the performing arts. The certificate program curriculum (a total of 16 credits) requires a foundational course in the field (Introduction to Dramatic Literature or Introduction to Performance Theory), four approved electives, and a 1-credit capstone in which students produce a portfolio. Students who fulfill all requirements with a minimum grade-point average (GPA) of 3.0 in these courses will be awarded the certificate. For more information, contact the faculty director, Professor Thomas Fulton tfulton@english.rutgers.edu

The certificate consists of 16 course credits, with a minimum 3.0 GPA in the following courses:

*1. One (1) required introductory course:*

358:240 Introduction to Dramatic Literature

359:220 Introduction to Performance Theory

*2. Any four (4) of the following courses*:*

351:303 Screenwriting for Film

351:304 Screenwriting for Television

351:308 Creative Writing Playwriting

351:408 Advanced Creative Writing Workshop: Playwriting

358:202 Shakespeare

358:240 Introduction to Dramatic Literature*

358:310 Medieval Drama

358:313 Drama in the Age of Shakespeare

358:314 Shakespeare: The Elizabethan Plays

358:315 Shakespeare: The Jacobean Plays

358:320 Shakespeare in England

358:325 Restoration and 19th-Centurey Theater and Drama

358:335 19th-Century Theater and Drama

358:347 American Theater and Drama

358:356 Early 20th-Century Theater and Drama

358:357 Later 20th-Century Theater and Drama

358:372 Black Theater and Drama

358:378 Black Music and Literature

358:394 Theater and Drama by Women

358:426 Seminar: Shakespeare

359:220 Introduction to Performance Theory

*At the discretion of the faculty director of the certificate, new and other courses in the department not listed above, as well as courses in other departments, might also count.

**Other Certificate Programs (16-18 credits)**

The primary goal of the certificate programs is to enhance the writing proficiency of business and science students in order to increase their eligibility for employment in professions that require advanced writing competency. Any student working toward the business and technical writing minor is eligible to receive either the professional writing certificate or the technical writing certificate upon completion of all required courses with a grade of C or above.

These certificates are only available to students enrolled in the business and technical writing minor at Rutgers University.

**Professional Writing Certificate (16-18 credits)**

Any student may request this certificate upon completion of the minor. There is a significant need for college graduates who can research and communicate information at a high level of competence in business, industry, and government. The professional writing certificate is designed to give students a firm grounding in the skills of oral, written, and electronic communication and prepare them to enter professions that require extensive writing skills.

**Technical Writing Certificate (18 credits)**

This certificate is open to undergraduates with majors or minors in approved scientific or technical subject areas (such as biology, mathematics, engineering, or computer science). The need for technical writers capable of communicating scientific or technically sophisticated information to various audiences is well established, and technical writing skills are in demand in a wide range of fields. This certificate program is designed to give students with a science or technical background a strong foundation in the skills of oral, written, and electronic communication.

*Certificate Requirements*

Both certificates require six courses in four key skill areas:

*1. Writing Training (6 credits)*

Since writing competence is at the heart of the certificate program, students must complete two writing courses intended to improve writing, editing, collaboration, and general communication skills. Electives may be chosen from among the following writing courses:

01:355:202 Technical Writing Essentials (3)

01:355:203 Business Writing Essentials (3)

01:355:315 Grant Writing (3)

01:355:342 Science Writing (3)

01:355:352 Writing as a Naturalist (3)

01:355:355 Writing in the Professions (3)

01:355:365 Technical Editing (3)

01:355:375 Collaborative Writing Practices (3)

04:192:315 Professional Writing and Communication (3)

04:192:380 Public Speaking (3)

04:567:205 Digital News Reporting and Writing (3)

*2. Research Practice (3 credits)*

In the information and technology economy, the ability to conduct research and use information to develop viable plans of action is essential to success and advancement. Students therefore must complete a research writing course in business or technical writing. These courses will also fulfill most students' second level writing requirements (consult with your school's academic advising office for specific requirements in your program). Research writing courses include:

01:355:302 Scientific and Technical Writing (3)

01:355:303 Writing for Business and the Professions (3)

01:355:315 Grant Writing (3)

01:355:322 Writing for Engineers (3)

*3. Computer Knowledge (6 credits)*

Basic computer knowledge and the ability to learn new programs quickly are essential to success in business and technical writing environments. Students in our program will be introduced to general and advanced writing software in many classes, and they will be required to pass an introductory course in computer science.

a) Though several of our courses will expect students to learn relatively simple programs (such as Microsoft Word and PowerPoint), students are also required to take one of the following courses, which teach advanced writing software, covered in our upper-level workshop courses. These include:

01:355:402 Advanced Writing Workshop (3)

01:355:415 Information Design (3)

01:355:425 Web Authoring (3)

b) Students will also need to pass one of the following introductory computer science courses:

01:198:107 Computing for Math and the Sciences (3)

01:198:110 Introduction to Computers and Their Application (3)

01:198:111 Introduction to Computer Science (4)

01:198:170 Computer Applications for Business (3)

04:198:103 Information Technology and Informatics (3)

04:547:220 Retrieving and Evaluating Electronic Information (3)

*4. Internship Experience* (1 or 3 credits for a professional writing certificate; 3 credits for a technical writing certificate)

Hands-on training in the work environment offers an invaluable, practical component to the certificate program, providing students with useful experience while encouraging professional attitudes toward work. In our program, students will have the option of fulfilling an independent internship or taking credits through the CESEP Program:

01:355:395,396,397,398 Internship (3,3,3,3)

Please see the internships website for more information.

For information on the Writing Program's business and technical writing minor through the School of Arts and Sciences, please see the Minor in Business and Technical Writing page in this catalog. For more information on the certificate programs or the minor, please see http://wp.rutgers.edu.

Students completing the certificate should fill out the Application for Professional and Technical Writing Certificates form. This form should be completed and submitted to donald.dow@rutgers.eduDonaldDow@rutgers.edu. All information will be verified and the certificate will be processed.

English (SAS)

# Notice to All Students

# Notice to All Students

Successful completion of 01:355:101 College Writing (3), by coursework or exemption, is prerequisite to enrollment in all other English department courses except those at the 200 level. Students can find literature

courses at all levels listed under 351 (English: Creative Writing); 354 (English: Film Studies); 358 (English: Literature); and 359 (English: Theories and Methods). Information regarding the English department is available at the department's website.

English (SAS)

# English Literature Courses (358)

# English Literature Courses (358)

**01:358:200** ***Once Upon a Time: Why We Tell Stories (4)***
Focusing on stories from Genesis and Homer to 21st-century best sellers, Once Upon A Time considers why we need stories and how we tell them.

**01:358:201** ***Introduction to Literature (3)***
Development of skills in close reading and interpretive writing; texts in various genres. Designed primarily for nonmajors.

**01:358:202** ***Shakespeare (3)***
One-semester introduction to Shakespeare, with readings in selected comedies, tragedies, and histories.

**01:358:203** ***Shakespeare and Film (3)***
Interpretation of Shakespeare's plays through a close reading of literary texts and films.

**01:358:204** ***Biblical Backgrounds of Literature in English (3)***
The Bible as Literature (3)The Bible, its literary variety, and the evolution of its text. Religious themes in literature, with attention to matters of rhetoric, style, and structure.

**01:358:205** ***The Coming Apocalypse (4)***
An interdisciplinary introduction to narrative using novels, films, and other contemporary representations of the world's imminent destruction.

**01:358:206** ***Introduction to Literary Studies (1.5)***
Fundamentals of literary interpretation, focusing on a particular period, genre, or author.

**01:358:207** ***Writing After the End of the World (3)***
An introduction to stories about the end of the world.

**01:358:210** ***British Literature from the Middle Ages to 1800 (3)***
Survey of poetry, prose, and drama from the Middle Ages through the 18th century.

**01:358:211** ***British Literature from 1800 to the Present (3)***
Survey of poetry, prose, and drama from the romantic period to the present.

**01:358:212** ***Introduction to American Literature (3)***
Survey of poetry, prose, and drama from the colonial period to the Civil War.

**01:358:213** ***Major Topics and Authors in American Literature (3)***
Survey of poetry, prose, and drama from the Civil War to the present.

**01:358:214** ***Introduction to 20th-Century Literature (3)***
Introduction to major works of 20th-century literature in English.

**01:358:215** ***Introduction to 21st-Century Literatures (3)***
Literary works and emergent forms of the current century.

**01:358:216** ***Introduction to World Literatures in English (3)***
Survey of English language literatures including Asian, African, and Caribbean in a global context.
***Credit not given for both this course and 01:195:216.***

**01:358:217** ***Black Literature from the Colonial Period to 1930 (3)***
Survey of poetry, prose, and drama from the 18th century through the Harlem Renaissance.

**01:358:218** ***Black Literature from 1930 to the Present (3)***
Survey of poetry, prose, and drama from 1930 to the present.

**01:358:222** ***Introduction to South Asian Literature (3)***
Overview of South Asian literatures of the 19th, 20th, and 21st centuries, including literatures representing historical events such as the independence struggle, partition, women's rights, religious conflicts, and caste politics.

**01:358:230** ***Major Topics and Authors in British Literature (3)***
Introduces major topics and authors in British literature.

**01:358:240** ***Introduction to Dramatic Literature (3)***
Major plays from several periods, chiefly British and American, with some attention to form, theory, and the development of the genre.

**01:358:241** ***Introduction to Poetry (3)***
Major poems from several periods, chiefly British and American, with some attention to form, theory, and the development of the genre.

**01:358:242** ***Introduction to the Novel (3)***
Major novels from several periods, chiefly British and American, with some attention to form, theory, and the development of the genre.

**01:358:243** ***Introduction to the Short Story (3)***
Major short stories from several periods, chiefly British and American, with some attention to form, theory, and the development of the genre.

**01:358:244** ***Introduction to Myth (3)***
Myths of various cultures; their structures and functions in social and especially literary contexts.

**01:358:245** ***Introduction to Folklore (3)***
Major genres of folklore, including folktale, folk song, and legend, with attention to the methods of collecting and analyzing these materials.
***Credit not given for both this course and 01:195:245.***

**01:358:246** ***Introduction to the Gothic (3)***
Genre of the Gothic from its beginnings in the 18th century to the present.

**01:358:247** ***Introduction to Comic Literature (3)***
Theory and practice of comedy organized around the topics of satire, farce, nonsense, parody, jokes, and the humor of daily life.

**01:358:248** ***Introduction to Tragic Literature (3)***
Literature and theory of tragedy from the Greeks through Shakespeare to the 20th century; chiefly plays, supplemented by some poetry and fiction.

**01:358:249** ***Introduction to Satiric Literature (3)***
Satire's variety of postures and games, across an array of such forms as novel, epigram, film, and cartoon, ranging from the Renaissance to the present.

**01:358:250** ***Introduction to Autobiography (3)***
Historical and formal development of autobiography in English, with special attention to theories of identity and narrative.

**01:358:251** ***Introduction to Travel Literature (3)***
Readings of works, mainly in English, concerning geographical exploration and speculation; relation to literary and nonliterary genres; and attention to imperial dimensions.

**01:358:252** ***Introduction to Children's Literature (3)***
Introduction to children's literature. Fairy tales, classics, and contemporary examples of literature for children and young adults.

**01:358:253** ***Introduction to Crime Fiction (3)***
Introduction to crime fiction. Works by such authors as Chandler, Highsmith, Himes, and Mankell.

**01:358:254** ***Introduction to Science Fiction (3)***
Introduction to science fiction. Works by such authors as Butler, Dick, Delany, and Gibson.

**01:358:255** ***Introduction to Modern Literary Fantasy (3)***
Literary conventions and distinctions between the surreal and the unreal, nonsense and the sublime in different forms of modern literary fantasy written in English.

**01:358:256** ***Introduction to the Graphic Novel (3)***
The history, techniques, structure, verbal-visual form, and thematic range of graphic narratives.

**01:358:260** ***Introduction to Multiethnic Literatures of the United States (3)***
Survey of multiethnic literatures of the United States through a comparative framework. Fiction, poetry, autobiography, graphic narrative, film, and personal essays by and about African Americans, Asian Americans, Native Americans, and Latinos/as.

**01:358:261** ***Introduction to the Study of Women Writers (3)***
Range of literature in English by women writers, analyzed in relation to the impact of authorial gender.

**01:358:262** ***Introduction to Literature and the Environment (3)***
General introduction to environmental writing, focusing on nonfiction, novels, and poems from the mid-19th century to the present day.

**01:358:263** ***Civilization and Its Discontents (3)***
Introduction to texts of fundamental importance for the imagination of the individual in society, focusing on the forms through which a culture understands itself including dialogue, tragedy, parable, and public address.

**01:358:275** ***The Cultural History of Now (3)***
Analysis of an issue of pressing global concern from a multidisciplinary perspective, but especially from that of literary and cultural history. Topics vary according to individual instructors; consult departmental information.

**01:358:301** ***History of the English Language (3)***
Growth and structure of the English language from its origins to the present with some attention to methods of linguistic description.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:302** ***Classical Backgrounds of Literature in English (3)***
Influence on literature in English of classical Greek and Roman epic, tragedy, comedy, and other literary forms.
***Credit not given for both this course and 01:195:346. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:303** ***Literature of Medieval Courts (3)***
Concepts of nobility, rule, courtship, and faith in works such as *Beowulf*, *Sir Gawain and the Green Knight*, *Pearl*, and Malory's *Morte d'Arthur*.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:304** ***Medieval Literature of Dissent (3)***
Traditions of dissent in later medieval England. Texts may include writings by Wulfstan and Ælfric, *Chronicle* poems, *Piers Plowman*, Lollard writings, macro-plays, the Wakefield cycle, and *The Book of Margery Kempe*.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:305** ***Medieval Romance (3)***
Medieval romances and their origins in the British Isles and on the continent, with emphasis on English versions of Arthurian material, especially *Sir Gawain and the Green Knight* and Malory's *Morte d'Arthur.*
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:306** ***Chaucer (3)***
Selected works of Chaucer, with an emphasis on *The Canterbury Tales.*
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:307** ***Medieval and Early Modern Women Writers (3)***
Selections from significant women writers of the medieval and early modern period, including Julian of Norwich, Margery Kempe, Aemelia Lanyer, Elizabeth Cary, Lady Mary Wroth, Katherine Philips, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:308** ***Cultures of the Middle Ages (3)***
Detailed introduction to a particular aspect of the rich cultural diversity of the European Middle Ages. Topics vary.
***Credit not given for both this course and 01:195:388 or 01:667:388. Prerequisite: 01:355:101 or equivalent.***

**01:358:309** ***Issues and Problems in Medieval Literature and Culture (3)***
Studies in particular themes, questions, forms, and historical issues in medieval literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:310** ***Medieval Drama (3)***
Surveys works of medieval drama, investigating relationships between history and religion, world and stage, work and play, and actors and audience.

**01:358:311** ***Renaissance Literature: The 16th Century (3)***
Poetry, plays, and prose from the Henrician to the Elizabethan periods.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:312** ***Renaissance Literature: The 17th Century (3)***
Poetry, plays, and prose from the Jacobean to Restoration periods.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:313** ***Drama in the Age of Shakespeare (3)***
Early modern drama, with emphasis on Marlowe, Jonson, Beaumont, Fletcher, Webster, and others.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:314** ***Shakespeare: The Elizabethan Plays (3)***
Selected comedies, tragedies, and English history plays written between the beginning of Shakespeare's career and the death of Elizabeth I in 1603.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:315** ***Shakespeare: The Jacobean Plays (3)***
Selected comedies, tragedies, and tragicomedies written after the succession of James I in 1603.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:316** ***Milton (3)***
*Paradise Lost*, *Paradise Regained*, *Samson Agonistes*, the shorter poems, and selected prose.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:317** ***Major Renaissance Writers (3)***
Selected writings of Milton studied in relation to other 16th- or 17th-century writers, such as Spenser, Shakespeare, Donne, Marvell, Cavendish, or Dryden.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:318** ***Sixteenth-Century Poetry (3)***
Forms, styles, and development of poetry from Skelton to Spenser.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:319** ***Seventeenth-Century Poetry (3)***
Forms, styles, and development of poetry from Jonson and Donne to Milton and Marvell.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:320** ***Issues and Problems in Renaissance Literature and Culture (3)***
Studies in particular themes, questions, forms, and historical issues in Renaissance literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:321** ***Renaissance Women Writers (3)***
Selections from significant women writers of the Renaissance including Mary Sidney, Emelia Lanyer, Mary Wroth, Anne Bradstreet, Margaret Cavendish, and Aphra Behn.

**01:358:322** ***Restoration and Early 18th-Century Literature (3)***
Poetry, prose, and drama by writers such as Dryden, Rochester, Behn, Pope, Haywood, Swift, and their contemporaries.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:323** ***Later 18th-Century Literature (3)***
Poetry, prose, and drama by writers such as Johnson, Sterne, Burney, Cowper, Sheridan, Equiano, Wollstonecraft and their contemporaries.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:324** ***Restoration and 18th-Century Poetry (3)***
Poems by authors such as Philips, Dryden, Behn, Swift, Pope, Gray, Cowper, and Wheatley.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:325** ***Restoration and 18th-Century Theater and Drama (3)***
Comedies and tragedies from the British modern age, by Congreve, Behn, Wycherly, Etheridge, Centlivre, Gay, Lillo, Sheridan, and others.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:326** ***Eighteenth-Century Novel (3)***
The early novel to Jane Austen, including authors such as Behn, Defoe, Haywood, Fielding, Richardson, Lennox, Sterne, and Burney.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:327** ***Restoration and 18th Century Women Writiers (3)***
Writing by women between the Restoration and the Romantic period, including authors such as Behn, Haywood, Montagu, Burney, Wheatley, and Austen.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:328** ***Issues and Problems in 18th-Century Literature and Culture (3)***
Studies in particular themes, questions, forms, and historical issues in Restoration and 18th-century literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:330** ***Early Romantic Literature (3)***
Works of poetry and prose by Austen, Blake, Coleridge, Wordsworth, and their contemporaries.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:331** ***Later Romantic Literature (3)***
Works of poetry and prose by Keats, P.B. Shelley, M. Shelley, Byron, Hemans, De Quincey, and their contemporaries.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:332** ***Victorian Literature (3)***
Poetry and prose from the 1830s to 1900, by Barrett Browning, Tennyson, Browning, Carlyle, Arnold, Christina Rossetti, the Brontës, Dickens, George Eliot, and Hardy.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:333** ***Late Victorian and Edwardian Literature (3)***
Poetry and prose of the transition to modernism by such authors as Pater, Wilde, the Decadents, the New Women novelists, Olive Shriner, Yeats, Hardy, Lawrence, and Woolf.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:334** ***Victorian Poetry (3)***
Major poetry of Tennyson, Barrett Browning, Browning, Arnold, the Pre-Raphaelites, Christina Rossetti, Hopkins, Yeats, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:335** ***Nineteenth-Century Theater and Drama (3)***
Drama from 1800 to the 1880s in England and America. Melodrama, the development of social realism, and the rise of modern drama. Plays by Holcroft, Jerrold, Boucicault, Taylor, Lewis, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:336** ***Nineteenth-Century British Fiction (3)***
Development of the novel into the major popular literary genre in England. Writers include Scott, Dickens, the Brontës, Thackeray, Gaskell, Eliot, Hardy, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:337** ***Nineteenth-Century Women Writers (3)***
Appearance of women writers as major public voices in British literature. Writers include Wollstonecraft, Austen, Mary Shelley, the Brontës, Gaskell, George Eliot, and Christina Rossetti.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:338** ***Issues and Problems in 19th-Century Literature and Culture (3)***
Studies in particular themes, questions, forms, and historical issues in 19th-century literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:340** ***Literature and Culture of the Colonial Americas (3)***
English writing of the New World, from exploration through colonization, on both sides of the Atlantic. Puritanism, the Enlightenment, empire, and the development of nationalism.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:341** ***Antebellum American Literature (3)***
American writing from Romanticism to the Civil War. Works by Equiano, Irving, Apess, Cooper, Sedgwick, Poe, Emerson, Fuller, Douglass, Hawthorne, Melville, Stowe, Thoreau, Whitman, Wilson, Jacobs, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:342** ***Nineteenth-Century American Poetry (3)***
Primary focus on Whitman and Dickinson, with additional readings in Wheatley, Bryant, Sigourney, Longfellow, Emerson, Fuller, Poe, Whittier, Horton, Melville, Harper, Dunbar
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:343** ***Nineteenth-Century American Fiction (3)***
Novels, stories, and sketches by Irving, Cooper, Poe, Fern, Stowe, Hawthorne, Melville, Alcott, Twain, James, Wharton, Chesnutt, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:344** ***American Realism and Naturalism (3)***
American writing from the Civil War to modernism. Works by Dickinson, Alcott, Twain, James, Howells, Jewett, Chopin, Sui Sin Far, Zitkala-Sa, Crane, Wharton, Dreiser, Du Bois, Johnson, Cather.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:345** ***Early 20th-Century American Literature (3)***
Writing by American authors from 1900 to 1945.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:346** ***Later 20th-Century American Literature (3)***
Writing by American authors from 1945 to the end of the century.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:347** ***American Theater and Drama (3)***
American theatrical traditions from the 18th century to the present, with emphasis on such 20th-century playwrights as O'Neill, Hellman, Williams, Miller, Albee, Hansberry, Wilson, Mamet, and Baraka.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:348** ***American Women Writers (3)***
Writing by American women including Bradstreet, Wheatley, Sedgwick, Wilson, Stowe, Jacobs, Child, Dickinson, Stoddard, Harper, Hopkins, Chopin, Wharton, Cather, Hurston, O'Connor, Le Guin, Angelou and Morrison
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:349** ***American Autobiography (3)***
Changing representations of self in narrative form. Readings range from conversion, captivity, and slave narratives, to modern autobiographies and memoirs.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:351** ***Literatures of the Americas (3)***
Literatures of the Western Hemisphere from the 19th century to the present.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:352** ***Early 20th-Century Literature (3)***
Writing from 1900 to 1945, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:353** *Later 20th-Century Literature (3)*
Writing from 1945 to the end of the century, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:354** *Early 20th-Century Poetry (3)*
Poetry from 1900 to 1945, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:355** *Later 20th-Century Poetry (3)*
Poetry from 1945 to the end of the century, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:356** *Early 20th-Century Theater and Drama (3)*
Drama from the 1880s to the 1920s in relation to modernism and contemporary social movements. Plays by Ibsen, Strindberg, Chekhov, Wilde, Jarry, Glaspell, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:357** *Later 20th-Century Theater and Drama (3)*
Expressionism through the Absurd (1920s through 1960s), in artistic and social contexts. Plays by Pirandello, O'Neill, Brecht, Genet, Beckett, Pinter, Williams, Hansberry, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:358** *Early 20th-Century Fiction (3)*
Fiction from 1900 to 1945, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:360** *Later 20th-Century Fiction (3)*
Fiction from 1945 to the end of the century, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:361** *Twentieth-Century Literature in a Global Context (3)*
Twentieth-century writing in English other than British and American.
***Credit not given for both this course and 01:195:324. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:362** *Twentieth-Century Women Writers (3)*
Twentieth-century writing by women, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:363** *Issues and Problems in 20th-Century Literature and Culture (3)*
Studies in particular themes, questions, forms, and historical issues in 20th-century literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:365** ***Twenty-First-Century Literature (3)***
Writing from the last 20 years, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:370** ***Black Narrative (3)***
Historical and stylistic range of prose forms; slave narratives, folklore, biography and autobiography, short fiction; social, literary, and cultural criticism; Douglass, Du Bois, Toomer, Hurston, and Walker.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:371** ***Black Poetry (3)***
History of black American poetry, including the influence of oral traditions; poems by such writers as Wheatley, Dunbar, Hughes, and Brooks.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:372** ***Black Theater and Drama (3)***
Work of modern black American playwrights, including Hansberry, Baraka, Baldwin, Bullins, Gordone, Fuller, and Shange.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:373** ***Black Novel (3)***
Thematic and structural development of the black novel as a voice for social and political change, including works by Wright, Ellison, Baldwin, Marshall, Walker, and Morrison.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:374** ***Black Autobiography (3)***
Examination of self-representation by major black autobiographers, including Frederick Douglass, Harriet Jacobs, Solomon Northup, Booker T. Washington, Maya Angelou, and Malcolm X.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:375** ***Nineteenth-Century Black Literature (3)***
Prominent African-American writers of fiction, poetry, autobiography, and essays of the 19th century, including Frederick Douglass, Harriet Wilson, Pauline Hopkins, Charles Chesnutt, and W.E.B. Du Bois.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:376** ***Harlem Renaissance (3)***
Black literature during the 1920s and 1930s in the context of African-American social and cultural history; essays, poems, and novels by such authors as Cullen, Hughes, Hurston, McKay, and Toomer.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:377** ***Black Writers and the 1960s (3)***
Innovations in black literature of the 1960s in light of the tumultuous social, cultural, and political movements of the decade.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:378** ***Black Music and Literature (3)***
Thematic and structural influences of black music on American poetry, fiction, and drama; writers may include Sterling Brown, Hughes, Baraka, Cortez, Bambara, Kerouac, Shepard, and August Wilson.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:379** ***Black Women Writers (3)***
Fiction and poetry by African-American women such as Brooks, Hurston, Marshall, Morrison, and Alice Walker; discussion of issues of literary influence and comparable traditions.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:380** ***Literature of the Black World (3)***
Comparative study of writing in English by African-American, Caribbean, and African authors, including Derek Walcott, V.S. Naipaul, Paule Marshall, and Chinua Achebe.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:381** ***Issues and Problems in Black Literature (3)***
Studies in particular themes, questions, forms, and historical issues in black literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:382** ***Southern African Literature (3)***
Study of selected literary works from the region of Southern African written or translated in English. Topics vary; consult departmental announcement.

***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:383** ***Readings in Colonial and Postcolonial Literature (3)***
Study of literature and criticism that explore facets of Western imperial expansion.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:384** ***Literatures of Migration, Immigration, and Diaspora (3)***
Writings that feature representations of place, community, and identity in relation to national and international movement and displacement.
***Credit not given for both this course and 01:195:336. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:385** ***Literatures of Africa in English (3)***
Study of selected literary works from Africa written in English. Topics vary; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:386** ***Literatures of Asia in English (3)***
Study of selected literary works from Asia written in English. Topics vary; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:358:387** ***Ethnic Literature in the United States (3)***
Selected literary works by Asian-American, black, Chicano/Chicana, and Native American writers. Topics vary; consult departmental information.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:358:388** ***Native American Literatures in English (3)***
Fiction, poetry, and autobiography by such writers as Apes, Momaday, Welch, Silko, and Erdrich. Attention to issues of Native American representation.
***Credit not given for both this course and 01:050:376. Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:358:389** ***Asian-American Literatures in English (3)***
Theme or genre-based study of selected Asian-American writing in English. Topics chosen by individual instructors; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:050:377.***

**01:358:390** ***Chicano/Chicana Literature (3)***
Theme or genre-based study of selected Chicano/Chicana literature; attention to comparative contexts (Puerto Rican, Cuban, and Dominican).
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:358:391** ***Irish Writing in English (3)***
Works of Irish writers in English from 1800 to the present.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:358:393** ***Independent Study (3)***
Individual work on a topic designed by the student in conference with an instructor who directs the project.
***Prerequisite: Permission of department. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:394** ***Theater and Drama by Women (3)***
Selected plays in English by women writers, with emphasis on the study of forms, conventions, and cultural contexts. Topics vary; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:395** ***Fiction by Women (3)***
Selected works of fiction in English by women writers, with emphasis on the study of forms, conventions, and cultural contexts. Topics vary; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:396** ***Poetry by Women (3)***
Selected poetry in English by women writers, with emphasis on the study of forms, conventions, and cultural contexts. Topics vary; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:398** ***The English Bible (3)***
The English Bible, its literary variety, and the evolution of its text. Special attention will be given to problems of interpretation and translation and their Hebrew and Greek origins.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:411** ***Old English Language and Literature (3)***
Intensive study of the English language and an introduction to its literature.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:412** ***Seminar: Old English Language and Literature (3)***
Intensive study, in a discussion-oriented format, of Old English poems, such as *Beowulf*, and prose writings studied in their original language. Topics vary according to individual instructors; consult departmental information.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:420** ***Seminar: Chaucer (3)***
Intensive study of *The Canterbury Tales, Troilus and Criseyde*, and other selected works.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:422** ***Seminar: Topics in Medieval Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of medieval literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:424** ***Seminar: Spenser (3)***
*The Faerie Queene*, *The Shepherd's Calendar*, *Amoretti*, *Epithalamion*, and selected minor works.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:426** ***Seminar: Shakespeare (3)***
Special studies in selected plays and poems. Consult departmental announcement.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:428** ***Seminar: Milton (3)***
Special studies in Milton's poetry and prose.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:434** ***Seminar: Topics in Renaissance Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of Renaissance literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:435** ***Seminar: Topics in Restoration and 18th-Century Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of 18th-century literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:436** ***Seminar: Topics in 19th-Century Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of 19th-century literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:437** ***Seminar: Topics in 20th-Century Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of 20th-century literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:438** ***Seminar: Topics in 21st-Century Literature (3)***
Focuses on topics and issues in 21st-century literature of all genres.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:440** ***Seminar: Topics in Genre (3)***
Intensive study, in a discussion-oriented format, of a particular genre (e.g., pastoral, epic, comedy, and lyric) or relationship among genres. Topics vary; consult departmental information.
***Credit not given for both this course and 01:195:440. Prerequisites: 01:359:201 or 202; English major.***

**01:358:441** ***Seminar: Topics in American Literature and Culture to 1800 (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of American literature and culture to 1800. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:442** ***Seminar: Topics in 19th-Century American Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of 19th-century American literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:445** ***Seminar: Topics in Black Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of black literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:452** ***Seminar: Special Topics in American Literature (3)***
Special studies in particular ideas, themes, forms, and historical units in American literature. Sections designed by individual instructors; consult departmental announcement.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:460** ***Seminar: Topics in Colonial and Postcolonial Literature (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of colonial and postcolonial literature. Topics vary; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:491** ***Seminar: Special Topics in Literature (3)***
Special studies in particular ideas, themes, forms, and historical units in literature. Sections designed by individual instructors; consult departmental announcement.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:493** ***Independent Study (3)***
Individual work on a topic designed by the student in conference with an instructor who directs the project.
***Prerequisites: Permission of department; 01:359:201 or 202; English major.***

**01:358:495** ***Independent Study (BA)***
Individual work on a topic designed by the student with an instructor who directs the project.
***Prerequisites: 01:359:201 or 202; English major.***

# English Theories and Methods Courses (359)

# English Theories and Methods Courses (359)

**01:359:201** ***Principles of Literary Study (3,3)***
An introduction to principal methods and materials in contemporary literary studies. This course will include close attention to works from at least two genres and two historical periods to be selected by the instructor. The course will introduce students to the meaning and use of key terms in literary studies.
***Required of all English majors.***

**01:359:205** ***Introduction to Research Methods (3)***
Workshop in advanced library skills and the use of secondary scholarship.
***Open only to junior English majors in the departmental honors program.***

**01:359:207** ***Data and Culture (3)***
Introduction to understanding and using data in humanistic scholarship.

**01:359:209** ***Introduction to Health, Medicine, and Literature (3)***
Examines how literature about disease, disability, or the body opens questions concerning language, metaphor, narrative traditions, and the shifting cultural meanings of health, medicine, and human experience.

**01:359:210** ***Introduction to Literary Theory (3)***
Literary theory through the close reading of texts with common themes; representation of diverse historical periods and theoretical frameworks.

**01:359:211** ***The Culture of Sport (3)***
Explores the cultural aspects of sport, focusing on basketball, soccer, and American football, using literature, film, journalism, televised events, and some secondary material.

**01:359:220** ***Introduction to Performance Theory (3)***
Interdisciplinary course introduces students to key concepts of performance and performativity from a variety of critical perspectives, including those of literary studies, critical theory, philosophy, theatre history, and anthropology, among others.

**01:359:310** ***History of Literary Theory I (3)***
Literary and rhetorical theory from antiquity to the Enlightenment.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:311** ***History of Literary Theory II (3)***
Selected trends and texts of literary theory from Romanticism to the present.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:312** ***Issues and Problems in Literary Theory (3)***
Close investigation of a specifically defined area of literary theory. Topics vary according to individual instructors; consult departmental information.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:315** ***Theories of Genre (3)***
Introduction to the ways in which criticism has theorized literature according to genre, form, and kind.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:316** ***Issues and Problems in Genre Theory (3)***
Formal and cultural issues within the development of a particular genre, or in the relation between genres, in literature in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:320** ***Cultural Theory in Literary Studies (3)***
Approaches to defining what culture is and how to theorize culture in relation to the production and consumption of literary and nonliterary texts.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:321** ***Popular Culture (3)***
Exploration of how popular forms like TV, movies, music video, rap, rock, comics, magazines, and advertising shape meaning and value in contemporary America.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:322** ***Marxist Literary Theory (3)***
Marxist analysis of literature, culture, and society. Attention to dialectical philosophy, the problem of base and superstructure, and theories of ideology and fetishism.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:325** ***Psychoanalytic Literary Theory (3)***
Impact of psychoanalysis upon theories of literature, language, and interpretation; Freud and beyond; attention to theories of subjectivity, trauma, affect, sexuality, textuality, and culture.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:326** ***Literature and Psychology (3)***
Exploration of interrelationships of literature and psychology (from Freud to feminists and contemporary theorists); topics include subjectivity, affect, trauma, gender, intersubjectivity, and identity.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:330** ***Theories of Gender and Sexuality (3)***
History and critique of gender and sexuality as discursive categories. May include nonliterary as well as literary texts and involve various theoretical perspectives.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:331** ***Literature and Sexuality (3)***
Themes and assumptions of sexual literature and its basis in sexual fantasy, including gender issues. Reading in major works of sexual literature.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:335** ***Feminist Theory in Literary Study (3)***
"Woman," "gender," and related concepts as discursive categories deployed in theoretical, literary, philosophical, and popular texts. Attention to historical issues and current debates.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:336** ***Issues and Problems in Feminist Literary Studies (3)***
Themes, questions, forms, and historical issues in feminist literary studies. Sections designed by individual instructors; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:340** ***Deconstruction and Poststructuralist Theory (3)***
Poststructuralism and its origins in France in the late 1960s; attention to the theoretical writings of Derrida, Barthes, Kristeva, and de Man.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:345** ***Colonial and Postcolonial Theory (3)***
Theories of colonial and postcolonial discourse; attention to issues of imperialism, primitivism, creolization, and globalization in fiction, film, and travel narratives.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:347** ***Serial Storytelling (3)***
Investigation of serial narrative as a modern mode of storytelling, from serialized novels in 19th-century Britain and Russian through the multimedia serials of our digital age. Exploration of this narrative form's enduring power, in multiple media, to interweave fiction with the course of current events and the rhythms of everyday life, and to bring together international audiences shaped by cultural, social, and geographical differences.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for 359:347 and either 01:195:345 or 01:860:345.***

**01:359:351** ***Literature and Medicine (3)***
Literature about medicine, exploring the meeting place of disease, medical treatment, and literary culture, along with shifting understandings of patient and healer, health and illness, and the reach and responsibility of medicine.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:352** ***Literary and Scientific Writings (3)***
Readings in English that explore the impact of science upon literary writing and the literary and discursive dimensions of selected scientific texts.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:360** ***Theories of Text and Image (3)***
Exploration of the field of media theory, especially as it has developed in dialogue with literary and cultural studies. Course materials and class projects will include works in multiple media.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:361** ***Literature and Visual Culture (3)***
Interactions of word and image on the page, on the stage, and onscreen. Examples may include graphic narratives, tableaux, public spectacles, photography, film, and digital culture, read alongside literary and theoretical texts.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:362** ***Digital Literary Studies (3)***
The relationship between literary practices and the technologies of recording, transmitting, data mining, and archiving. Topics: the history of the book, media shift, the history of reading, literature in relation to other media, hypertext, and digital literacies and analysis.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:365** ***Literature, Religion, and Theory (3)***
Relationships between theological and literary ways of reading texts, including both sacred and secular examples.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:366** ***Literary Approaches to Sacred Texts (3)***
Literary analysis of the formation and structure of the major texts of several world religions. Attention to style, genre, and cross-cultural interpretation.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:370** ***Literary Editing and Publishing (3)***
The place and purpose of literary journals within the publishing world; history and current state of the publishing industry, including mainstream book publishing, independent presses, and literary magazines.

***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:394** ***Independent Study (3)***
Individual work on a topic designed by the student in conference with an instructor who directs the project.
***Prerequisites: Permission of department and 01:355:101 or equivalent.***

**01:359:395** ***Junior Honors Seminar (3)***
Focus on particular text, theme, or approach in order to develop reading and writing skills using critical and theoretical materials.
***Open only to junior English majors in the departmental honors program.***

**01:359:410** ***Seminar: Topics in Literary Theory (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of literary theory. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:359:425** ***Seminar: Topics in Literature and Psychology (3)***
Examines literary texts and the processes of reading them through the lens of psychological theory, including psychoanalytic and cognitive.
***Prerequisites: 01:359:201 or 202; English major.***

**01:359:435** ***Seminar: Topics in Feminist Theory (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of feminist theory. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:359:460** ***Seminar: Media Theory (3)***
Explores the field of media theory, especially as it has developed in dialogue with literary and cultural studies.
***Prerequisites: 01:359:201 or 202; English major.***

**01:359:470** ***History and Theory of Tragedy (3)***
Explores, contextualizes, and assesses the most prominent and influential works in the history and theory of tragedy, beginning with the dramas of Greek antiquity and extending through modern philosophy.
***Prerequisites: 01: 359:201 or 202; English major***

**01:359:494** ***Independent Study (3)***
Individual work on a topic designed by the student in conference with an instructor who directs the project.
***Permission of department; 01:359:201 or 202; English major.***

**01:359:495** ***Independent Study (3)***
Individual work on a topic designed by the student in conference with an instructor who directs the project.

***Prerequisites: Permission of department; 01:359:201 or 202; English major.***

**01:359:496** ***Junior Honors Seminar (1.5)***
Workshop focusing on methodological and theoretical aspects of literary study or creative writing, with particular emphasis on preparing to write an honors thesis.
***Open only to junior English majors in the departmental honors program.***

**01:359:497** ***Senior Honors Seminar (3)***
Workshop focusing on methodological and theoretical aspects of literary study, with particular emphasis on the senior thesis.
***Open only to senior English majors in the departmental honors program.***

**01:359:498,499** ***Senior Honors Tutorial (3,3)***
Workshop focusing on methodological and theoretical aspects of literary study, with particular emphasis on the senior thesis.
***Open only to senior English majors in the departmental honors program.***

English (SAS)

# English Creative Writing Courses (351)

# English Creative Writing Courses (351)

**01:351:209** ***Introduction to Multimedia Composition (3)***
Introduction to composition across digital media platforms, with attention to the conceptual challenges it poses. Individual digital media projects, blog posts, and group exercises to provide experience composing and sharing works that are both thought provoking and entertaining.

**01:351:211,212** ***Introduction to Creative Writing (3,3)***
Practice in creative writing in various forms (fiction, poetry, drama, and essay); critical analysis of students' manuscripts in class and/or individual conferences.

**01:351:220** ***Writing for Experimental Film (3)***
A hands-on film making experience focusing on writing and producing experimental film.

**01:351:303** *Screenwriting for Film (3)*
Practice in screenwriting for film focused on dramatic action, narrative structure, and character.
***Prerequisite: 01:351:211 or 212.***

**01:351:304** *Screenwriting for Television (3)*
Practice in screenwriting for television focused on dramatic action, scene structure, and character.
***Prerequisite: 01:351:211 or 212.***

**01:351:305** *Creative Nonfiction (3)*
Investigation, through weekly reading and writing assignments, of creative nonfiction, emphasizing modes of first-person writing such as memoirs, travel narratives, and personal essays.
***Prerequisite: 01:351:211 or 212.***

**01:351:306** *Form and Technique in Poetry (3)*
***Prerequisite: One 200-level course in creative writing or permission of instructor. Pre- or corequisite: A literature course in poetry.***

**01:351:307** *Form and Technique in Fiction (3)*
***Prerequisite: One 200-level course in creative writing or permission of instructor. Pre- or corequisite: A literature course in fiction.***

**01:351:308** *Form and Technique in Playwriting (3)*
***Prerequisite: One 200-level course in creative writing or permission of instructor. Pre- or corequisite: A literature course in drama.***

**01:351:309** *Digital Composition (3)*
Filmmaking as creative writing, including study of film language, grammar, and narrative structure, with focus on visual composition, placement of dialogue, and editing to assemble a story for the screen.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:351:314** *Documentary Filmmaking for Writers (3)*
This course focuses on the importance of storytelling in documentaries and teaches students about the various filmic techniques, elements, and choices needed to create their own successful short film.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:351:405** *Advanced Workshop: Multi-Genre (3)*
Advanced work in creative writing; criticism of manuscripts in individual conferences and/or class.
***Prerequisite: One 300-level course in creative writing or permission of instructor.***

**01:351:406** *Advanced Workshop: Poetry (3)*
Advanced workshop in poetry.
***Prerequisite: One 300-level course in creative writing and/or permission of instructor.***

**01:351:407** *Advanced Workshop: Fiction (3)*
Advanced workshop in fiction.
***Prerequisite: One 300-level course in creative writing and/or permission of instructor.***

**01:351:408** *Advanced Workshop: Playwriting (3)*
Advanced workshop in playwriting.
***Prerequisite: One 300-level course in creative writing and/or permission of instructor.***

English (SAS)

# English Film Studies Courses (354)

# English Film Studies Courses (354)

**01:354:201** *Introduction to Film I (3)*
Film study, with emphasis on basic concepts of film analysis (narrative, editing, mise-en-scène, and sound) and the historical development of cinema as an institution.
***Credit not given for both this course and 01:175:201.***

**01:354:202** *Introduction to Film II (3)*
Film study, with emphasis on commercial cinema as an institution (genres, directors, and stars) and on nonnarrative types of film (documentary, experimental).
***Credit not given for both this course and 01:175:202.***

**01:354:205** *Cinema Today (4)*
This course surveys contemporary cinema from 2000 to the present.

**01:354:210** *Close Readings of Cinema (4)*
Formal analyses of six or seven individual films; emphasis on visual track, sound track, and scenario-narrative construction.
***Credit not given for both this course and 01:175:210. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:250** *The Films of Alfred Hitchcock (4)*
A survey of the major films of the "master of suspense" from the silent era through the 1970s.

**01:354:270** *American Screen Comedy (4)*
Classical American screen comedy: American screen comedy from the 1920s to the 1960s, ranging from the films of comedians to those of writers and directors.

**01:354:301** *Digital Cinema (4)*
A study of the role played by digital technology in shaping the imaging and sound practices found in the contemporary cinematic landscape from the 1990s to the present.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:308** *The Craft of Screenwriting (3)*
Nature and theory of the screenplay; practice in writing for the screen, from short scenes to longer projects.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:312** *Cinema and the Arts (3)*
Relationship between film and aesthetic movements in literature and the arts, such as expressionism, cubism, futurism, constructivism, and surrealism.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:315** *American Cinema I (3)*
American film from the silent period to 1940; emphasis on the development of American cinema both as a social institution and a symbolic form.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:316** *American Cinema II (3)*
American film from 1940 to the present; emphasis on the height of the Hollywood studio and its decline in the late 1950s and 1960s.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:175:316.***

**01:354:318** *Cinema of New York and New Jersey (4)*
A history of the development of the motion picture industry in New York and New Jersey, where filmmakers unhappy with conditions of industrial mass production on the west coast worked to create an alternative "Hollywood on the Hudson."
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:320** *World Cinema I (3)*
Developments in French, Italian, British, Russian, and other national cinemas from 1896 to World War II; also examines cross-influences between foreign and American cinema.
***Credit not given for both this course and 01:195:320 or 01:175:320. Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:354:321** *World Cinema II (3)*
Developments in French, Italian, British, Russian, Japanese, and other national cinemas after World War II; also examines cross-influences between foreign and American cinema.
***Credit not given for both this course and 01:195:321 or 01:175:321. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:330,331** *Critical Methodology in Film (3,3)*
Critical methodology, reviewing genre theory, theories of authorship, Marxist, feminist, cultural-materialist, and psychoanalytic criticism as applied to film.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:354:335** *Film Sound (4)*
An international history of film sound with emphasis on the development of sound technology, the stylistic and aesthetic conventions of film sound, and theoretical discourses surrounding sound in the cinema.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:354:350,351** *Major Filmmakers (3,3)*
Questions of meaning in film through the work of such major directors as Ford, Renoir, Hawks, Ophuls, Bergman, Mizoguchi, and Hitchcock.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:175:350, 351.***

**01:354:355** *Films of John Ford (4)*
A study of films made by American cinema's poet laureate that explores topics such as Ford, Lincoln, and history; race and ethnicity; populism and politics; and women, native Americans, and the West.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:356** *Films of Jean Renoir and Fritz Lang (4)*
A comparison of the work of two European directors who, after achieving international prominence in their respective countries (France, Germany), fled Hitler and came to Hollywood in the 1940s
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:360** *Film Noir (4)*
Survey of American hard-boiled cinema from the early 1940s to 1958 with a focus on private eyes, lone wolves, femme fatales, and losers.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:370** *Film Genres (3)*
Analysis of film genres, such as the western, comedy, horror film, film noir, and the musical; theory of genre; and history of genre criticism. May cover more than one genre.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:175:370.***

**01:354:371** *Film Melodrama (4)*
Survey of film melodrama from the silent era to the present, including subgenres such as the family melodrama, the romantic melodrama, melodramatic triangles, the maternal melodrama, and race and melodrama.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:373** *The Documentary (3)*
History, theory, and practice of documentary film, including ethnographic film, propaganda, newsreel, direct cinema, video verite, social activist film, postmodern documentary, and antidocumentary.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:175:373.***

**01:354:374** *Science Fiction Film (4)*
A survey of science fiction cinema that explores the relationship between the human and the inhuman, the fantastic and the realistic, the familiar and the "other," and the present and the future.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:050:322 or 01:175:322.***

**01:354:375** *Film and Society (3)*
Analysis of films in their sociopolitical contexts, including issues of race, class, and gender; relation between film as art form and the politics of culture.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:385** *Theories of Women and Film (3)*
Basic concepts in feminist film theory; the female voice in cinema; representations of women in classical Hollywood film; and films made by women.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:391,392** ***Special Topics in Film Studies (3,3)***
Intensive study of a particular national cinema, period in film history, studio, or genre. Sections designed by individual instructors; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:410** ***Seminar in Film Studies (3)***
Contemporary issues in film studies, ranging from the return to history to questions about the role of theory in the age of post-theory.
***Prerequisite: 01:359:201 or 202.***

**01:354:420** ***Seminar: Film Theory (3)***
Major developments in film theory from the silent era to the present; writings on film by Eisenstein, Kracauer, Bazin, Metz, Barthes, and others; practice in using different methods to analyze films.
***Prerequisites: 01:359:201 or 202 plus any 200-level English department film course (01:354:201, 202, or 210). Credit not given for both this course and 01:175:420.***

English (SAS)

# English Composition and Writing Courses (355)

# English Composition and Writing Courses (355)

**Learning Goals**

Students who complete English 201 and 301 will be able to read and understand specialized texts from a range of disciplines; cite and explicate key passages in support of specific claims; evaluate the claims of individual texts and synthesize information provided by multiple sources; engage in independent research using print and online sources; develop a written argument with a thesis supported by reasoning, explanation, illustration, and the use of evidence; understand the major conventions of argument, quotation, paraphrase, and citation; understand the conventions of standard written English including paragraphing, grammar, and punctuation; evaluate the quality of information; and make a public presentation of their course research.

Students who complete Writing Program courses beyond 201 will be able to demonstrate proficiencies in the specialized areas indicated by the course title and description.

**01:355:090** ***Grammar Workshop (E1.5)***
The Grammar Workshop is a support class in grammar skills featuring both group and individualized instruction.
***Open to all students in Writing Program courses.***

**01:355:096** ***Writing Center (E1.5)***
At the tutorial centers located on the College Avenue, Livingston, and Douglass campuses, registered students receive concentrated assistance in specific writing skills.
***The Writing Center is open to all undergraduates.***

**01:355:100** *Basic Composition (4.5)*
Basic Composition focuses primarily on the reading-comprehension skills necessary for success in Expository Writing (01:355:101) and in future college courses. Students read eight complex nonfiction essays and write four expository papers.
*Prerequisites: 01:355:099 or 01:355:098 or 01:356:156.*

**01:355:101** *Expository Writing I (3)*

College Writing introduces students to the strategies and practices necessary to become a successful writer at the university level and beyond. As the required writing course for undergraduate students at Rutgers University-New Brunswick, College Writing challenges students to reflect upon and cultivate their strengths as readers and writers at this new stage of their education careers. College Writing is required of all students except those who are exempt through AP credit or transfer equivalency. Prerequisites: Placement,.

*May not be used for credit toward the English major or minor. Prerequisites: 01:355:100, 01:356:156, or placement.*

**01:355:103** *Exposition and Argument (3)*

Exposition and Argument is an intensive writing course for first-year students who demonstrate advanced reading and writing skills.

Open only to honors students, and is not open to students who have taken 01:355:101. Credit is not given for both this course and 01:355:101.

*Prerequisites: Placement in 01:355:101.*

**01:355:104** *College Writing Extended (4.5)*
College Writing Extended introduces students to the strategies and practices necessary to become a successful writer at the university level and beyond. Students develop their critical reading abilities and written communication skills through meaningful writing projects of diverse genres, including multimodal composition. Satisfies The College Writing core curricular requirement. Prerequisites: placement.
*Prerequisites: placement.*

**01:355:197** *SAS Summer Writing Practicum (1)*
The Summer Writing Practicum will focus on developing reading strategies that encourage connective and analytical thinking, drafting an academic paper that presents a coherent and independent claim, and revising a rough draft for submission. Students will read nonfiction texts, discuss those texts, and develop claims of their own using textual evidence.

**01:355:201** *Research in the Disciplines (3)*
Research in the Disciplines promotes further development of competence in reading, thinking, and writing, with emphasis on the intellectual and practical skills required for the research paper.
*May not be used for English major or minor credit. Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:202** *Technical Writing Essentials (3)*
Technical Writing Essentials is designed to meet the fundamental workplace communication needs of students and professionals in a wide range of fields, including scientific and technical careers. The course teaches students how to effectively communicate using various kinds of documents common to the workplace including memos, business

letters, research reports, and instructions.
*May not be used for English major or minor credit. Credit not given for both this course and 01:355:203. Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:203** *Business Writing Essentials (3)*
Business Writing Essentials is designed to meet both the basic communication needs of students planning careers in business and the writing improvement needs of current working professionals. The class writing assignments will be structured around scenarios where students will apply both writing and critical thinking skills in the context of real business situations.
*May not be used for English major or minor credit. Credit not given for both this course and 01:355:202. Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:301** *College Writing for Transfer Students (3)*
If you have received WC credit for English 101 College Writing, consider taking English 301 College Writing for Transfer Students to fulfill one of your upper-level Core Curriculum WCr or WCd writing requirements. Students will write two four page essays that emphasize the writing, reading, and critical thinking skills valued by Rutgers, then complete an 8-10 page research paper on a subject of personal interest.
*Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:302** *Scientific and Technical Writing (3)*
Scientific and Technical Writing offers students practice in the forms and discourses of scientific and technical writing as they develop, research, and revise an independent project. The purpose of the class is to prepare students for their professional lives in scientific, technical, or public service fields by helping them organize their knowledge while exploring ways of applying it, thus developing their professional expertise.
*Credit not given for both this course and 01:355:303. Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:303** *Writing for Business and the Professions (3)*
Writing for Business and the Professions offers students practice writing for a business or professional audience as they develop, research, and revise an independent project. The purpose of the class is to prepare students to think as managers capable of putting information to practical use.
*Credit not given for this both course and 01:355:302. Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:312** *Writing for Biology and Natural Science(3)*
This project-focused course is designed to address the needs of students doing research in natural sciences. Coursework covers grant proposals, research papers, and journal publications.
Prerequisites 01:355:101 or 01:355:103 or 01:355:104.

*Prerequisites 01:355:101 or 01:355:103 or 01:355:104.*

**01:355:315** *Writing Grant Proposals (3)*
This course focuses on the theory and practice of grant writing to support research, education, or community. It includes a focus on identifying appropriate sources of grant funding, organizing research, and tailoring projects to specific audiences.
*Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:322** ***Writing for Engineers (3)***
This project-focused course is designed to address the needs of students in engineering. Covers project proposals, patent applications, technical reports, and other engineering documents.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:342** ***Science Writing (3)***
This course provides students with practice in writing about science for general readers and presenting scientific issues or information in the genres common to journals, magazines, newspapers, and the internet.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:352** ***Writing as a Naturalist (3)***
Advanced writing course focusing on observing and writing about animals and the natural world.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:355** ***Writing in the Professions (3)***
Provides specialized writing training for professional, business, scientific, or technical fields.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:365** ***Technical Editing (3)***
Practice editing technical documents for grammar, syntax, organization, style, emphasis, and audience awareness.

***Prerequisites: 01:355:101 or or 01:355:103 or 01:355:104.***

**01:355:375** ***Collaborative Writing Practices (3)***
Students will engage in the theory and practice of managing collaborative writing in organizations. Students will collaborate on group projects involving planning, writing, presentation, and editing tasks.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:395,396,397,398** ***Internship (3,3,3,3)***
These internships include the application of skills learned in literary studies in professional settings and an appropriately designed academic project resulting in a paper.
***Prerequisite: Permission of department required to enroll in these internships. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:399,400** ***CESEP Internship (1,1)***
The Civic Engagement and Service Education Partnerships (CESEP) internship is a one-credit community service placement in English.
***Not for English major or minor credit. Must be taken in conjunction with designated Civic Engagement and Service Education Partnerships (CESEP) program course in the English department.***

**01:355:402** ***Advanced Writing Workshop (3)***
Focuses on advanced work in expository, scientific, technical, or business writing. Topics vary from semester to semester.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:410** ***Composing Graphic Narratives (3)***
Composing Graphic Narratives is an advanced writing workshop devoted to producing both fiction and non-fiction comics and other forms of text image communication. We'll explore ways to communicate information, construct

arguments, and tell stories through the medium of graphic narrative. The course approaches graphic narrative as a flexible form of writing that uses images, text, narrative structure, and page design as active parts of its language. ***Prerequisites: 01:350:101 or 01:355:101 or 01:350:103 or 01:355:103.***

**01:355:415** ***Information Design (3)***
This project-focused workshop course uses specialized writing software to design and produce a portfolio of user-friendly documents for a specific audience and purpose.
***Prerequisite: Complete 01:355:101 or 103 or 104 or equivalent before enrolling.***

**01:355:425** ***Web Authoring (3)***
This project-focused workshop course uses specialized software to design, research, generate content for, and publish a website.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. May not be used for major or minor credit.***

English (SAS)

# English for Academic Purposes Courses (356)

# English for Academic Purposes Courses (356)

**01:356:152** ***Discussion and Presentation Skills (1)***This course improves listening and note-taking skills and builds confidence to speak in front of groups through individual and collaborative projects. Skills acquired through this course include planning oral presentations, developing visual aids such as PowerPoint, and responding to audience questions.***Pre- or corequisite: 01:356:155 or 156.***

**01:356:155** ***English for Academic Purposes I: Writing Across Cultures (4.5)***First-year writing course for learners of English as an additional language. Reading, responding to, and critically analyzing texts from a range of perspectives and fields addressing the relationship between culture and communication.***Prerequisite Note: Placement required**

**01:356:156** ***English for Academic Purposes II: Academic Writing in the United States (4.5)***First-year writing course for learners of English as an additional language. Narrative, analytical, and synthetic writing assignments, a discipline specific research project, and a final digital project showcasing critical thinking and composition.***Prerequisite: EAP I: Writing Across Cultures (01:356:155)**

# American Studies 050 (SAS)

## AMERICAN STUDIES 050

Department of American Studies, School of Arts and Sciences

**Website:** Here

**Chair:** Sylvia Chan-Malik

**Undergraduate Director:** Andrew Urban

**Board of Governors Professor and Distinguished Professor:**

Louis P. Masur, B.A., Buffalo; M.A., Ph.D., Princeton

**Professors:**

Angus Kress Gillespie, B.A., Yale; Ph.D., Pennsylvania

Allan Punzalan Isaac, B.A., Williams College; M.A., M.Phil., Ph.D., New York

Ben Sifuentes-Jáuregui, B.A., M.A., M.Phil., Ph.D., Yale

**Associate Professors:**

Sylvia Chan-Malik, B.A., California (Berkeley); M.F.A., Mills; Ph.D., California (Berkeley)

Jefferson Decker, B.A., Amherst; M.A., Ph.D., Columbia

Andrew Urban, B.A., Middlebury College; M.A., Ph.D., Minnesota

Carla Cevasco, B.A., Middlebury College; M.A., Ph.D., Harvard

**Assistant Professors:**

Jameson Sweet, B.A., Tennessee; M.A., Montana State; Ph.D., Minnesota

**Instructors:**

Maria Kennedy, Ph.D., Indiana

Faculty Emeriti:

Leslie E. Fishbein, B.A., CUNY (Hunter College); Ph.D., Harvard

Michael Aaron Rockland, B.A., CUNY (Hunter College); M.A., Ph.D., Minnesota

**Affiliate Faculty:**

Ulla Berg, Anthropology and Latino and Caribbean Studies; Ph.D., New York

Brad Evans, English; Ph.D., Chicago

Judy Gerson, Sociology; Ph.D., Cornell

Christopher Iannini, English; Ph.D., CUNY (Graduate Center)

T.J. Jackson Lears, History; Ph.D., Yale

Kathy Lopez, History and Latino and Caribbean Studies; Ph.D., Michigan

Meredith McGill, English; Ph.D., Johns Hopkins

Albert Nigrin, Cinema Studies; B.A., M.A., M.F.A., Rutgers

Frank Popper, Urban Studies; Ph.D., Harvard

Louisa Schein, Anthropology; Ph.D., California (Berkeley)

Jeffrey Shandler, Jewish Studies; Ph.D., Columbia

Karen R. Stubaus, B.A., Ph.D., Rutgers

Carla Yanni, Art History; Ph.D., Pennsylvania

The Department of American Studies encompasses the richness, breadth, and evolution of the field of American Studies.¿ From early America to 9/11, from the blues to rock `n¿ roll to hip hop, through the study of race, indigeneity, migration, empire, diaspora, and ever-evolving forms of national identity, American Studies examines a wide range of materials that emphasize a variety of critical approaches to the study of American history, politics, and culture. American Studies introduces students to interdisciplinary scholarship and methods in the study of the nation. In our classes, students develop their critical skills in thinking, analysis, and writing. They learn to locate and evaluate primary sources and scholarly texts, to write effectively and clearly, and to apply conceptual frameworks to their lived experience and practice.

Our faculty is dedicated to helping students learn to write well, to speak articulately, and to think analytically and creatively. These are skills necessary for success in any field. We are a small department, and we give students a great deal of individual attention. We try to maintain a small-college atmosphere within our enormous state university.



# Departmental Major and Minor Goals

# Departmental Major and Minor Goals

*Cultural Competency:* American studies students will be knowledgeable about historical and present-day diversity (including gender, race, class, and sexuality, among many others) of American experiences. Students will be able to apply conceptual frameworks about cultural and historical analysis to their lived experience and practice and future aspirations.

*Research Competency:* Students will learn how to write and speak effectively and clearly, demonstrating the ability to explain the complex meaning and significance of a text and formulate a cogent argument supported by evidence.

*Global Competency:* American studies students will understand the history, culture, and politics of the United States in the context of large-scale global changes.
the context of large-scale global changes.

American Studies 050 (SAS)

# Major Requirements

# Major Requirements

Coursework for the American studies major is composed of (1) six core courses in American studies that present the methodology and the conceptual framework for a cultural approach to the civilization of the United States; and (2) six elective courses totaling at least 18 credits.

Students who wish to major in American studies must complete the following courses:

01:050:101 Introduction to American Studies (3)
01:050:225 Thought and Society in the American Past (3)
01:050:227 Nineteenth-Century American Literature and Culture (3)
01:050:310 Approaches to American Studies (3)
01:050:389 Junior Seminar in American Studies (3)
01:050:487,488,489 Seminars in American Studies (3,3,3)

Another 18 credits from American studies course offerings are required. No more than 9 of these credits (three courses) may be selected from courses numbered below 300.

Independent Studies 01:050:390,391 or 01:050:490,491; Independent Study/Project in American Culture (01:050:390,391); and Senior Essay or Senior Project in American Culture (01:050:490,491) allow American studies majors, minors, and other students to do independent work for credit.

For double-majors, only 3 of the 12 elective credits may overlap with the major requirements of other departments.

Grades of C or better must be earned in all courses in order to fulfill the requirements for the major.

Students must take required courses in the following sequence: 101 in their first or second year; 310 after completing 101, and before taking junior seminar; junior seminar is required for senior seminar.

American studies majors interested in certification for teaching should consult the Office of Teacher Education at the Graduate School of Education.

Students may not take any courses in fulfillment of the major on a pass/no credit basis.

American Studies 050 (SAS)

# American Studies Minor Requirements

# American Studies Minor Requirements

Students who wish to minor in American studies must complete 18 credits consisting of three American studies courses at or above 300 level (3 credits each), including 01:050:310 or 01:050:389, and three more American studies courses at any level (3 credits each).

Please be aware that these courses must be in the American studies department only, except with permission of the undergraduate adviser. All courses used for the minor must have a grade of C or better.

American Studies 050 (SAS)

# Minor in Comparative and Critical Race and Ethnic Studies (CCRES)

# Minor in Comparative and Critical Race and Ethnic Studies (CCRES)

The minor in comparative and critical race and ethnic studies (CCRES) gives students the opportunity to study race, migration, and diverse American community histories with courses from various departments, including Africana, Latino and Caribbean, and women's, gender, and sexuality studies.

The minor requires six courses, at least three of which must be at 300 level or above:

1. an introductory course in comparative race and ethnic studies (050:102) offered in American studies or an approved 100- or 200- level course in African-American, U.S. Latina/o, Native American, or Asian American history or literary tradition;
2. one course in non-U.S. or global processes of racial and ethnic formation; and
3. four more courses on race and ethnicity, two of each must deal with two different traditional racial groupings or in comparative context.

Students may count at most two courses toward both their major outside of American studies and the CCRES minor. All courses used for the minor must have a grade of C or better.

To qualify as a comparative race and ethnicity elective, a course must fulfill at least two of the following learning goals: 1) critically engage histories and geographies of race and difference; 2) critically engage a particular population's experience with power; 3) explore critical race issues and theories with one or more historical categories; and 4) examine non-U.S. racial formations. A list of approved electives will be updated yearly.

American Studies 050 (SAS)

# Asian American Studies Initiative

# Asian American Studies Initiative

The field of Asian American studies explores the politics and history of racialization of Asian-descent peoples, including East, South, Southeast, and Southwest Asian Americans, both within the United States and in the Americas. These multiple diasporic groups share historical and legal connections with other racial and ethnic groups in the United States.

The department offers content courses and a Minor in Asian American studies, houses the Asian/Asian American Studies undergraduate certificate (see below), the Asian American Studies Living/Learning Community, and develops programming for the interdisciplinary field, such as the annual Undergraduate Symposium on Asians in the Americas and the Diaspora.

American Studies 050 (SAS)

# Minor in Asian American Studies 051

# Minor in Asian American Studies 051

The minor in Asian American Studies gives students the opportunity to study race, politics, history, migration, labor, literature, art, and popular cultural production of Americans with personal or ancestral connections to the continent of Asia, conceived broadly to include the Pacific Islands, East Asia, Southeast Asia, South Asia, Central Asia, and West Asia/the Middle East. Courses eligible for the minor will originate in the American Studies department and a number of other departments, including Asian languages and cultures, Africana, Latino and Caribbean, History, and English.

The minor requires six courses, at least two of which must be at 300 level or above:

1. an introductory course in Asian American Experience (050:245) offered in American studies or an approved 100- or 200- level course centered on Asian American history or culture;
2. one course in Asian histories, literature, cultures, or civilizations in a non-U.S. context; and
3. four more courses with substantial Asian American content, either from a list of approved courses or by the approval of the department. Students may count at most three courses toward both their major outside of American Studies and the Asian American Studies minor. All courses used for the minor must have a grade of C or better.

To qualify for the Asian American Studies minor, a course must contain substantial Asian or Asian American content, defined as one of the following: 1) the course is primarily about the literature, histories, arts, cultural production, politics, or societies associated with one or more nations or regions within the Asian continent or Americans who identify with one or more regions of the Asian continent on a personal or ancestral level; 2) the course compares the experiences or cultures of multiple groups of people on a common subject, and Asians or Asian Americans must be the subject of at least one-third of the case studies under comparison. A list of approved electives will be updated yearly. Please consult with the Undergraduate Director.

American Studies 050 (SAS)

# Undergraduate Certificate in Asian/Asian American Studies

# Undergraduate Certificate in Asian/Asian American Studies

The Department of American Studies (AMS) and the Department of Asian Languages and Cultures (ALC) offer in cooperation a certificate in Asian/Asian American studies (13 credits) comprised of Asian American studies-content courses offered in American studies, English, history, anthropology, among other units; and courses in English on aspects of modern Asian cultures offered by ALC.

The certificate in Asian/Asian American studies is intended for students majoring in other disciplines in the School of Arts and Sciences (SAS), planning or already pursuing careers in education, business, international relations, policy, law, medicine and allied health professions, medical research, public health, or global development. It is anticipated that students may earn the certificate as part of their intercultural learning and training in the course of an undergraduate degree as a supplement or as continuing education for those pursuing careers in social work, health policy, education, among other career paths in which diverse cultural knowledge and learning is necessary. Some examples of potential alumni of the certificate program might be:

- educators, all levels;
- health professionals, including general practitioners, specialists, and nurses;
- immigration and law enforcement officials;
- legal professionals; and
- social workers.

Requirements for Undergraduate Certificate Program

1. Complete two contemporary Asian culture courses in English with a grade of C or better from the course list.
2. Complete two Asian American studies-content courses with a grade of C or better from the course list.
3. Complete an additional credit-bearing Asian American-content course (1 or 1.5 credit[s], Byrne Seminars, First-Year Interest Group Seminars [FIGS], learning community, or independent study).
4. Register with SAS American studies for the certificate in Asian/Asian American studies.

American Studies 050 (SAS)

# Certificate in Curation and Cultural Programming (CCP)

# Certificate in Curation and Cultural Programming (CCP)

The CCP certificate draws on the American Studies department's strengths in public humanities, digital humanities, folklore, curation, and visual and material culture. Over twelve credits, the CCP certificate prepares students to apply humanities frameworks to careers in event management, project management, museums and other cultural institutions, libraries, nonprofits, education, and more.

Requirements for Curation and Cultural Programming Undergraduate Certificate Program (12 credits total):

1. Complete 12 credits of the list below of department-approved courses with a grade of C or higher

Certificate-Eligible Courses (Four courses, 12 credits required):

AMST 263: American Folklore
AMST 264: American Folklife
AMST 333: Cultures of Consumption
AMST 350: Folk Festival Curation
AMST 355: Museums, Monuments, and American Culture
AMST 389: Junior Seminar: Digital Humanities
History 301: Public History: Theory, Method, Practice

History 451: Public History Internship
History 302: Oral History
History 303: Digital History
History 310: New Jersey History
Art History 430: Foundations in Cultural Heritage and Preservation Studies
Art History 563: Curatorial Training
Art History 441: Topics in Historical Preservation: Museums, Collections, & Preservation
Art History 442: Topics in Historical Preservation: Methods in Cultural Heritage and Preservation Studies
Other courses at discretion of certificate director, Dr. Carla Cevasco

American Studies 050 (SAS)

# Departmental Honors Program

# Departmental Honors Program

Students with cumulative grade-point averages of 3.0 or better and averages of 3.4 or better in courses taken for the major are eligible to do honors work. Honors students must complete an adviser-guided, distinguished two-semester independent essay or project in connection with enrollment in 01:050:495 and 496 in their senior year. They also must satisfactorily pass an oral examination administered by the American studies faculty, based largely on the essay or project. Students are encouraged to speak with an adviser in their junior year to discuss a program of study and schedule of work.

American Studies 050 (SAS)

# The American Studies Prize

# The American Studies Prize

The American Studies Prize is awarded annually to the best interdisciplinary student project that illuminates the culture of the United States. Projects must be submitted to the American studies faculty by April 30.

American Studies 050 (SAS)

# Courses

# Courses

**01:050:101** ***Introduction to American Studies (3)***
Introduces the American studies method through the use of primary documents including novels, autobiographies, paintings, photographs, and films.

**01:050:102** ***Introduction to Race and Ethnicity in America (3)***
Examines the logics of race and racism within political, legal, and cultural discourses both in and beyond the United States.

**01:050:200,201** ***Topics in American Studies (3,3)***
Varied field topics in American studies that lend themselves to interdisciplinary treatment.
***May be repeated for credit when topic differs.***

**01:050:202** ***American Regionalism (3)***
Multidisciplinary study of the regions of the United States, with focus on their literature, folklore, music, and other arts.

**01:050:203** ***The American West (3)***
Introduction to the American West through the classic Western film genre, Native American literature, and American Western writers.

**01:050:204** ***American Environmental History and Thought (3)***
Connections among America's natural environment, its national development, and how Americans thought about both. Classic readings to understand the formation of environmental ideas and their influence on environmental action.
***Credit not given for both this course and 10:762:297:01.***

**01:050:210** ***The American Dream (4)***
The change in the "American Dream" over time and the stories we tell about it. How our assumptions about American identity shape challenges on such broad issues as democracy, freedom, and social justice.

**01:050:215** ***Springsteen's American Vision (3)***
The changing persona of Bruce Springsteen and his representation in photography, documentary, and autobiography.

**01:050:216** ***America in the Arts (3)***
What is "American" about American art and design; examination of the architecture as well as fine, folk, and industrial arts and artifacts of the United States. Normally a craft project required of students.

**01:050:218** ***Visual Culture in the United States (3)***
Examination of visual culture in the United States in terms of picture theory including print, advertising, and digital media.

**01:050:223** ***Learning from the Past: Early America and the 21st Century (3)***
Twenty-first century challenges--climate change, income inequality, epidemic disease, border disputes, identities, new technologies--were faced by early America (c. 1500-1865), where diverse peoples navigated a rapidly changing world.

**01:050:225** ***Thought and Society in the American Past (3)***
Examines American cultural constructions from the Revolutionary era to the eve of World War I. Analyzes a variety of historical, visual, literary, and performance texts from the era.

**01:050:227** ***Nineteenth-Century American Literature and Culture (3)***
Examines classic 19th-century texts written by Emerson, Thoreau, Melville, Hawthorne, Twain, Whitman, and Dickinson, among others, with attention paid to the social and cultural context of these writings, including Transcendentalism, the Abolitionist movement, and the whaling industry.
***Credit not given for both this course and 01:350:227.***

**01:050:228** ***The Contemporary American (3)***
The emerging American of our times. Forces shaping American culture as revealed in literature, the media, social criticism, and psychology.

**01:050:230** ***Transforming Bodies and American Identities (3)***
Examines identities through the lens of gender, sexuality, race, socioeconomic class, ability, and culture. Social media, film, art, comics, fashion, and pop culture as sites and spaces of American body formations.

**01:050:240** ***Latina/o Literature and Culture (3)***
Survey of Latino/a literary voices drawn from the Mexican, Puerto Rican, Dominican, Cuban, and other Latin American migrations to the United States. Discussion of exile, resistance, and assimilation; political presence and identity formation; race, ethnicity, gender, and sexuality; and examination of literary modes and genres (autobiography, poetry, novel, film, music).
***Credit not given for both this course and 01:595:240.***

**01:050:244** ***American Land Patterns (3)***
Exploring the diverse connections between America's national development and its land environment. This is essentially a course in ecological history.
***Credit not given for both this course and 10:762:244.***

**01:050:245** ***Asian American Experience: Identity and Ethnicity (3)***
General introduction to history and culture of Asian America and major debates in Asian American studies.
***Credit not given for both this course and 01:098:262.***

**01:050:247** ***History and Culture of Hip-Hop (3)***
Historical, social, political, and aesthetic roots of hip-hop culture and music. The place of hip-hop in a larger global commercial exchange, advertising, fashion, cinema, music video, and popular literature.

**01:050:248** ***Native American Experience (3)***
Introductory survey of Native American history, cultures, literature, language, and current issues. Themes include colonialism, racism, and federal Indian policy but especially Indian political activism, resistance, and cultural continuity and revitalization.

**01:050:250** ***Cultures of the Portuguese-Speaking Communities in the United States (3)***
Discussion of sociocultural issues concerning the diverse Portuguese-speaking communities of the United States.
***Course taught in English; will count for the Portuguese major or minor if all written work is done in Portuguese. Credit not given for both this course and 01:810:250.***

**01:050:253 Asian American History (3)**
Introduction to the political, economic, and sociocultural aspects of immigrants from Asia and their descendants in the United States from the 16th to the 21st century.
***Credit not given for both this course and 01:512:253.***

**01:050:259** ***Popular Culture (3)***
How popular culture shapes and reflects society in advertising, music, popular entertainment, fads, fashion, radio, television, sports, and games.

**01:050:260** ***On the Road: Mobility in America (3)***
Considers mobility, mainly physical but also social, as a singularly American trait if not obsession. Includes films as well as literature (both fiction and nonfiction) and music.

**01:050:261** ***The American Best Seller (3)***
Representative best-selling novels of recent decades and what they and their popularity indicate about American values and assumptions.

**01:050:262** ***American Film and American Myth (3)***
American film and its relationship to American myths, society, and culture. Representative classic films screened.

**01:050:263** ***American Folklore (3)***
Traditional verbal and material lore. American folk narratives, myths, legends, tales, ballads, and songs. How folklore functions in American society and institutions.
***One field trip: $10.***

**01:050:264** ***American Folklife (3)***
Examination of the lifestyles of American folk groups with emphasis on artifacts: folk architecture, handicrafts, art, costume, and foods.
***One field trip: $10.***

**01:050:265** ***American Experimental Film and Video (3)***
Survey course on history and development of American experimental cinema movements from beginning to present. Filmmakers include Andy Warhol, Maya Deren, Stan Brakhage, Sidney Peterson, Kenneth Anger, Yoko Ono, and others.
***Credit not given for both this course and 01:175:265.***

**01:050:266** ***Cult Films in American Culture (3)***
Focus on the American "cult" film from its origins in the 1920s and its evolution in American culture. Close analyses of cult films will be paired with critical readings in film, theory, and cultural history.
***This course previously given as a 300-level topics course. Credit not given for that course and 01:175:266.***

**01:050:267** ***American Film Directors (3)***
In-depth analyses of the structure and content of films of Stanley Kubrick, Orson Welles, John Frankenheimer, David Lynch, Val Lewton, Andy Warhol, and others. Emphasis on the mise-en-scène, narrative form, set design, sound, and special effects in the films of these celebrated filmmakers.
***Credit not given for both this course and 01:175:267.***

**01:050:268** ***David Lynch and the American Film Avant-Garde (3)***
Focuses on the surreal films of David Lynch and the American Film Avant-Garde. Includes in-depth analyses of the structure and content of many of Lynch's bizarre and unique films, including *Eraserhead*, *Mulholland Drive*, and *Blue Velvet*.
***Credit not given for both this course and 01:175:268.***

**01:050:269** ***The Concept of Home (3)***
Examination of the concept of "home" in the United States, and the competing cultural, political, and economic meanings that have been attached to American domesticity. Historical examination of the place of "home" in the way Americans think about gender, sexuality, race, legal rights, and the organization of labor.

**01:050:272 American Food, Past and Present (3)**
A history of the collision of people, animals, plants, recipes, and flavors from all over the globe and encounters between Native American, enslaved Africans, and immigrants that created a national cuisine that is as diverse and varied as its people.

**01:050:281,282,283,284** ***Topics in American Studies (1.5,1.5,1.5,1.5)***
Half-semester minicourses given each year on topics of contemporary interest that lend themselves to interdisciplinary treatment.
***May be repeated for credit when topic differs.***

**01:050:285** ***Independent Study/Project: Media Culture (1.5)***
For students undertaking an independent study project in media culture.

**01:050:291** ***Jerseyana: New Jersey as a Culture (3)***
Interdisciplinary, regional approach to New Jersey, examining its landscape, the peculiarities of its history, its folklore and myths, arts and architecture, music, and literature.

**01:050:295** ***Latino and Caribbean Cultural Studies (3)***
Comparative study of Latino and Caribbean cultures by reviewing key definitions of culture, paying attention to the historical and disciplinary development of the term, as well as the key debates on cultural studies in the humanities.
***Reading knowledge of Spanish recommended. Credit not given for both this course and 01:595:295 or 01:195:295.***

**01:050:300,301,302** ***Topics in American Studies (3,3,3)***
Topics of contemporary interest that lend themselves to interdisciplinary treatment.
***May be repeated for credit when topic differs.***

**01:050:303** ***A Decade in American Culture (3)***
Interdisciplinary approach to understanding a particular decade in American culture, employing the arts, humanities, and social sciences. Decade studied depends on the instructor.

**01:050:304** ***The American City (3)***
Interdisciplinary approach to the origin, development, and problems of the American city.

**01:050:305** ***Images and Narratives of War (3)***
Examination of the various ways that wars, post-WWII (such as Korea, Vietnam, the Gulf Wars, and others), have been represented in American popular culture. Material includes films, novels, memoirs, reportage, and histories.

**01:050:306** ***American Detective Fiction and Film (3)***
Examination of the distinctively American literary genre of the hard-boiled detective novel and the many films that this genre has inspired, including a look at film noir.

**01:050:307** ***The Culture of the 1960s (3)***
Examination of the culture of the 1960s, with emphasis on the civil rights movement, the war in Vietnam and student radicalism, Woodstock, women's liberation, and the sexual revolution, using social history, literature, music, and film.

**01:050:308** ***The Culture of Metropolis (3)***
Examination of the urban culture of New York City in the 19th and 20th centuries, emphasizing the impact of race, class, gender, and ethnicity on developing subcultures.

**01:050:309** ***Nineteenth-Century Architecture in the United States (3)***
Overview of the social and intellectual history of architecture in the United States to 1900. Role of architecture in societal transformations (the development of nationhood, industrialization, and urbanization). Emphasis on the invention of new building types, including universities, government buildings, prisons, hospitals, railroad stations, and the architecture of World's Fairs.
***Credit not given for both this course and 01:082:391.***

**01:050:310** ***Approaches to American Studies (3)***
Introduction to interdisciplinary approaches in American studies. Examination and analysis of debates that have shaped and transformed the discipline.
***Prerequisite: 01:050:101. Required for the major. Restricted to majors, or with special permission.***

**01:050:311** ***Seminar in Black Diasporic Media (3)***
Examines a range of visual media by black cultural producers. Offers a diasporic framework as an opportunity to trace how technologies, genres, styles, and issues circulate through various historical moments, media, conceptualizations of blackness, and locations.
***Credit not given for both this course and 01:014:303.***

**01:050:312** ***Sports in American Culture (3)***
Examines the place of sports in American life and how sports may be thought of as "the American religion," as a metaphor for American ideals and values. Figures from the world of sports (players and coaches) will be regular guest speakers.

**01:050:313** ***America as a Business Culture (3)***
Interdisciplinary approach explaining how living in a market-based society impacts various aspects of everyday life--spending, savings, and investing. Examine social, cultural, and political underpinnings of economic constructs such as money, the market, and consumption.

**01:050:314** ***Technology and Culture in America (3)***
Cultural responses to the growth and elaboration of American technology as reflected in literature, art, and popular culture.

**01:050:315** ***Documentary Expression in America (3)***
Relationship between the social and aesthetic functions of documentary in film, photography, journalism, biography, and the nonfiction novel.

**01:050:316** ***Twenty-First Century Expression (3)***
Exploration of the carryover of mass media from older analog mediums (records, books, etc) and how they interact and create meaning on the internet we know today with access to vast resources of human knowledge. Exploration of ways by which forms of expression, by both individuals and groups, form new communities and new identities online and off and how those human interactions with technology impact our present time and the future.

**01:050:317** ***Law and American Culture (3)***
Exploration of law in the United States in literature, popular culture, feminism, postmodernism, and political philosophy.

**01:050:318** ***Money and Modern America (3)***
Cultures of materialism and ostentatious displays of consumption; the ethics of money, from the meaning of an "honest day's work" to the gray areas of bribery, insider dealing, and profiting from the misery of others; recent financial crises and their impact on American life.
***Credit not given for both this course and 01:790:332.***

**01:050:320** ***American Life During the Cold War (3)***
Examines American domestic life during the Cold War (roughly 1945-1991), when U.S. culture was shaped decisively by its geopolitical rivalry with the Soviet Union.

**01:050:321** ***American Conservatism (3)***
Exploration of the conservative tradition in U.S. politics and culture, from the American Revolution to the present day. Investigation of the major impulses and ideas associated with the political right and discussion of how conservatism has been manifested in American politics, government, literature, and culture.

**01:050:322 Science Fiction Film (4)**
Introduction to science fiction cinema that explores the relationship between the human and the inhuman, the fantastic and the realistic, the familiar and the "other", and the present and the future.
***Credit not given for this course and 01:1775:322 or 01:354:374.***

**01:050:324** ***Wayward Americans (3)***
Exploration various normal/abnormal dichotomies within American culture and how normal is determined. Examination of groups that have been described as different, weird, deviant, strange, abnormal, disobedient or unnatural and the historical, sociological and psychological underpinnings of the cultural norms from which these groups are/were excluded.

**01:050:325** ***Women on the Fringe: Perceptions of Women as Social and Sex-Role Deviants in American Civilization (3)***
Societal reaction to female behavior deviating from social and feminine norms. Use of historical narratives, literature, and film to treat such themes as heresy, madness, prostitution, adultery, criminality, political protest, and lesbianism.

**01:050:326** ***The Culture of American Women (3)***
Construction of feminine culture as distinct from the dominant patriarchal culture, examining social history, religion, psychology, sociology, oral history, literature, and film.

**01:050:327** ***Latino Ethnography (3)***
Cultural description of U.S. Latinos and their communities; introduction to reading, writing, and theorizing ethnography; ethnographic film; ethnography of migration and diaspora; *testimonio* as ethnography; locating anthropology within Latino studies.
***Credit not given for both this course and 01:070:321 or 01:595:307.***

**01:050:329** ***The United States as Seen from Abroad (3)***
United States as perceived by foreign commentators, such as Dickens, Trollope, and Waugh, and American expatriate intellectuals and artists, such as James, Hemingway, and Baldwin.

**01:050:330** ***American Cults and Communes (3)***
Examination of historic and fictional communal and religious experiments, illuminating their surprising similarities and what they tell us about American society and culture. From the Shakers and the Oneida community through Jonestown and the Hare Krishnas. Texts include novels and feature films.

**01:050:331** ***Ethnic America (3)***
Examination of cultural pluralism and the means by which ethnic groups such as Irish, Italians, Jews, African Americans, Asian Americans, and Hispanics have constructed their ethnic identities and the political and cultural forces that shaped those constructions.

**01:050:332** ***American Jewish Culture (3)***
Examination of the evolution of Jewish identities through the prisms of acculturation, religion, race, gender, ethnicity, and sexuality though literature, film, and other visual media.
***Credit not given for both this course and 01:563:332.***

**01:050:333** ***The Cultures of Consumption (3)***
Examination of the development of mass society, mass production, and consumption from the 1880s to the present. Areas considered may include industrialization and the development of work in relation to leisure, the development of the advertising industry, television, technology, and popular and mass production and consumption.
***Credit not given for both this course and 01:512:333.***

**01:050:335** ***Jewish-American Women: Contested Lives (3)***
Explores the Jewish-American female identity in autobiography and memoir, social history, literature, and film. Examines interplay of religious belief, secularism, social mobility, and acculturating influences within American experience.
***Credit not given for both this course and 01:563:335 or 01:988:334.***

**01:050:336** ***American Jews and the Media (3)***
Examines the roles that the news media (film, recordings, radio, television, and computers) played in American Jewish life throughout the 20th century.
***Credit not given for both this course and 01:563:306.***

**01:050:337** ***Contemporary Jewish Culture (3)***
Study of contemporary Jewish life, especially in America--in communities, institutions, rituals, personal histories, etc.--through the approach of fieldwork and ethnographic writing.
***Credit not given for both this course and 01:563:346.***

**01:050:340** ***Race Matters (3)***
How "race" is represented and narrated as a political, cultural, and critical category. Discussions on racial formations in contemporary American culture; race as social construction; race as "natural" and as a "performance"; inquiry and debate on self-hatred, racisms, whiteness, Orientalism; race, gender, and queer intersectionality; and color.

**01:050:341** ***American Childhoods (3)***
Evolution of concepts of childhood and adolescence in America and of child-rearing practices through an examination of social history, religious tracts, novels, poetry, film, and child care manuals.

**01:050:342** ***American Sexuality (3)***
Changing American attitudes toward sexual expression and changes in sexual behavior. Examination of literature, film, 19th- and 20th-century advice manuals, and reports on sexual behavior such as the Kinsey Report and the works of Masters and Johnson.

**01:050:344** ***Islam in/and America (3)***
Explores the polycultural presence of Islam in the Americas from the early colonial period to the present, issues of gender and sexuality, U.S. foreign policy and its consequences, pre- and post-9/11 racializing practices, and the contemporary terrains of Muslim-American culture.
***Credit not given for both this course and 01:840:373 or 01:988:315.***

**01:050:350** ***Festival Curation Seminar (3)***
Fundamentals of public humanities curation and communication to multiple audiences through original research that will provide the basis for curation of a future New Jersey Folk Festival.

**01:050:351** ***American Art, 1776-1913 (3)***
Visual and material culture of the United States from the American Revolution to the Armory Show. Survey of painting, sculpture, photography, and print culture in relation to American social, political, and cultural history.
***Prerequisite: 01:082:105 or 106 or permission of instructor. Credit not given for this course and 01:082:351.***

**01:050:353 American Animated Cinema (4)**
Explores how American animated films by everyone from Winsor McCay in the early 1900s to Walt Disney and Tim Burton have shaped and been shaped by national and international visual cultures. Reflects essential questions about the medium's potential as an art of movement and transformation, an art of time, and an art of dreams.
***Credit not given for both this course and 01:175:353.***

**01:050:355** ***Museums, Monuments, and American Culture (3)***
Introduction to museum studies. Theories of societal roles of museums, monuments, and historical sites: history versus heritage, preservation laws, restoration, and governmental censorship. Includes field trips and collaborative projects.

**01:050:359** ***Race, Culture, and Politics: Blacks and Jews in America (3)***
How black and Jewish identities have evolved in relationship to one another through an examination of social and political history, literature, and film.
***Credit not given for both this course and 01:512:359 or 01:014:359 or 01:563:359.***

**01:050:365** ***American Folk Song and Ballad (3)***
Social concerns in folk songs--sources and circulation in oral tradition, with reference to lyrical folk songs, narrative folk songs, traditional ballads, broadside ballads, and Native American ballads.

**01:050:366** ***Folklore of American Occupational and Regional Groups (3)***
Folklore of occupational groups such as sailors, lumbermen, cowboys, and miners, and of regional groups such as southern mountaineers, Mississippi Delta blacks, Louisiana Cajuns, and Jersey Pineys.

**01:050:370** ***The Black Community and Social Issues (3)***
Examines a variety of social issues that impact the life chances of African Americans in the United States.
***Credit not given for both this course and 01:014:384.***

**01:050:376** ***Native American Literatures in English (3)***
Fiction, poetry, and autobiography by such writers as Apes, Momaday, Welch, Silko, and Erdrich. Attention to issues of Native American representation.
***Credit not given for both this course and 01:351:376 or 01:358:388.***

**01:050:377** ***Asian-American Literatures in English (3)***
Theme or genre-based study of selected Asian-American writing in English. Topics chosen by individual instructors; consult departmental announcement.
***Credit not given for both this course and 01:351:377 or 01:358:389.***

**01:050:380,381** ***Internship in American Studies (3,3)***
Professional, supervised work in an approved organization or agency; an appropriately designed academic project required.
***Prerequisite: Permission of the department before registration. No more than one internship can count toward the major or minor.***

**01:050:389** ***Junior Seminar in American Studies (3)***
A required interdisciplinary seminar for majors. Theme dependent on instructor.
***Prerequisites: Two 300-level American studies courses, or one American studies 300-level course and one approved section of 01:355:201 (Research in the Disciplines). To be taken by American studies majors in their junior year.***

**01:050:390,391** ***Special Problems in American Culture (3,3)***
Independent study of an interdisciplinary nature, which may be expressed in a paper, audiovisual project, or other creative enterprise.
***Prerequisite: Permission of department during preceding semester required. May be repeated for credit with permission of department.***

**01:050:400,401** ***Advanced Topics in American Studies (3,3)***
Advanced topics and readings in American studies. May be repeated for credit when topic differs.

**01:050:449** ***Principles of Folk Festival Management (3)***
Introduction to the folk festival's organizational structure, approaches to project management, technical skills, and key processes and philosophies of the project. Students learn to develop project plan.
***Prerequisite for the 3 credit spring semester course Folk Festival Management (01:050:450).***

**01:050:450** ***Seminar: Folk Festival Management (3)***
Designed to accompany presentation of the New Jersey Folk Festival. Readings in histories of folk performance and fieldwork in folklore, as well as planning and production of public event.
***Prerequisite: 01:050:449 or Permission of instructor during preceding semester required.***

**01:050:455** ***Maritime Culture (3)***
Uses a number of disciplines to explore the influence of the sea on American life. A study of marine policy that embraces both economic and environmental issues, as well as current policy regarding world trade and regulatory reform, conservation and fisheries, national defense, and admiralty law.

**01:050:465** ***Cultures of U.S. Imperialism (3)***
An exploration of American nation-building through the imperial projections of the United States. Topics include the economic, political, social, and cultural dynamics between the United States and its colonies, both formal and informal. Focus might be on a single location or on a comparative approach to imperialist projects.

**01:050:487,488,489** ***Seminars in American Studies (3,3,3)***
Interdisciplinary seminars for majors. Themes dependent on instructor.
***Prerequisite: For American studies majors who have completed 01:050:389.***

**01:050:490** ***Senior Essay or Senior Project in American Studies (3)***
Independent study of an interdisciplinary nature, which may be expressed in a paper, audiovisual project, or other creative enterprise.
***Prerequisites: Permission of department and instructor during preceding semester required. May be repeated for credit with permission of department.***

**01:050:491** ***Independent Study/Project in American Culture (BA)***
For students undertaking an independent study project.

**01:050:495 and 496** ***Honors in American Studies (3,3)***
Research essay or project, designed by the student and prepared under faculty supervision. An oral defense is required.
***Prerequisite: Permission of department. Open only to seniors***

# Animal Science 067 (SEBS)

## ANIMAL SCIENCE 067

**Degree:** B.S.

**Director:** Aparna Zama (zama@rutgers.edu)

**Undergraduate Program Website:** Here

**Department:** Carol Bagnell

**Chair:** Nicholas Bello

**Department Website**: Here

The animal science curriculum provides training and career development for students that have an interest in animal biology or related fields including veterinary medicine, biomedical research, laboratory animal care, companion animal-related careers, equine science, agribusiness, and livestock production and management. The biological sciences form a basis for the study and management of animals. Options are offered in preveterinary medicine/research, companion animal science, laboratory animal science, and equine and production animal science. .

**Options within the Animal Science Major**

*1. Preveterinary Medicine/Research.* Rigorous instruction and experience are provided in the biological and molecular basis of animal sciences in preparation for further education in medical or graduate studies. This option fulfills the academic course requirements of most U.S. veterinary colleges. Students completing this option may also enter medical and dental schools or pursue graduate studies leading to advanced degrees.

*2. Companion Animal Science.* Instruction and practical experience in companion animal science (selection, breeding/reproduction, nutrition, physiology, behavior) and appropriate business courses provide students the basic knowledge and skills to manage commercial or not-for-profit companion animal science enterprises.

*3. Laboratory Animal Science.* Instruction and practical experience are provided in research techniques and the care and use of laboratory animals. Many graduates choose careers in animal care programs as well as research laboratories of major pharmaceutical and related industries, many of which are located in New Jersey.

*4. Equine and Production Animal Science.* Instruction and practical experience in equine and production animal science (selection, breeding/reproduction, nutrition, physiology, behavior) and appropriate business courses provide students with the basic knowledge and skills needed to manage commercial or research enterprises in the horse and livestock (dairy/beef, poultry, sheep, swine) industries, or pursue careers in related/supporting fields such as the feed and animal health care industries, zoos, or wildlife preserves.

Animal Science 067 (SEBS)

# Learning Goals

# Learning Goals

Learning goals for students who successfully complete the program in animal science:

1. Students will gain a broad knowledge of the animal science discipline to understand the future of the field and its diversity
2. Students will apply biological and chemical principles and quantitative reasoning to concepts presented in core subject areas in animal science such as physiology, nutrition, genetics, and reproduction.
3. Students will develop an in-depth understanding of option-specific subject areas such as preveterinary medicine, equine and production animal science, companion animal science, and lab animal science.
4. Students will acquire skills for handling and caring for laboratory animals and livestock species.
5. Students will develop critical thinking skills to identify scientific questions and devise solutions, including designing experiments, analyzing and interpreting research data, and summarizing findings.
6. Students will develop oral and written communication skills to effectively deliver scientific and technical information to scientists as well as the public.
7. Students will develop an understanding of the principles of animal welfare and the ethical treatment of animals.

Animal Science 067 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

Students matriculating fall 2015 or after and transfer students matriculating in 2016 and after must complete a goal-based Core Curriculum. The goal-based core is described here. Courses are certified for the Core Curriculum by a faculty committee. A current list of certified courses can be found here. Animal science major requirements are as described below.

For an up-to-date description of animal sciences major requirements, courses, and course sequences please refer to the program website here.

## Major Requirements for All Students Regardless of Matriculation Date

**A. REQUIRED COURSES (35-37)**

01:119:115,116 General Biology I, II (4,4) or 01:119:101,102 General Biology (4,4)
01:119:117 Biological Research Laboratory (2)
01:160:161,162 General Chemistry I, II (4,4) or equivalent
01:160:171 Introduction to Experimentation (1)

11:067:142 Animal Science (3)

11:067:300 Integrative Physiology (4) or 01:146:356 Systems Physiology (3)

11:067:327 Animal Reproduction (3)

11:067:328 Animal Genetics (3) or 01:447:380 Genetics (4 cr)

11:067:330 Animal Nutrition (3)

11:067:331 Animal Nutrition Laboratory (1)

**B. OPTIONS (42-61)**

**1. Preveterinary Medicine and Research (57-61)**

Required Courses (35-36)

01:160:307-308 Organic Chemistry (4,4)

01:160:311 Organic Chemistry Laboratory (2)

01:640:135 Calculus I (4) or 01:640:151 Calculus for Mathematical and Physical Sciences (4)

01:750:193-194 Physics for the Sciences (4,4) or equivalent

01:960:401 Basic Statistics for Research (3)

11:115:403,404 General Biochemistry (4,3) or 01:694:407,408 Molecular Biology and Biochemistry (3,3)

11:680:390 General Microbiology (4) or 01:447:390 General Microbiology (4)

Option-specific Electives: at least three of the following (9-12):

01:146:322 Human Histology (4)

01:146:328 Human Parasitology (3)

01:146:474 Immunology (3)

01:377:213 Functional Human Anatomy (4)

01:377:424 Human Anatomy (4)

01:640:136 Calculus II (4) or equivalent

01:694:315 Introduction to Molecular Biology and Biochemistry Research (3) or equivalent

11:067:390 Equine Nutrition (3)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:398 Advanced Equine Health Care and Management (3)

11:067:404 Animal Diseases (3)

11:067:410 Neuroendocrinology (3)

11:067:416 In Vivo Lab Animal Techniques

11:067:430 Animal Microtechniques and Tissue Culture (4)

11:067:450 Endocrinology (4)

11:067:490 Pathophysiology (3)

11:067:491 Reproductive and Developmental Toxicology (3)

11:067:492 Molecular and Cellular Physiology (3)

11:126:481 Molecular Genetics (3) and 11:126:482 Molecular Genetics Laboratory (4)

11:216:441 Animal Behavior (3) or equivalent

11:370:406 Medical and Veterinary Entomology (3)

Experiential Learning courses (7); no more than 6 credits from practicum or research courses.

01:090:320 Peer Instructor Education (3)

11:015:483 Research Problems: Agriculture and Environmental Science (BA)

11:015:484 Research Problems: Agriculture and Environmental Science (BA)

11:067:150 Introduction to Animal Handling (P/NC 1)

11:067:175 Animal Handling, Fitting, and Exhibition (P/NC 1)

11:067:176 Animal Handling, Fitting, and Exhibition Supervisor (P/NC 1)

11:067:201 Cattle Practicum (2)

11:067:202 Small Ruminant Practicum (2)

11:067:203 Swine Practicum (2)

11:067:205 Laboratory Animal Practicum (2)

11:067:207 Horse Practicum (2)

11:067:210 Introduction to Veterinary Technology (3)

11:067:260 Animal Evaluation and Selection (3)

11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:406 Farm Productivity Analysis (3)

11:067:411 Studies in Animal Science (BA)

11:067:414 Teaching in Animal Science (BA)

11:067:415 Leadership in Animal Science (BA)

11:067:416 In Vivo Lab Animal Techniques (3)

11:067:493,494 Research in Animal Science (BA, BA)

11:902:300,301,400 SPIN (3-6)

11:554:487,488 George H. Cook Scholars Program (3-6, 3-6)

Animal Science Electives (6)
At least 6 additional credits approved by the adviser, depending on the student's interests and career goals. See additional courses listed in the Animal Science (067) section of the Course Listings chapter.

**2. Companion Animal Science (49)**

Required courses (36)

01:160:209 Elementary Organic Chemistry (3) or equivalent

01:160:211 Elementary Organic Chemistry Laboratory (1) or equivalent

01:640:115 Precalculus College Mathematics (4) or equivalent

11:115:301 Introductory Biochemistry (3)

11:115:313 Introductory Biochemistry Laboratory (1)

11:373:121,122 Principles and Applications if Microeconomics/Macroeconomics (3,3)

11:067:101 Careers in Animal Science (3)

11:067:250 Companion Animal Science (3)

11:067:404 Animal Diseases (3)

11:704:441 Animal Behavior (3)

At least two of the following (6):

01:830:311 Learning Processes (3)

01:830:313 Physiological Psychology (3)

01:830:315 Comparative Psychology (3)

11:067:395 Animal Assisted Therapy (3)

11:067:460 Animals and the Law (3)

11:067:461 Topics in Companion Animal Science Issues (3)

11:216:240 Behavioral Biology (3)

11:216:269 Evolution of Animal Behavior (3)

Option-specific Electives (6):

11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:336 Livestock Production and Management II (3)

11:067:384 Horse Management (3)

11:067:390 Equine Nutrition (3)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:395 Animal Assisted Therapy (3)

11:067:398 Advanced Equine Health Care & Management (3)

11:067:401 Topics in Equine Science (3)

11:067:402 Equine Exercise Physiology (3)

11:067:406 Farm Productivity Analysis (3)

11:067:410 Neuroendocrinology (3)

11:067:413 Developing Future Leaders for the Equine Industry (1)

11:067:450 Endocrinology (4)

11:216:323 Ornithology (4)

11:216:325 Vertebrate Zoology (4)

Experiential Learning courses (7); no more than 6 credits from practicum or research courses.

01:090:320 Peer Instructor Education (3)

11:015:483 Research Problems: Agriculture and Environmental Science (BA)

11:015:484 Research Problems: Agriculture and Environmental Science (BA)

11:067:150 Introduction to Animal Handling (P/NC 1)

11:067:175 Animal Handling, Fitting, and Exhibition, Section DO (P/NC 1)

11:067:176 Animal Handling, Fitting, and Exhibition, Supervisor (P/NC 1)

11:067:201 Cattle Practicum (2)

11:067:202 Small Ruminant Practicum (2)

11:067:203 Swine Practicum (2)

11:067:205 Laboratory Animal Practicum (2)

11:067:207 Horse Practicum (2)

11:067:210 Introduction to Veterinary Technology (3)

11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:336 Production Animal Management (3)

11:067:406 Farm Productivity Analysis (3)

11:067:411 Studies in Animal Science (BA)

11:067:414 Teaching in Animal Science (BA)

11:067:415 Leadership in Animal Science (BA)

11:067:416 In Vivo Lab Animal Techniques (3)

11:067:493,494 Research in Animal Science (BA,BA)

11:902:300,301,400 SPIN (3-6) in a companion animal-related field

11:554:487,488 George H. Cook Scholars Program (3-6, 3-6) or equivalent

**3. Laboratory Animal Science (49)**

Required Courses (36)

01:160:307-308 Organic Chemistry (4,4)

01:160:311 Organic Chemistry Laboratory (2) or 01:160:313,314 Organic Chemistry Laboratory (1,1)

01:640:115 Precalculus College Mathematics (4) or equivalent

01:960:401 Basic Statistics for Research (3)

11:067:205 Laboratory Animal Practicum (2)

11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:404 Animal Diseases (3)

11:067:430 Animal Microtechniques and Tissue Culture (4)

11:373:121 Principles and Applications or Microeconomics (3)

11:680:390 General Microbiology (4) or 01:447:390 General Microbiology (4)

Experiential Learning courses (7); no more than 6 credits from practicum or research courses.

01:090:320 Peer Instructor Education (3)

11:015:483 Research Problems: Agriculture and Environmental Science (BA)

11:015:484 Research Problems: Agriculture and Environmental Science (BA)

11:067:150 Introduction to Animal Handling (P/NC 1)

11:067:175 Animal Handling, Fitting, and Exhibition (P/NC 1)

11:067:176 Animal Handling, Fitting, and Exhibition Supervisor (P/NC 1)

11:067:201 Cattle Practicum (2)

11:067:202 Small Ruminant Practicum (2)

11:067:203 Swine Practicum (2)

11:067:207 Horse Practicum (2)

11:067:210 Introduction to Veterinary Technology (3)

11:067:260 Animal Evaluation and Selection (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:336 Production Animal Management (3)

11:067:406 Farm Productivity Analysis (3)

11:067:411 Studies in Animal Science (BA)

11:067:414 Teaching in Animal Science (BA)

11:067:415 Leadership in Animal Science (BA)

11:067:416 In Vivo Lab Animal Techniques (3)

11:067:493,494 Research in Animal Science (BA, BA)

11:902:300,301,400 SPIN (3-6)

11:554:487,488 George H. Cook Scholars Program (3-6, 3-6)

Option-specific Electives (6)

11:067:101 Careers in Animal Science (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:336 Livestock Production and Management II (3)

11:067:384 Horse Management (3)

11:067:390 Equine Nutrition (3)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:395 Animal Assisted Therapy (3)

11:067:398 Advanced Equine Health Care & Management (3)

11:067:401 Topics in Equine Science (3)

11:067:402 Equine Exercise Physiology (3)

11:067:406 Farm Productivity Analysis in the Animal Sciences (3)

11:067:410 Neuroendocrinology (3)

11:067:416 In Vivo Lab Animal Techniques (3)

11:067:450 Endocrinology (4)

11:067:460 Animals and the Law (3)

11:067:490 Pathophysiology (3)

**4. Equine and Production Animal Science (50)**

Required courses (33)

01:640:111,112 Precalculus Pts1, 2 (2,2) or 01:640:115 Precalculus College Mathematics (4) or 01:640:135 Calculus I (4) or 01:640:151 Calculus for Mathematical and Physical Sciences (4)

11:960:285 Introductory Statistics for Business (3)

11:067:336 Production Animal Management (3)

11:067:384 Horse Management (3)

11:067:406 Farm Productivity Analysis (3)

11:373:121,122 Principles and Applications of Microeconomics/Macroeconomics (3,3) or 01:220:102,103 Introduction to Microeconomics/Macroeconomics (3,3)

11:373:231 Introduction to Marketing (3) or 11:020:305 Starting and Managing a Small Farm (3)

11:373:241 Introduction to Management (3)

33:010:272 Introduction to Financial Accounting (3) or 11:373:200 Agricultural Accounting (3)

Experiential Learning courses (7); no more than 6 credits from practicum or research courses.

01:090:320 Peer Instructor Education (3)

11:015:483 Research Problems: Agriculture and Environmental Science (BA)

11:015:484 Research Problems: Agriculture and Environmental Science (BA)

11:067:150 Introduction to Animal Handling (P/NC 1)

11:067:175 Animal Handling, Fitting, and Exhibition, Section HO (P/NC 1)

11:067:176 Animal Handling, Fitting, and Exhibition Supervisor (P/NC 1)

11:067:201 Cattle Practicum (2)

11:067:202 Small Ruminant Practicum (2)

11:067:203 Swine Practicum (2)

11:067:205 Laboratory Animal Practicum (2)

11:067:207 Horse Practicum (2)

11:067:210 Introduction to Veterinary Technology (3)

11:067:260 Animal Evaluation and Selection (3) 11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:411 Studies in Animal Science (BA), with equine research faculty

11:067:414 Teaching in Animal Science (BA)

11:067:415 Leadership in Animal Science (BA)

11:067:416 In Vivo Lab Animal Techniques (3)

11:067:493,494 Research in Animal Science (BA,BA), with equine research faculty

11:902:300,301,400 SPIN (3-6), in equine-related field

11:554:487,488 George H. Cook Scholars Program (3-6, 3-6)

Option-specific Electives (6)

11:067:310 Domestic Animal Behavior and Welfare (3)

11:067:390 Equine Nutrition (3)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:398 Advanced Equine Health Care and Management (3)

11:067:401 Topics in Equine Science (3)

11:067:402 Equine Exercise Physiology (3)

11:067:404 Animal Diseases (3)

11:067:460 Animals and the Law (3)

11:216:360 Animal Physiological Ecology (3)

11:373:321 Economics of Production (3)

11:375:453 Soil Ecology (3)

11:776:301 The Grain Crops (3)

11:776:440 Soil Fertility (3)

Animal Science Electives

At least 6 additional credits approved by the adviser, depending on the student's interests and career goals. See additional courses listed in the Animal Science (067) section of the Course Listings chapter. Suggested courses are:

11:020:210 Introduction to Agriculture and Food Systems (3)

11:067:101 Careers in Animal Science (3)

11:067:260 Animal Evaluation and Selection (3), also EL

11:067:250 Companion Animal Science (3)

11:067:275 Lab Animal Science: Management and Techniques (3)

11:067:295 Biosecurity in Animal Agriculture (3)

11:067:296 Honors Seminar (3)

11:067:310 Domestic Animal Behavior and Welfare (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:410 Neuroendocrinology (3)

11:067:430 Animal Microtechniques and Tissue Culture (4)

11:067:450 Endocrinology (4)

11:067:460 Animals and the Law (3)

11:067:490 Pathophysiology (3)

11:067:491 Reproductive and Developmental Toxicology (3)

11:067:492 Molecular and Cellular Physiology (3)

11:373:205 Small Business Essentials (3)

11:776:200 Modern Crop Production (3)

11:776:221 Principles of Organic Crop Production (3)

**C. UNSPECIFIED ELECTIVES**

In addition to courses meeting the above requirements, students can take other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 120 (matriculated 2018 or later) or 128 (matriculated prior to 2018) required for graduation.

# Anthropology 070 (SAS)

## ANTHROPOLOGY 070

Department of Anthropology, School of Arts and Sciences

**Website:** Here

**Chair:** Omar Dewachi

**Undergraduate Director:** Dan Cabanes

**Professors:**

Susan Marie Cachel, B.A., M.A., Ph.D., Chicago

Lee Cronk, B.A., Northwestern; M.A., Wisconsin; Ph.D., Northwestern

Craig S. Feibel, B.A., Dartmouth; M.S., Iowa; Ph.D., Utah

David M. Hughes, B.A., Princeton; M.A., Ph.D., California (Berkeley)

Carmel Schrire, B.A., Capetown (South Africa); B.A., Cambridge; Ph.D., Australian National

Erin Vogel, B.A., Colby; Ph.D., Stony Brook

**Associate Professors:**

Ulla Berg, B.A., M.Phil., Copenhagen; M.A., Ph.D., New York

Omar Dewachi, M.B.Ch.B., University of Baghdad; M.A., Ph.D., Harvard

Parvis Ghassem-Fachandi, B.A., M.A., Freie Universität (Germany); M.A., Ph.D., Cornell

Zeynep Gürsel, B.A., Yale; M.A., Ph.D., California (Berkeley)

Ryne Palombit, B.A., B.S., New Mexico State; Ph.D., California (Davis)

Louisa Schein, B.A., Brown; M.A., Ph.D., California (Berkeley)

Robert S. Scott, B.A., Yale; M.A., Ph.D., Texas (Austin)

Dan Cabanes, B.A., M.A., Ph.D., Rovira i Vigili (Tarragona, Spain)

**Assistant Professors:**

Becky L. Schulthies, B.A., M.A., Brigham Young; Ph.D., Arizona

Christien Tompkins, B.A., Columbia; Ph.D., Chicago

**Assistant Teaching Professor:**

Pilar Rau, B.A., Maryland (Baltimore County); M.Phil., Ph.D., New York

Hylke De Jong, Doctoraal,Leiden (the Netherlands); Ph.D., Bristol (UK)

**Teaching Instructors:**

Anthropology 070 (SAS)

# Learning Goals

# Learning Goals

1. Students gain knowledge that will allow them to identify, explain, and historically contextualize the primary objectives, fundamental concepts, modes of analysis, and central questions in their major field and demonstrate proficiency in their use of this knowledge.
2. Students are able to demonstrate proficiency in critical thinking skills.
3. Students are able to demonstrate proficiency using current methods in their major fields, including library research skills.
4. Students are able to express themselves knowledgeably and proficiently in writing about central issues in their major field.
5. Students are able to express themselves knowledgeably and proficiently in speaking about central issues in their major field.

Anthropology 070 (SAS)

# Major Requirements

# Major Requirements

There are three options for completing a major in anthropology: a B.A. track in anthropology, a B.A. track in cultural anthropology, and a B.S. in evolutionary anthropology.

**Bachelor of Arts (B.A.) in Anthropology**

The B.A. track in anthropology trains students in the discipline's four traditional subfields: cultural, biological, linguistic anthropology, and archaeology, providing them with a holistic understanding of humans as biological, cultural, and linguistic beings, both in the present and the past. This track is intended for students who seek a comprehensive understanding of human cultural and physical diversity within a broad social, historical, and evolutionary framework.

Requirements for a major in anthropology. The degree code is 070.

Total number of required credits: 40 credits, of which at least 18 credits are at the 300 or 400 level.

*Requirements for anthropology track*

INTRODUCTORY COURSES: four courses required (16 credits)

01:070:101 Culture and Social Life

01:070:102 Introduction to Human Evolution

01:070:105 Introduction to Archaeology

01:070:108 Language, Culture, and Society

300- OR 400-LEVEL COURSES: one course in three of the four anthropology subdisciplines (9 credits):

300- OR 400-LEVEL CULTURAL ANTHROPOLOGY COURSES

01:070:302 Culture and the Environment

01:070:303 Wealth and Culture

01:070:304 Political Anthropology

01:070:305 Anthropology of Development

01:070:306 Space, Place, and Practice

01:070:307 Medical Anthropology

01:070:308 Anthropology of Religion

01:070:309 Visual Anthropology

01:070:311 History of Anthropology

01:070:317 Method and Analysis in Cultural Anthropology

01:070:318 Reading Ethnographic Writing

01:070:319 Anthropology and Human Rights

01:070:320 Diaspora, Race, and Ethnicity in the United States

01:070:321 Latino Ethnography

01:070:322 Anthropology of Islam

01:070:323 Women Writing Culture

01:070:324 Globalization, Sex, and Families

01:070:338 Culture, Wealth, and Power in Africa

01:070:360 Law, Justice, Rights

01:070:367 Anthropology Goes to the Movies

01:070:368 Media and Culture

01:070:370 Life and Death in Anthropological Perspective

01:070:371 The Politics of Culture

01:070:372 Body Politics

01:070:373 Visual Ethnography of Everyday Life

01:070:374 Localities and Global Systems

01:070:376 Power and Difference

01:070:378 The Anthropology of Gender

01:070:379 Gender and Power in Africa

01:070:380 Culture, Memory, History

01:070:389 Ethnography of Gender in South Asia

01:070:406 Rights and Wrongs of Indigenous Peoples

01:070:407 Documenting Latino Lives

01:070:408 Video Production Lab for Latino Lives

01:070:410 Explanation in Anthropology

01:070:417 Writing Ethnography

01:070:486 Gender Development, Environment: Policies, Politics, Perspectives

300- OR 400-LEVEL LINGUISTIC ANTHROPOLOGY COURSES

01:070:312 Language and Social Diversity

01:070:341 Language, Food, and Society

300- OR 400-LEVEL BIOLOGICAL ANTHROPOLOGY COURSES

01:070:316 Quantitative Methods in Evolutionary Anthropology

01:070:325 Evolution and Culture

01:070:328 Evolution, Cooperation, and Conflict

01:070:329 Human Evolutionary Genetics

01:070:336 Primatology, Wildlife Ecology, and Conservation in Kenya

01:070:337 Field Methods and Analysis in Primatology in Kenya

01:070:345 Study Abroad - Applied Conservation and Ecosystem Management

01:070:346 Honors Study Abroad - Applied Conservation and Ecosystem Management

01:070:347 Study Abroad - Advanced Primate Behavior and Ecology

01:070:348 Primate Behavioral Ecology

01:070:350 Primatology and Human Evolution

01:070:356 Human Variation

01:070:358 Human Osteology

01:070:359 Human Osteology Laboratory

01:070:361 Hunters and Gatherers

01:070:362 Evolution of Human Diet

01:070:377 Evolution and Religion

01:070:390 Fossil Hominin Anatomy

01:070:398 Field Study in Paleoanthropology

01:070:402 Primate Conservation Biology

01:070:409 Primate Nutritional Ecology

01:070:422 Theories in Physical Anthropology

01:070:491 Capstone Colloquium in Evolutionary Medicine

300- OR 400-LEVEL ARCHAEOLOGY COURSES

01:070:313 Historical Archaeology

01:070:314 Prehistoric Funerary Archaeology

01:070:326 Life in the Pleistocene

01:070:327 Life in the Early Holocene

01:070:330 Archaeology of Australia

01:070:332 North American Archaeology

01:070:333 Colonial Archaeology

01:070:334 Field Study in Archaeology

01:070:335 Analysis of Archaeological Data

01:070:339 Caribbean Archaeology

01:070:391 Lithic Analysis in Archaeology

01:070:392 Faunal Analysis in Archaeology

01:070:393 Cultural Resource Management

01:070:394 Geological Context in Paleoanthropology

01:070:395 Quantification of Archaeological Data

01:070:404 Advanced Seminar in Archaeology

01:070:412 Topics in African Prehistory and Paleoanthropology

01:070:426 South African Archaeology

ELECTIVE COURSES: five courses required, of which at least three are at the 300 or 400 level (15 credits)

Honors in Anthropology credit, and one approved independent study course, may be used toward elective credit. No course may fulfill more than one subdisciplinary requirement. Credit may be given for courses in other departments if approved. All courses applied to this major must be completed with a grade of C or better.

**Bachelor of Arts (B.A.) in Cultural Anthropology**

The B.A. track in cultural anthropology focuses on the issues, modes of inquiry, fieldwork strategies, methods of data collection and analysis, and forms of ethnographic representation that characterize contemporary cultural anthropology. The cultural anthropology track is intended for students interested in current cultural, social, and political issues, especially in understanding the relationship of global processes to new cultural forms and social inequalities. Students learn how cultural theory is integrated with empirical ethnographic research and how to balance knowledge of worldwide interconnections with in-depth knowledge of particular geographic regions (e.g., Africa, Asia, Latin America, and the United States). Students trained in cultural anthropology develop a unique set of skills enabling them to work successfully in many different cultural environments; a major in cultural anthropology also provides excellent preparation for students planning graduate training in anthropology or other disciplines, including professional training in law, teaching, and social work.

***Requirements for cultural anthropology track***

Total number of required credits: 40 credits

INTRODUCTORY COURSES: both required (8 credits)

01:070:101 Culture and Social Life

01:070:108 Language, Culture, and Society

GEOGRAPHIC AREA COURSES: two courses required (6 credits)

01:070:223 Anthropology of Latin America

01:070:238 Anthropology of Europe

01:070:242 Anthropology of the Middle East

01:070:243 Anthropology of Africa

01:070:244 Ethnographies of South Asia

01:070:246 Anthropology of Southeast Asia

01:070:248 Anthropology of China

01:070:250 Anthropology of the Contemporary United States

01:070:320 Diaspora, Race, and Ethnicity in the United States

01:070:338 Culture, Wealth, and Power in Africa

01:070:379 Gender and Power in Africa

01:070:389 Ethnography of Gender in South Asia

GLOBAL PERSPECTIVES ON JUSTICE, INEQUALITY, AND DIFFERENCE: one course required (3 credits)

01:070:303 Wealth and Culture

01:070:304 Political Anthropology

01:070:305 Anthropology of Development

01:070:312 Language and Social Diversity

01:070:319 Anthropology and Human Rights

01:070:324 Globalization, Sex, and Families

01:070:360 Law, Justice, Rights

01:070:371 The Politics of Culture

01:070:372 Body Politics

01:070:374 Localities and Global Systems

01:070:376 Power and Difference

01:070:378 The Anthropology of Gender

01:070:380 Culture, Memory, History

01:070:406 Rights and Wrongs of Indigenous Peoples

01:070:486 Gender, Development, Environment: Policies, Politics, Perspectives

METHODS AND ANALYSIS IN CULTURAL ANTHROPOLOGY: one course required (3 credits)

01:070:317 Method and Analysis in Cultural Anthropology

ELECTIVE COURSES: seven cultural anthropology courses required (21 credits)

01:070:111 Extinction

01:070:216 Anthropology and Contemporary Issues

01:070:217 Psychology and Culture

01:070:220 Food and Culture

01:070:222 Sexuality and Eroticism in Global Perspective

01:070:223 Anthropology of Latin America

01:070:225 Gender in Global Perspective

01:070:230 Anthropology of Native North Americans

01:070:238 Anthropology of Europe

01:070:242 Anthropology of the Middle East

01:070:243 Anthropology of Africa

01:070:244 Ethnographies of South Asia

01:070:246 Anthropology of Southeast Asia

01:070:248 Anthropology of China

01:070:250 Anthropology of the Contemporary United States

01:070:293 Current Issues in Cultural and Linguistic Anthropology

01:070:294 Current Issues in Cultural and Linguistic Anthropology

01:070:295 Current Issues in Cultural and Linguistic Anthropology

01:070:302 Culture and the Environment

01:070:303 Wealth and Culture

01:070:304 Political Anthropology

01:070:305 Anthropology of Development

01:070:306 Space, Place, and Practice

01:070:307 Medical Anthropology

01:070:308 Anthropology of Religion

01:070:309 Visual Anthropology

01:070:311 History of Anthropology

01:070:312 Language and Social Diversity

01:070:317 Method and Analysis in Cultural Anthropology

01:070:318 Reading Ethnographic Writing

01:070:319 Anthropology and Human Rights

01:070:320 Diaspora, Race, and Ethnicity in the United States

01:070:321 Latino Ethnography

01:070:322 Anthropology of Islam

01:070:323 Women Writing Culture

01:070:338 Culture, Wealth, and Power in Africa

01:070:341 Language, Food, and Society

01:070:360 Law, Justice, Rights

01:070:367 Anthropology Goes to the Movies

01:070:368 Media and Culture

01:070:370 Life and Death in the Anthropological Perspective

01:070:371 Politics of Culture

01:070:372 Body Politics

01:070:373 Visual Ethnography of Everyday Life

01:070:374 Localities and Global Systems

01:070:376 Power and Difference

01:070:378 The Anthropology of Gender

01:070:379 Gender and Power in Africa

01:070:380 Culture, Memory, History

01:070:389 Ethnography of Gender in South Asia

01:070:406 Rights and Wrongs of Indigenous Peoples

01:070:407 Documenting Latino Lives

01:070:408 Video Production Lab for Latino Lives

01:070:410 Explanation in Anthropology

01:070:417 Writing Ethnography

01:070:486 Gender, Development, Environment: Policies, Politics, Perspectives

Honors in Anthropology credit, and one approved independent study course, may be used toward the elective requirement. No course may fulfill more than one requirement. All courses applied to this major must be completed with a grade of C or better.

**Bachelor of Science (B.S.) in Evolutionary Anthropology**

The B.S. degree in evolutionary anthropology is designed for students who plan to go to graduate school in archaeology, biological anthropology, paleoanthropology, geoarchaeology, or other related fields in human evolutionary studies (e.g., skeletal biology, forensic science, primatology). This option prepares students with a multidisciplinary, science-oriented background for careers in the field of evolutionary anthropology. This degree is also useful and desirable for careers in the medical sciences.

*Requirements for evolutionary anthropology track*

INTRODUCTORY COURSES: three courses required (070:102 and 105, and 201 or 212) (11 credits)

01:070:102 Introduction to Human Evolution

01:070:105 Introduction to Archaeology

01:070:201 Evolution and Human Behavior

01:070:212 The Life of Primates

STATISTICS COURSE: one course required (3 credits)

01:070:316 Quantitative Methods in Evolutionary Anthropology

01:070:395 Quantification of Archaeological Data

BIOLOGY OR GEOLOGY COURSES: courses required in either subject (8 or 4 credits)

01:119:115 General Biology (4 credits) (formerly 01:119:101)

01:119:116 General Biology (4 credits) (formerly 01:119:102)

01:460:101 Introductory Geology (4 credits)

200 -- 400 LEVEL COURSES: One course in each of the six subdisciplines of evolutionary anthropology, of which four are at the 300- or 400-level (18 credits):

I. PRIMATOLOGY: one course required (3 credits)

01:070:212 The Life of Primates

01:070:336 Primatology, Wildlife Ecology, and Conservation in Kenya

01:070:337 Field Methods and Analysis in Primatology in Kenya

01:070:347 Study Abroad - Advanced Primate Behavior and Ecology

01:070:348 Primate Behavioral Ecology

01:070:350 Primatology and Human Evolution

01:070:402 Primate Conservation Biology

01:070:409 Primate Nutritional Ecology

II. SOCIAL EVOLUTION: one course required (3 credits)

01:070:201 Evolution and Human Behavior

01:070:325 Evolution and Culture

01:070:328 Evolution, Cooperation, and Conflict

01:070:356 Human Variation

01:070:361 Hunters and Gatherers

01:070:377 Evolution and Religion

III. SKELETAL BIOLOGY/HOMINID PALEONTOLOGY: one course required (3 credits)

01:070:215 Survey of Fossil Primates

01:070:358 Human Osteology

01:070:359 Human Osteology Laboratory

01:070:362 Evolution of Human Diet

01:070:390 Fossil Hominin Anatomy

01:070:398 Field Study in Paleoanthropology

IV. ARCHAEOLOGY: one course required (3 credits)

01:070:206 Survey of New World Prehistory

01:070:207 Prehistoric Archaeology of Europe

01:070:313 Historical Archaeology

01:070:314 Prehistoric Funerary Archaeology

01:070:326 Life in the Pleistocene

01:070:327 Life in the Early Holocene

01:070:330 Archaeology of Australia

01:070:332 North American Archaeology

01:070:333 Colonial Archaeology

01:070:334 Field Study in Archaeology

01:070:335 Analysis of Archaeological Data

01:070:339 Caribbean Archaeology

01:070:391 Lithic Analysis in Archaeology

01:070:392 Faunal Analysis in Archaeology

01:070:393 Cultural Resource Management

01:070:404 Advanced Seminar in Archaeology

01:070:412 Topics in African Prehistory and Paleoanthropology

01:070:415 Prehistoric Archaeology of New Jersey

01:070:426 South African Archaeology

V. GEOARCHAEOLOGY/PALEOECOLOGY: one course required (3 credits)

01:070:213 Environment and Human Evolution

01:070:351 Fieldwork in Paleoecology

01:070:352 Practicum in Geoarchaeology

01:070:394 Geological Context in Paleoanthropology

01:460:340 Sedimentary Geology

01:460:396 Geochronology in Geosciences and Anthropology

VI. ANTHROPOLOGICAL GENETICS: one course required (3 credits)

01:070:240 Introduction to Molecular Evolutionary Anthropology

01:070:329 Human Evolutionary Genetics

ELECTIVE COURSES: four or five courses in evolutionary anthropology required (10 or 14 credits)

01:070:111 Extinction

01:070:201 Evolution and Human Behavior

01:070:206 Survey of New World Prehistory

01:070:207 Prehistoric Archaeology of Europe

01:070:212 The Life of Primates

01:070:213 Environment and Human Evolution

01:070:215 Survey of Fossil Primates

01:070:218 Introduction to Forensic Anthropology

01:070:240 Introduction to Molecular Evolutionary Anthropology

01:070:296 Current Issues in Evolutionary Anthropology

01:070:297 Current Issues in Evolutionary Anthropology

01:070:298 Current Issues in Evolutionary Anthropology

01:070:313 Historical Archaeology

01:070:314 Prehistoric Funerary Archaeology

01:070:316 Quantitative Methods in Evolutionary Anthropology

01:070:325 Evolution and Culture

01:070:326 Life in the Pleistocene

01:070:327 Life in the Early Holocene

01:070:328 Evolution, Cooperation, and Conflict

01:070:329 Human Evolutionary Genetics

01:070:330 Archaeology of Australia

01:070:332 North American Archaeology

01:070:333 Colonial Archaeology

01:070:336 Primatology, Wildlife Ecology, and Conservation in Kenya

01:070:337 Field Methods and Analysis in Primatology in Kenya

01:070:339 Caribbean Archaeology

01:070:345 Study Abroad - Applied Conservation and Ecosystem Management

01:070:346 Honors Study Abroad - Applied Conservation and Ecosystem Management

01:070:348 Primate Behavioral Ecology

01:070:350 Primatology and Human Evolution

01:070:351 Fieldwork in Paleoecology

01:070:352 Practicum in Geoarchaeology

01:070:356 Human Variation

01:070:358 Human Osteology

01:070:359 Human Osteology Laboratory

01:070:361 Hunters and Gatherers

01:070:362 Evolution of Human Diet

01:070:364 Sex Roles and Social Structure

01:070:377 Evolution and Religion

01:070:390 Fossil Hominin Anatomy

01:070:391 Lithic Analysis in Archaeology

01:070:392 Faunal Analysis in Archaeology

01:070:393 Cultural Resource Management

01:070:394 Geological Context in Paleoanthropology

01:070:395 Quantification of Archaeological Data

01:070:397 Practicum in Vertebrate Paleontology

01:070:398 Field Study in Paleoanthropology

01:070:402 Primate Conservation Biology

01:070:404 Advanced Seminar in Archaeology

01:070:409 Primate Nutritional Ecology

01:070:412 Topics in African Prehistory and Paleoanthropology

01:070:415 Prehistoric Archaeology of New Jersey

01:070:422 Theories in Physical Anthropology

01:070:426 South African Archaeology

Honors in Anthropology credit, and one approved independent study course, may be used toward elective credit. No course may fulfill more than one requirement. Credit may be given for courses in other departments if approved. All courses applied to this major must be completed with a grade of C or better.

Anthropology 070 (SAS)

# Minor Requirements

# Minor Requirements

*Minor in Anthropology*

This minor is designed for students who seek an overview of the discipline's four traditional subfields: cultural, biological, and linguistic anthropology and archaeology.

**Total number of required credits:** 20 credits

Required courses include one introductory course in cultural anthropology (01:070:101 or 108) and one in evolutionary anthropology (01:070:102 or 105). Of the remaining 12 credits, at least 6 must be at the 300 level or above. All courses applied to this minor must be completed with a grade of C or better.

*Minor in Cultural Anthropology*

This minor is intended for students interested in an overview of the issues, modes of inquiry, fieldwork strategies, methods of data collection and analysis, and forms of ethnographic representation that characterize contemporary cultural anthropology. It is designed for students interested in current cultural and political issues, especially in understanding the relationship of global processes to local cultural forms and social inequalities. All courses applied to this minor must be completed with a grade of C or better.

**Total number of required credits:** 20 credits, of which 6 are at the 300 level or above

INTRODUCTORY COURSES: both courses required (8 credits)

01:070:101 Culture and Social Life

01:070:108 Language, Culture, Society

GEOGRAPHIC AREA COURSES: one course required (3 credits)

01:070:223 Anthropology of Latin America

01:070:238 Anthropology of Europe

01:070:242 Anthropology of the Middle East

01:070:243 Anthropology of Africa

01:070:244 Ethnographies of South Asia

01:070:246 Anthropology of Southeast Asia

01:070:248 Anthropology of China

01:070:250 Anthropology of the Contemporary United States

01:070:320 Diaspora, Race, and Ethnicity in the United States

01:070:338 Culture, Wealth, and Power in Africa

01:070:379 Gender and Power in Africa

01:070:389 Ethnography of Gender in South Asia

ELECTIVE COURSES: three courses required (9 credits)

01:070:111 Extinction

01:070:216 Anthropology and Contemporary Issues

01:070:217 Psychology and Culture

01:070:220 Food and Culture

01:070:222 Sexuality and Eroticism in Global Perspective

01:070:223 Anthropology of Latin America

01:070:225 Gender in Global Perspective

01:070:230 Anthropology of Native North Americans

01:070:238 Anthropology of Europe

01:070:243 Anthropology of Africa

01:070:244 Ethnographies of South Asia

01:070:246 Anthropology of Southeast Asia

01:070:248 Anthropology of China

01:070:250 Anthropology of the Contemporary United States

01:070:293 Current Issues in Cultural and Linguistic Anthropology

01:070:294 Current Issues in Cultural and Linguistic Anthropology

01:070:295 Current Issues in Cultural and Linguistic Anthropology

01:070:302 Culture and the Environment

01:070:303 Wealth and Culture

01:070:304 Political Anthropology

01:070:305 Anthropology of Development

01:070:306 Space, Place, and Practice

01:070:307 Medical Anthropology

01:070:308 Anthropology of Religion

01:070:309 Visual Anthropology

01:070:311 History of Anthropology

01:070:312 Language and Social Diversity

01:070:317 Method and Analysis in Cultural Anthropology

01:070:318 Reading Ethnographic Writing

01:070:319 Anthropology and Human Rights

01:070:320 Diaspora, Race, and Ethnicity in the United States

01:070:321 Latino Ethnography

01:070:322 Anthropology of Islam

01:070:323 Women Writing Culture

01:070:324 Globalization, Sex, and Families

01:070:338 Culture, Wealth, and Power in Africa

01:070:341 Language, Food, and Society

01:070:365 Anthropology of Childhood

01:070:367 Anthropology Goes to the Movies

01:070:368 Media and Culture

01:070:370 Life and Death in Anthropological Perspective

01:070:371 The Politics of Culture

01:070:372 Body Politics

01:070:373 Visual Ethnography of Everyday Life

01:070:374 Localities and Global Systems

01:070:376 Power and Difference

01:070:378 The Anthropology of Gender

01:070:379 Gender and Power in Africa

01:070:380 Culture, Memory, History

01:070:389 Ethnography of Gender in South Asia

01:070:406 Rights and Wrongs of Indigenous Peoples

01:070:407 Documenting Latino Lives

01:070:408 Video Production Lab for Latino Lives

01:070:410 Explanation in Anthropology

01:070:417 Writing Ethnography

01:070:486 Gender, Development, Environment: Policies, Politics, Perspectives

*Minor in Evolutionary Anthropology*

The evolutionary anthropology minor is for students interested in an overview of the diverse approaches and knowledge used by archaeologists, biological anthropologists, cultural anthropologists, paleoanthropologists, geoarchaeologists, and paleoecologists to understand the evolution of human form, physiology, behavior, culture, and ecology, including these aspects of nonhuman primates.

**Total number of required credits:** 20 credits

Required courses include at least 20 credits, of which 6 are at the 300-level or above. All courses applied to this minor must be completed with a grade of C or better. No pass/fail courses will be accepted.

INTRODUCTORY COURSES: 102, 105, AND 201 or 212 (11 credits)

01:070:102 Introduction to Human Evolution

01:070:105 Introduction to Archaeology

01:070:201 Evolution and Human Behavior

01:070:212 The Life of Primates

ELECTIVE COURSES: 3 courses required; 9 credits, of which 6 are at the 300 level or above

01:070:111 Extinction

01:070:112 World Prehistory

01:070:113 Introduction to Greek and Roman Archaeology

01:070:201 Evolution and Human Behavior

01:070:206 Survey of New World Prehistory

01:070:207 Prehistoric Archaeology of Europe

01:070:212 The Life of Primates

01:070:213 Environment and Human Evolution

01:070:215 Survey of Fossil Primates

01:070:240 Introduction to Molecular Evolutionary Anthropology

01:070:296 Current Issues in Evolutionary Anthropology

01:070:297 Current Issues in Evolutionary Anthropology

01:070:298 Current Issues in Evolutionary Anthropology

01:070:316 Quantitative Methods in Evolutionary Anthropology

01:070:325 Evolution and Culture

01:070:326 Life in the Pleistocene

01:070:327 Life in the Early Holocene

01:070:328 Evolution, Cooperation, and Conflict

01:070:329 Human Evolutionary Genetics

01:070:330 Archaeology of Australia

01:070:332 North American Archaeology

01:070:333 Colonial Archaeology

01:070:336 Primatology, Wildlife Ecology, and Conservation in Kenya

01:070:337 Field Methods and Analysis in Primatology in Kenya

01:070:345 Study Abroad - Applied Conservation and Ecosystem Management

01:070:346 Honors Study Abroad - Applied Conservation and Ecosystem Management

01:070:347 Study Abroad - Advanced Primate Behavior and Ecology

01:070:348 Primate Behavioral Ecology

01:070:350 Primatology and Human Evolution

01:070:356 Human Variation

01:070:358 Human Osteology

01:070:359 Human Osteology Laboratory

01:070:361 Hunters and Gatherers

01:070:362 Evolution of Human Diet

01:070:377 Evolution and Religion

01:070:390 Fossil Hominin Anatomy

01:070:391 Lithic Analysis in Archaeology

01:070:392 Faunal Analysis in Archaeology

01:070:393 Cultural Resource Management

01:070:394 Geological Context in Paleoanthropology

01:070:395 Quantification of Archaeological Data

01:070:397 Practicum in Vertebrate Paleontology

01:070:398 Field Study in Paleoanthropology

01:070:402 Primate Conservation Biology

01:070:404 Advanced Seminar in Archaeology

01:070:409 Primate Nutritional Ecology

01:070:412 Topics in African Prehistory and Paleoanthropology

01:070:415 Prehistoric Archaeology of New Jersey

01:070:426 South African Archaeology

Anthropology 070 (SAS)

# Certificate in Evolutionary Medicine

# Certificate in Evolutionary Medicine

The certificate in evolutionary medicine is intended for students planning or already pursuing careers in medicine and allied health professions, medical research, public health, or global development. It is anticipated that students may earn the certificate as part of premed preparation in the course of an undergraduate degree, in preparation for an advanced research-oriented degree, as a supplement to a degree in public health, or as continuing education for those pursuing careers in health policy or global development.

**Codirectors**

Siobain Duffy, Foran Hall 316, 848-932-6299 (siobain@rci.rutgers.edu)

Rob Scott, BIO 210 (robertsc@rutgers.edu)

**Prerequisites for Certificate (two courses)**

Complete one introductory evolution course with a grade of B or better from among any one of the following:

01:070:102 Introduction to Human Evolution (3)

11:216:110 Evolution, Disease, and Medicine (3)

11:216:251 Fundamentals of Evolution (3)

01:090:274 SAS Honors Program Seminar with a focus on evolution (3)

Complete one quantitative perspectives course with a grade of B or better from among any one of the following:

01:070:316 Quantitative Methods in Evolutionary Anthropology (3)

01:447:302 Quantitative Biology and Bioinformatics (3)

01:960:401 Basic Statistics for Research (3)

Another quantitative course approved by either the SAS or SEBS certificate in evolutionary medicine program codirector

**Certificate Requirements (five courses, minimum of 13 credits)**

*Genetics or Evolutionary Anthropology: one course required (3-4 credits)*

01:070:240 Introduction to Molecular Evolutionary Anthropology (3)

01:070:356 Human Variation (3)

01:447:380 Genetics (4)

01:447:384 Genetic Analysis (4)

*Evolutionary Approaches to Diet or Evolutionary Physiology: one course required (3 credits)*

01:070:362 Evolution of Human Diet (3)

01:070:409 Primate Nutritional Ecology (3)

11:216:360 Animal Physiological Ecology (3)

*Genetic Variation and Evolution in Humans or Infectious Microbes: one course required (3 credits)*

01:070:356 Human Variation (3)

11:216:302 Parasite Ecology (3)

11:216:405 Evolution of Infectious Disease (3)

*Advanced Evolution or Evolutionary Medicine: one course required (3 credits)*

01:070:328 Evolution, Cooperation, and Conflict (3)

01:070:348 Primate Behavioral Ecology (3)

01:070:422 Theories in Physical Anthropology (3)

01:447:356 Evolutionary Medicine (3)

01:447:486 Evolutionary Genetics (3)

11:216:486 Principles of Evolution (3)

**Capstone Colloquium: (1 credit)**

01:070:491 Evolutionary Medicine Capstone Colloquium (1)

Anthropology 070 (SAS)

# Departmental Honors Program

# Departmental Honors Program

Students with a 3.0 or better cumulative grade-point average and a 3.4 or better average in anthropology at the end of the junior year may make a written application for honors to the undergraduate director in the spring semester of the junior year or the first week of the senior year. Candidates who are accepted spend two semesters conducting original research and writing an honors thesis under the supervision of a faculty member in anthropology (or other qualified faculty approved by the undergraduate director) and take an oral examination on the paper at the end of the senior year. The faculty adviser and one other faculty member will decide the level of honors, if any, after completion of the oral defense.

Anthropology 070 (SAS)

# Courses

# Courses

**01:070:100** ***Introduction to Anthropology (3)***
Central approaches, concepts, and methods of anthropology's four subfields: archaeology and biological, cultural, and linguistic anthropology. Anthropology as comparative study of human physical and cultural diversity, past and present. Provides background for students seeking a firm foundation in the discipline before moving on to higher-level courses.
***Does not count toward the major or minor in anthropology.***

**01:070:101** ***Culture and Social Life (4)***
History of cultural anthropology; changing theoretical and methodological approaches; fieldwork, ethnographic writing, and the culture concept; cross-cultural analyses and comparisons; complex society; local, regional, and global perspectives.

**01:070:102** ***Introduction to Human Evolution (4)***
Evolutionary processes, including adaptation and speciation; fossil and archaeological records of human morphological and social-behavioral evolution.

**01:070:104** ***Introduction to Microbiomes (3)***
Evolution of microbial life and hosts, symbioses, ecology, pathogens, degradation of the human microbiota and restoration potential; principles of host-associated microbes, how do humans acquire them, their functions; principles relevant to microbiomes such as resilience, resistance, diversity and stability.

Credit not given for this course and 11:680:104.

**01:070:105** ***Introduction to Archaeology (4)***
Overview of human prehistory over the past 5 million years, from origins in Africa to the spread of people first to Asia and Europe, and later to Australia and the Americas, culminating in the archaeology of colonial contact between Europe and distant lands.

**01:070:108** ***Language, Culture, and Sociey (3)***
Introduction to linguistic anthropology. Language as social action, language and culture, language use in specific sociocultural contexts.
***Credit not given for both this course and 01:615:101.***

**01:070:111** ***Extinction (4)***
An interdisciplinary approach to understanding the idea and the reality of the extinction process. Extinction as a challenge of the 21st century. Topics include extinctions of fossil hominins, cultures, religions and ethnic groups, language, and endangered species; and the possible extinction of our own species.

**01:070:112** ***World Prehistory (3)***
An overview of world prehistory from the first human-made tools to the development of farming and herding.

**01:070:113** ***Introduction to Greek and Roman Archaeology (3)***
Introductory survey of the archaeology, architecture, and material culture of the Mediterranean world from the Bronze Age throughout the transformation of the Roman Empire following the reign of Constantine. Consideration given to chronological developments, Greek and Roman artistic production in its social and cultural settings, and Classical Art.
***Credit not given for both this course and 01:190:215.***

**01:070:152** ***Bones and Stones Laboratory (1.5)***
Basics of human bone and lithic material analysis; human paleoanthropological fossil record; lithic technologies through time.
***Prerequisite: Special permission. This course in conjunction with 3 transfer credits of an introductory course in physical anthropology fills the same evolutionary anthropology requirement as 01:070:102.***

**01:070:153** ***Anthropology of Art (1.5)***
Issues of cultural relativism, emic and etic description, ethnocentrism, symbolism, ritual, and the politics of representation through the lens of art.

**01:070:161** ***Anthropology of Robots and Artificial Intelligence (1.5)***
Anthropological approach to robotics, artificial intelligence, artificial life, and cyborgs; concurrent exploration of anthropological methods and theory, ideas about kinship, personhood, gender, class, race, religion, and "culture."

**01:070:170** ***Learning an Endangered Language (1.5)***
Linguistic structure and function; language in ethnohistorical and sociocultural contexts; social life of languages; language shift, obsolescence, endangerment, and revitalization; linguistic relativity; performativity; techniques used by linguists and anthropologists heading to the field to work with endangered languages.

**01:070:201** ***Evolution and Human Behavior (3)***
Introduction to the evolutionary biological study of human behavior, including basic evolutionary theory, cultural learning, mating, parenting, and cooperation.

**01:070:202** ***Reading Culture and the Environment in Spanish (1.5)***
A Spanish language module attached to 01:070:302 Culture and the Environment. Oral and reading proficiency in environmental topics. Different perspectives on the environment and social justice as shaped by the different histories of Spain, Latin America, and Equatorial Guinea. Taught in Spanish.
***Prerequisite: 01:940:201 or 01:940:203.***

**01:070:203** ***Climate Change, Disaster, and Reconstruction (3)***
Politics of climate change, disaster as social phenomenon, intersectional analysis of the political economy of reconstruction, New Orleans, Puerto Rico, USA, philosophy of neoliberalism, epistemology of crisis, translation of political models.

**01:070:206** ***Survey of New World Prehistory (3)***
Focus on the major cultural traditions and adaptations from the earliest appearance of humans in the Americas through the colonial period.
***Prerequisite: 01:070:105.***

**01:070:207** ***Prehistoric Archaeology of Europe (3)***
Prehistory of Europe from the arrival of the first humans until the end of the Viking Age, focusing on Neanderthal and modern human interactions, ritual systems of Paleolithic cave painters, Atlantic societies that built megalithic monuments, beginnings of agriculture, Mycenaean culture, Northern European "barbarians" who terrorized Rome, trade, metallurgy, early states, writing, religion, and women in ancient societies.
***Prerequisite: 01:070:105 or permission of instructor.***

**01:070:209** ***The Prehistory of Iberia (3)***
Overview of the prehistory of Iberia from the first human arrival to the expansion of the Neolithic.
***Prerequisite: 01:940:202 or 01:940:204.***

**01:070:212** ***The Life of Primates (3)***
Introduction to the biology of monkeys, apes, and other primates, covering features of anatomy, ecology, and especially social behavior, communication, and thinking.

**01:070:213** ***Environment and Human Evolution (3)***
Analysis of influence of environment on evolution in record of human ancestry. Morphological and physiological adaptations of humans in reaction to environmental controls.

**01:070:215** ***Survey of Fossil Primates (3)***
Outline of primate evolution; origin of primates and primate relatives; description and paleoecology of fossil species, including Paleocene and Eocene species, Malagasy lemurs, first higher primates, New World and Old World monkeys, and Miocene apes; hominid origins.

**01:070:216** ***Anthropology and Contemporary Issues (3)***
Cross-cultural perspectives on contemporary issues such as urban poverty, international migration, health epidemics, and human rights. Interconnections of social problems in contemporary global world.

**01:070:217** ***Psychology and Culture (3)***
Influence of culture on mind and of mind on culture. Relationship of the individual to culture and of personal experience to collective meaning. Topics include religious experience and altered states of consciousness; cultural basis of emotions, the senses, and psychosomatic and mental illnesses; relationship of selfhood and identity to nationhood and citizenship.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:218** ***Introduction to Forensic Anthropology (3)***
Application of biological anthropology techniques, methods, and theory to the medico-legal setting; establishment of a positive identification for unknown human remains; analysis of skeletal trauma for insight to an individual's cause of death; techniques and underlying theory used by anthropologists to recover skeletal remains, reconstruct biological profiles from the skeleton, interpret skeletal trauma, and assist in the identification process.

**01:070:219** ***Anthropology of Music (3)***
Concepts, principles, and theoretical models used by anthropologists to study myths, beliefs, and traditions expressed in musical systems of selected cultures; analysis of music making as behavior grounded in both cultural aesthetics and societal customs and practices.
***Credit not given for both this course and 07:700:292.***

**01:070:220** ***Food and Culture (3)***
Culinary customs studied cross-culturally. Food in relation to sex, kinship, politics, economics, and religion. Visual, olfactory, textural, and gastronomic food preferences. Values and nutrition. World nutritional systems.

**01:070:221** ***Culture and the Museum (3)***
Critical examination of different kinds of museum exhibitions from an anthropological perspective.

**01:070:222** ***Sexuality and Eroticism in Global Perspective (3)***
Exploration of sexual diversity, meanings, and cultures in a variety of ethnographic contexts and impact of global processes on them; sexuality as key dimension of difference in the United States and diverse societies around the world.

**01:070:223** ***Anthropology of Latin America (3)***
Overview of the diverse societies of Latin America from an anthropological perspective. Explores cultural, economic, political, and religious aspects of life in the region; urbanization and urban life; migration and transnationalism; indigenous peoples and their role in recent political transformations in the region; the war on drugs.

**01:070:225** ***Gender in Global Perspective (3)***
Introductory exploration of the role of gender in organizing social relations and symbolic systems across the globe. Draws on comparative ethnographic readings to examine issues of gender and inequality, family, religion, work, sexuality, popular culture, and global processes.

**01:070:226** ***The Archaeology of What We Eat (3)***
Food in prehistory, evidence for historic cuisine, approaches to food and culture based on archaeological evidence.
***Prerequisite: 01:070:105 or 01:070:102 or 01:070:112.***

**01:070:230** ***Anthropology of Native North Americans (3)***
Richness and diversity of Native American cultures; major social, economic, religious, and political forms of organization; conquest, colonialism, and contemporary issues such as survival, maintenance of cultural traditions, health, and casinos.

**01:070:238** ***Anthropology of Europe (3)***
European societies and cultures in modern history; changing anthropological perspectives. Gender, ethnicity, and class. Representations and realities of Europe in the making, including issues of nation-building, colonialism, mass culture, and violence.

**01:070:240** ***Introduction to Molecular Evolutionary Anthropology (3)***
Demonstrates how genetic data are used in biological anthropology to address major questions of human and primate evolution, including origins, patterns of migration and dispersal, characteristics of genome organization, and evidence of molecular adaptations and selection.
***Prerequisites: 01:070:102 or 212.***

**01:070:242** ***Anthropology of the Middle East (3)***
Introduction to ethnographic studies of the Middle East.

**01:070:243** ***Anthropology of Africa (3)***
Precolonial, colonial, and postcolonial African cultures and societies. Gender, ethnicity, and class. Representations and realities of Africa in a global context, including issues of development, conservation, and tourism. Popular culture and contemporary rural and urban experiences.
***Prerequisite: One introductory course in social science or permission of instructor. Credit not given for both this course and 01:016:337.***

**01:070:244** ***Ethnographies of South Asia (3)***
Traditional South Asia, emphasizing Hindus; contemporary reconstructions and contestations. Sexuality, gender, family, village, caste, religion; regional and national identities; class, urban South Asia, contemporary pop culture; and the diaspora.

**01:070:246** ***Anthropology of Southeast Asia (3)***
Peoples of Indonesia, the Philippines, Malaysia, and Singapore, indigenous and immigrant. Relative gender egalitarianism in relation to various subsistence types and religious systems. Intercultural relations in multiethnic societies.

**01:070:248** *Anthropology of China (3)*
Chinese society and culture before and after 1949. Socialism and reform. Issues of gender, ethnicity, popular culture, ecology, and population. Internal diversity; China in a world context.
*No knowledge of Chinese required.*

**01:070:250** *Anthropology of the Contemporary United States (3)*
Older characterizations and analyses of American culture; current constructions and contestations of U.S. national, regional, and local culture(s). Ethnographic descriptions and analyses.

**01:070:252** *Fundamentals of Evolution Lab (1)*
Hands-on activities indoors and outdoors to investigate, test, reconstruct, and observe evolution in a broad sense; phylogenetic reconstruction, species concepts and boundaries (including DNA barcoding), population evolution, and evolution at the molecular level.
*Prerequisite: 01:070:102. Open to evolutionary anthropology (071) majors only.*

**01:070:283** *French Gastronomy and Global Food Culture (3)*
Cultural codes and socioeconomic contexts that shape the preparation and consumption of food in France and the United States. Cross-cultural interdisciplinary perspectives on contemporary issues such as technology and cultural identity, cultural heritage in a globalized world, food and migration, sustainable communities, food insecurity, food justice, and food sovereignty.

**01:070:284** *Breaking the Glass Ceiling: Women Religious Leaders (3)*
Interdisciplinary approach to analyzing women¿s religious leadership in Judaism, Christianity, and Islam. Ethnographic case studies of religious communities. Topics include: strategies that preclude women from leadership; informal and formal leadership for women; differences across traditions; feminism; Internet and religious authority. Readings, films, discussions, interviews with female religious leaders.

Credit not given for both this course and 01:563:224 or 01:988:221.

**01:070:291** *Special Topics in Anthropology (1.5)*
A brief survey of a relevant topic applying tools from anthropology.

**01:070:292** *Current Issues in Anthropology (3)*
Topics vary with semester and instructor.

**01:070:293** *Current Issues in Cultural and Linguistic Anthropology (3)*
Full-semester course on special topics in cultural or linguistic anthropology. Topics vary with semester and instructor.
*Prerequisite: 01:070:101 or 108, or permission of instructor.*

**01:070:294** *Current Issues in Cultural and Linguistic Anthropology (3)*
Full-semester course on special topics in cultural or linguistic anthropology. Topics vary with semester and instructor.
*Prerequisite: 01:070:101 or 108, or permission of instructor.*

**01:070:295** ***Current Issues in Cultural and Linguistic Anthropology (3)***
Full-semester course on special topics in cultural or linguistic anthropology. Topics vary with semester and instructor.
***Prerequisite: 01:070:101 or 108, or permission of instructor.***

**01:070:296** ***Current Issues in Evolutionary Anthropology (3)***
Full-semester course on special topics in evolutionary anthropology. Topics vary with semester and instructor.
***Prerequisite: 01:070:102 or 105 or 201 or 212, or permission of instructor.***

**01:070:297** ***Current Issues in Evolutionary Anthropology (3)***
Full-semester course on special topics in evolutionary anthropology. Topics vary with semester and instructor.
***Prerequisite: 01:070:102 or 105 or 201 or 212, or permission of instructor.***

**01:070:298** ***Current Issues in Evolutionary Anthropology (3)***
Full-semester course on special topics in evolutionary anthropology. Topics vary with semester and instructor.
***Prerequisite: 01:070:102 or 105 or 201 or 212, or permission of instructor.***

**01:070:299** ***Current Issues in Anthropology (3)***
Topics vary with semester and instructor.

**01:070:302** ***Culture and the Environment (3)***
Relationships between cultural and environmental phenomena; how the relationships are studied and explained. Readings deal with culture and environment in Asia, Africa, the Americas, Europe, and Oceania.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:303** ***Wealth and Culture (3)***
Introduction to economic anthropology. Cultural notions of wealth in the United States, Africa, Asia, Latin America, and Europe. Anthropological perspectives on economic inequality, individualism, rationality, moral economy, exchange, consumption, production, and globalization.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:304** ***Political Anthropology (3)***
Comparative analysis of political systems and practices. Emergent anthropological theories of power, violence, and patterns of domination. Relation of culture to power and political practice. Politics in local and global contexts.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:305** ***Anthropology of Development (3)***
Anthropological theories of and approaches to social, cultural, and economic development. Use of concepts such as "culture" and "social change" in construction of development paradigms and policies; role of anthropologists as practitioners, consultants, and critics in development projects; relation of "development" to lived experience of people being "developed."
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:306** ***Space, Place, and Practice (3)***
Social space as a product of social life; approaches to the anthropological study and analysis of space, place, and sociopolitical and cultural landscapes; spatial practices across cultures, societies, and institutions.
***Prerequisite: 01:070:101 or permission of the instructor.***

**01:070:307** ***Medical Anthropology (3)***
Cultural diversity and similarity in the interpretation of health, illness, and death. Preventive and therapeutic medicine. Premodern and modern populations. Interaction between western and other medical systems.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:308** ***Anthropology of Religion (3)***
Cross-cultural comparison of religious concepts, roles, and practices. The analysis of religious symbolism. Sociopolitical and economic concomitants.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:309** ***Visual Anthropology (3)***
Use of film, videotape, still photography, and painting as media of anthropological analysis.
***Prerequisite: 01:070:101 or 04:567:334 or permission of instructor.***

**01:070:311** ***History of Anthropology (3)***
Development of contemporary professional western anthropology from 18th- and 19th-century roots to modern schools of thought.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:312** ***Language and Social Diversity (3)***
Language and communication in social life. Class, ethnic, and sex-role differences in language use. Bilingualism and linguistic diversity studied cross-culturally.
***Prerequisite: 01:070:108 or permission of instructor.***

**01:070:313** ***Historical Archaeology (3)***
Introduction to the archaeology of historic times; the interpretation of the past using both archaeological residues and written documents. Emphasis on Africa, Britain, and North America.
***Prerequisite: 01:070:105 or 102 or permission of instructor.***

**01:070:314** ***Prehistoric Funerary Archaeology (3)***
Introduction to the theories, methods, and applications of funerary archaeology; the evolution of funerary practices among prehistoric societies.
***Prerequisite: 01:070:105 or 01:070:102 or by permission of the instructor.***

**01:070:316** ***Quantitative Methods in Evolutionary Anthropology (3)***
Quantitative and statistical approaches to questions asked by evolutionary anthropologists and the quantitative methods employed to answer these questions. Topics include what is a scientific question, how to read the primary literature, scientific methodology, hypothesis testing, ethical research design and presentation, descriptive statistics, and basic inferential statistics.
***Prerequisites: 01:070:102 or 105; 01:640:025 or placement or permission of instructor.***

**01:070:317** ***Method and Analysis in Cultural Anthropology (3)***
Designing and implementing research projects: formulating problems; selecting methodologies; methods of collecting, constructing, and analyzing qualitative, quantitative, and textual data (emphasis on computer-based techniques). Training in participant-observation, census and questionnaire construction and coding, interview techniques, and narrative analysis.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:318** ***Reading Ethnographic Writing (3)***
Exemplary fieldwork-based monographs in cultural anthropology, with an emphasis on most recent ones. Ethnography as text; ethnography as cultural description, inscription, interpretation, and criticism; ethnography as theory-laden versus ethnography as data for theorizing.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:319** ***Anthropology and Human Rights (3)***
Anthropological perspective on human rights; explores how this idea is deployed and negotiated by nation-states, transnational bodies, and localized groups in a variety of different contexts around the world today.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:320** ***Diaspora, Race, and Ethnicity in the United States (3)***
Theory and ethnography of recent immigrations; community, identity construction; class, race, gender, and age; local, national, and transnational factors; various case studies.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:321** ***Latino Ethnography (3)***
Cultural description of U.S. Latinos and their communities; introduction to reading, writing, and theorizing ethnography; ethnographic film; ethnography of migration and diaspora; testimonio as ethnography; locating anthropology within Latino studies.
***Credit not given for both this course and 01:595:307 or 01:050:327.***

**01:070:322** ***Anthropology of Islam (3)***
Anthropological perspectives on lived experiences of Islam; the politics of Muslim diasporas; social lives of Islamic texts and media Islam; ethnicity, race, and Islam; leisure, consumption, and morality.
***Prerequisite: 01:070:101.***

**01:070:323** ***Women Writing Culture (3)***
How gender, power, and difference shape the writings of women ethnographers. Interpretation, analysis, authority, intellectual representation, and creativity; life experiences and ethnography.
***Prerequisite: 01:070:101 or permission of instructor. Credit not given for both this course and 01:988:323.***

**01:070:324** ***Globalization, Sex, and Families (3)***
Transnational intimacies, travel, and migration. Case studies of transnational adoption, marriage, sex work, and domestic work. Larger contexts of globalization and impact on families and sexual relations.
***Prerequisite: 01:070:101 or permission of instructor. Credit not given for both this course and 01:988:337.***

**01:070:325** ***Evolution and Culture (3)***
Examination of current research on the relationship between evolutionary biology and culture. Topics include animal culture studies, cultural transmission theory, gene-culture coevolution, and the application of signaling theory to human cultural phenomena.
***Prerequisite: 01:070:201, 212 or permission of instructor.***

**01:070:326** ***Life in the Pleistocene (3)***
Cultural and biological aspects of hominin evolution during the Pleistocene.
***Prerequisite: 01:070:102 or 105 or permission of instructor.***

**01:070:327** ***Life in the Early Holocene (3)***
African, Asian, and European cultural developments in the Early Holocene, including origins of farming, village life, and complex society.
***Prerequisite: 01:070:105 or permission of instructor.***

**01:070:328** ***Evolution, Cooperation, and Conflict (3)***
Use of evolutionary theory to study cooperation and conflict in anthropology and related fields. Topics include the origins of multicellularity, kin selection, reciprocity, costly signaling theory, collective action and coordination problems, and the emergence of social norms and conventions.
***Prerequisites: 01:070:201 and 212, or permission of instructor.***

**01:070:329** ***Human Evolutionary Genetics (3)***
Presents the most recent work on human evolutionary genetics, including selection in the past 10,000 years, the genome of Neanderthals, genomic imprinting, the importance of miRNAs, and internal genetic conflict. Includes student presentations of assigned articles.
***Prerequisites: 01:070:102 or 01:119:115 and 116.***

**01:070:330** ***Archaeology of Australia (3)***
Prehistory of Australia in its worldwide perspective, with special reference to Asian origins, impact of human colonization, and interpretative models based on modern aboriginal hunter-gatherer behavior.
***Prerequisite: 01:070:105.***

**01:070:331** ***Xenophobia and the Other in Europe Today (3)***
Contemporary world refugee crisis; migration into Europe; anxieties about the presence of the foreign; cultural and legal categories of friend, guest, neighbor, and enemy; national and ethnic-racial identification; encounter, and transference and counter-transference, racism and discrimination; Islamophobia and anti-Semitism; the sociopsychology of xenophilia and xenophobia; projection and projective identification; main focus is Germany and France.
***Prerequisite: 01:070:101 or 01:070:238.***

**01:070:332** ***North American Archaeology (3)***
Prehistory of North America from the appearance of humans on the continent to European discovery. Varieties of adaptation, cultural interrelationships, and developmental trends.
***Prerequisite: 01:070:105.***

**01:070:333** ***Colonial Archaeology (3)***
Archaeology of post-Colombian European colonial spread worldwide, with particular reference to North America and Africa. Strong focus on practical laboratory work, specifically analysis of colonial artifacts, including ceramics, glass, pipes, and fauna.
***Prerequisite: 01:070:105 or 208 or permission of instructor.***

**01:070:334** ***Field Study in Archaeology (3)***
Emphasis on archaeological field work and methods. Topics include cognitive abilities of early humans implied by their technologies, early human adaptation and social behavior, and the interrelationships between stone tool technology, paleoecology, and hominin biological evolution. Associated with field school.
***By permission. Origins Field School, Turkana Basin Institute, or equivalent approved by undergraduate director.***

**01:070:336** ***Primatology, Wildlife Ecology, and Conservation in Kenya (3)***
Overview of wildlife ecology and conservation in the tropics, with emphasis on primate behavioral ecology and studies of living primates.
***Corequisite: 01:070:337. Offered only during the summer.***

**01:070:337** ***Field Methods and Analysis in Primatology in Kenya (3)***
Training in the methodology of tropical field biology, with emphasis on primate behavioral ecology and studies of living primates.
***Corequisite: 01:070:336. Offered only during the summer.***

**01:070:338** ***Culture, Wealth, and Power in Africa (3)***
Cultural dimensions of wealth and power in historical and contemporary Africa. Popular culture, media, ethnicity, genocide, urban and rural life, globalization, social change, development, gender relations, political ecology, conservation, tourism, and Africa as discursive and imaginative object.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:339** ***Caribbean Archaeology (3)***
Archaeological perspectives on Caribbean prehistory and history.
***Prerequisite: 01:070:105.***

**01:070:341** ***Language, Food, and Society (3)***
How food is grown and distributed, cooked and consumed, discussed and represented around the world in culturally diverse ways. Includes culinary fieldwork.
***Prerequisite: 01:070:101 or 01:070:108.***

**01:070:342** ***Urban Ecologies (3)***
Relationships among culture, ecology, and the city; histories of capitalism, urbanization, and globalization; case studies from world cities of contemporary urban environmental issues, including resources and their distribution, disasters and responses, and planning and sustainability.
***Prerequisite: 01:070:101 or 01:070:100.***

**01:070:343** ***North American Ethnography (3)***
The first of two modules of the Fez, Morocco Study Abroad program; emphasis on representations of peoples and place in ethnographies of North Africa; exploration of anthropological theories of personhood, identity, gender, religion, illness, politics, and economics. Topics include customs and rituals, Sufism and spirituality, medicine and magic, as well as youth and social movements.

**01:070:344** ***Practicum in Ethnographic Field Methods (3)***
The second of the two modules of the Fez, Morocco Study Abroad program; focus on a theoretical understanding of and hands-on practice in how ethnographic research is formulated and conducted.

**01:070:345** ***Study Abroad - Applied Conservation and Ecosystem Management (3)***
Students must apply to enroll in this course and participation is conditioned on the approval of the instructor. Topics in conservation and ecosystem management as part of the "Primates, Ecology, and Conservation in Indonesia" Field School.
***Prerequisites: 01:070:212 or 11:704:101 or permission of instructor(s). Corequisite: 01:070:347.***

**01:070:346** ***Honors Study Abroad - Applied Conservation and Ecosystem Management (3)***
Topics in conservation and ecosystem management as part of the Primates, Ecology, and Conservation in Indonesia Field School. Includes a faculty-mentored School of Arts and Sciences Honors Program project.
***Prerequisites: 01:070:212, 11:704:101 or permission of instructor(s). Corequisite: 01:070:347. Students must apply to enroll in this course and participation is conditioned on the approval of the instructor.***

**01:070:347** ***Study Abroad - Advanced Primate Behavior and Ecology (3)***
Topics in primate behavior and ecology as part of the Primates, Ecology, and Conservation in Indonesia Field School.
***Prerequisites: 01:070:212, 11:704:101 or permission of instructor(s). Corequisite: 01:070:345 or 346. Students must apply to enroll in this course and participation is conditioned on the approval of the instructor.***

**01:070:348** ***Primate Behavioral Ecology (3)***
Understanding the diversity of primate social and reproductive strategies as adaptive solutions to problems posed by foods, predators, mates, rivals, friends, and offspring.
***Pre- or corequisite: 01:070:212 or permission of instructor.***

**01:070:350** ***Primatology and Human Evolution (3)***
History of primatology and paleoanthropology; how the study of nonhuman primate anatomy, social organization, culture, tool behavior, and cognition contributes to ideas about human evolution.
***Pre- or corequisite: 01:070:212 or 215 or permission of instructor.***

**01:070:351** ***Fieldwork in Paleoecology (3)***
Introduction to ecosystems and habitats through examples of present-day flora, fauna, and ecology of the Lake Turkana Basin, in context of evolution of various taxa and general principles of evolutionary biology. Turkana Basin Field School, Kenya, Africa.

**01:070:352** ***Practicum in Geoarchaeology (3)***
A field-based course involving visits to important geological and fossil sites. Geologic concepts and methods are linked to modern and ancient environments, archaeology, and paleoanthropology.

**01:070:356** ***Human Variation (3)***
History of the concept of race in the West. Physical anthropological perspective, with emphases on human variation through time and on the principles of study of modern human variability.
***Prerequisite: 01:070:102 or permission of instructor.***

**01:070:357** ***Labor and Climate Migration from Africa to Europe - Study Abroad (3)***
International migration and refugee flows; poverty, political violence, and the violence of climate change; differential risks and opportunities of crossing the Morocco-Spain border; backlashes against migrants; the impact of the climate crisis; the politics of South-to-North migration; includes practical exercises in fieldwork and analysis.

Credit not given for both this course and 01:920:357.

**01:070:358** ***Human Osteology (3)***
Intensive introduction to human osteology, bone biology and growth, and paleopathology. Basis for advanced work in paleoanthropology, forensic anthropology, bioarchaeology, and osteometry.
***Prerequisites: 01:070:102, or 01:119:115 and 116, or permission of instructor. Corequisite: 01:070:359.***

**01:070:359** ***Human Osteology Laboratory (3)***
Accompanies 01:070:358. Intensive practical training in osteology lab identification and analysis techniques.
***Prerequisites: 01:070:102, or 01:119:115 and 116, or permission of instructor. Corequisite: 01:070:358.***

**01:070:360** ***Law, Justice, Rights (3)***
Meanings and practices of justice and rights. Course reviews key texts in the anthropology of law, politics, governance, and contemporary ethnographic studies.
***Prerequisite: 01:070:101 or 108, or permission of instructor.***

**01:070:361** ***Hunters and Gatherers (3)***
Consideration of data from aboriginal Australia, the Southern African bushmen, and elsewhere, in light of social theory, including gender studies.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:362** ***Evolution of Human Diet (3)***
Diet as a basic component of the human lifeway. Exploration of its significance in human evolution; introduction to technical approaches to studying hominid diets; exploration of application of evolutionary approaches to studying diet-related illness.
***Prerequisite: 01:070:102 or 105 or 11:704:110 or 251 or 01:090:274.***

**01:070:365** ***Anthropology of Childhood (3)***
Differing conceptualizations of children as a socially relevant category or identity. Influence of culture, language, and history on meanings and social realities pertaining to ideas of childhood and what these reveal about social order, social change and power dynamics. Western notions of children as innocent; understandings childhood under conditions of forced migration, poverty, and war; children as marginalized street workers and child-soldiers.

***Prerequisite: 01:070:101 or 01:070:108***

**01:070:367** ***Anthropology Goes to the Movies (3)***
Role of film in ethnographic representation and ethnographic representation in popular film. Relationship of anthropology to the construction of popular film and of popular film to the construction of culture.
***Prerequisite: 01:070:101 or 04:567:334 or permission of instructor.***

**01:070:368** ***Media and Culture (3)***
Media and culture; impact of media on the production and consumption of cultural identities; media production, consumption, and circulation; political life of media.
***Prerequisite: 01:070:101 or 04:567:334 or permission of instructor.***

**01:070:370** ***Life and Death in Anthropological Perspective (3)***
How cultural, medical, religious, political, economic, and forensic anthropologists approach the study of issues pertaining to life and death and the transition between them.
***Prerequisite: 01:070:101 or 108 or permission of instructor.***

**01:070:371** ***The Politics of Culture (3)***
Politics of cultural processes. Race, gender, ethnicity, and sexuality in representations. Theories of cultural production, domination, distribution, and consumption. Resistance and nonmainstream culture; ethnographic examples of ideology, economy, and global cultural flows.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:372** *Body Politics (3)*
Body in history and society. Comparative approaches to cultural construction of bodies. Impact of gender, sexuality, ethnonational, racial, and class differences on body practices. Formation of normative discourses on the body in medical science, consumer culture, and mass media.
***Prerequisite: 01:070:101 or permission of instructor. Recommended: an additional course in cultural anthropology.***

**01:070:373** *Visual Ethnography of Everyday Life (3)*
The poetics and politics of producing ethnographic images using commonly-owned digital media; analysis of ethnographic, documentary, vernacular, and fine art media; aesthetic and technical dimensions of digital image production; narrative, observational, and antinarrative experimental shooting and editing, as well as the ethical, political, ethnographic, semiotic, and philosophical concerns such decisions entail.
***Prerequisite: 01:070:101.***

**01:070:374** *Localities and Global Systems (3)*
Interaction of transnational and local processes through case studies and theory. Political economy, world systems, and cultural imperialism. Global culture and media. Intercultural representation and stereotyping. Diaspora, transnational movements, and nation-state.
***Prerequisite: 01:070:101 or permission of instructor. Recommended: An additional course in cultural anthropology.***

**01:070:376** *Power and Difference (3)*
Emergent theories of inequality. Social constructions of difference. Topics challenging conventional notions of cultural anthropology--identity, representation, discrimination, exclusion, marginalization, contestation, and resistance.
***Prerequisite: 1:070:101 or permission of instructor. Recommended: two additional courses in cultural anthropology. Intended for majors.***

**01:070:377** *Evolution and Religion (3)*
Examination of recent evolutionary theories regarding the origins and functions of religious phenomena.
***Prerequisite: 01:070:201 or 212.***

**01:070:378** *The Anthropology of Gender (3)*
Gender as an analytic category; exchange, production, reproduction, binarism, representation. Intersections of gender with class, race, and ethnicity. Theoretical and ethnographic readings.
***Prerequisite: 01:070:101 or permission of instructor. Credit not given for both this course and 01:988:378.***

**01:070:379** *Gender and Power in Africa (3)*
Experiences and expressions of gender in historical and contemporary Africa emphasizing issues of diversity and commonality, modalities of power, and articulation with other forms of difference, such as ethnicity, class, and nationality.
***Prerequisite: 01:070:101 or permission of instructor. Credit not given for both this course and 01:988:379.***

**01:070:380** *Culture, Memory, History (3)*
Anthropological approaches to history and memory. Theory, method; comparative study of remembering, forgetting, commemorating, narrating, ritualizing, and structuring time. Early, contemporary scholarship; political economy, identity, authority, representation in shaping cultural memory, and historical constructions.
***Prerequisite: 01:070:101 or permission of instructor.***

**01:070:382,384,385** ***Advanced Issues in Cultural and Linguistic Anthropology (3,3,3)***
Full-semester courses on special topics in cultural or linguistic anthropology. Topics vary with semester and instructor.
***Prerequisite: 01:070:101 or 108, or permission of instructor.***

**01:070:383** ***Anthropology and Activism (3)***
Anthropological research practice that is both academically rigorous and socially concerned. Impacts, ethical dilemmas, political implications, and creative possibilities of anthropology beyond the academy.
***Prerequisite: 01:070:101 or 108 or permission of instructor.***

**01:070:386** ***Internship in Anthropology (3)***
Internship with an anthropological focus.

**01:070:387,388** ***Advanced Issues in Evolutionary Anthropolgy (3,3)***
Full-semester courses on special topics in evolutionary anthropology. Topics vary with semester and instructor.
***Prerequisite: 01:070:102 or 105 or 204 or 212, or permission of instructor.***

**01:070:389** ***Ethnography of Gender in South Asia (3)***
An explanation of gendered practices in South Asia. Ethnographies from Hindu, Buddhist, and Muslim communities explore the various aspects of gender in particular South Asian contexts.
***Prerequisite: 01:070:101 or 244. Credit not given for both this course and 01:925:389 or 01:988:389.***

**01:070:390** ***Fossil Hominin Anatomy (3)***
Hominin fossil record: taxonomy, phylogenetics, and functional morphology. Origins of Hominidae, diversity in Australopithecus and Paranthropus, rise of Homo and of Homo sapiens. Casts and published reports; methods of inference.
***Prerequisite: 01:070:102 or permission of instructor.***

**01:070:391** ***Lithic Analysis in Archaeology (3)***
Archaeological study of how stone tools were made and used. Consideration of manufacturing technology, use and wear, experimental replication, and their implications for archaeological interpretation.
***Prerequisite: 01:070:105.***

**01:070:392** ***Faunal Analysis in Archaeology (3)***
Identification of animal bones, teeth, and other faunal remains in archaeological contexts. Quantifying number of individuals and skeletal elements; butchery techniques and bone modification and their implications for archaeological interpretation.
***Prerequisite: 01:070:105.***

**01:070:393** ***Cultural Resource Management (3)***
Legal, administrative, executive, and practical aspects of the theory and practice of cultural resource management, with emphasis on archaeological resources. One field trip.
***Prerequisite: 01:070:105.***

**01:070:394** ***Geological Context in Paleoanthropology (3)***
Field and laboratory studies of geological context in archaeological sites. Data collection and sampling, sediment analysis, and reporting. Interpretation of depositional and postdepositional features.
***Recommended: 01:460:340 (may be concurrently enrolled). Credit not given for both this course and 01:460:394.***

**01:070:395** *Quantification of Archaeological Data (3)*
Data analysis, coding schemes, data management, and the application of statistical techniques to problems in archaeology. Emphasis on creating, maintaining, and using computer files of archaeological data.
*Prerequisite: 01:070:105.*

**01:070:397** *Practicum in Vertebrate Paleontology (3)*
A course focused on the practice of vertebrate paleontology used to solve diverse theoretical questions. Vertebrate fossils as important sources of information about the appearance, evolution, and extinction of major organisms. Relevance of these fossils to understanding climate, selection pressures, hominin discoveries, and reconstructing paleoenvironments. Turkana Basin Field School, Kenya, Africa.
*Prerequisite: By permission. Origins Field School, Turkana Basin Institute or equivalent approved by undergraduate director.*

**01:070:398** *Field Study in Paleoanthropology (3)*
A course on field study in paleoanthropology. Fossils as important sources of information concerning human evolution. Field methods and techniques in hominin paeleontology. Turkana Basin Field School, Kenya, Africa.

**01:070:402** *Primate Conservation Biology (3)*
Ecological diversity of primates. Biological, abiotic, and anthropogenic factors related to primate extinction risk. Means of monitoring threatened populations and efforts to increase the likelihood of their survival.
*Prerequisite: 01:070:212.*

**01:070:404** *Advanced Seminar in Archaeology (3)*
Selected topics and problems in archaeology.
*Prerequisite: 01:070:105. Open only to juniors and seniors.*

**01:070:406** *Rights and Wrongs of Indigenous Peoples (3)*
History, agendas, and local-global dynamics of indigenous peoples and the indigenous rights movement in several regions of the world.
*Prerequisites: 01:070:101 and 6 credits in anthropology or permission of instructor.*

**01:070:407** *Documenting Latino Lives (3)*
Video-production seminar on the social experience of Latinos in the United States. Project development, advanced production techniques, narrative structure, storytelling strategies, and ethical issues in filmmaking. Students will produce their own 5-10-minute documentary film.
*Prerequisite: By permission of instructor only. Not open to first- and second-year students. Credit not given for both this course and 01:595:402.*

**01:070:408** *Video Production Lab for Latino Lives (1)*
Video production laboratory taken with 01:070:407 or 01:595:402 Documenting Latino Lives.
*Not open to first- and second-year students. Credit not given for both this course and 01:595:403.*

**01:070:409** *Primate Nutritional Ecology (3)*
How primates meet their nutritional needs through interactions with their environments including foraging theory, dietary ecology, macronutrient and micronutrient acquisition, and digestive ecology. Overview of methods to analyze primate diets, primate anatomy, physiology, microbiology, ecology, behavior, and life history in relation to primate nutrition.
*Prerequisite: 01:070:102 or 01:070:212 or 01:119:103 or 01:119:115-116.*

**01:070:410** ***Explanation in Anthropology (3)***
Analysis of anthropologists' explanations, with consideration of such topics as the explanatory use of generalizations, models, narratives, culture-specific categories, and causal, functionalist, and essentialist claims.
***Prerequisites: 6 credits in anthropology or permission of instructor.***

**01:070:412** ***Topics in African Prehistory and Paleoanthropology (3)***
Focused consideration of current research and explanatory theory on topics ranging from hominid origins to Holocene adaptations in Africa.
***Prerequisite: 01:070:326 or 327 or permission of instructor.***

**01:070:415** ***Prehistoric Archaeology of New Jersey (4)***
Prehistoric life in the state since 13,000 years before present examined in the context of cultural adaptations to changing environmental conditions.
***Prerequisite: 01:070:105.***

**01:070:417** ***Writing Ethnography (3)***
Reviews recent and current debates on ethnography as a literary form. Ideal for students planning or beginning honors theses or other independent projects. Writing intensive.
***Prerequisites: 6 credits of upper-level anthropology courses or permission of instructor.***

**01:070:422** ***Theories in Physical Anthropology (3)***
Introduction to the formal definition of science and theories in science. Analyzes several topics rich in theoretical arguments that have been areas of contention for over 150 years, since the inception of anthropology as a science, placed within the context of the history of evolutionary anthropology from the 19th through the 21st centuries.
***Prerequisite: 01:070:102.***

**01:070:426** ***South African Archaeology (3)***
Archaeology, ecology, and historical archaeology of South Africa. Covers two million years, early hominids to colonial contact.
***Prerequisite: 01:070:102 or 105 or permission of instructor.***

**01:070:486** ***Gender, Development, Environment: Policies, Politics, Perspectives (3)***
Examines the experiences and implications of transnational development and environmental policies, using ethnography as a method and gender as a category of analysis.
***Prerequisites: 6 credits in anthropology or permission of instructor. Credit not given for both this course and 01:988:486.***

**01:070:490** ***Preparation for Honors Thesis (1)***
Preparation for work the following year on an honors thesis.
***Prerequisite: Permission of undergraduate program director.***

**01:070:491** ***Capstone Colloquium in Evolutionary Medicine (1)***
Student development of a portfolio of short papers using evolutionary theory to generate predictions, synthesize contributions of evolutionary theory to medical research and treatment, and integrate evolutionary predictions and concepts with medical problems and applications.
***Prerequisite: Permission of instructor.***

**01:070:495,496** ***Independent Study in Anthropology (BA,BA)***
Supervised study or research on selected anthropological topics.
***Prerequisite: Permission of instructor.***

**01:070:497,498** ***Honors in Anthropology (3,3)***
Two-semester supervised project, usually resulting in a thesis, for qualified seniors.
***Prerequisites: Senior standing and acceptance into departmental honors program.***

# Archaeology 075 (SAS)

## ARCHAEOLOGY 075

**Website:** Here

**Program Director:** Dan Cabanes

**Program Faculty:**

Dan Cabanes, Anthropology, Ph.D., Universitat Rovira i Vigili (Tarragona, Spain)

Hylke De Jong, Anthropology; Ph.D., Bristol (UK)

Gary Farney, History, SAS-Newark; Ph.D., Bryn Mawr

Craig S. Feibel, Geology and Anthropology; Ph.D., Utah

Trinidad Rico, Art History; Ph.D., Stanford

Carmel Schrire, Anthropology; Ph.D., Australian National



# Learning Goals

# Learning Goals

Students will understand the archaeological perspective.

1. Students will develop the skills necessary to read archaeological research in an intelligent and critical manner.
2. Students will understand the role of theory and methods in archaeological sciences.
3. Students will understand how key questions in human history and human evolution can be better analyzed using key concepts in archaeology.

Archaeology 075 (SAS)

# Minor Program

# Minor Program

This minor is designed for students interested in the multidisciplinary study of archaeology and includes courses drawn from the Departments of Anthropology, Art History, Classics, Geography, History, Jewish Studies, and Statistics.

*Total number of required credits: 19 credits.*

Required courses include 01:070:105 Introduction to Archaeology, which is a general introduction to the methods and techniques used in archaeology, regardless of the chronological or geographical specialization. Four elective courses from at least two departments must include at least one course from each of the three areas: chronology, geographic area, and methodology. In addition, all students must complete one of the practicum options listed below.

INTRODUCTORY COURSE. Required (4 credits):

01:070:105 Introduction to Archaeology (4)

CHRONOLOGY COURSES. At least one course required (3 credits):

Courses in the chronology group emphasize a particular chronological range and students will be able to make diachronic comparisons within this range.

01:070:112 World Prehistory
01:082:105 Introduction to Western Art History, Pre-History to 1400
01:190:215 Introduction to Greek and Roman Archaeology
01:090:295:H6 Historical Archaeology of Slavery
01:070:313 Historical Archaeology
01:070:326 Life in the Pleistocene
01:070:327 Life in the Holocene
01:070:333 Colonial Archaeology

GEOGRAPHIC AREA COURSES. At least one course required (3 credits):
Courses in the geographic area group emphasize the archaeology of a particular geographic area. Students will be afforded the opportunity to develop some proficiency with a particular geographic area.

01:070:206 Survey of New World Prehistory
01:070:207 Prehistoric Archaeology of Europe
01:070:209 The Prehistory of Iberia
01:070:330 Archaeology of Australia
01:070:332 North American Archaeology
01:070:339 Caribbean Archaeology
01:070:426 South African Archaeology
01:082:321 Art of Early China
01:082:333 Pre-Columbian Art

01:082:362 Native Arts of North America
01:082:388 The City of Rome
01:190:372 Cities of the Classical World
01:190:373 Pompeii: The Life and Death of a Roman Town
01:506:271 Jewish History: Ancient and Medieval
01:190:205 Greek Civilization

METHODOLOGY COURSES. At least one course required (3 credits):
These courses emphasize sets of methods or practices in archaeology defined very broadly.

01:070:314 Prehistoric Funerary Archaeology
01:070:352 Practicum in Geoarchaeology
01:070:391 Lithic Analysis in Archaeology
01:070:392 Faunal Analysis in Archaeology
01:070:335 Analysis of Archaeological Data
01:070:395 Quantification of Archaeological Data
01:070:393 Cultural Resource Management
01:082:430 Foundations in Cultural Heritage and Preservation
01:082:440 Cultural Heritage and Preservation Studies: Museums, Collecting, and Preservation
01:070:394 Geological Context in Paleoanthropology
01:450:321 Geographic Information Systems
01:450:322 Remote Sensing
01:960:401 Basic Statistics for Research or one of the following: 01:960:201, 01:960:211, 01:960:285.

PRACTICUM. Required (3 credits):
The practicum requirement can be fulfilled through a variety of options involving research and professional experience, either in the field, in the laboratory, or in another professional setting

1. By completing 01:070:334 by attending either of the Rutgers archaeological field schools: the Turkana Basin Field School or the Archaeological Field School in Italy (Vacone).
2. By completing at least 3 credits in a non-Rutgers field school approved by the minor director. An example of such a field school that has been frequently used by Rutgers students is the Slavia Field School in Mortuary Archaeology, Drawsko, Poland.
3. By completing a professional internship relevant to archaeology whether in the field, in the lab, or in another professional setting. The internship will require the approval of the minor director. The course of record may be 01:070:386 any Rutgers internship course with the specific internship approved by the minor director.
4. By completing an advanced-level course. With preapproval from the program director, students unable to fulfill the practicum requirements via options 1, 2, or 3 may enroll in an advanced undergraduate or a graduate level course with significant hands-on experiences.

Students are advised to consult the anthropology department webpage for suggested course combinations for specializations in human origins, prehistoric archaeology, zooarchaeology, or heritage and recent archaeology.

# Architectural Studies 076 (SAS)

## ARCHITECTURAL STUDIES 076

**Website:** Here

**Director:** Carla Yanni, Art History, B.A., Wesleyan; Ph.D., Pennsylvania

**Architectural Studies Minor and Certificate 076**

The minor (for students not majoring in art history) and the certificate (for art history majors) serve as an interdisciplinary introduction to the historical, social, and artistic study of architecture. The minor and certificate in architectural studies combine required coursework in art history and landscape architecture, allowing students to better understand the form and meaning of the built environment. The curriculum (18 credits for the minor and 15 credits for the certificate) begins with three foundational courses in architectural design, contemporary architecture, and the history of western architecture. Electives may be selected from a wide variety of disciplines.



# Learning Outcomes and Career Relevance

# Learning Outcomes and Career Relevance

**Learning Outcomes**

- Students will demonstrate the ability to read critically, to think critically, to design creatively, and to write synthetically.
- Students will acquire a foundation in the history and theory of architecture and urbanism.
- Students will effectively analyze visual, spatial, and structural issues in architecture.
- Students will demonstrate the ability to conduct research, manage evidence, and construct an argument concerning a topic in architecture, landscape architecture, or urbanism.
- Students will achieve basic skills in architectural drawing and model-making (both traditional and digital).

**Career Relevance**

This minor/certificate may be of special interest to students considering careers in architecture, interior design, real estate development, land use law, historic preservation, and urban planning.

This minor/certificate is a general introduction to a topic that may take the student on a variety of career paths. The process of becoming a professional architect, however, requires years of study beyond the undergraduate level, approximately two years as a supervised paid intern, and the successful completion of a battery of standardized examinations managed by state licensing boards and based on national standards. The practice of architecture is highly professionalized for reasons of public safety.

Architectural Studies 076 (SAS)

# Minor and Certificate Requirements

# Minor and Certificate Requirements

**Summary of the Minor (for Majors other than Art History)**
The minor in architectural studies consists of six courses (18 credits): 3 required classes and 3 electives.

**Summary of the Certificate (for Art History Majors only)**
The certificate in architectural studies consists of five courses (15 credits): 3 required classes and 2 electives.

**Requirements**

The following three courses are required. Grades of C or better must be earned in all courses used to fulfill the minor or certificate:

11:550:133 Architectural Design (3)
Concepts of architectural and urban design process, systems, and practice. Built environments in relation to human functions, perception, and needs. Space and form design and sketch studies. One 80-min. lec., lab. 3 hrs. Additional field trips by arrangement. (This requirement may be satisfied by completion of an intensive summer architectural design course from an accredited architecture school, e.g., Design Discovery at Harvard's Graduate School of Design.)

01:082:101 Building the Future: An Introduction to Architecture (3)
Introduction to architecture emphasizing building for the future. Overview of the social and intellectual history of cities an architecture using global examples.

01:082:105 Introduction to Art History: Prehistory to 1400 (3)
Survey of the major monuments and trends in the history of painting, sculpture, and architecture before 1400.

*Important Note about the Minor for School of Environmental and Biological Sciences Students*

Students in the bachelor of science (B.S.) in landscape architecture or the B.S. in environmental planning degree programs may use a total of 6 credits (but no more than 6 credits) in landscape architecture toward the completion of the architectural studies minor. Given that all students who complete the minor will have taken the required class 11:550:133 Architectural Design, this means that students majoring in landscape architecture or environmental design may take one 3-credit landscape architecture class from the list of electives. Additional electives must come from other departments.

# Elective Courses

# Elective Courses

**List of Elective Courses for the Architectural Studies Minor or Certificate**

Students may petition the Department of Art History to request credit for courses not on this list, including study abroad classes, courses from other universities, and relevant internships.

*Anthropology*

01:070:342 Urban Ecologies (3)
Relationships among culture, ecology, and the city; histories of capitalism, urbanization, and globalization; case studies from world cities of contemporary urban environmental issues, including resources and their distribution, disasters and responses, and planning and sustainability.

*Art History*

01:082:205 Introduction to Asian Art (3)
Survey of the history of art across Asia, with particular emphasis on India, China, and Japan, and with forays into Southeast Asia. Strong emphasis on parallel developments, important cultural connections, and moments of cultural contact through pilgrimage.

01:082:206 Art of India (3)
Introduction to the history of art in the Indian subcontinent, from the rise of early empires through the grandeur of the Taj Mahal and up to the challenges of globalization today. No background in Asian art is necessary for the successful completion of this course.

01:082:275 Cinema and the City (3)
Urbanism and architecture as read through film, urban planning, and social history associated with 20th-century cities.

01:082:329 The South Asian Temple: Art and Devotion in South Asia (3)
History of South Asian temples from their inception to present day. Stylistic, anthropological, and ethnographic analysis reading of the temple architecture as communal living space.

01:082:378 Nineteenth-Century Architecture in Europe (3)
Overview of the social and intellectual history of architecture in Great Britain, France, and present-day Germany to 1900. Role of architecture in societal transformations (the development of nationhood, industrialization, and urbanization). Emphasis on the invention of new building types, including universities, government buildings, prisons, hospitals, railroad stations, and the architecture of World's Fairs.

01:082:392 Twentieth-Century Architecture (3)
European and American architecture and planning from 1900 to the present.

01:082:428 The Modern City (3)
Architecture and urban design in select European and American cities from the 18th century to the present. Attention to political, socioeconomic, and cultural contexts.

01:082:430 Foundations in Cultural Heritage and Preservation Studies (3)
Examines historic preservation and heritage conservation issues within a global and transcultural context. Topics include the illicit trade in historic material, looting and pillage of monuments and sites, national and international preservation laws and treaties, and model historic preservation projects.

01:082:431 Theories and Methods of Architectural Preservation (3)
Political, social, and cultural significance of historic buildings and sites throughout the United States and abroad. Overview of the origins of architectural conservation in Europe. Contemporary theories, methods, techniques, and problems in the field of historic preservation.

01:082:394-395 Study Abroad in Paris (6)
Development of architecture, sculpture, and painting in the city from the time of the Caesars through the present. Changes in art in relation to political and social conditions. Taught on site.

01:082:339-340 Study Abroad in Rome (6)
Architecture, sculpture, and painting of the Eternal City from Antiquity to the present. Emphasis on historical context with all classes taught on site. 339: From Antiquity through the Middle Ages; 340: From the Renaissance to the Present.

01:082:446 Studies in American Architecture (3)
The role of North American architecture in art history. Contribution of individual architects, periods, and styles from Federalist beginnings through the 19th and early 20th century.

*Geography*

01:450:241 The City: Introduction to Urban Geography (3)
The role of cities in the world and overview of various aspects of the city, spanning geographical, political, climactic, psychological, and socioeconomic analysis. Credit not given for both this course and 01:450:240 or 01:450:250.

01:450:250 Cities (4)
Spatial organization and functioning of cities in different world regions. Emphasis on societal system factors that influence urban development. Credit not given for both this course and 01:450:240 or 01:450:241.

*History*

01:508:424 African Cities Past and Present (3)
Social, cultural, economic, and political history of African cities with focus on student-led comparative research. Not open to first-year students. Prerequisite recommended: one course on Africa.

01:510:311 Cities of the Classical World (3)
Study of urban development in antiquity, focusing on Athens and Rome, and synthesizing the evidence of literary, historical, and archaeological sources. Credit not given for both this course and 01:190:372.

01:512:314 The City in American History (3)
Urbanization from the colonial city to the 20th-century metropolis; urban population, institutions, problems, and planning; urbanism in American culture.

01:512:319 Nineteenth-Century Architecture and Society in the United States (3)
Overview of the social and intellectual history of architecture in the United States to 1900. Role of architecture in societal transformations (the development of nationhood, industrialization, and urbanization). Emphasis on the invention of new building types, including universities, government buildings, prisons, hospitals, railroad stations, and the architecture of World's Fairs. Credit not given for both this course and 01:082:391.

*Landscape Architecture*

11:550:237 Visualization I - Drawing and Drafting (3)
A drawing is not just a personal expression but also a tool for observing the world, developing design ideas, and exploring spatial issues. The student will learn to depict three-dimensional objects and spaces in a two-dimensional drawing format.

11:550:230 Environmental Design Analysis (3)
Students will learn about the evolution of designed spaces in a global and local context. Design, by its very nature, is multidisciplinary, incorporating the creative arts, social sciences, environmental science, political science, and other perspectives

11:550:301 Social and Cultural Aspects of Design (3)
This course engages students in the complex relationship of people and the environment. Our discussions focus on the design and use of everyday environments as expressions of the individual, community, and civic society. We consider how our environment shapes our everyday life and how we shape the environment.

11:550:480 Topology Seminar (3)
The term "topology" derives from the Greek words for "place," "space," and "study," "word," "sense". It comprises a theory of place (concept of "genius loci") and a method of presenting arguments in a discourse. As a design approach, topology advocates to pay attention to deeper spatial, physical, poetic, and philosophical values in a long tradition of designed nature.

*Latino and Caribbean Studies*

01:595:305 Caribbean Urbanism and Urban Policy (3)
Urbanism in the Caribbean since the colonial period; the social, economic, and political dynamics that have shaped the urban form and the experiences of those who inhabit these cities. Not open to first-year students.

*Urban Planning and Design*

10:971:201 Introduction to Urban Planning and Design (3)
Introduction to the purpose of plans and planning including planning domains such as housing, land use, and transportation with an emphasis on solutions to local problems. Credit not given for both this course and 10:762:201.

10:971:202 Designing Healthy Cities (3)
A review of the nature of America's cities and suburbs from their original planning stage to their ultimate reality and how it affects human health and well-being. Digital camera required. Credit not given for both this course and 10:762:202 or 10:832:202.

10:971:314 Graphics Communications for Planners (3)
Development of basic graphic skills necessary to communicate the visual and spatial characteristics of streets, buildings, and neighborhoods using Autocad, Sketchup, and Photosimulations. Credit not given for both this course and 10:971:314.

01:971:316 Introduction to Site Planning and City Design
Understanding the impact of physical design on quality of life with a focus on analytic processes for the basic elements of human environments. Fieldwork is required. Prerequisite: 10:971:201. Credit not given for both this course and 10:762:316.

10:971:318 History and Theory of Urban Planning and Design (3)
Assessment of major ideas in city and regional planning since the early 19th century. Origin, growth, and impact of these ideas on the evolution of planning in the context of intellectual, social, and technological change. Credit not given for both this course and 10:762:318.

10:762:448 Historic Preservation
Overview of historical evolution of the preservation movement in the United States, examining important public preservation regulations and programs and the economics of historic preservation. Credit not given for both this course and 10:082:431 or 34:970:521.

10:762:484 Special Topics in International Historic Preservation (3)
Overview of the evolution of the historic preservation movement in an international context, examining the regulations, programs, and economics impacting historic preservation.

# Armenian 078 (SAS)

School of Arts and Sciences

For more information about these courses, contact the School of Arts and Sciences Office of Undergraduate Education.

Armenian 078 (SAS)

## Courses

**01:078:115,116** ***Elementary Armenian (3,3)***
Introduction to speaking, reading, and writing modern western Armenian.

**01:078:117,118** ***Intermediate Armenian (3,3)***
Development of fluency in written and spoken modern western Armenian.

# Art 080 (MGSA)

## ART 080

(See also Art History 082)

Department of Art & Design, Mason Gross School of the Arts

See the Mason Gross School of the Arts section for faculty listing and bachelor of fine arts (B.F.A.) program information.

The bachelor of arts (B.A.) program in art provides students the opportunity to explore the techniques, processes, materials, places, events, and images that are the basis for creative work. The program offers a curriculum that seeks to develop professional skills as well as an understanding of the cultural and social implications of art. All B.A. students begin with the same foundation studio curriculum as those in the B.F.A. Track. These courses are designed to familiarize students with core concepts and basic skills in preparation for a rigorous studio practice. The course's emphasis is on the study of drawing, color, and composition, as well as time and screen-based contemporary art practices. Beyond the foundations level, the B.A. art program offers studio and critical study courses. Studio courses focus on the mastery of skills within specialized media such as sculpture, drawing, painting, design, media, photography, and print. Critical studies courses focus on art in relation to social, environmental, psychological, and philosophical systems. This focus provides a basis for understanding the position of the artist in the modern world.

Art 080 (MGSA)

## Major Requirements: B.A. Program

## Major Requirements: B.A. Program

Art majors in the bachelor of arts (B.A.) degree program are required to complete a total of 42 credits as follows:

Foundation Courses (28 credits)

- Drawing Fundamentals and 4D Fundamentals 121-122 (4,4)
- Introduction to Art History 105 and 106 (3,3)
- Seminar in Contemporary Art A and B 200-201 (3,3)
- Visual Thinking A and B 227-228 (4,4)

Studio Electives (12 credits)

Visual Arts Practice (2 credits Pass/Fail)

Each student plans a cohesive program of study with faculty and staff advisers.

Dual majors and special interdisciplinary degree programs that include those offered through the Department of Art & Design should be arranged through the School of Arts and Sciences and the Art & Design faculty and staff advisers.

Bachelor of arts students who desire to major in art must submit a portfolio and transcripts for review by the Art & Design Evaluation Committee for acceptance into the program. Additionally, students submit a request to declare the art major in myMajor.

Please click here for details.

Art 080 (MGSA)

# Courses (081)

# Courses (081)

The following bachelor of fine arts (B.F.A.) courses serve as the advanced courses for the bachelor of arts (B.A.) curriculum and are open to all B.A. majors after fundamental requirements have been met.

Note: All but a few of these courses have prerequisites. See Art 081 in the Course Listing chapter in the Mason Gross School of the Arts section of this catalog for prerequisites and course descriptions.

07:081:105 Visual Arts Practice (1-3)

07:081:121 Drawing Fundamentals (4)

07:081:122 4-D Fundamentals: Time and Space (4)

07:081:200-201 Seminar in Contemporary Art A and B (3,3)

07:081:221-222 Drawing I-A and I-B (4,4)

07:081:227 Visual Thinking A: Black and White (4)

07:081:228 Visual Thinking B: Color (4)

07:081:231-232 Design I-A and I-B (4,4)

07:081:243-244 Media I-A and I-B (4,4)

07:081:251-252 Painting I-A and I-B (4,4)

07:081:261-262 Photography I-A and I-B (4,4)

07:081:271-272 Print I-A and I-B (4,4)

07:081:281-282 Sculpture I-A and I-B (4,4)

07:081:303 Seminar in Media (3)

07:081:306 Seminar in Print (3)

07:081:308 Seminar in Design A: History (3)

07:081:310 Seminar in Photography (3)

07:081:313 Ceramics/Sculpture (3)

07:081:317 Seminar in Sculpture (3)

07:081:321-322 Drawing II-A and II-B (4,4)

07:081:324 Figure Drawing (3)

07:081:329 Seminar in Painting (3)

07:081:331-332 Design II-A and II-B (4,4)

07:081:343-344 Media II-A and II-B (4,4)

07:081:351-352 Painting II-A and II-B (4,4)

07:081:361-362 Photography II-A and II-B (4,4)

07:081:371-372 Print II-A and II-B (4,4)

07:081:381-382 Sculpture II-A and II-B (4,4)

07:081:391,392 Independent Study (3,3)

07:081:393,394 Internships (3,3)

07:081:421-422 Drawing III-A and III-B (4,4)

07:081:431-432 Design III-A and III-B (4,4)

07:081:433-434 Advanced Design A and B (4,4)

07:081:441-442 Media III-A and III-B (4,4)

07:081:446-447 Advanced Media A and B (4,4)

07:081:451-452 Painting III-A and III-B (4,4)

07:081:453-454 Advanced Painting A and B (4,4)

07:081:455-456 Advanced Drawing A and B (4,4)

07:081:461-462 Photography III-A and III-B (4,4)

07:081:463-464 Advanced Photography A and B (4,4)

07:081:471-472 Print III-A and III-B (4,4)

07:081:473-474 Advanced Print A and B (4,4)

07:081:481-482 Sculpture III-A and III-B (4,4)

07:081:483-484 Advanced Sculpture A and B (4,4)

07:081:491-492 Independent Study (3,3)

07:081:493,494 Internships (3,3)

# Art History 082 (SAS)

## ART HISTORY 082

**Department of Art History, School of Arts and Sciences**

**Website**: Here

**Chair:** Laura Weigert

**Graduate Director:** Tamara Sears

**Undergraduate Director:** Jenevieve DeLosSantos

**Distinguished Professor:**

Carla Yanni, B.A., Wesleyan; Ph.D., Pennsylvania

**Professors:**

Jane Ashton Sharp, B.A., California (Los Angeles); Ph.D., Yale

Erik Thunø, B.A., M.A., Copenhagen (Denmark); Ph.D., Johns Hopkins

Laura Weigert, B.A., Swarthmore College; M.A., Ph.D., Northwestern

Andrés Zervigón, B.A., Brown; M.A., Ph.D., Harvard

**Associate Professors:**

Benjamin Paul, B.A., Free University Berlin; M.A., Cornell; M.A., Ph.D., Harvard

Trinidad Rico, B.A., Cambridge (UK); M.A., University College London (UK); M.A., Ph.D., Stanford

Tamara Sears, B.A., Wesleyan; Ph.D., Pennsylvania

**Assistant Professors:**

Deniz Túrker, B.A., Yale; SMArchS, Massachusetts Institute of Technology; Ph.D., Harvard

Christina Knight, B.A., Stanford University, M.A. Harvard, Ph.D., Harvard

**Associate Teaching Professors:**

Jenevieve DeLosSantos, B.A., Bucknell, M.A., Rutgers, Ph.D., Rutgers

**Faculty Emeriti:**

Matthew Baigell

Sarah Brett-Smith

Angela Howard

John Kenfield

Tod Marder

Joan Marter

Sarah Black McHam

Catherine Puglisi

Susan Sidlauskas

Jocelyn Penny Small

Jack Spector

Archer St. Clair Harvey



# Learning Goals

# Learning Goals

Students who major in Art History will develop:

1. The ability to interpret the formal attributes, discuss the historical contexts, and assess the social functions of artworks and objects of material and visual culture from a broad chronological and geographic span and from diverse media.

2. The visual literacy necessary to analyze and critically evaluate the images that comprise our increasingly media rich and technologically driven world.

3. The ability to write and speak about images with clarity and rigor.

4. The ability to construct historical and theoretical arguments that demonstrate an awareness of the relevant critical terms and interpretive approaches of the discipline of art history, engage the appropriate methods for conducting research, and practice proper conventions of citation.

# Major Requirements

# Major Requirements

Art history majors are required to complete 33 credits in the department. You must receive a grade of C or better for the class to count toward the major.

**Introductory Classes:** Students must take two introductory courses: 01:082:105 and 01:082:106. Students may use a 4 or 5 on the AP Art History to place out of these two classes.

**Upper-Level Distribution Requirements**
Students must take at least one upper-level courses in each of the following chronological periods:

- Prehistory to 1500
- 1500 to 1900
- 1900 to present
- Transhistorical

Students must take upper-level courses in three out of the five geographical regions:

- Africa and the Middle East
- East, South, and Southeast Asia and Pacific Islands
- Europe and Eurasia
- The Americas
- Cross-Cultural Exchange/Transregional

Individual courses may be used to meet two, but no more than two, of the distribution requirements. In the course list maintained by the department, the requirements that each course can be used to meet are clearly listed. Note: 200, 300, and 400-level courses count as upper level courses for this part of the major.

**Capstone Seminar:** You must take 01:082: 491 (Fall) or 01:082:492 (Spring). These are capstone seminars for majors; the subjects vary, but in every case you will be asked to conduct original research, give an oral presentation, and write a research paper. Students are encouraged to take more than one capstone seminar. If you take more than one Capstone seminar, you may use the second one in the chronological and geographical distribution.

# Minor Requirements

# Minor Requirements

Students minoring in art history are expected to complete 18 credits (six courses) in the department including two introductory courses: 01:082:105 and 01:082:106. Twelve credits must be at the 200 level or above. There are no distribution requirements. Only courses completed with grades of C or better are counted toward the minor.

Art History 082 (SAS)

# Departmental Honors Program

# Departmental Honors Program

Candidates for honors in art history must, at the end of their junior year, have a cumulative grade-point average of 3.0 or better and an average of 3.5 or better in the major. In their senior year, students enroll in 01:082:497-498, in which independent research on a specific topic is undertaken, and an honors thesis is written under the supervision of a department faculty member. The supervisor and a second reader determine the level of honors based on the thesis. Students planning to write an honors thesis are strongly encouraged to enroll in 01:082:403, Approaches to Art History, before beginning the thesis. For a more complete description of the honors program guidelines, refer to the art history website: https://arthistory.rutgers.edu/academics/undergraduate-welcome/honors-program-in-art-history.

Art History 082 (SAS)

# Architectural Studies Minor

# Architectural Studies Minor

Please note that Art History Majors and Minors must enroll in the Architectural Studies Certificate, not the Architectural Studies Minor.

The Minor in Architectural Studies consists of six courses (18 credits): 3 required classes and 3 electives

3 Foundational Courses (Required):

Grades of C or better must be earned in all courses used to fulfill the minor or certificate:

Landscape Architecture, SEBS 11:550:133 Architectural Design (3)

Building the Future: Introduction to Architecture 01:082:101, an introduction to architecture using global examples

Introduction to Art History, 01:082:105 (F2F and online) Survey of the major monuments and trends in the history of painting, sculpture, and architecture before 1400.

Art History 082 (SAS)

# Architectural Studies Certificate

# Architectural Studies Certificate

(The certificate is for Art History Majors and Art History Minors only.)

The Certificate in Architectural Studies consists of five courses (15 credits): 3 required classes and 2 electives

Grades of C or better must be earned in all courses used to fulfill the minor or certificate:

3 Foundational Courses (Required):
Landscape Architecture, SEBS 11:550:133 Architectural Design (3)

Building the Future: Introduction to Architecture 01:082:101, an introduction to architecture using global examples

Introduction to Art History, 01:082:105 (F2F and online) Survey of the major monuments and trends in the history of painting, sculpture, and architecture before 1400

and

2 electives.

Art History 082 (SAS)

# Courses

# Courses

**01:082:101** ***Building the Future: An Introduction to Architecture (3)***
Introduction to architecture emphasizing building for the future. Overview of the social and intellectual history of cities and architecture using global examples.
***Credit not given for both this course and 01:082:392.***

**01:082:105** ***Introduction to Art History: Prehistory to 1400 (3)***
Survey of major artworks, buildings, and objects of material and visual culture as related to their social, economic, and political contexts from prehistory to 1400.

**01:082:106** ***Introduction to Art History: 1400 to the Present) (3)***
Survey of the major monuments and trends in the history of painting, sculpture, and architecture across the globe from 1400 to the present.

**01:082:118** ***Looking at 21st-Century World History (3)***
Interdisciplinary examination of the role of the visual in both our daily lives and in the way we remember the past. Taught through a series of topics ranging from war and violence and gender to work and play.
***Credit not given for both this course and 01:506:118.***

**01:082:202** *Contemporary Art (3)*
Developments in painting and sculpture since 1950. Classes include field trips to galleries and museums.

**01:082:203** *Sacred Sites. Materializing and Experiencing the Divine (3)*
A consideration of the spatial and visual strategies by which site-bound holiness was materially evoked, staged and experienced.

**01:082:205** *Asian Art (3)*
Survey of the history of art across Asia, with particular emphasis on India, China, and Japan, and with forays into Southeast Asia. Strong emphasis on parallel developments, important cultural connections, and moments of cultural contact through pilgrimage and trade.

**01:082:206** *Art of India (3)*
Introduction to the history of art in the Indian subcontinent, from the rise of early empires through the grandeur of the Taj Mahal and up to the challenges of globalization today.

**01:082:214** *Renaissance Art in Europe (3)*
Masterpieces of the European tradition from the 14th through 16th centuries that reveal artistic forms intrinsic to culture north and south of the Alps. Provides a background for an understanding of the development of early modern culture.

**01:082:215** *Baroque Magnificence (3)*
Introduction to major monuments and themes of 17th- and 18th-century European art.

**01:082:220** *Critical Issues in Art History (3)*
An introduction to critical issues in the history of art and an exploration of the way that art resonates with contemporary society.

**01:082:226** *Art and Visual Culture of the Caribbean (3)*
Introduction to art and visual culture of the Caribbean from pre-Conquest to the present. Representational practices in relation to the region's diversity, history of colonization, dictatorships, and revolutions. Role of the visual in defining national, gendered, classed, racial, and regional identities.
***Credit not given for both this course and 01:595:226.***

**01:082:230** *Latinx Art (3)*
Survey of art produced by Latinas and Latinos across the United States from the 1950s to the present.
***Credit not given for both this course and 01:595:230.***

**01:082:240** *Modern and Contemporary African Art (3)*
An overview of modern and contemporary African art, including photography as well as installation art, paintings, and sculptures.

**01:082:250** *Oceanic, African, and Pre-Columbian Art (3)*
Basic concepts in the arts of pre-Columbian Mesoamerica, Africa, and Oceania: time, natural landscape and architecture, and the ritual functions of art.

**01:082:251** *Russian Art (3)*
Introduction to the art of Russia covering the 10th century through the 20th century.

**01:082:252** ***East Asian Art (3)***
Discussion of major works (painting, sculpture, and architecture) of China and Japan. Stress on techniques and styles radically different from those of Western art.

**01:082:253** ***Contemporary Photography (3)***
Explores a broad range of contemporary photographs from around the world and asks what typifies the medium's everyday popularity and changing aesthetic practices.

**01:082:255** ***History of Jewish Art (3)***
Synagogue frescoes and architecture, medieval Illuminations, Jewish ritual art, and Israeli art.
***Credit not given for both this course and 01:563:226.***

**01:082:275** ***Cinema and the City (3)***
Urbanism and architecture as read through film, urban planning, and social history associated with 20th-century cities.

**01:082:276** ***Radical Modernism and Anti-Art (3)***
Introduction to major movements and protagonists of early 20th-century European modernism. Artists, styles, spaces, and political agendas of Expressionism, Futurism, Dada, and Surrealism to be explored by means of a story map and in multimedia assignments. Examples from visual arts (Kirchner, Kandinsky, Duchamp, Höch), literature (Rimbaud, Wedekind, Benn, Marinetti, Kokoschka, Kafka), cinema (Wiene, Richter, Buñuel), music (Schönberg), and avant-garde journals and books. Taught in English.
***Credit not given for this course and 01:195:276 or 01:470:276.***

**01:082:277** ***Art and Medicine (3)***
Explores the evolving relationship between western art and medicine in the modern period. Representations of doctors, patients, disease, pain, and medical technologies in paintings, prints, photography, early film, and new media.

**01:082:291,292,293,294** ***Topics in Art History (3,3,3,3)***
Various topics. Detailed descriptions available at time of registration.

**01:082:295** ***Topics in Art History (1)***
Various topics. Detailed descriptions available at time of registration.

**01:082:296** ***Topics in Art History (2)***
Various topics. Detailed descriptions available at time of registration.

**01:082:300** ***History of Modern Crafts and Design (3)***
Crafts from the mid-19th century to the present, with particular attention to major developments such as art nouveau, art deco, and functionalism.

**01:082:301** ***Ancient Architecture (3)***
Survey of the architecture of ancient civilizations, emphasizing development of monumental architecture in Egypt, Mesopotamia, Greece, and Rome. Development of classical orders and principles of design are stressed.

**01:082:303** ***Art of Egypt and the Ancient Near East (3)***
Introductory survey of the architecture, painting, and sculpture of the ancient civilizations of the Nile Valley, Asia Minor, and Persia.

**01:082:308** ***Italy, 1250-1400: The Hinge between Medieval and Renaissance (3)***
Italian art and architecture from ca. 1250 to ca. 1400, with an emphasis on the stylistic and thematic innovations of Giotto and his successors and the developments of the schools of Florence, Siena, and Venice.

**01:082:309** ***Fifteenth-Century Italy: The Birth of the Renaissance (3)***
Italian art and architecture of the 15th century, focusing on such masters as Masaccio, Donatello, Botticelli, and Alberti; the triumph of naturalism; Renaissance humanism and art theory.

**01:082:310** ***The High Renaissance in Italy (3)***
Sixteenth-century art and architecture, emphasizing the achievements of the great central Italian masters: Leonardo da Vinci, Raphael, and Michelangelo; the artistic cult of personality and rivalry with classical antiquity; the crisis of Mannerism.

**01:082:311** ***Egyptian Art (3)***
Survey of art and architecture in ancient Egypt from pre-Dynastic to Ptolemaic times. Extensive examination of the culture of Egypt--burial customs, religion, kingship, etc. Related discussions centered on the legacy of Egypt in Western art and popular culture.

**01:082:312** ***Byzantine Art (3)***
Art and architecture of the Eastern Roman Empire, third through the 15th centuries. Emphasis on sources of Byzantine style and iconography and on the historical context of Byzantine art.
***Credit not given for both this course and 01:489:315.***

**01:082:313** ***The Renaissance in Northern Europe (3)***
Religious and secular art in Germany, the Netherlands, and France during the 16th century; painting, sculpture, and prints; impact of reformation and humanism.

**01:082:314** ***The Etruscans (3)***
Study of the social history, material culture, and artistic expression of the Etruscans. Survey of urbanism and architecture, trade, funerary practices, painted decoration, sculpture, and minor arts between the 9th and 2nd centuries BC.
***Credit not given for both this course and 01:190:314.***

**01:082:316** ***Mexican Art Across Borders (3)***
Art, visual culture, and cultural history, with emphasis on the 20th century. Modernism, muralism, varied minor media and artists, post-revolutionary art, Mexican-American/Chicano Civil Rights Movement art, visual production, and politics.
***Credit not given for both this course and 01:595:316.***

**01:082:317** ***Ancient Painting (3)***
Survey of Greek, Etruscan, and Roman painting from the eighth century BC through the Roman Empire. Emphasis on the development of style and on the cultural significance of painted images in different social contexts.
***Credit not given for both this course and 01:190:317.***

**01:082:318** ***Myth and Legend in Art (3)***
Mythology and the artist's response to the myths and legends of his or her civilization, from antiquity through the Middle Ages. Continuity and transformation of central themes.

**01:082:319** ***Celtic and Early Irish Art (3)***
Celtic, early Irish, and Anglo-Saxon art ca. 800 BC to AD 800. Emphasis on sculpture, metalwork, and enamel, and manuscript illumination.

**01:082:320** ***Islamic Art and Architecture (3)***
Intensive overview of the art and architecture of the Islamic world, from Spain to India.
***Credit not given for both this course and 01:667:320 or 01:685:320.***

**01:082:321** ***Art of Early China (3)***
Concentration on archaeological finds: pottery, jade, bronze, precious metals, lacquer from the Neolithic through the early great dynasties (5000 BC to AD 600).

**01:082:322** ***Japanese Art (3)***
The many facets of Japanese art (5000 BC to modern times). Study of sculpture and painting, temples, and decorative arts.
***Credit not given for both this course and 01:082:324.***

**01:082:324** ***Japanese Painting (3)***
Religious and secular painting from 700 to 1800. Secular paintings as decorations reflecting famous literary themes and sensitivity to nature.
***Credit not given for both this course and 01:082:322.***

**01:082:325** ***Chinese Painting (3)***
Special techniques, special link to calligraphy, format, subject matter, aesthetic principles, and symbolism governing artistic process, from 400 to 1600.

**01:082:326** ***Chinese Sculpture (3)***
Major religious (Buddhist and Taoist) and secular sculpture of China of the three great dynasties, Han, Tang, and Song (from common era to 1250).

**01:082:328** ***Modern Islamic Art and Architecture (3)***
Modern and contemporary histories of visual culture including architecture, painting, sculpture, photography, and cinema in the Islamic world. Special focus on the Arabic, Turkish, and Persian spheres.

**01:082:329** ***The South Asian Temple: Art and Devotion in South Asia (3)***
History of South Asian temples from their inception to present day. Stylistic, anthropological, and ethnographic analysis reading of the temple architecture as communal living space.

**01:082:332** ***African-American Art (3)***
Art of people of African descent in the United States between the 18th century and the present.

**01:082:333** ***Meso-American Art (3)***
Art and archaeology of pre-Hispanic North and South America; major contributions of the Olmec, Mayan, and Aztec peoples.

**01:082:339-340** ***Study Abroad in Rome: From Ancient Capital to Modern Metropolis (3,3)***
Architecture, sculpture, and painting of the Eternal City from Antiquity to the present. Emphasis on historical context with all classes taught on site. 339: from Antiquity through the Middle Ages; 340: from the Renaissance to the present.
***Offered only in summer program in Rome. Taught on site.***

**01:082:341** ***Venice (3)***
City and art of Venice considered in context of social/cultural history as reflected in masters such as Bellini, Titian, Palladio; their interpretation of favored Venetian themes: sensuality, religion, politics.

**01:082:342** ***Early Greek Art (3)***
Survey of art in the Aegean from the early Bronze Age through the Archaic period (ca. 2500-500 BC).

**01:082:343** ***Later Greek Art (3)***
Survey of classical and Hellenistic Greek art.

**01:082:345** ***Field Study (6)***
Provides supervised participation in fieldwork. Involves participation and instruction in techniques of archaeological excavation and in analysis, evaluation, and conservation of objects.
***Prerequisite: Permission of instructor. Offered only in summer (eight weeks).***

**01:082:347** ***Early Northern European Painting (3)***
Development of 15th-century easel painting in France, the Netherlands, and Germany; relationship of painting to decorative arts; symbolism, realism, invention from Van Eyck to Bosch.

**01:082:348** ***Northern European Painting of the 17th Century (3)***
Styles, themes, and historical context of painting in 17th-century Northern Europe, with emphasis on the Netherlands. Artists include Rubens, Van Dyck, Rembrandt, and Vermeer.

**01:082:351** ***Art in the United States, 1776-1913 (3)***
Visual and material culture of the United States from the American Revolution to the Armory Show. Survey of painting, sculpture, photography, and print culture in relation to social, political, and cultural history.
***Credit not given for both this course and 01:050:351.***

**01:082:357** ***Art and Literature of the Soviet Period and the Varieties of Nonconformism (3)***
Official and unofficial literature and art; literary and art institutions; alternative venues.
***Credit not given for both this course and 01:860:336.***

**01:082:359,360** ***Zimmerli Museum Internship in Russian Art (3,3)***
Research work related to Riabov and Dodge collections, assisting in development and coordination of special exhibitions, translations, and compiling artists' files.
***Prerequisite: Permission of program director. Credit not given for both this course and 01:860:335. Knowledge of Russian necessary.***

**01:082:361** ***Russian and Soviet Avant-Gardes (3)***
Avant-garde art in Russia and the Soviet Union, 1905 through the perestroika period.

**01:082:362** ***Native Arts of North America (3)***
The traditional arts and architecture of the indigenous peoples of the United States, Canada, and Greenland surveyed through archaeological data and ethnohistoric records. Field trips to museums with relevant collections.

**01:082:364** ***Arts in Baroque Rome (3)***
Review of practical and aesthetic concerns in painting, sculpture, and architecture, with discussions of urbanism, stage design, theater and ephemeral arts, and antiquarian studies.

**01:082:365** ***Baroque Visions (3)***
Baroque painting and sculpture from Caravaggio to Giordano.

**01:082:366** ***Spanish Painting (3)***
Major Spanish painters from El Greco to Goya.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:367** ***Art in United States before 1876 (3)***
Visual and material culture from colonial times to 1876.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:368** ***Art in the United States, 1876-1945 (3)***
Visual and material culture in the U.S. from 1876 to the mid-20th century.

**01:082:371** ***Arts of West Africa (3)***
In-depth history of the traditional arts of West Africa (Guinea, Mali, Togo, Ghana, and Nigeria).

**01:082:372** ***History of the Print (3)***
Media of woodcut, engraving, etching, lithography, and silkscreen, from the 15th century through the present; processes, functions, and historical development exemplified by principal artists represented in the Zimmerli Art Museum.

**01:082:373** ***Early Medieval Art (3)***
Art of western Europe from Constantine to ca. AD 1000, with emphasis on transformation of the classical image of physical man to the medieval image of spiritual man.

**01:082:374** ***Romanesque and Gothic Art (3)***
Art and architecture of Western Europe from AD 1000 to 1400, from Romanesque symbolic style to Gothic realism.

**01:082:376** ***Arts of Central Africa (3)***
In-depth survey of the traditional arts of Cameroon, Gabon, the Central African Republic, Zaire, and Angola.

**01:082:377** ***Gothic (3)***
Gothic artistic production in Northern Europe from the mid-12th through the early 15th century in architecture, sculpture, manuscript illumination, and various crafts, in their religious, social, political, and economic context. Topics include liturgy and ceremony, mysticism and devotion, pictorial narrative, lay literacy, attitudes towards death, courtly love, and the construction of the "other."
***Credit not given for both this course and 01:082:374.***

**01:082:378** ***Nineteenth-Century Architecture in Europe (3)***
Overview of the social and intellectual history of architecture in Great Britain, France, and present-day Germany to 1900. Role of architecture in societal transformations (the development of nationhood, industrialization, and urbanization). Emphasis on the invention of new building types, including universities, government buildings, prisons, hospitals, railroad stations, and the architecture of World's Fairs.

**01:082:379** ***Imagery and Architecture of Medieval Rome (3)***
Traces the development of the imagery and architecture of medieval Rome from the legitimization of Christianity to the removal of the papacy to Avignon. Imagery includes frescoes, mosaics, sculpture, and architecture; encompasses both religious and secular buildings.

**01:082:380** ***Modern Jewish Art (3)***
The Jewish experience in modern art.

***Credit not given for both this course and 01:563:38***

**01:082:381** ***Contemporary Latin American Art (3)***
Surveys the artistic production of Latin America from post-World War II to the present. Topics include social realism, surrealism and the fantastic, geometric abstraction, conceptualism, performance art, and the effects of globalization on contemporary Latin American art.

**01:082:382** ***Nineteenth-Century Photography (3)***
Overview of the social, cultural, and art history of photography from circa 1839 to 1900.

**01:082:383** ***Twentieth-Century Photography (3)***
Overview of the social, cultural, and art history of photography from 1900 to 2000.

**01:082:387** ***Realism (3)***
Analysis of themes and characteristics of 19th-century realist art, especially in England and France, and topics such as photographic realism, orientalists, pre-Raphaelites.

**01:082:388** ***The City of Rome (3)***
Archaeology and architectural mythology of a city, its buildings, and its planning from Romulus to Mussolini.

**01:082:389** ***European Modern Art: 19th Century (3)***
19th-century art, including painting, sculpture, prints, and other media.

**01:082:390** ***European Modern Art: 20th Century (3)***
20th--century art, including painting, sculpture, prints, and other media.

**01:082:391** ***Nineteenth-Century Architecture and Society in the United States (3)***
Overview of the social and intellectual history of architecture in the United States to 1900. Role of architecture in societal transformations (the development of nationhood, industrialization, and urbanization). Emphasis on the invention of new building types, including universities, government buildings, prisons, hospitals, railroad stations, and the architecture of World's Fairs.
***Credit not given for both this course and 01:512:319.***

**01:082:392** ***Twentieth-Century Architecture in Europe and North America (3)***
European and North American architecture and planning from 1900 to the present; emphasis on major architects, styles, and buildings from art nouveau to postmodernism.
***Credit not given for both this course and 01:082:101.***

**01:082:393** ***Modern Latin American Art (3)***
Overview of the origins and development of Latin American art from the post-independence period through the first half of the 20th century.
***Credit not given for both this course and 01:590:393.***

**01:082:394-395** ***Study Abroad in Paris(3,3)***
Development of architecture, sculpture, and painting in the city from the time of the Caesars through the present. Changes in art in relation to political and social conditions.
***Offered only in summer program in Paris. Taught on site.***

**01:082:396** ***Impressionism (3)***
Subjects, style, and social significance of 19th-century French impressionism, including Manet, Monet, Degas, and themes of women, cafe society, urbanization, leisure.

**01:082:397** ***Medieval Architecture (3)***
Western European and Byzantine architecture from the 3rd through the 14th century. Emphasis on planning and structure in the Early Christian basilica, the Middle Byzantine church, and the Gothic cathedral.

**01:082:403** ***Approaches to Art History (3)***
An overview of the literature and methods of art history from 1400 to the present day; emphasizing close reading and class participation and discussion.
***Prerequisites: 01:082:105,106 or permission of the instructor***

**01:082:420** ***African Architecture (3)***
In-depth study of various concepts and traditional forms of shelter in Africa south of the Sahara.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:428** ***The Modern City (3)***
Architecture and urban design from the 18th century to the present. Attention to political, socioeconomic, and cultural contexts.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:430** ***Foundations in Cultural Heritage and Preservation Studies (3)***
Examines historic preservation and heritage conservation issues within a global and trans-cultural context. Topics include the illicit trade in historic material, looting and pillaging of monuments and sites, national and international preservation laws and treaties, and model historic preservation projects.
***Prerequisites: 01:082:105,106 or permission of instructor. Credit not given for both this course and 16:082:530 or 01:506:391.***

**01:082:431** ***Theories and Methods of Architectural Preservation (3)***
Political, social, and cultural significance of historic buildings and sites throughout the United States and abroad. Overview of the origins of architectural conservation in Europe. Contemporary theories, methods, techniques, and problems in the field of historic preservation.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:440** ***Museums, Collecting, and Preservation: CHAPS (3)***
Examines the history of museums, modes of collecting, and the preservation of the past, and considers these activities in the context of contemporary political issues.
***Credit not given for both this course and 01:190:440.***

**01:082:441** ***Special Topics in Politics, History, and Heritage: CHAPS (3)***
Special studies in particular theoretical and practical aspects of cultural heritage and preservation studies. Designed by individual instructor. Open to students in program in historic preservation or by permission of instructor.
***Credit not given for both this course and 01:506:305.***

**01:082:444** ***Special Topics in Architectural Preservation: CHAPS (3)***
Exploration of the documentation and investigative techniques, modern methods of conservation, regulatory and legal concerns, and designs for historic districts.

**01:082:445** ***Studies in the Art and Architecture of New Jersey (3)***
The distinct contributions of New Jersey's art and architecture to a broader history of the visual arts in the U.S., from colonial times to the present day.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:446** ***Studies in North American Architecture (3)***
The role of North American architecture in art history. Contribution of individual architects, periods, and the social history of architecture from colonial period through the 19th and early 20th century.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:447,448** ***Internship in CHAPS (3,3)***
Supervised internship in the field of cultural heritage conservation and preservation at an approved institution.

**01:082:450** ***Seminar: Major Italian Renaissance Artists and Themes (3)***
Special studies in Italian Renaissance art. Deals with different subjects, changing from year to year, such as artists (Donatello, Michelangelo, Titian); themes (death, women, patronage); and genres of art (portraits, nudes, altarpieces).
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:451** ***Seminar: Public Monuments in America, 19th-21st Centuries (3)***
Addresses the issues surrounding public monuments from the 19th century through the present day. Focuses on sculptures commissioned to commemorate major events in the United States, but will also consider some important European examples.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:452** ***Interior Architecture in the United Statesfrom the Colonial to the Modern Era (3)***
Introduction to the major decorative periods and social and cultural movements that influenced the choice of furnishings and the organization of interiors. Emphasis on domestic interiors; discussion of major commercial and institutional spaces. Includes field trips.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:454** ***Seminar: Major Baroque Artists and Themes (3)***
Principal artists of the 17th and 18th centuries in Italy, Spain, France, and/or England in monographic format.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:462** ***Workshop in Curatorial Practices (3)***
Practical experience for students interested in curatorial work in museums and/or galleries. Investigation of various responsibilities of museum professionals through field trips to museums and galleries in New York. Organizing exhibitions and preparing accompanying catalogs.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:473** ***Seminar: Illuminated Manuscripts (3)***
Materials, techniques, and styles of decoration and illustration of manuscripts from antiquity to the introduction of printing. Relationship of ornament to text in various genres and style periods, and to patterns of use and patronage. Types of functional and ornamental bindings and their relationship to function and storage of luxury manuscripts.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:478** ***Seminar: Latin American Art (3)***
Latin American art and visual culture. Topics may vary with instructor.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:479** ***Seminar: Asian Art (3)***
Asian art and visual culture. Topics may vary with instructor.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:483** ***From Text to Image in Japanese Art (3)***
Impact of classic literature on Japanese paintings; artistic transformations of emotions and events of literary masterpieces into images.
***Corequisite: 01:082:324 or permission of instructor. Credit not given for both this course and 01:565:483.***

**01:082:484** ***Seminar: Ancient Art (3)***
Focus on various problems of Greek, Etruscan, and Roman art, such as style, iconography, painting, sculpture, portraits, minor arts, architecture, cities, and sanctuaries.
***Prerequisite: 01:082:105, 106, or permission of instructor.***

**01:082:486** ***Seminar: Medieval Art History (3)***
Particular genre, medium, monument, or area within medieval art (e.g., ivory carving, seals, the Bayeux tapestry, Chartres cathedral).
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:487** ***Seminar: Modern Art (3)***
Specialized study in 19th- and 20th-century art and architecture. Seminar may be organized by the time period, thematic content, artistic movement, artist, type of monument, or genre.
***Prerequisite: 01:082:105, 01:082:106 or permission of instructor.***

**01:082:488** ***Seminar: American Art (3)***
Specialized study in American art and visual culture. Seminar considers various topics, such as artists, monuments, artistic and cultural movements, genres, and periods.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:489** ***Public Policy and the Arts (3)***
Public policies that have created a vigorous world-class arts culture. Changes in domestic and international politics, market economics, globalization, and technology reshaping the cultural policy debate worldwide.
***Prerequisites: 01:082:105,106 or permission of instructor. Credit not given for both this course and 10:975:499.***

**01:082:491,492** ***Capstone in Art History (3,3)***
Advanced study in selected area of art history. Required of art history majors. All others (including minors) need permission of instructor.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:493,494** ***Individual Studies in Art History (3,3)***
Guided independent research in a particular area of interest. Open only to seniors in art history or by special permission of instructor.
***Prerequisites: 01:082:105,106 or permission of instructor.***

**01:082:495,496** ***Internship in Art History (3,3)***
Open only to majors. Supervised internship, usually at a museum or gallery.
***Prerequisites: 01:082:105,106. Permission required.***

**01:082:497-498** ***Honors in Art History (3,3)***Independent research on a specific topic leading to an honors thesis written under the supervision of a department faculty member. Candidates for honors in art history must, at the end of their junior year, have a cumulative grade-point average of 3.0 or better and an average of 3.5 or better in the major. Both semesters must be completed in order to receive the total credits (6) for both courses.

# Arts and Sciences 090 (SAS)

## ARTS AND SCIENCES 090

Arts and Sciences 090 (SAS)

## School of Arts and Sciences

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**01:090:100** ***SAS Summer Institute First-Year Experience (1)***
Introduction to the university. Tools and resources for academic success at the university level.

**01:090:101** *The Byrne Seminars (1)*
Focusing on the research and interests of the faculty and introducing students to the range of intellectual and career possibilities offered to them at Rutgers.
*For first-year students. Graded Pass/No Credit.*

**01:090:102** *Costa Rica Study Seminar (1)*
Study abroad in Costa Rica.

**01:090:103** *Cross-Cultural Competency (1)*
Theory and practice of creating a cross-cultural community based on respect, communication, and empathy. Encouraging student advocacy, course seeks to advance inclusion, belonging, and respect in the Rutgers community through discussions, readings, and activities. Three units: Identity, Interaction, and Interdependence. Culminates in a collaborative, Advancing True Inclusion Project.

**01:090:105** *RU1st (1.5)*
First-year seminar for international students.

**01:090:109** *Purpose Project Part 1: Discover Yourself (1.5)*
Guided process of defining what a purposeful life and work mean to individual students while building affinity as a team. Preparation for a joint service project in spring semester.
*Requires enrollment in the JFEW Scholars program.*

**01:090:110** *Purpose Project Part 2: Connecting to a Wider Purpose (1.5)*
Guided, team-based project management will give students hands-on experience connecting their values and strengths with a larger goal and purpose while building teamwork, networking, continuous reflection and project management skills.
*Prerequisite: 01:090:109 or permission. Requires enrollment in the JFEW Scholars program.*

**01:090:111,112** *Honors Colloquium (1,1)*
Ongoing series of meetings, lectures, discussions, and cultural events. Topics vary each semester.
*Open to all students in the School of Arts and Sciences Honors Program. Graded Pass/No Credit.*

**01:090:120** *First-Year Interest Group Seminar (FIGS) (1)*
Highly interactive seminars on selected topics focusing on career goals/potential majors of first-year students. Analysis and discussion of presentations by a broad spectrum of faculty and alumni speakers; introduction to and utilization of university resources. Each seminar led by a peer instructor closely supervised by the FIGS curriculum coordinator.
*Open to first-year students only. Graded Pass/No Credit. May not be repeated for credit.*

**01:090:121** *International Student Transition Seminar I (1)*
For students in the International Living-Learning Community. Introduces tools that promote success for international students in and outside the classroom during their first semester; provides an in-depth introduction to Rutgers University and the School of Arts and Sciences. Topics designed to assist international students in their transition and adjustment to the university and to enrich their knowledge of American culture and life in an American university.
*Special permission required. Graded Pass/No Credit.*

**01:090:122** ***International Student Transition Seminar II (1)***
For international students.
***Special permission required.***

**01:090:123** ***RU Path (1)***
For students in the RU Path Program. Topics designed to assist international students in their transition and adjustment to the University and to enrich their knowledge of American culture and life in an American University.
***Special permission required. Pass/No credit.***

**01:090:125** ***Honors College Forum (3)***

**01:090:126** ***IDEA Incubator (3)***

IDEA Incubator focuses on the development of social innovation focusing on community-centered research. IDEA Incubator is structured as a practicum to allow you to develop knowledge of social innovation whilst acquiring a special skillset applicable to other areas of life.

**01:090:127** ***Honors College Innovation Lab (BA)***
First-year honors college course.
***For Honors College students.***

**01:090:128** ***Global Dialogues (1)***
Provides international students practical opportunities to learn and engage in structured speaking situations on internationally relevant topics collaboratively. Builds core communication competencies on global issues.
***For international students only.***

**01:090:130** ***Cohort Seminar I (1)***
First-year fall semester seminar for Cohort Program Scholars.
***Pass/No credit. Special permission required.***

**01:090:131** ***Cohort Seminar II (1)***

First-year spring semester seminar for Cohort Program Scholars.

***Pass/No credit. Special permission required.***

**01:090:132** ***Cohort Seminar III (1)***

Sophomore fall semester seminar for Cohort Program Scholars.

***Pass/No credit. Special permission required.***

**01:090:133** ***Cohort Seminar IV (1)***
Sophomore spring semester seminar for Cohort Program Scholars.
***Pass/No credit. Special permission required.***

**01:090:170** ***Summer Institute Math Practicum (1)***
Development of mathematical skills at placement level.

**01:090:171** *Study Skills (1.5)*
Not for degree credit.

**01:090:172** *Strategies for College Success (1.5)*
Development of strategies for time management, organizing course preparation time, accessing university resources, and learning new ways to enhance studying efforts. Not for degree credit.

**01:090:173** *Special Topics (1.5)*
Not for degree credit.

**01:090:174** *Approaches to Mathematical Problem Solving (2)*
Cognitive Science based approaches to solving mathematical problems commonly found not only in Calculus but in a broad range of disciplines and careers, given the increasingly widespread use of mathematical thinking.
***Pass/No Credit.***

**01:090:175** *LSAT Skills (1.5)*
Not for degree credit.

**01:090:176** *GRE Skills (1.5)*
Not for degree credit.

**01:090:177** *GMAT Skills (1.5)*
Nor for degree credit.

**01:090:178** *MCAT Prep Workshop (3)*

**01:090:179** *SAT Prep Workshop (3)*

**01:090:180** *GRE Prep Workshop (3)*

**01:090:181** *Academic Success Seminar (1.5)*
***Graded on a Pass/No Credit basis.***

**01:090:182** *MCAT Prep Workshop (1.5)*

**01:090:183** *MCAT Prep Workshop (1.5)*

**01:090:195,196** *Introduction to Honors Research (BA)*
Introduction to research. Topics and faculty members vary.
***Special permission required.***

**01:090:199** *Preparing for an Internship (1.5)*
This course will build on the Career Explorations and Arts and Sciences course by helping students to refine their job application skills based on their values, strengths, and interests. It will prepare students to apply to an internship and to develop a plan for success in the internship and beyond.
***Prerequisite: 01:090:210 or SPN***

**01:090:200** *Internship (1)*
Not for degree credit.

**01:090:201,202** ***Internship in Arts and Sciences (3,3)***
Integrated academic and work experience.
***By permission of dean, School of Arts and Sciences Office of Undergraduate Education. Graded Pass/No Credit.***

**01:090:203** ***Co-op in Arts and Sciences (6)***
Integrated academic and work experience; six months.
***By permission of dean, School of Arts and Sciences Office of Undergraduate Education. Graded Pass/No Credit.***

**01:090:204** ***Rutgers Experiential Learning and Condensed Internship Course (1)***
One credit elective internship course which can accommodate shorter-term or on-campus learning-focused work experiences that may not meet the hours requirements for 3-credit internship courses.
***Registration by special permission.***

**01:090:210** ***Career Explorations in Arts and Sciences (1.5)***
Increases career readiness though investigation, reflection, and planning. Makes transparent the contributions of the liberal arts and sciences curriculum to students' professional lives. Students will learn a framework for choosing a career, articulate career relevant skills developed in arts and sciences, and practice job search skills (networking, resume, interviews).
***Recommended for School of Arts and Sciences sophomores and juniors. Special sections for seniors***

**01:090:215** ***Introduction to Mentoring (3)***
Fundamental mentoring skills, communication skills, and ethics; relevant concepts in psychology. Motivation and goal-setting, the teenage brain, self-concept, grit and resilience, social problem solving, and culturally sensitive mentoring practices.
***Special permission required.***

**01:090:220** ***Students in Transition Seminar (1)***
Introduction to the university and services for transfer students. Topics designed to assist students in the adjustment to the university and to facilitate better first-semester academic performance; characterized by small-group learning.
***Open to entering transfer-year students only. Graded Pass/No Credit. May not be repeated for credit.***

**01:090:223** ***Bibliography and Research Techniques (3)***

**01:090:224** ***Special Topics (1)***
Exploration of problems and issues relating to a particular theme.

**01:090:225,226** ***Special Topics (3,3)***
Exploration of problems and issues relating to a particular theme.

**01:090:227,228** ***Academic Coaching for International Students (1,1)***
Exploration of problems and issues relating to a particular theme.

**01:090:250, . . . ,297** ***SAS Honors Program Interdisciplinary Seminar (3, . . . ,3)***
Selected topics in the arts and sciences. Titles vary from semester to semester.
***Open only to School of Arts and Sciences Honors Program students and New Brunswick General Honors Program students.***

**01:090:298** ***Public Scholarship and Service Internship (1-2)***
One- or two-credit service-learning placement in an approved Civic Engagement and Service Education Partnership (CESEP) field setting.

**01:090:299** ***Public Scholarship and Service Internship (1-2)***
One- or two-credit service-learning placement in an approved field setting related to the public good. Must be taken in conjunction with a designated Civic Engagement and Service Education Partnership (CESEP) course.

**01:090:301,302** ***Princeton/Rutgers Exchange (BA)***

**01:090:303,304** ***Spelman/Rutgers Exchange (BA)***

**01:090:305,306** ***"Behind the Camera" Learning Community (1.5, 3)***
Exploration of global film through screenings, discussions, and field trips to cinemas and festivals in the area. Yearlong collaborative project related to film.
***Corequisite: One cinema studies course, taken in either the fall or the spring semester of the year the student is enrolled in the "Behind the Camera" Learning Community. Limited to and required of participants in the "Behind the Camera" Learning Community.***

**01:090:308** ***Institute for Research on Women Learning Community (1.5)***
Explores Institute for Research on Women (IRW) annual theme through readings, weekly discussions, lectures, and interactions with IRW seminar fellows, visiting scholars, and distinguished lecturers. Development and presentation of research/action project.
***Limited to and required of participants in the IRW Learning Community. Graded Pass/No Credit.***

**01:090:309** ***Women in Community Service (1)***

**01:090:312** ***Purpose Project Part VI: Launching with Purpose (1.5)***

This sixth and final course in the Purpose Project Scholars program. Scholars will build on the work students completed in earlier courses. Launching with Purpose is designed to assist senior undergraduate students in navigating the transition from college to their post-graduation endeavors. Through readings, discussions, assignments, and activities, students will explore their values, interests, strengths, and identities, and develop essential skills and strategies.

***Prerequisite: 01:090:204***

**01:090:315** ***Mentoring and Youth Challenges (3)***
Understanding of adolescent development, with a focus on physical, cognitive, social, and emotional development. Examination of positive and destructive issues related to mental health and wellness, including positive psychology, dating violence/domestic abuse, substance abuse, and bullying.
***Prerequisite: Special permission of program.***

**01:090:316** ***Mentoring, Communication, and Ecological-Community Context (3)***
Advanced communication micro-skills and strategies. Development of broader understanding of adolescent identity development by examination of a variety of theories related to identity development.
***Prerequisite: Special permission of program.***

**01:090:320** ***Peer Instructor Education (3)***
Student peer educators learn how to teach a first-year interest group seminar and help new students make the transition to university life. Selected topics focus on effective methods of college teaching and program strategies to increase understanding of the first-year and transfer experience. Discussions center on teaching techniques to integrate faculty, current research topics, academic advising, developmental and adjustment issues, and cooperative/group-learning experiences.
***Open to selected upper-class students only. May not be repeated for credit.***

**01:090:321,322** ***Peer Instructor Education (3,3)***
Selected topics focus on effective methods of college teaching and program strategies.
***Open to selected upper-class students only.***

**01:090:325,326** ***Special Topics (3,3)***
Exploration of problems and issues relating to a particular theme.

**01:090:327,328** ***Special Topics (BA,BA)***
Exploration of problems and issues relating to a particular theme.

**01:090:391,392** ***Introduction to the Thesis (1,1)***
Provides prospective thesis writers with the background, resources, and understanding necessary to produce independent research work.
***Special permission required. Graded Pass/No Credit.***

**01:090:393,394** ***Independent Study and Research (BA,BA)***
Individualized study supervised by a faculty member.

**01:090:395,396** ***Honors Independent Study and Research (3,3)***
Individualized study supervised by a faculty member.

**01:090:399** ***Public Scholarship and Service Internship (1-2)***
One- or two-credit service-learning placement in an approved field setting related to the public good. Must be taken in conjunction with a designated Civic Engagement and Service Education Partnership (CESEP) course.

**01:090:491,492** ***Research Workshop (1,1)***
Provides prospective thesis writers with the background, resources, and understanding necessary to produce independent research work.

**01:090:493,494** ***Independent Study and Research (BA,BA)***
Individual research supervised by a faculty member.

**01:090:495,496** ***Honors Interdisciplinary Thesis (3,3)***
Independent research supervised by a faculty member leading to an interdisciplinary senior honors thesis.
***Open only to students in the School of Arts and Sciences Honors Program.***

**01:090:497,498** ***Honors College Interdisciplinary Thesis (3,3)***
Independent research supervised by a faculty member leading to an interdisciplinary senior honors thesis.

**01:090:EC** ***Advanced Placement Elective Credits (3)***

**01:090:EC1** *Elective Credit (BA)*

# Asian Studies 098 (SAS)

## ASIAN STUDIES 098

Department of Asian Languages and Cultures, School of Arts and Sciences

**Website:** Here

**Chair:** Wendy Swartz

**Director of Undergraduate Studies:** Satoru Saito

**Distinguished Professor:**

Senko K. Maynard, B.A., Tokyo University of Foreign Studies; M.A., Illinois (Chicago); Ph.D., Northwestern

**Professors:**

Young-mee Yu Cho, B.A., Seoul National (South Korea); Ph.D., Stanford

Suzy Kim, B.A., California (Los Angeles); Ph.D., Chicago

Paul Schalow, B.A., Hampshire College; M.A., Ph.D., Harvard

Wendy Swartz, B.A., California (San Diego); Ph.D., California (Los Angeles)

**Associate Professors:**

Jessey Choo, B.A., Rochester; M.A., Ph.D., Princeton

Satoru Saito, B.A., Virginia; M.A., Ph.D., Columbia

Weijie Song, B.S., Xi'an Jiaotong (China); M.A., Ph.D., Peking; Ph.D., Columbia

Xiaojue Wang, B.A., M.A., Peking; Ph.D., Columbia

**Assistant Professors:**

Jae Won Edward Chung, B.A., Swarthmore; M.F.A., M.A., Ph.D., Columbia

Hieu Phung, B.A., M.A., Vietnam National University-Hanoi; Ph.D., Hawaii

**Associate Teaching Professor:**

Haruko Wakabayashi, B.A., Sophia (Japan); Ph.D., Princeton

Yuan-Chen Jenny Yang, B.A., National Taiwan; M.A., University College London; Ph.D., Yale

**Assistant Teaching Professors:**

Hee Chung Chun, M.A., Ewha Womans (South Korea); Ph.D. candidate (Rutgers)

Jiro Harasaki, M.A., Columbia

Jaehyun Jo, B.A., M.A., Yonsei; Ph.D., California (Los Angeles)

Peng Liu, B.A., M.A., Soochow; Ph.D., Fudan; Ph.D., Columbia

**Teaching Instructors:**

Jane Huang, B.A., Penn State; M.A., Rutgers

Michiru Ichihara Lowe, B.A., Nanzan; M.A., Columbia

Kyoung-eun Jang Moon, B.A., Seoul National (South Korea); M.A,, Rutgers

**Faculty Emeriti:**

Peter Li, B.A., Washington; Ph.D., Chicago

Richard VanNess Simmons, B.A., M.A., Ph.D., Washington

Ching-I Tu, B.A., National Taiwan; Ph.D., Washington



# Major Program Learning Goals and Requirements

# Major Program Learning Goals and Requirements

**Learning Goals**

Majors in Asian studies will acquire an interdisciplinary knowledge of Asia through a wide range of course offerings in the humanities and social science disciplines such as: Asian languages, literature, visual culture, history, religion, economics, political science, art history, geography, anthropology, sociology, musicology, and linguistics. Students will develop critical skills in analyzing and interpreting texts from these disciplines and acquire the competency necessary for continuing on to graduate study or employment requiring such knowledge.

**Requirements**

The major in Asian studies requires 12 courses (of 3 credits or more) distributed as follows:

1. Two courses in Asian studies, chosen from East Asian Civilizations: Traditional Era (01:098:241), East Asian Civilizations: Modern Era (01:098:242), or Global East Asia (01:098:250)
2. Nine elective courses in Asian Studies, at least four of which must be offered in subject codes 098, 165, 565, or 574, and may include language courses above the 100-level
3. Capstone Seminar on East Asian Societies (01:098:444)

# Minor Program Learning Goals and Requirements

# Minor Program Learning Goals and Requirements

**Learning Goals**

Minors will be introduced to the cultural heritage of East Asia (China, Japan, and Korea) through a wide and coherent curriculum, which includes courses in the following humanities and social science disciplines: literature, visual culture, history, religion, language, and linguistics. Minors will learn critical skills in analyzing and interpreting literary, historical, and cultural materials appropriate to the student's area of specialization. Students will be able to relate relevant issues to other areas in the humanities.

**Requirements**

The minor program in Asian studies consists of six courses (of 3 credits or more) distributed as follows:

1. Two courses in Asian studies, chosen from East Asian Civilizations: Traditional Era (01:098:241), East Asian Civilizations: Modern Era (01:098:242) or Global East Asia (01:098:250)
2. Four elective courses in Asian studies, at least three of which must be offered in subject codes 098, 165, 565, or 574, and may include language courses above the 100 level

Asian Studies 098 (SAS)

# Asian Studies Courses

# Asian Studies Courses

**01:098:101** ***Elementary Filipino (4)***
Introduction to sound, grammar, and writing system of Tagalog; practice and exercises in speaking, reading, and writing.

**01:098:102** ***Elementary Filipino (4)***
Continued acquisition of conversational skills; deeper understanding of the language's grammar and syntax; broadening of vocabulary and feel for contemporary Tagalog, or Filipino. Focus on real situations and modes of interaction.
***Prerequisite: 01:098:101 or equivalent.***

**01:098:111** ***Elementary Vietnamese (4)***
Introduction to sound, grammar, and writing system of modern Vietnamese; practice and exercises in speaking, reading, and writing.

**01:098:112** ***Elementary Vietnamese (4)***
Basic skills requisite for modern conversational Vietnamese. Communicative and interactive listening and speaking skills; higher register of written Vietnamese. Introduction to folktale literature with written critiques.
***Prerequisite: 01:098:111 or equivalent.***

**01:098:151** ***Elementary Manchu (4)***
Introduction to sound, grammar, and writing system of Manchu; practice and exercises in speaking, reading, and writing.

**01:098:201** ***Intermediate Tagalog/Culture I (3)***
Further practice of conversational skills learned in Elementary Filipino/Tagalog I and II; understand more completely the grammar and syntax of the language; and build a vocabulary and feel for natural, contemporary Tagalog/Filipino. Contextual lessons in Philippine history, culture, values, and literature, to be conducted progressively in Tagalog/Filipino.
***Prerequisite: 01:098:101, 01:098:102, or equivalent.***

**01:098:202** ***Intermediate Tagalog/Culture II (3)***
Continues an understanding, and appreciation of, contemporary Tagalog/Filipino and its cultural context. Grammatical and syntactical principles, vocabulary expansion and improvement of reading, speaking, and writing. Examination of Tagalog/Filipino as living tongue though exploration of its cultural, literary, and historical contexts.
***Prerequisite: 01:098:201 or equivalent.***

**01:098:211** ***Intermediate Vietnamese I (4)***
Development of intermediate language skills; vocabulary building, oral proficiency, listening, and reading comprehension.
***Prerequisite: 01:098:112 or equivalent.***

**01:098:212** ***Intermediate Vietnamese II (4)***
Continued development of intermediate language skills; vocabulary building, oral proficiency, listening,and reading comprehension.
***Prerequisite: 098:098:211 or placement.***

**01:098:215** ***Introduction to Vietnamese Literature in Translation (3)***
Introduces traditional Vietnamese literature from its beginnings in the early second millennium to the advent of the French conquest in the mid-19th century.
***No knowledge of Vietnamese language necessary.***

**01:098:235** ***Mongolian Literature in Translation (3)***
Examines the development of modern Mongolian literature since the socialist revolution of 1921 as an expression of the broader social, political, and cultural forces which have shaped Mongolia during the Soviet and post-Soviet periods.

**01:098:241** ***East Asian Civilizations: Premodern Era (3)***
Introduction to traditional Chinese, Japanese, and Korean civilizations, including governmental institutions, educational systems, belief systems, language, literature, art, and everyday life.

**01:098:242** ***East Asian Civilizations: Modern Era (3)***
Introduction to modern Chinese, Japanese, and Korean civilizations, including the impact of modernization, East-West contact, governmental institutions, belief systems, educational systems, language, literature, art, and everyday life.

**01:098:250** ***Global East Asia (4)***
Critical analysis of social, cultural, and political narratives and counter-narratives used to describe and discuss East Asia. Global and regional dynamics and interrelated issues of modernity, war, gender, and the geopolitical balance of power, shaping events of the 21st century.

**01:098:252** ***Southeast Asia and the World (3)***
Introduction to Southeast Asia¿ one of the crossroads of the world ¿from ancient civilizations until the end of the twentieth century. Includes the histories of Brunei, Burma/Myanmar, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Timore Leste, and Vietnam.
***Credit not given for both this course and 01:508:250.***

**01:098:255** ***Heroism (4)***
Offers global and comparative examination of different conceptions of heroism across cultures, time, and gender. Explores cultural conditioning, ethical reasoning, and moral compass behind heroes and heroines in history and literature, from Greek epic heroes to Chinese assassin-retainers, women warriors to samurais, civil rights leaders to women's rights crusaders, and comic superheroes to modern day heroes.

**01:098:262** ***Asian American Experience: Identity and Ethnicity (3)***
General introduction to history and culture of Asian America and major debates in Asian American studies.
***Credit not given for both this course and 01:050:245.***

**01:098:280** ***Modern Vietnam in Literature and Film (3)***
This course drops you into Vietnam, a place right at the crossroads of Southeast and East Asia.You will learn to analyze a wide range of approaches by which the Vietnamese, including their diaspora, have come to identify themselves, memorialize their histories, and reproduce their cultures. Taught in English.

**01:098:321** ***Topics in Asian Studies (3)***
Study of specific topics in Asian studies. Topics change per semester.
***May be repeated for credit with department permission.***

**01:098:322** ***Interdisciplinary Topics in East Asia: Understanding Asian Community (3)***
Interdisciplinary introduction to East Asia and Asian community with critical approaches to modern literature, film, history, and culture in China, Japan, Korea, other Asian regions and beyond.

**01:098:326** ***Immorality Suffering and Retribution in the Great Romances of East Asia (3)***
This course provides an introduction to vernacular narrative traditions of East Asia.

**01:098:331** ***The Sounds of Asia: Music of the East in the Global Era (3)***
Introduction to musical sound, musical activities, and musicians as a means of understanding Asia. Analysis of musical genres, instruments, musicians, and associated artistic/cultural ideas that have developed historically, and are current today.

**01:098:338** ***Religious Themes in East Asian Literature (3)***
Religious ideas and attitudes as expressed in Indian, Chinese, and Japanese classics.
***Credit not given for both this course and 01:840:338.***

**01:098:340** ***TransAsia: A Transnation History of Asia, Gender, and Sexuality (3)***
Transnational history of Asia; how (trans)regional movements in peoples, ideas, commodities, technologies, and capital have shaped and been shaped by gender/sexuality.

**01:098:345** ***Asia-Pacific in Cross-Cultural Perspective (3)***
Explores the social, cultural, and political interactions in the Asia-Pacific region from the late nineteenth century to the present from a cross-cultural perspective.

**01:098:373** ***Classical Tibetan (3)***
Introduction to the grammar and writing system of classical Tibetan, working directly with original Buddhist texts.

**01:098:393** ***Independent Study of Asian Languages and Literatures (3)***
Intensive study of a specific Asian language and/or literature not covered in regularly scheduled classes.
***Prerequisites: Permission of instructor and department approval.***

**01:098:394** ***Independent Study of Asian Languages and Literatures (3)***
Intensive study of a specific Asian language and/or literature not covered in regularly scheduled classes.
***Prerequisites: Permission of instructor and department approval.***

**01:098:410** ***The History of East Asian Writing Systems (3)***
General survey of writing and literacy in the East Asian countries of the Sinitic cultural sphere.

**01:098:444** ***Seminar on East Asian Societies (3)***
Examines major social and cultural issues of contemporary East Asia (China, Japan, Korea) from nineteenth century to present through a variety of disciplinary perspectives such as literary approaches, visual studies, social history, women¿s and gender studies, and global studies. Provides systematic introduction to research process and equips students with necessary knowledge and skills to understand major issues in the larger context of East Asian culture and societies.
***Prerequisites: 01:098:241, 01:098:242, 01:098:250, or by Department Permission.***

**01:098:473** ***The Silk Road: A History of Cultural and Material Exchanges (3)***
An interdisciplinary introduction to the history of the Silk Road with a focus on the cultural and material exchanges between the peoples and cultures it connected over the period from 500 BCE to 1500 CE.
***Credit not given for both this course and 01:165:473.***

**01:098:477** ***Gender in East Asian Religiosity (3)***
Examines the religious beliefs and practices of and about women in Buddhism, Confucianism, Daoism, and other religious traditions popular in China, Japan, and Korea.

**01:098:479** ***Environmental Crises in Southeast Asia (3)***
Examines the diversity of human relationships with nature and the various perceptions humans have about environmental crisis.

# Other Approved Asian Studies Courses Offered by the Department of Asian Languages and Cultures

# Other Approved Asian Studies Courses Offered by the Department of Asian Languages and Cultures

01:165:201,202 Intermediate Chinese (4,4)

01:165:205 Intermediate Chinese in China (4)

01:165:207,208 Intermediate Spoken Chinese I, II (4,4)

01:165:210 The Chinese Language: Description and History (3)

01:165:211 Language and Identity in Modern Chinese Societies (3)

01:165:215 Introduction to Chinese Civilization (3)

01:165:220 Chinese Classics and Thought: Confucianism, Daoism, and Buddhism (3)

01:165:222 Intermediate Chinese Reading and Writing for Mandarin Speakers (3)

01:165:241 Classical Chinese Prose and Poetry in Translation (3)

01:165:242 Classical Chinese Popular Fiction and Drama in Translation (3)

01:165:262 Chinese Cinema (3)

01:165:264 Chinese Drama and Performing Arts (3)

01:165:301,302 Advanced Modern Chinese (3,3)

01:165:305 Advanced Chinese in China (4)

01:165:310 Modern Chinese Literature in Translation (3)

01:165:321,322 Introduction to Classical Chinese (3,3)

01:165:341,342 Major Traditions in Chinese Thought (3,3)

01:165:350 Chinese Martial Arts Film and Culture (3)

01:165:361 Business Chinese (3)

01:165:362 Business Chinese II (3)

01:165:371 Contemporary Expository Chinese (3)

01:165:393 Guided Research in China: Global and Local (3)

01:165:401 Advanced Chinese Conversation and Composition (3)

01:165:402 Advanced Chinese Conversation and Composition II (3)

01:165:410 Classic Chinese Novels (3)

01:165:412 Chinese Poetry: Major Themes and Texts (3)

01:165:419,420 Readings in Classical Chinese Literature (3,3)

01:165:424 The Origin and Development of Chinese Writing (3)

01:165:425 Chinese Dialects (3)

01:165:430 Advanced Chinese Grammar (3)

01:165:451,452 Readings in Modern Chinese Literature (3,3)

01:165:461 History of Chinese Literature: Beginnings to 1300 (3)

01:165:462 History of Chinese Literature: 1300 to 1900 (3)

01:165:463 Nature in Chinese Literature (3)

01:165:470 The City in Modern Chinese Literature and Film (3)

01:165:471 Early "China" in the "World" - Cosmography, Epistemology, and Encountering the Strange (3)

01:165:473 The Silk Road: A History of Cultural and Material Exchanges (3)

01:165:476 Women in Premodern China (3)

01:165:480 Cultural Memory in Contemporary China (3)

01:165:482 Cold War Chinese Literature and Film (3)

01:165:484 Youth Culture in Global Chinese Films (3)

01:165:486 Women in Modern Chinese Literature and Film (3)

01:165:490 Seminar in Chinese Literature and Thought (3)

01:165:493,494 Independent Study (3,3)

01:165:497,498 Honors in Chinese (6,6)

01:565:201,202 Intermediate Japanese (4,4)

01:565:210 Introduction to Japanese Culture (3)

01:565:213,214 Japanese Conversation and Culture (3,3)

01:565:215 A-Bomb Literature and Film in Japan (3)

01:565:241 Premodern Japanese Literature in Translation (3)

01:565:242 Modern Japanese Literature in Translation (3)

01:565:250 Language and Society in Japan (3)

01:565:301,302 Advanced Japanese (3,3)

01:565:303,304 Advanced Japanese for Business (3,3)

01:565:313,314 Advanced Japanese Conversation and Contemporary Issues (3,3)

01:565:317 Love, Honor, and Suicide in Japanese Literature (3)

01:565:320 The Samurai Tradition in Japanese Literature and Film (3)

01:565:325 Advanced Japanese Grammar and Rhetoric (3)

01:565:333 Anime: Introduction to Japanese Animation (3)

01:565:350 Japanese Film (3)

01:565:360 Japanese Women Writers (3)

01:565:361,362 Japanese Popular Culture (in Japanese) (3,3)

01:565:370 Community and Difference in Japanese Literature and Film (3)

01:565:380 Contemporary Japanese Literature and Film (3)

01:565:395 Issues in Japanese Literature (3)

01:565:401,402 Advanced Readings in Japanese (3,3)

01:565:411 Readings in Classical Japanese: Bungo (3)

01:565:451,452 Translating Japanese Popular Media (3,3)

01:565:460 Seminar in Japanese Film (3)

01:565:470 Seminar in Japanese Language and Literature (3)

01:565:475 The Tale of Genji as World Literature (3)

01:565:480 Seminar on Modern Japanese Literature (3)

01:565:483 From Text to Image in Japanese Art (3)

01:565:495,496 Independent Study (3,3)

01:565:497,498 Honors in Japanese (6,6)

01:574:201,202 Intermediate Korean (4,4)

01:574:203 Intermediate Korean Reading and Writing for Heritage Students (3)

01:574:210 Introduction to Korean Culture (3)

01:574:220 Introduction to Korean Literature in Translation I (3)

01:574:221 Topics in Korean Literature in Translation II (3)

01:574:230 Introduction to Korean Cinema and Cinematic Language (3)

01:574:250 Korean Language in Culture and Society (3)

01:574:301,302 Advanced Korean (3,3)

01:574:303 Advanced Korean for Business I (3)

01:574:304 Advanced Korean for Business II (3)

01:574:310 Gender and Social Change in Korea (3)

01:574:320 Korean Translation: Introduction to Practical Translation and Translation Theories (3)

01:574:350 North Korea in the Socialist and Post-Socialist Worlds (3)

01:574:365 Advanced Topics in the Korean Language and Linguistics (3)

01:574:390 Topics in Korean Studies (3)

01:574:401,402 Advanced Readings in Korean (3,3)

01:574:410,411 Readings in Korean Literature (3,3)

01:574:420 Traditional Korean Poetry: Sijo (3)

01:574:450 Korea in Translations: Modern Literature and Film (3)

01:574:451 Korea in Translations: Contemporary Media (3)

01:574:470 Seminar on Modern Korean History (3)

01:574:471 Korea in Translations: Contemporary Media (3)

01:574:480 Korean Interpreting (3)

01:574:495,496 Independent Study in Korean (3)

01:574:497,498 Honors in Korean (6,6)

**Asian Studies Electives from Other Departments**

01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)

01:013:202 Cinemas of Africa and Asia (3)

01:013:203 Language and Society in Africa, the Middle East, and South Asia (3)

01:013:231 Introduction to the Literatures of South Asia (3)

01:013:232 Women Writers of South Asia (3)

01:013:331 Modern Literatures of South Asia (3)

01:013:337 Film and Literature in South Asia (3)

01:013:430 Gender, Nation, and Literature in South Asia (3)

01:050:245 Asian American Experience: Identity and Ethnicity (3)

01:050:377 Asian American Literature in English (3)

01:070:244 Ethnographies of South Asia (3)

01:070:246 Anthropology of Southeast Asia (3)

01:070:248 Anthropology of China (3)

01:070:389 Ethnography of Gender in South Asia (3)

01:082:205 Introduction to Asian Art (3)

01:082:252 East Asian Art (3)

01:082:321 Art of Early China (3)

01:082:322 Survey of Japanese Art (3)

01:082:323 Buddhist Art of Asia (3)

01:082:324 Japanese Painting (3)

01:082:325 Chinese Painting (3)

01:082:326 Chinese Sculpture (3)

01:082:329 The South Asian Temple: Art and Devotion in South Asia (3)

01:082:481 Seminar on Buddhist Religion and Art of China (3)

01:195:232 Women Writers of South Asia (3)

01:195:243 Introduction to the Literatures of South Asia (3)

01:165:249 Modern Literatures of South Asia (3)

01:195:329 Japanese Selves, Western Others (3)

01:195:331 The Novel, East and West (3)

01:195:332 The Samurai Tradition in Japanese Literature and Film (3)

01:195:333 Modern Writers and East Asia (3)

01:195:430 Gender, Nation, and Literature in South Asia (3)

01:220:357 Economics of India (3)

01:220:359 Economics of Asia (3)

01:351:377 Asian-American Literatures in English (3)

01:358:222 Introduction to South Asian Literatures (3)

01:358:386 Literatures of Asia in English (3)

01:358:389 Asian-American Literatures in English (3)

01:450:341 South Asia (3)

01:450:342 East Asia (3)

01:506:203 Histories of the Pacific (3)

01:508:230 The Making of Modern India and Pakistan (3)

01:508:231 South Asian Civilization: The First Five Millennia (3)

01:508:240 Classical Asia (3)

01:508:242 Modern East Asia (3)

01:508:244 China and the United States (3)

01:508:246 History of Chinese Civilization (3)

01:508:247 China, 1800 to the Present (3)

01:508:250 Southeast China and the World (3)

01:508:330 Early Modern South Asia, 1500-1800 (3)

01:508:331 Women in South Asian History (3)

01:508:332 Slavery in South Asian History (3)

01:508:333 Culture and Power in South Asia (3)

01:508:334 Passage to India: South Asia through Travel Narratives (3)

01:508:335 Modern South Asia (3)

01:508:336 South Asia, 1947-Present (3)

01:508:338 Asian Migrations (3)

01:508:340 Late Imperial Chinese Culture and Society (3)

01:508:341 Chinese Renaissance, 1000 to 1400 (3)

01:508:344 China's Socialist Revolution (3)

01:508:346 TransAsia: A Transnational History of Gender and Sexuality in Asia (3)

01:508:348 Chinese Intellectual History (3)

01:508:349 Modern China through Film and Fiction (3)

01:508:352 Japan's Rise to World Power (3)

01:508:450 Society and Culture in Japan (3)

01:730:140 Chinese Philosophy (3)

01:730:368 Hindu Philosophy (3)

01:730:369 Buddhist Philosophy (3)

01:790:353 Government and Politics of Southeast Asia (3)

01:790:354 East Asia in World Affairs (3)

01:790:386 Political Change in China (3)

01:790:454 Political Development of Asia (3)

01:840:204 Hindu Scriptures (3)

01:840:205 Introduction to Buddhism (3)

01:840:211 Religion in Asia (3)

01:840:321 Yoga: Its History and Philosophy (3)

01:840:323 Buddhism (3)

01:840:324 Chinese Religions (3)

01:840:335 Buddhist Meditation Traditions (3)

01:840:338 Religious Themes in East Asian Literature (3)

01:840:345 Hindu Gurus in the West (3)

01:840:350 Women in Eastern Religions (3)

01:840:357 Krishna (3)

01:840:358 Bhagavad Gita (3)

01:840:368 Hindu Philosophy (3)

01:840:369 Buddhist Philosophy (3)

01:840:370 Buddhism, Society, and Politics in Southeast Asia (3)

01:840:379 Early Chinese Religion and the Origins of Morality in China (3)

01:840:411 Seminar in the History of Eastern Religions (3)

01:840:423 Seminar in Buddhism (3)

01:840:481 Seminar in Buddhist Religion and Art of China (3)

01:988:232 Women Writers of South Asia (3)

01:988:310 South Asian Feminisms (3)

01:988:360 Japanese Women Writers (3)

01:988:431 Gender, Nation, and Literature in South Asia (3)

# Astrobiology 101 (SAS)

## ASTROBIOLOGY 101

**Website:** Here

Astrobiology is an interdisciplinary scientific field of study that examines the origins and distribution of life in the universe. The astrobiology minor is designed to educate students to cover the range of scientific disciplines that contribute to our general understanding of life, the origin of life, the past history of life on Earth, and the possible existence of life on other planets and moons. The principal goal of the minor is to develop student literacy in astrobiology so that they can critically evaluate claims related to this field reported in the news media and popular culture.

**Contact:** For information about the minor, students should contact Nathan Yee, the astrobiology faculty adviser, at nyee@envsci.rutgers.edu; or Lauren Adamo, the Department of Earth and Planetary Sciences undergraduate program director, at Lneitzke@eps.rutgers.edu.

# Learning Goals

# Learning Goals

Students completing this program will be able to:

1. Critically evaluate scientific issues related to astrobiology discussed in the media and popular culture;
2. Apply the scientific method to investigate problems in multiple scientific disciplines;
3. Interpret and analyze field and laboratory data; and
4. Communicate technical information effectively (orally, in writing, and/or through electronic media).

Astrobiology 101 (SAS)

# Minor Requirements

# Minor Requirements

**Requirements**

Students must complete 01:460:225 Astrobiology (3) plus 9 credits from Group A Courses and 6 credits from Group B courses for a total 18 credits. At least two courses must be 300-level or higher. Students cannot use the same course to satisfy requirements in a major and the astrobiology minor. The minor is not open to students with majors in the Department of Earth and Planetary Sciences. Other restrictions are noted below.

**Group A Courses**

01:460:203 Building and Maintaining a Habitable Planet (3)
01:460:212 Earth and Life through Time (3)
01:460:222 Planet Mars (3)
01:460:224 Geology of Moons and Planets (3)
01:460:304 Introduction to Geochemistry (4)
Prerequisites: Both 01:460:100 and 01:460:103 or 01:460:101 or 01:160:161 General Chemistry

01:460:305 Evolution and Geologic Time (3)
Prerequisites: 01:460:100 or 01:460:101.

01:460:441 Structure and Formation of the Terrestrial Planets (3)
Prerequisites: 01:460:302 or 01:460:304 or 01:460:306 Introduction to Geophysics or by permission of instructor.

01:460:476 History of the Earth System (3)
Prerequisites: Any three of 01:119:102, 01:160:162, 01:460:101, 01:750:204, or permission of instructor.

01:460:480 Major Events in Earth History (3)
Prerequisite: Permission of instructor.

**Group B Courses**

01:750:341 Principles of Astrophysics (3)
Prerequisites: Two semesters of introductory physics and two semesters of calculus. Credit not given for both this course and 01:105:341. Astrophysics majors must select another course.

01:750:342 Principles of Astrophysics (3)
Prerequisites: Two semesters of introductory physics and two semesters of calculus. Credit not given for both this course and 01:105:341. Astrophysics majors must select another course.

11:115:100 Molecules of Life (3)
Students will not receive credit for 11:115:100 if they have already completed 01:119:150 Biology, Society, and Biomedical Issues. Biochemistry and molecular biology and biochemistry majors must select another course.

11:680:201 Introduction to Microbiology (3)
Prerequisites: Two semesters of general biology and two semesters of general chemistry or by permission. Microbiology majors must select another course.

11:216:251 Fundamentals of Evolution (3)
Prerequisites: 01:119:102 or 01:119:117. Ecology, evolution, and natural resources majors must select another course.

# Astrophysics 105 (SAS)

## ASTROPHYSICS 105

Astrophysics 105

See Physics and Astronomy 750.

Department of Physics and Astronomy, School of Arts and Sciences

**Website:** Here

**Chair:** John P. Hughes

Undergraduate Program Director: Jolie Ciziewski

**Professors:**

Andrew Baker, A.B., Harvard; Ph.D., California Institute of Technology

Eric Gawiser, A.B., Princeton; M.A., Ph.D., California (Berkeley)

John Hughes, A.B., Columbia College; Ph.D., Columbia

Saurabh Jha, A.B., A.M., Ph.D., Harvard

Charles Keeton, B.A., Cornell; Ph.D., Harvard

Carlton Pryor, B.S., California Institute of Technology; M.A., Ph.D., Harvard

Rachel Somerville, B.A., Reed College; Ph.D., California (Santa Cruz)

**Associate Professor:**

Alyson Brooks, B.A., Macalester College; M.S., Ph.D., Washington

**Assistant Professors:**

Matthew Buckley, B.A., Kenyon College; M.A., Ph.D., California (Berkeley)

Kristen McQuinn, B.S., Lehigh; M.S., Boston; Ph.D., Minnesota

Astrophysics 105 (SAS)

# Learning Goals

# Learning Goals

Majors will demonstrate knowledge of fundamental physics principles and their application to astronomy. They will make astronomical observations using optical and radio telescopes, and demonstrate knowledge of how to analyze the data. The top 25 percent of majors will demonstrate preparedness for graduate study in astrophysics, conduct frontier astrophysics research with a faculty member, and demonstrate high quality of work.

Astrophysics 105 (SAS)

# Major Requirements

# Major Requirements

The astrophysics major, leading to a bachelor of science degree, provides a thorough introduction to the subject. It is suitable for those with an interest in astronomy who aspire to a career in astronomy research, science education, science journalism, technical development, and other professional areas. Prospective majors should consult an adviser in the Department of Physics and Astronomy before choosing their courses.

In the astrophysics major, at least 15 credits of physics or astrophysics courses at the 300 level or higher that are applied toward the major must be completed at Rutgers University-New Brunswick.

Required courses and suggested curricula for honors students and other well-prepared students:

First year: 01:750:271-272, 275-276; 01:640:151-152

Second year: 01:750:273, 381-382, 351; 01:750:341,342; 01:640:251, 244

Third year: 01:750:361, 385-386; 01:750:343, 344; 01:640:423 or 421; 01:750:368 recommended

Fourth year: At least two courses out of 01:750:441, 442, 443, 444. Students who plan to take the physics subject test of the Graduate Record Examination should take 01:750:417 in a prior semester.

An alternate curriculum is available for students who did not begin with the Honors Physics sequence:

First year: 01:750:123-124; 01:640:151-152

Second year: 01:750:227-228, 229-230, 381-382; 01:640:251, 244

Third year: 01:750:361, 385-386, 351; 01:750:341,342; 01:750:368 recommended

Fourth year: 01:640:423 or 421, 01:750:343, 344, and at least two courses out of 01:750:441, 442, 443, 444

Students who took 01:750:203-204 (or 201-202) as their introductory physics sequence should consult a departmental adviser to plan an appropriate curriculum for the astrophysics major.

Astrophysics 105 (SAS)

# Astronomy Minor Requirements

# Astronomy Minor Requirements

The following courses are required for the astronomy minor:

01:750:203-204 (or any other equivalent physics sequence)

01:750:205-206 (or 229-230 or 275-276)

01:750:341,342, 343, 344

The grade-point average for all courses applied toward the minor must be at least 2.0. No more than one D may be applied toward the minor. Three of the four 300-level courses must be taken at Rutgers University-New Brunswick. Physics majors or minors who also wish to minor in astronomy must complete 01:750:341,342, 343, 344. These courses may not also be used to satisfy requirements for the major or minor in physics.

Astrophysics 105 (SAS)

# Departmental Honors Program

# Departmental Honors Program

The chair of the department will invite astrophysics majors who have shown considerable ability by the end of their junior year to participate in the departmental honors program. Candidates for honors either (1) take 01:750:497,498, write a thesis, and conduct a seminar on a project undertaken in the senior year; or (2) take two physics and astronomy graduate courses. They also take advanced courses in addition to the required courses of the astrophysics curriculum. Honors are awarded on the basis of the excellence of the honors project (if applicable), general performance in physics and astrophysics courses, and recommendations of the faculty.

Astrophysics 105 (SAS)

# Courses

# Courses

For a description of the physics courses that are required for the astrophysics major, see the Physics 750 subject heading in this catalog.

**01:750:341,342** ***Principles of Astrophysics (3,3)***
Properties and processes of the solar system, the stars, and the galaxies; origin of the elements; evolution of the stars and the universe; neutron stars and black holes.
***Prerequisites: Two semesters of introductory physics and two semesters of calculus.***

**01:750:343** ***Observational Radio Astronomy (3)***
Observational study of the solar system, stars, and galaxies, using the Serin 3 meter radio telescope. Emphasizes computer techniques for data reduction and analysis. Topics may include calibrating system properties; the variability of the Sun, Jupiter, or quasars; and mapping the distribution of hydrogen in our Milky Way galaxy and measuring its rotation.
***Lec. 1.5 hrs., lab. 3 hrs. Prerequisites: 01:750:341,342 or permission of instructor. Lab schedule will vary through the semester. Credit not given for both this course and 01:105:343.***

**01:750:344** ***Observational Optical Astronomy (3)***
Observational study of the solar system, stars, and galaxies, using the Serin 0.5 meter optical telescope. Emphasizes computer techniques for data reduction and analysis. Topics may include the dimensions of lunar features, planetary satellite orbits, color-magnitude diagrams for star clusters, and the structure and colors of galaxies.
***Lec. 1.5 hrs., lab. 3 hrs. Prerequisites: 01:750:341,342, or permission of instructor. Students must have nighttime hours free for observing.***

**01:750:441** ***Stars and Star Formation (3)***
Observed properties of stars. Internal structure of stars, energy generation and transport, neutrinos, and solar oscillations. Evolution of isolated and double stars, red giants, white dwarfs, variable stars, supernovae. Challenges presented by formation of stars, importance of magnetic fields. Pre-main sequence stellar evolution.
***Prerequisites: 01:750:361, 385-386.***

**01:750:442** ***High Energy Astrophysics and Radiative Processes (3)***
Radiation and scattering processes in plasma. Detection and X- and gamma-rays. Supernovae and remnants, pulsars. Gamma-ray bursts. Accretion disks and binary star outbursts. Quasars and active galactic nuclei. Cosmic rays.
***Prerequisites: 01:750:361, 385-386.***

**01:750:443** ***Galaxies and the Milky Way (3)***
Properties of galaxies: photometry, kinematics, and masses. Disk galaxies; spiral patterns, bars and warps, gas content, star formation rates, chemical evolution. Elliptical galaxies; shapes. Structure of the Milky Way. Nature of dark matter.
***Prerequisites: 01:750:381-382, 385-386.***

**01:750:444** ***Introduction to Cosmology (3)***
Expansion of the universe, techniques for distance estimation. Large-scale structure of the universe. Cosmological models: open, closed, flat, and accelerating universes. Microwave background: observations, properties, and origin. Problems of standard cosmology and preliminary concept of inflation.
***Prerequisites: 01:750:361, 385-386.***

**01:750:497,498** ***Honors in Astronomy (1-6 BA,1-6 BA)***
Supervised independent research or reading in astronomy, culminating in a seminar conducted by the student.
***Prerequisite: Invitation of chair.***

# Biochemistry 115 (SEBS)

## BIOCHEMISTRY 115

**Degree**: B.S.

**Director:** Lori A. White (lori.white@rutgers.edu)

**Undergraduate Program Website:** Here

**Department Managing the Undergraduate Program in Biochemistry:** Biochemistry and Microbiology

**Department Chair:** Max Haggblom

**Department Website:** Here

The biochemistry major provides students with an integrated education in biochemistry that brings together the basics of biochemistry and its application to biological systems. The major takes advantage of the diversity of molecular/biochemical research and coursework that is offered at Rutgers School of Environmental and Biological Sciences (SEBS) and the other schools. Students will apply their basic understanding of biochemistry to a specific area of interest, ranging from toxicology/pharmacology to food and nutritional sciences, microbiology, animal science, and plant biology. This redesigned and enhanced curriculum follows the recommendations of the American Society for Biochemistry and Molecular Biology (ASBMB) and has components of both a traditional course-centered approach to teaching and the more current content- and outcome-centered approach. The purpose of the major is to prepare students for futures in science, either through obtaining advanced degrees or through entering the workforce in the pharmaceutical, biotechnological and chemical industries, government service, communications, law, and many other fields.

# Learning Goals

# Learning Goals

Upon graduation, students will have an understanding of the following:

1. Biochemistry graduates will be able to describe and discuss the basic concepts of biochemistry, including metabolism, enzymatic structure and function, and regulation of gene and protein expression.
2. Biochemistry Major graduates will be able to apply the scientific method, stating and testing a hypothesis, and will be able to design experiments to solve problems in biochemistry.
3. Graduates will gain hands-on experience in current biochemical techniques and be able to evaluate and present scientific data.
4. Upon completion, students will be able to critically analyze scientific data and scientific papers and be able to be effective science communicators
5. Graduates will be able to discuss and communicate a fundamental understanding of ethical and current issues in biochemistry and demonstrate an understanding of the importance of ethics in scientific research.

Biochemistry 115 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

Students matriculating prior to the fall semester 2015 in the School of Environmental and Biological Sciences (SEBS) must complete the SEBS general education requirements. In addition, students majoring in biochemistry must complete the major requirements described below.

Students matriculating fall 2015 or after and transfer students matriculating in 2016 and after must complete a goal-based Core Curriculum in place of general education requirements. The goal-based core is described here. Courses are certified for the Core Curriculum by a faculty committee. A current list of certified courses can be found here. Biochemistry major requirements are as described below.

For an up-to-date description of biochemistry major requirements, courses, and course sequences please refer to the program webpage.

**Proficiency in Biochemistry (90 credits)**

The major in Integrated biochemistry consists of the six parts listed immediately below. They are described briefly here; the specific requirements are listed below.

- **Life and Physical Sciences Core**
  These courses prepare students to enter the major. These courses are normally completed in the first two years of college.

- **Quantitative Methods**
  Quantitative reasoning, computational facility, and a grasp of calculus are essential skills for people to be well educated in molecular biosciences. As with the life and physical sciences core, students should normally complete this requirement within the first two years of college.
- **Biochemistry Core**
  This set of courses is required for all majors and prepares the student for both advanced coursework and research experience.
- **Professional Ethics**
  Ethical conduct has at least two components: general ethical behavior and the ethical implications for society at large as a consequence of advances in biochemistry. Although Contemporary Issues in Biochemistry will meet the formal requirement, all courses within the major will include ethical components and examples. In addition, all students in the major and in any of our courses will be required to adhere to a strict honor code.
- **Major-Related Experiential Learning**
  It is important that students be able to apply their knowledge of biochemistry in a laboratory setting. Therefore, all students will be required to take 6 credits of Experiential Learning. The School of Environmental and Biological Sciences requires 3 cr for graduation; therefore, Biochemistry Majors take an additional 3 cr. This can be accomplished through working in an academic laboratory at Rutgers, either at SEBS or the other campuses. This requirement can also be met through the George H. Cook Honors program, the General Honors Program, the Aresty Program, summer research opportunities (RISE or SURF), or through research experience through the Student Professional Internship Network (SPIN). The Research Experience may be structured to satisfy the college's experiential learning requirement.

- **Biochemistry Options**

    - **Biochemistry of Microbial Systems**
      This option blends biochemistry with microbiology, allowing students to become proficient in the biochemistry of microbial organisms and systems. This will include aspects of clinical microbiology and infection, as well as environmental microbiology. Microbial infections of higher organisms are of continuing importance in human and animal health. Microorganisms also have profound environmental implications. Microbial systems detoxify toxic substances and contribute to nutrient cycling in the ecosphere. Another area of study is the use of microbial organisms to synthesize useful materials and to convert biomass to fuels.
    - **Biochemical Toxicology**
      This option will allow the student to gain specific understanding of the study of toxic compounds. Toxicology is of critical importance in food and nutrition, the environment, and in pharmacological science. Understanding the biochemical effects allows one to design appropriate treatments of illness, and to learn what exposures must be avoided. An equally important second purpose, the study of how biochemical systems are made to go awry by toxic substances, illuminates normal functioning and development of organisms. This understanding applies equally to all animals, including humans, as well as to plants and microorganisms. It applies also to ecological communities of organisms, as toxic substances alter the interactions within ecosystems.

- **Biochemistry of Plant Systems**
  Plants are not only at the root of the human and animal food chains, they are one of the dominant components of the planet's ecosphere. Understanding their biochemistry is a large and growing area of basic and applied research and public policy development.
- **Protein and Structural Biochemistry**
  Biochemistry stands on two legs: structure and function. Neither can be understood without the other. The principles that confer thermodynamic stability--or the lack of it--on proteins, nucleic acids, and other biomolecules are universal to all forms of life as are the principles by which enzyme catalysis and other functions arise from three-dimensional structure. Evolution drives the formation of structure based on the functional needs of the organism and on the prior constraints imposed by the species' evolutionary history. In addition to basic understanding, study in this area develops the bases for protein design to solve practical problems.

**Detailed Requirements**

**I. Life and Physical Sciences Core**
*The following are required*
01:119:115/116 General Biology I, II (4,4)
01:119:117 Biological Research Laboratory (2)
01:160:161,162 General Chemistry I, II (4,4) or equivalent
01:160:171 Introduction to Experimentation (1)
01:750:193,194 Physics for the Sciences* (4,4) or
01:750:201,202 Extended General Physics (5,5) or
01:750:203,204 General Physics I, II (3,3)
01:160: 307,308 or 315,316 Honors Organic Chemistry I, II (4,4)
01:160:309 (2.5) or 311 Organic Chemistry Laboratory (2)
01:447:380 Genetics (4)

**II. Quantitative Core**
01:640:135 Calculus I for the Life & Social Sciences (4) OR
01:640:151 Calculus I for Mathematical & Physical Science (4)
01:640:136 Calculus II for the Life & Social Sciences (4) OR
01:640:152 Calculus II for Mathematical & Physical Science (4) OR
01:960:401) Basic Stats for Research (4) OR
01:960:211 Statistics I (4) and 01:960:212 Statistics II (4)
**FOR PROTEIN AND STRUCTURAL BIOLOGY OPTION Calc II is Required.

**III. Biochemistry Core**
11:115:201 Contemporary Issues in Biochemistry** (2)
11:115:403/404 General Biochemistry I, II (4,3)
*Note: To enroll in 11:115:403,404 General Biochemistry (4,3), students, be they majors in biochemistry or not, must have completed 01:160:307-308 Organic Chemistry (4,4) or 160:315-316 Honors Organic Chemistry with grades of C or higher.*

11:115:413/414 Experimental Biochemistry I, II (3,3)
11:115:409 Principles of Biophysical Chemistry (3) or
01:160:341Phys Chem Bio System (3)
11:115:491 Biochemical Communications (3)

***Normally taken in the sophomore year. Transfer students entering in the fall of the junior year will take it in the fall of that year. Among other matters included in it, this class will satisfy the ethics requirement for biochemistry majors.*

**IV. Upper Level Lab Courses(two of the following courses)**
11:115:436 Molecular Toxicology (3)
11:680:494 Applied Microbiology (4)
11:126:383 Nucleotide Sequence Analysis (3)
11:126:482 Molecular Genetics Laboratory (4)
11:126:484 Tools for Bioinformatic Analysis (3)
11:126:485 Bioinformatics (3)
11:776:452 Plant Tissue Culture (3)
01:146:357 Systems Physiology Lab (1)
01:160:251 Analytical Chemistry (3)
11:115:493/494 Research Problems in Biochemistry (3)
01:198:111 Intro to Comp Sci (3)
01:198:142 Data 100 Data Literacy (3)

**V. Ethics**
11:115:201 Contemporary Issues in Biochemistry (3)
11:115:321 Ethical Issues in Biochemical Research (3)
11:015:405 Ethics in Science (3)
11:015:433 Critical Scientific Thinking (3)
01:730:249 Bioethics (3)

**VI. Research Experience (3 cr)**
The curriculum is designed to provide students with the basics of laboratory experimentation followed by independent research experience in a research lab. A minimum of two semesters of research is required. With the approval of the undergraduate program director, Experiential Learning may be accepted to meet this requirement. Biochemical Communications provides the opportunity for students to present their own research, in both written and oral formats, as well as research from the biochemical literature.

11:115:493,494 (Research Problems in Biochemistry May be replaced by 11:015:497, 498 George H. Cook Honors Research,11:554:302 Aresty Research Assistantship

**VII. Options:**
Requires four classes from the specific lists below. Biochemistry electives, including option requirements, must equal at least 12 credits.
*Course(s) indicated by an * in each option is(are) required.*

**Biochemistry of Microbial Systems**
11:115:423 Fundamentals of Genomics (3)
11:680:390 General Microbiology (4)*
11:680:494 Applied Microbiology (4)
11:680:475 Microbiomes and Health (3)
11:680:480 Microbial Genetics and Genomics (3)
11:680:481 Microbial Physiology (3)
11:067:490 Pathophysiology (3)
11:126:486 Analytical Methods in Microbiology (3)
11:126:407 Comparative Virology (3)
11:126:481 Molecular Genetics (3)
01:146:481 Virology (3)
01:146:474 Immunology (3)
11:216:405 Evolution in Infectious Disease (3)
11:400:423 Food Microbiology

**Biochemical Toxicology**
11:115:421 Biochemistry of Cancer (3)
11:115:422 Biochemical Mechanisms of Toxicology (3)*
11:115:436 Molecular Toxicology Laboratory (3)
11:067:450 Endocrinology (4)
11:067:300 Integrative Physiology (4)
11:067:301 Integrative Physiology Lab (1)
11:067:490 Pathophysiology (3)
11:067:491 Reproductive and Developmental Toxicology (3)
01:146:356 Systems Physiology (3)
01:146:474 Immunology (3)
11:126:481 Molecular Genetics (3)
01:146:245 Fundamentals Of Neurobiology (3)
01:146:270 Fundamentals of Cell and Developmental Biology (3)
01:146:295 Essentials of Cell Biology and Neurobiology (3)
01:146:445 Advanced Neurobiology I (3)
01:146:447 Advanced Neurobiology II (3)

**Biochemistry of Plant Systems**
11:115:423 Fundamentals of Genomics (3)
16:765:520 Plant Biochemistry and Metabolism (3)*
11:776:382 Plant Physiology (4)
11:776:302 General Plant Pathology (3)
11:776:312 Medicinal Plants (3)
11:776:242 Plant Science (3)
11:776:305 Plant Genetics (4)
11:776:312 Medicinal Plants (3)
11:776:415 Hemp and Medical Cannabis (3)
11:776:403 Plant Science Techniques (3)

11:776:415 Fungi and Human Health (3)
11:776:438 Plants and Human Health (3)
11:776:452 Plant Tissue Culture & Engineering (3)

**Protein and Structural Biochemistry**
11:115:423 Fundamentals of Genomics (3)
11:115:485 Advanced Methods for 3D Structure Determination of Biomolecules (3)
11:216:405 Evolution in Infectious Diseases (3)
01:160:344 Introduction to Molecular Biophysics Research (3)
01:160:410 Introduction to Molecular Modeling (3)
01:160:418 Bioorganic Mechanisms (3)
01:160:480 Structural Biology, Structural Biophysics, and Chemical Biology of Transcription (3)01:640:251 Multivariable Calculus III (4)
01:694:412 Proteomics and Functional Genomics (3)
01:694:413 Chromatin and Epigenomics: The Science of Chromatin Modifications in Development and Disease (3)
01:160:480 Structural Biology, Structural Biophysics, and Chemical Biology (3)
11:115:485 Structural Biochemistry (3)

**General Option (12 cr total)**
12 credits of classes taken from any of the above lists

**Unspecified Electives**
In addition to courses meeting the above requirements, students can take other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 120 (matriculated 2018 or later) or 128 (matriculated prior to 2018) required for graduation.

# Biological Sciences 119 (SEBS)

## BIOLOGICAL SCIENCES 119

**Degree:** B.A.

**Program Director:** Martha Haviland (haviland@biology.rutgers.edu)

**Director of Advising:** Anne Carr-Schmid (schmid@biology.rutgers.edu)

**Adviser:** Joseph Ventola (ventola@rutgers.edu)

Students in the School of Environmental and Biological Sciences (SEBS) may choose the major in biological sciences, which is offered by the School of Arts and Sciences (SAS). Completion of the major prepares students for graduate study; for careers in government, industry, or secondary school teaching; and also satisfies the entrance requirements for medical and dental schools.

Students interested in more specialized majors in the life/biological sciences (such as agriculture and food systems; animal science; biochemistry; biotechnology; cell biology and neuroscience; ecology, evolution, and natural resources; exercise science; food science; genetics; marine sciences; microbiology; molecular biology and biochemistry; nutritional sciences; or plant biology) should refer to the relevant sections of the catalog and should also contact the program coordinator or adviser for the specific major of interest.



# Learning Goals

# Learning Goals

Our overarching goal for educating our students majoring in biological sciences is to inspire them to want to discover and understand the natural world. In the process of achieving this goal, we expect our students to acquire not only facts and concepts but also skills and perspectives. We hope that our learning goals will both prepare our students for a variety of career objectives and supply them with the tools to become lifelong learners in the ever-evolving world of biological sciences.

**Learning Goals**

I. To acquire the appropriate factual and conceptual knowledge that provides students with a foundation to further their education and career in the areas of life science or health science. Students will be able to demonstrate basic knowledge (e.g., identify, define, explain, etc.) of the concepts, practices, and principles that comprise the biological sciences.

II. To develop data analysis and statistical reasoning skills that prepare students for a society increasing reliant on the use of data and information. Students will be able to interpret/evaluate patterns in data presented in tables, figures, and graphs as well as be able to organize, summarize, and present data.

III. To develop the ability to use scientific reasoning as embodied by the structured process commonly known as the scientific method to empower students with the ability to generate and refine knowledge. Students will be able to evaluate and apply the practice of science.

IV. To develop critical thinking and problem-solving skills appropriate to prepare students to evaluate, synthesize, and generate knowledge that provides them with a competitive advantage to adapt to an evolving, global, and knowledge-based society. Students will be able to demonstrate application of higher order thinking (e.g., classify, diagnose, evaluate, synthesize, hypothesize, etc.). Students will develop an understanding of not only the connections within biology but also the connections between biology and other scientific disciplines.

Biological Sciences 119 (SEBS)

## Entry Requirements for the Major

## Entry Requirements for the Major

Students wishing to major in biological sciences must have completed two semesters of General Biology and the Biological Research Laboratory with a grade of C or better in each course. Both semesters of General Biology must have been completed at the same institution or on the same campus at Rutgers. No more than two courses with a grade of D may be used to fulfill the requirements of the major. A 2.0 GPA must be maintained in the life sciences core and elective courses applied toward the major. Students must meet with an adviser before they can successfully declare their major.

Biological Sciences 119 (SEBS)

## Graduation Requirements for the Major

## Graduation Requirements for the Major

**A. Major Requirements (73 credits)**

The major in biological sciences is offered by the School of Arts and Sciences (SAS). It involves 49 credits of required life science core courses, and 24 credits of approved life science electives. No more than two courses with a grade of D may be used to fulfill the requirements of the major. Please refer to the SAS section of the catalog for the Life Sciences for a full description of the requirements of the major.

**B. Additional SEBS Requirements for Students Majoring in Biological Sciences**

School of Environmental and Biological Sciences (SEBS) biological sciences majors matriculating fall 2015 or after and transfer students matriculating in 2016 must complete a goal-based Core Curriculum. A current list of certified courses can be found here.

SEBS biological sciences majors matriculating prior to the fall semester 2015 must complete major requirements as described in the SAS section of the catalog for the Life Sciences as well as the general education requirements.

# Mathematics 640 (SAS)

## MATHEMATICS 640

Department of Mathematics, School of Arts and Sciences

**Website:** Here

**Chair:** Stephen D. Miller

**Undergraduate Vice-Chair:** Avraham Soffer

**Associate Undergraduate Vice-Chair for Assessment:** Lewis Hirsch

**Distinguished Professors:**

Michael Beals, B.A., M.S., Chicago; Ph.D., Princeton

Lev A. Borisov, B.S., Moscow State; Ph.D., Michigan

Fioralba Cakoni, Dip. Math, M.S., Tirana (Albania); Ph.D., Patras/Tirana (Albania)

Eric Carlen, B.A., Virginia; Ph.D., Princeton

Sagun Chanillo, B.S., M.S., Indian Institute of Technology; Ph.D., Purdue

Paul Feehan, B.Eng., Dublin; M.S., Missouri; M.A., Southern California; M.S., Ph.D., Columbia

Gerald Goldin, Graduate School of Education; Ph.D., Princeton

Sheldon Goldstein, B.S., M.A., Ph.D., Yeshiva

Xiaojun Huang, B.S., Nanjing Aeronautical Institute (China); M.S., Wuhan (China); Ph.D., Washington

Henryk Iwaniec, Ph.D., Warsaw

Jeffry Kahn, B.S., Rensselaer Polytechnic Institute; Ph.D., Ohio State

János Komlós, Ph.D., Eötvös (Budapest)

Joel L. Lebowitz, B.S., CUNY (Brooklyn College); M.S., Ph.D., Syracuse

James Lepowsky, A.B., Harvard; Ph.D., Massachusetts Institute of Technology

Yanyan Li, B.S., Hefei (China); M.S., Academica Sinica (Taiwan); Ph.D., New York

Feng Luo, B.S., Beijing; Ph.D., California (San Diego)

Stephen D. Miller, A.B., California (Berkeley); M.A., Ph.D., Princeton

Konstantin Mischaikow, Ph.D., Wisconsin

Fred S. Roberts, Director, DIMACS; A.B., Dartmouth College; M.S., Ph.D., Stanford

Xiaochun Rong, B.S., M.A., Beijing Teachers College (China); Ph.D., SUNY (Stony Brook)

Michael Saks, B.S., Ph.D., Massachusetts Institute of Technology

Natasa Sesum, B.A., Belgrade (Yugoslavia); Ph.D., Massachusetts Institute of Technology

Avraham Soffer, B.S., M.S., Ph.D., Tel Aviv

Simon Thomas, B.S., Ph.D., London

Pham Tiep, Ph.D., Moscow State (Russia)

Michael S. Vogelius, Cand. Scient., Aarhus (Denmark); Ph.D., Maryland

Charles Weibel, B.S., B.A., Michigan; S.M., Ph.D., Chicago

Christopher Woodward, A.B., Harvard; Ph.D., Massachusetts Institute of Technology

Doron Zeilberger, B.S., London; Ph.D., Weizmann Institute of Science (Israel)

**Professors:**

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Lisa Carbone, M.S., Melbourne; M.A., M.Ph., Ph.D., Columbia

Zheng-Chao Han, B.S., Beijing; M.S., Ph.D., New York

Yi-Zhi Huang, B.S., M.S., Fudan (China); Ph.D., Rutgers

Michael Kiessling, Doctor of Nat. Sci., Habil. Diplomphysiker, Bochum (Germany)

Alexander Kontorovich, B.A., Princeton; Ph.D., Columbia

Kasper Larsen, Ph.D., Southern Denmark

Liping Liu, B.E., Beijing; Ph.D., Minnesota

Juan Pablo Mejia-Ramos, Graduate School of Education, B.S., Universidad de Los Andes (Colombia); M.S., Ph.D., Warwick (UK)

Vladimir Retakh, M.A., Ph.D., Moscow Pedagogical Institute

Siddhartha Sahi, B.S., Delhi (India); M.A., Ph.D., Yale

Vladimir Scheffer, B.S., M.S., Florida; Ph.D., Princeton

Jian Song, B.S., Tsinghua (China); M.A., Ph.D., Columbia

A. Shadi Tahvildar-Zadeh, B.S., Sharif (Iran); M.S., Ph.D., Courant Institute of Mathematical Sciences

**Associate Professors:**

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Chi Li , Ph.D., Princeton

**Assistant Professors:**

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Daniel Ketover, Ph.D., Massachusetts Institute of Technology

Dennis Kriventsov, B.S., Chicago; Ph.D, Austin

Konstantin Matveev , Ph.D., Harvard

Mariusz Mirek, Ph.D., Wroclaw (Poland)

Bhargav Narayanan, Ph.D., Cambridge

Hongbin Sun, Ph.D., Princeton

Kimberly Weston, Ph.D., Carnegie Melon

**Teaching Professor:**

Lewis Hirsch, Ph.D., Pennsylvania State

**Associate Teaching Professors:**

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Shari Prevost, Ph.D., Rutgers

Mathew Sequin , Ph.D., Ohio State

Sara Soffer, B.S., Tel-Aviv; M.S., California Institute of Technology; Ph.D., Rutgers

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Malcolm N. S. Bowles , Ph.D., British Columbia (Canada)

Matthew Charnley, Ph.D., Rutgers

Mariano Echeverria, Ph.D., Virginia

Carrie F. Frizzell, Ph.D., Kansas State

Alejandro Ginory, Ph.D., Rutgers

Sophia Gonet, Ph.D., Vermont

Lasantha Goonetilleke , Ph.D., Purdue

Joseph Guadagni, Ph.D., New York

Moulik Kallupalam Balasubramanian, Ph.D., Rutgers

Melissa Lieberman, B.A., Ed.M., Rutgers

Ioanna Mavrea, M.S., Connecticut

Nishali Mehta, B.A., California (Berkeley); M.A., California (Los Angeles); Ph.D., Ohio

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Saiju Patel, B.S., M.S., Maharaja Sayajirao (India)

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Joshua Salamon, M.A., Brooklyn

Emily Sergel, Ph.D., California (San Diego)

Vladimir Shtelen, M.S. Physics, Kiev; Ph.D., Institute of Mathematics of the Academy of Sciences of the Ukrainera

Laura Nicole Silverstein , Ph.D., Vienna University of Technology (Austria)

Sheila Tabanli, Ph.D., Missouri University of Science and Technology

Peter Ullman, M.S., Emporia State

Laurent Vera , Ph.D,, California (Los Angeles)

**Faculty Emeriti:**

Tadeusz Balaban, M.S., Ph.D., Warsaw

József Beck, Ph.D., Hungarian Academy of Sciences

Haim Brezis, Doctorat, Paris

Richard Bumby, Ph.D., Princeton

Terence Butler, Ph.D., Indiana

Gregory Cherlin, Ph.D., Yale

Richard Falk, Ph.D., Cornell

Steven Ferry, Ph.D., Michigan

Simon Gindikin, M.A., Ph.D., Moscow

Roe Goodman, Ph.D., Massachusetts Institute of Technology

Stephen Greenfield, Ph.D., Brandeis

Antoni Kosinksi, Ph.D., Institute of Mathematics, Polish Academy of Sciences (Poland)

Peter Landweber, Ph.D., Harvard

Richard Lyons, Ph.D., Chicago

Richard Nussbaum, Ph.D., Chicago

Daniel Ocone, Ph.D., Massachusetts Institute of Technology

Barbara Osofsky, Ph.D., Rutgers

Ted Petrie, Ph.D., Princeton

Eugene Speer, Ph.D., Princeton

Héctor Sussmann, M.A., Buenos Aires; Ph.D., New York

Jean Taylor, Ph.D., Princeton

Francois Treves, Ph.D., Université Paris IV-Sorbonne (France)

Bertram Walsh, Ph.D., Michigan

Robert Wilson, Ph.D., Yale

Mathematics 640 (SAS)

# Learning Goals

# Learning Goals

Majors will be able to employ problem-solving skills in a wide range of modern mathematics, analyze quantitative information and apply advanced mathematics techniques and concepts where appropriate, communicate rigorous mathematical ideas and reasoning effectively, appropriately use supporting technology, and work cooperatively as part of a team to solve mathematical problems. Top students will demonstrate experience in research. Students in combined math/education programs will be able to demonstrate a broad perspective on mathematics, including the history of the subject, and an understanding of the connections between college mathematics and the state's curriculum framework. Students in the bachelor of science (B.S.) program (honors track) will be prepared to engage in graduate-level work in a doctoral program.

Minors will be able to demonstrate an understanding of the special nature of mathematical thinking, create and communicate mathematical arguments, and apply mathematical knowledge and techniques in advanced courses in their major discipline.

Biomath majors will be able to employ problem-solving skills in a wide range of modern mathematics; solve mathematical problems and apply mathematics, mathematical concepts, and mathematical models to problems in biology; communicate rigorous mathematical ideas and mathematical reasoning effectively; conduct laboratory work in the biological sciences; and pursue graduate study, medical school, or research jobs in government and industry.

The general liberal arts student will be able to employ elementary mathematics and discuss bringing abstract mathematics to bear on areas related to everyday life, such as political science, personal finance, or games of chance. Students whose majors require more advanced mathematics will be adequately prepared. Students aiming toward careers in elementary school education will be able to pass state-mandated examinations before certification, and to satisfy the university's course requirements related to certification. Students aiming at actuarial careers will be able to pass the exams for professional certification, including the P, FM, and LTAM exams.

# Major Requirements

# Major Requirements

The Department of Mathematics annually publishes a *Brochure for Math Majors*, which contains detailed information about the math major program; copies of this brochure may be obtained on the web here.

**The requirements for a math major are as follows:**

1. Three semesters of calculus (01:640:151-152, and 251 or equivalent), Introductory Linear Algebra (01:640:250), and Elementary Differential Equations (01:640:252). Courses 01:640:250, 251, and 252 must be passed with grades of C or better. Majors normally should take both 01:640:250 and 251 no later than the first semester of their sophomore year.

2. 01:198:107 Computing for Mathematics and the Sciences with a grade of C or better. (01:198:111 Introduction to Computer Science or 14:332:252 Programming Methodology I may be substituted for 01:198:107.) It is recommended strongly that this course be completed by the end of the second semester of the sophomore year.

3. The completion of all the requirements in one of the mathematics major options listed below. (Students must notify the mathematics department in writing if they are not following the standard mathematics major option. Courses in other departments may not be substituted).

**Grade Requirements for Mathematics Majors**

To be admitted to the mathematics major program, a student normally must have completed three semesters of calculus with a grade of C or better in each course. To continue as a mathematics major, a student must make satisfactory progress toward completing the program. Satisfactory progress for a full-time student normally means passing at least one mathematics course at an appropriate level each semester with a grade of C or better. To complete the mathematics major program, a student must receive grades of C or better in 01:640:250, 251, and 252 and in all but one of the further mathematics courses. A student also must receive grades of C or better in the courses in other departments (e.g., computer science) used to fulfill the requirements of the program.

**Mathematics Major Options**

***Option A, Standard Mathematics (Curriculum Code 640).*** In addition to the requirements above, to complete the standard mathematics major a student must pass eight 300- to 400-level mathematics courses, excluding 01:640:491,492. All but one of these courses (curriculum code 640) must be passed with a grade of C or better. At least four of the upper-level courses used to complete the major must be taken at Rutgers University-New Brunswick, including one of 01:640:311,312, 411-412, and one of 01:640:350, 351, 451-452. An appropriate Rutgers graduate mathematics course may be substituted for the required analysis and/or algebra course, with departmental approval.

Recommended are probability (01:640:477), statistics (01:640:481), a course in mathematical modeling (01:640:321, 338, or 478), and a course in discrete mathematics (01:640:338, 354, 428, or 454). Also recommended is a two-semester sequence of mathematically oriented courses in some other discipline.

***Option B, Honors Track.*** The Department of Mathematics offers a special honors track to qualified students. Admission to the honors track is by application, which is available from the mathematics undergraduate office or from the mathematics department website. Students should normally apply no later than the end of the first semester of their sophomore year. Students in the honors track will have their progress reviewed by the honors committee, and are expected to earn a B or better in their advanced math courses (300 level and above). Students who successfully complete the honors track are eligible for graduation with a bachelor of science.

Each student in the honors track will be assigned a faculty adviser. Together with the adviser, he or she will formulate a proposed course plan, subject to the approval of the mathematics honors committee. This course of study will normally include 01:640:291 and 292 (01:640:151,152, 251, and 252 may be accepted if approved by the Honors Committee); either 01:198:107 or 01:198:111; 01:640:250, 300 (honors), 411-412, and 451-452; two semesters of 1-credit honors seminar, at least one at the junior/senior level; and four mathematics electives as approved by the honors committee.

**Option C, Actuarial Mathematics Track**. The actuarial track in mathematics requires 66 credits, primarily in mathematics and economics, as indicated below. See Brochure for Math Majors.

I. Core Math and Computer Science Courses (21 credits total)
Calculus I-IV; 01:640:151, 152, 251, 252
Linear Algebra; 01:640:250
Computer Science; 01:198:107 or 01:198:111

II. Core Economics and Accounting Courses (9 credits total)
Micro- and macroeconomics; 01:220:102, 01:220:103
Accounting 33:010:272

III. Additional Mathematics Courses (21 credits total)
Required courses:

01:640:285 Introduction to Interest Theory for Actuarial Sciences (3) (covers material on the SOA FM exam; students who pass the FM exam may be excused from this requirement)

01:640:477 Mathematical Theory of Probability (3) (Covers Material on the SOA P exam)

01:640:481 Mathematical Theory of Statistics (3) (Covers Material on the SOA P exam)

01:640:486 Mathematics of Life Contingent Risk Models I (3) (covers material on the SOA LTAM exam)

Elective courses: three additional mathematics courses at the level of 300 and above. The following are recommended:
01:640:485 Introduction to Mathematical Finance (3) (covers material on the SOA FM exam)
01:640:478 Introduction to Stochastic Processes (3)
01:640:487 Mathematics of Life Contingent Risk Models II (3) (covers material on the SOA LTAM exam)
01:640:354 Linear Optimization (3)
01:640:373 Numerical Analysis (3)

IV. Additional Economics courses (15 credits)
Required:
01:220:320 Intermediate Microeconomic Analysis (3)
01:220:321 Intermediate Macroeconomic Analysis (3)
01:220:322 Econometrics (3)

Students must take two additional electives from the following list:

Other 300/400-level math courses
01:220:421 Economic Forecasting and Big Data (3)
01:220:413 Financial Economics (3)
01:220:423 Advanced Time Series and financial Econometrics (3)
01:220:481 Economics of Uncertainty (3)

**Biomathematics Interdisciplinary Major (Curriculum Code 122)**

The biomathematics interdisciplinary major requires 63-67 credits distributed as follows: mathematics 33 credits, and biology and cognate fields 30-34 credits. A grade of C or better in courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades. See *Brochure for Math Majors.*

Core biology and chemistry required courses:

01:119:115-116 General Biology I and II (4,4), or equivalent
01:160:161-162 General Chemistry I and II (4,4), or equivalent
01:160:171 Introduction to Experimentation (1)

Mathematics required courses:

01:640:151,152, 251 Calculus for Mathematical and Physical Sciences I, II, and III (4,4,4)
01:640:250 Introductory Linear Algebra (3)
01:640:252 Elementary Differential Equations (3)
01:640:336 Dynamical Models in Biology (3)
01:640:338 Discrete and Probabilistic Models in Biology (3)
01:640:477 Mathematical Theory of Probability (3)
01:640:481 Mathematical Theory of Statistics (3)

One of the following courses:

01:640:350 Linear Algebra (3)
01:640:373 Numerical Analysis (3)
01:640:423 Elementary Partial Differential Equations (3)
01:640:428 Graph Theory (3)
01:640:454 Combinatorics (3)
01:640:478 Introduction to Stochastic Processes (3)

Required lab, one of the following:

01:146:357 (1); 01:146:475 (1); 14:125:315 (1)

Note: 01:447:390 is a 4-credit elective (see below) and includes a lab that satisfies this requirement.

Electives:
Four courses from the following list. 01:447:380 is highly recommended. No more than one course from 14:125 (biomedical engineering) can count as an elective.

01:146:245 Fundamentals of Neurobiology (3)
01:146:270 Fundamentals of Cell and Developmental Biology (3)
01:146:302 or 01:447:302 Computers in Biology (3)
01:146:356 Systems Physiology (3)
01:146:445 Advanced Neurobiology (3)
01:146:470 Advanced Cell Biology (3)
01:146:474 Immunology (3)
01:185:335 Neural Structure of Language (3)
01:185:350 Fundamentals of Cognitive Neuroscience (3)
01:160:305 (3) or 307 (4) or 315 (4) Organic Chemistry
01:160:306 (3) or 308 (4) or 316 (4) Organic Chemistry
01:447:380 Genetics (4)
01:447:384 Genetic Analysis (4)
01:447:390 General Microbiology (4)
01:447:480 Topics in Molecular Genetics (3)
01:447:486 Evolutionary Genetics (3)
11:704:486 Principles of Evolution (3)
11:216:351 Principles of Applied Ecology (3)
11:216:431 Fundamentals of Ecological and Environmental Modeling (4)
11:216:486 or 11:704:486 Principles of Evolution (3)
11:776:495 Functional Genomics for Research (3)
16:215:513 Population Genetics (01:447:380) (3)

No more than one of:

01:146:478 Molecular Biology (3)
01:694:301 Introductory Biochemistry and Molecular Biology (3)
01:694:407 Biochemistry (3)
01:694:408 Molecular Biology and Biochemistry (3)

No more than one of:

14:125:303 Biomedical Transport Phenomena (3)
14:125:403 Cardiovascular Engineering (3)
14:125:407 Fundamentals of Computer Tomography (3)
14:125:410 Sensory Processes, Mechanisms, and Computational Models (3)
14:125:437 Computational Systems Biology (3)

**Graduation with Honors in Biomathematics**

The interdisciplinary major in biomathematics has a program to recognize graduating biomathematics majors for outstanding performance. Such students, upon graduation, may be awarded honors in biomathematics.

Note that the requirements for graduation with honors in biomathematics are distinct from other honors graduation programs such as the honors program of the School of Arts and Sciences. Students may qualify for one or more honors programs, in multiple departments.

Students who will meet the requirements for biomathematics graduation honors and wish to be considered for graduation with honors in biomathematics should file the Intent to Complete Biomathematics Honors by February of their senior year, in order to ensure consideration.

To graduate with biomathematics honors, a biomathematics major must:

1. have a cumulative grade-point average of 3.4 or better in the five mathematics courses at or above the 300 level taken to fulfill the biomathematics required and elective courses;
2. have a cumulative grade-point average of 3.4 or better in the four courses taken to fulfill the biomathematics required upper-level science courses;
3. have an overall cumulative grade-point average of 3.0;
4. at least one of 01:640:336 and 01:640:338 must be completed with a grade of B+ or better; and
5. must have completed with a B+ or better grade in the biomathematics research courses 01:122:491 and 01:122:492.

**Statistics-Mathematics Interdisciplinary Major (Curriculum Code 961)**

See Statistics 960.

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# Minor Requirements

# Minor Requirements

A minor in mathematics consists of three semesters of calculus (ordinarily 01:640:151-152, 251), linear algebra (01:640:250), and four additional 3- or 4-credit courses, one of which may be either 01:640:244 or 252, and the rest of which must be 300- or 400-level mathematics courses (curriculum code 640). Three of the four courses beyond 01:640:251 must be taken at Rutgers University-New Brunswick. Grades of C or better are required in 01:640:250 and 251; at most, one D is permitted in the four courses beyond 01:640:250.

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# Departmental Honors Programs

# Departmental Honors Programs

Eligible first-year students and sophomores may take 01:640:291 and 292, which are honors courses in second-, third-, and fourth-semester calculus, respectively. The department also offers an honors version of 01:640:300 Introduction to Mathematical Reasoning and honors versions of proof-based courses in abstract algebra and real analysis.

Entry into these courses is determined by the department and is based on the student's previous performance in mathematics. The department occasionally offers honors sections of other courses.

To graduate with departmental honors, a mathematics major must have a cumulative grade-point average of at least 3.4 or better in mathematics courses at the 300 level or above and an overall cumulative grade-point average of at least 3.0, and must complete successfully two courses that are either approved independent study courses, approved graduate courses, approved sections of 300- or 400-level courses, or an approved project. A student who would like to have a course count toward the two-course honors requirement must apply at the department office no later than the first week of classes of the semester during which he or she takes the course. The determination of whether a candidate graduates with departmental honors depends on the student's total performance in mathematics (including the written exposition of mathematical ideas). A more detailed description of the honors program can be obtained at the departmental offices or on the website.

Mathematics 640 (SAS)

# Preparation for Secondary School Teaching

# Preparation for Secondary School Teaching

There are several paths that Rutgers students can follow to prepare for a career in secondary school teaching.

1. The five-year mathematics teacher preparation program in the Rutgers University Graduate School of Education (GSE) integrates the mathematics undergraduate program with teaching preparation, leading to a bachelor of arts (B.A.) degree in mathematics, a master of education (M.Ed.) degree, and New Jersey teacher certification. Students must apply for admission (usually in the junior year), complete a standard mathematics major, satisfy undergraduate requirements set by the GSE as well as those set by the School of Arts and Sciences, and, in the fifth year, complete additional coursework, including an additional mathematics elective, and do a student teaching internship. The nine required mathematics courses at the 300 to 400 level must include 01:640:300, 311, 351, 435, 437, 477, 481, and an applied math course.

2. After completing the mathematics major, students may obtain an M.Ed. and New Jersey teacher certification through the Rutgers GSE postbaccalaureate certification program or through postbaccalaureate certification programs at other institutions. Application to the program may be made in the fall of a student's senior year or anytime after graduation. This 45-credit program requires coursework in both mathematics and education as well as a student teaching internship, and may be pursued either full time or part time.

3. Other paths to secondary school mathematics teaching include: 1) "alternate route" certification, which usually requires a period of apprenticeship in a high school and 200 hours of coursework at a cooperating college or university; and 2) teaching without certification in a private independent or parochial school.

Prospective teachers should contact the mathematics department and/or the Office of Teacher Education in the Graduate School of Education as early as possible in their undergraduate careers and should stay informed about the rapidly evolving procedures and standards for certification. Further information on all Rutgers teaching programs can be obtained from GSE or from the website.

Mathematics 640 (SAS)

# Five-Year Bachelor of Arts/Master's Programs

# Five-Year Bachelor of Arts/Master's Programs

Many career paths in business, industry, and government depend on mathematical modeling and mathematical analysis. Rutgers offers five-year B.A./M.S. tracks that help to prepare students for entry into such careers. Tracks leading to master's degrees are available in fields such as economics, mathematical finance, industrial and systems engineering, and statistics. There is also a five-year, dual-degree track with the Graduate School of Education (see the catalog section Preparation for Secondary School Teaching). With proper planning, students in these tracks can finish a bachelor of arts degree in mathematics and a master's degree from one of these fields within five years.

The various tracks differ in details and requirements, but share the following common features. Undergraduate math majors apply for entry into a five-year track before their senior year. Accepted applicants are admitted to the master's program contingent upon successful completion of their undergraduate mathematics degree, plus additional coursework in their area of applied interest. Typically, this requires students to take as undergraduates more than the standard 120 credits needed for graduating with a bachelor of arts degree. Some of these credits will be in graduate courses and will count toward the master's degree. In the fifth year, accepted students complete the coursework for the master's program. More detailed information on the five-year tracks is available on the mathematics department webpage.

Students will find that a mathematics major is excellent preparation for graduate study in statistics, operations research, industrial engineering, economics, or financial mathematics, even if they choose not to pursue a five-year track. Such students would apply to graduate programs in these areas in their senior year, as normal. Departmental advisers can guide students in their selection of coursework outside the mathematics department to best prepare them for the graduate programs of their choice.

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# Before Taking Mathematics Courses

# Before Taking Mathematics Courses

Entering first-year students and most transfer students are required to take the mathematics placement test before registering for any mathematics course at Rutgers University-New Brunswick. Students will be informed by their school of the times for taking the test.

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# Courses

# Courses

The following abbreviations are used in the course listing.

1. CALC1 indicates that the prerequisite is any one of 01:640:135 or 151.

2. CALC2 indicates that the prerequisite is 01:640:152.

3. CALC3 indicates that the prerequisite is any one of 01:640:251 or 291.

4. CALC4 indicates that the prerequisite is any one of 01:640:244, 252, or 292.

5. CR1 indicates that students may not receive credit for more than one of the first-semester calculus courses 01:640:135 or 151.

6. CR2 indicates that students may not receive credit for more than one of the courses including second-semester topics 01:640:136 or 152.

7. CR3 indicates that students may not receive credit for more than one of the courses including third-semester topics 01:640:251 or 291.

8. CR4 indicates that students may not receive credit for more than one of the fourth-semester courses 01:640:244, 252, or 292.

**01:640:011** ***Precalculus I Workshop (E2)***
Workshop to accompany 01:640:111.
***Corequisite: 01:640:111.***

**01:640:012** ***Precalculus II Workshop (E2)***
Workshop to accompany 01:640:112.
***Corequisite: 01:640:112.***

**01:640:013** ***Preparation for Calculus Workshop (E2)***
Workshop to accompany 01:640:123. Hybrid online.
***Corequisite: 01:640:123.***

**01:640:025** ***Elementary Algebra (E3)***
Operations with polynomials, rational and square root expressions, exponents, solving linear and quadratic equations, basic applications, and graphing.

**01:640:026** ***Intermediate Algebra (E3)***
Absolute value equations and inequalities, radical expressions, rational exponents, quadratic equations and inequalities, introduction to functions, and topics in analytic geometry.
***Prerequisite: 01:640:025 or appropriate performance on the placement test in mathematics.***

**01:640:103** *Topics in Mathematics for the Liberal Arts (3)*
Topics in mathematics including voting theory, apportionment, fair division, exponential growth in nature and finance, Euler circuits, Traveling Salesman Problem, and networks.
*An elementary course for liberal arts majors. Prerequisite: 01:640:025 or appropriate performance on the placement test in mathematics. May not be used as an elective for the math major or minor.*

**01:640:104** *Introduction to Probability (3)*
Concrete introduction to probability and its applications, with some statistics. Intended for majors in social science or liberal arts disciplines.
*Prerequisite: 01:640:026 or 027 or placement. May not be used as an elective for the math major or minor. May not be taken for credit simultaneously with or after a student has received credit for any of the following courses: 01:640:477, 01:198:206, 01:960:379, 01:960:381, 14:332:226, 14:540:210.*

**01:640:106** *Mathematics of Money (3)*
Introduction to the uses of college-level mathematics in personal finance applications, including mortgages, student loans, and leasing. Some related nonfinancial applications. May not be used as an elective for the math major or minor. Not intended for students majoring in business, economics, or STEM fields.
*Prerequisite: 01:640:025.*

**01:640:107** *Number and Operation for K-8 Teaching (3)*
Reexamination of familiar mathematical ideas, primarily about number systems and arithmetic operations, in the context of mathematics as a whole and from the perspective of young students first learning them. Emphasis on reasoning and communication.
*Prerequisites: 01:640:025 or appropriate performance on the placement test in mathematics, and permission of department. For students interested in pursuing a career in elementary school teaching. May not be used as an elective for the math major or minor.*

**01:640:108** *Problem Solving and Reasoning with Discrete Mathematics (3)*
Discrete mathematics as a tool for developing problem-solving and reasoning skills. Applications of vertex-edge graphs and systematic counting, which can be introduced at K-8 grade levels. For students interested in a career in teaching in elementary or middle schools.
*Prerequisites: 01:640:026 or 027 or appropriate performance on the placement test in mathematics, and permission of department. May not be used as an elective for the math major or minor.*

**01:640:109** *Geometry and Measurement for Middle Grades Teaching (3)*
Math content course on geometry and measurement stressing depth of understanding needed for effective middle grade teaching. Justifying procedures and formulas. Multiple points of view in explanations. Geometric objects in two and three dimensions. Transformations, symmetry, congruences, similarity, scaling. Perimeter, area, volume. Error estimates in measurement. Changing units.
*Prerequisites: 01:640:026 or 107 or placement into 01:640:111, and permission of department. Primarily for those intending to teach in grades K-8.*

**01:640:110** *Algebra for Middle School Teachers (3)*
Examines algebraic thinking in the context of middle school algebra, with emphasis on mathematical reasoning, conceptual reasoning, and communicating concepts effectively.
*Intended for future and current K-8 teachers. Prerequisite: 01:640:107 or permission of the department.*

**01:640:111-112** *Precalculus I,II (2,2)*
Math 111: Algebraic expressions, algebraic equations, inequalities, functions, and graphing. Math 112: Exponential, logarithmic, and trigonometric functions.
*Prerequisite: 01:640:026 or appropriate performance on the placement test in mathematics. Corequisites: 01:640:011 for 111; 01:640:012 for 112. These two courses cover the same material as 01:640:115, but at a slower pace. Students may not receive more than 4 normal credits for any combination of 01:640:111-112 and 115.*

**01:640:115** *Precalculus College Mathematics (4)*
Algebraic expressions, algebraic equations, inequalities, functions, and graphing. Exponential, logarithmic, and trigonometric functions.
*Prerequisite: 01:640:026 or appropriate performance on the placement test in mathematics. Students may not receive more than 4 normal credits for any combination of 01:640:111-112 and 115. Students who feel unprepared for this course (who have not had math for several years or whose mathematical background is weak) should consider taking 01:640:111-112, which covers the same material as 115 but at a slower pace and begins with an extensive review of intermediate algebra.*

**01:640:123** *Preparation for Calculus I (2)*
Beginning after six weeks of the semester for students who start Calculus 1 and encounter serious difficulties. Intensive review of topics in algebra and precalculus, in context of how they are used in Calculus 1. Hybrid online.
*Prerequisite: Placement into CALC1.*

**01:640:125** *Methods of Mathematical Problem Solving (2)*
Equips students with effective methods for mathematical problem solving drawing on research into the relevent cognitive science and expert practices. Provides the scientifically-based strategic knowledge to succeed in the mathematics courses.

**01:640:131** *Calculus I Practicum (1)*
Application of algorithms studied in 01:640:135 to problems.
*Corequisite: 01:640:135.*

**01:640:135-136** *Calculus I,II for the Life and Social Sciences (4,4)*
Primarily for majors in the social sciences, business, and pharmacy. Students in the life sciences should take 135-136 or 151-152. Students intending to take more than two semesters of calculus should take 151-152. Students should review the requirements for their intended major when choosing between 135-136 and 151-152.
*Prerequisite for 135: 01:640:112 or 115 or appropriate performance on the placement test in mathematics. Prerequisite for 136: CALC1. Credit restrictions: CR1, CR2.*

**01:640:138** *Calculus II for the Biological Sciences (4)*
Techniques of integration, elementary differential equations and their applications to biological sciences, and an introduction to linear algebra. For students who do not intend to continue beyond 01:640:250.
*For biological sciences majors. Prerequisite: CALC1. Credit restriction: CR2.*

**01:640:151-152** *Calculus I, II for Mathematical and Physical Sciences (4,4)*
For mathematics, physics, computer science, statistics, chemistry, or engineering majors. Techniques of integration, elementary differential equations, sequences, infinite series, Taylor series, parametric equations, polar coordinates. Students should review the requirements for their intended major when choosing between 135-136 and 151-152.
*Prerequisite for 151: 01:640:112 or 115 or appropriate performance on the placement test in mathematics. Prerequisite for 152: 01:640:151 or 01:640:135 with a C or better. Credit restrictions: CR1, CR2.*

**01:640:195,196** ***Seminar in Mathematics I,II (1,1)***
Discussion of selected topics in mathematics. For first- and second-year students.
***Prerequisite: Permission of department. Corequisite: Enrollment in a calculus course.***

**01:640:197** ***Topics in Mathematics for K-8 Teaching I (3)***
Topics covered vary. Details available at registration.
***Prerequisites: 01:640:026 or 027 or appropriate performance on the placement test in mathematics, and permission of the department. For students interested in a career in K-8 teaching. May not be used as an elective for the math major or minor. May be repeated for credit, with permission of the department.***

**01:640:198** ***Topics in Mathematics (3)***
Topics covered vary. Details available at registration.
***Prerequisite: 01:640:026 or 027 or appropriate performance on the placement test in mathematics, and permission of the department. May not be used as an elective for the math major or minor. May be repeated for credit, with permission of the department.***

**01:640:244** ***Differential Equations for Engineering and Physics (4)***
First- and second-order ordinary differential equations; introduction to linear algebra and systems of ordinary differential equations.
***Prerequisite: CALC3. Credit restriction: CR4. Pre- or corequisite: 01:640:247 or 01:640:250.***

**01:640:247** ***Fundamentals of Matrix Algebra (3)***
Basics of linear algebra; matrix operations, linear independence, inverses, determinants. Equivalent in content to the first third of 01:640:250.
***Prerequisite: CALC1.***

**01:640:250** ***Introductory Linear Algebra (3)***
Systems of linear equations, Gaussian elimination, matrices and determinants, vectors in two- and three-dimensional Euclidean space, vector spaces, introduction to eigenvalues and eigenvectors. Possible additional topics: systems of linear inequalities and systems of differential equations.
***Prerequisite: 640:112 or 115, or Placement.***

**01:640:251** ***Multivariable Calculus (4)***
Analytic geometry of three dimensions, partial derivatives, optimization techniques, multiple integrals, vectors in Euclidean space, and vector analysis.
***Prerequisite: CALC2. Credit restriction: CR3.***

**01:640:252** ***Elementary Differential Equations (3)***
First- and second-order ordinary differential equations; systems of ordinary differential equations.
***Prerequisites: 01:640:250 and CALC3. Credit restriction: CR4.***

**01:640:285** ***Introduction to Interest Theory for Actuarial Sciences (3)***
Compound interest rate theory and application to valuation of financial instruments; measurement of interest; present value; equations of value and yield rates; amortization; annuities; bond valuation; duration; immunization.
***Prerequisite: 01:640:251.***

**01:640:291** ***Honors Calculus III (4)***
Covers the same material as 01:640:251 and 252 in a more thorough and demanding fashion.
***Registration by special permission of department. Credit restriction: CR3. Grades of B or better are required to continue in the honors sequence.***

**01:640:292** ***Honors Calculus IV (4)***
First- and second-order ordinary differential equations; systems of ordinary differential equations. A more thorough and demanding alternative to 01:640:244 or 252.
***Prerequisite: 01:640:291 or permission of department. Pre- or corequisite: 01:640:250. Credit restrictions: CR4. Grades of B or better are required to continue in the honors sequence.***

**01:640:300** ***Introduction to Mathematical Reasoning (3)***
Fundamental abstract concepts common to all branches of mathematics. Special emphasis placed on ability to understand and construct rigorous proofs.
***Prerequisite: 01:640:250 or 01:640:251 or 01:640:291.***

**01:640:311** ***Introduction to Real Analysis I (4)***
Introduction to language and fundamental concepts of analysis. The real numbers, sequences, limits, continuity, and differentiation in one variable.
***Prerequisites: CALC4 and C or better in 01:640:300; or permission of department.***

**01:640:312** ***Introduction to Real Analysis II (3)***
Series of numbers and functions, integration of functions of one variable, pointwise and uniform convergence, differential calculus in several variables, implicit and inverse function theorems.
***Prerequisite: 01:640:311.***

**01:640:321** ***Introduction to Applied Mathematics (3)***
Mathematical models of mechanical vibrations, population dynamics, and traffic flow, involving ordinary differential equations and nonlinear first-order partial differential equations.
***Prerequisite: CALC4.***

**01:640:325** ***Foundations of Quantum Mechanics (3)***
Interdisciplinary course, intended primarily for juniors and seniors majoring in mathematics, physics, or philosophy, dealing with what can be concluded from quantum mechanics about the nature of reality.
***Prerequisite: CALC4 or permission of instructor. Credit not given for both this course and 01:556:325.***

**01:640:336** ***Dynamical Models in Biology (3)***
Models for biological processes based on ordinary and partial differential equations. Topics selected from models of population growth, predator-prey dynamics, biological oscillators, reaction-diffusion systems, pattern formation, neuronal and blood flow physiology, neural networks, and biomechanics.
***Prerequisites: CALC4 and 01:640:250.***

**01:640:338** ***Discrete and Probabilistic Models in Biology (3)***
Models for biological processes based on discrete mathematics (graphs, combinatorics), probabilistic and optimization methods, Markov chains and Markov fields, Monte-Carlo simulation, maximum-likelihood estimation, entropy, and information. Applications selected from epidemiology, inheritance and genetic drift, combinatorics and sequence alignment of nucleic acids, energy optimization in protein structure prediction, and topology of

biological molecules.
*Prerequisites: 01:640:250, 251; and either 01:198:206, 01:640:477, 01:960:381, 14:332:321, or 14:540:210. Only one of 01:640:338 and 339 may count for credit toward any math major or minor option.*

**01:640:339** *Mathematical Models in the Social Sciences (3)*
Introduction to the modeling process and survey of mathematical models from such areas as economics, sociology, psychology, and urban and policy science. Models dealing with energy use, air pollution, currency transfer, transportation, bargaining, voting, auctions, ecommerce, learning, and allocation of scarce resources. Models use graphs, signed graphs, Markov chains, n-person games, consensus functions, and differential equations.
*Prerequisites: 01:640:250; and either 01:640:477, 01:198:206, or 01:960:381. Only one of 01:640:338 and 339 may count for credit toward any math major or minor option.*

**01:640:348** *Cryptography (3)*
Applications of algebra and number theory to cryptography (encryption/decryption) and cryptanalysis (attacking encrypted messages). Topics include congruences, finite fields, finding large primes, pseudoprimes, and primality testing, as well as the Vigenere and Hill ciphers, the Data Encryption Standard, probabilistic, trapdoor attacks on encrypted messages, and public key ciphers.
*Prerequisites: 01:640:250; one of 01:640:300, 356, or 477; or permission of department.*

**01:640:350** *Linear Algebra (3)*
Continuation of 01:640:250. Abstract vector spaces and linear transformations, inner product spaces, diagonalization, and canonical forms. Possible additional topics: systems of ordinary differential equations and numerical techniques.
*Prerequisites: CALC4, 01:640:250, and C or better in 01:640:300; or permission of department.*

**01:640:351-352** *Introduction to Abstract Algebra I,II (4,3)*
Abstract algebraic systems, including groups, rings, fields, polynomials, and some Galois theory.
*Prerequisites: CALC3, 01:640:250, and C or better in 01:640:300; or permission of department.*

**01:640:354** *Linear Optimization (3)*
Linear programming problems, the simplex method, duality theory, sensitivity analysis, introduction to integer programming, the transportation problem, network flows, and other applications.
*Prerequisite: 01:640:250. Credit not given for both this course and 01:640:453 or 01:711:453.*

**01:640:356** *Theory of Numbers (3)*
Properties of the natural numbers, congruences, diophantine equations, and elementary arithmetical functions.
*Prerequisites: CALC3 and 01:640:300, or permission of department.*

**01:640:357** *Topics in Applied Algebra (3)*
Material relevant for various applications. Topics chosen from finite Fourier and wavelet transforms for signal and image processing, coding theory, algebraic graph theory, algebraic combinatorics, and algebraic computational complexity. Details available at time of registration.
*Prerequisites: CALC3 and 01:640:250.*

**01:640:361** *Set Theory (3)*
Introduction to set theory. The set-theoretic foundations of mathematics, including the construction of the real number system. Countable and uncountable sets, cardinal numbers, and ordinals, the axiom of choice.
*Prerequisites: 01:640:300 and one of 01:640:250 or CALC3, or permission of department. Credit not given for both this course and 01:730:423.*

**01:640:373-374** *Numerical Analysis I,II (3,3)*
Analysis of numerical methods for the solution of linear and nonlinear equations, approximation of functions, numerical differentiation and integration, and the numerical solution of initial and boundary value problems for ordinary differential equations.
*Prerequisites: CALC4 and familiarity with a computer language. Credit not given for both these courses and 01:198:323, 324.*

**01:640:395** *Studies in Mathematics (3)*
Topics vary from semester to semester. Details available at time of registration.

**01:640:403** *Introductory Theory of Functions of a Complex Variable (3)*
First course in the theory of a complex variable. Cauchy's integral theorem and its applications. Taylor and Laurent expansions, singularities, conformal mapping.
*Prerequisite: CALC4.*

**01:640:411-412** *Mathematical Analysis I,II (3,3)*
Rigorous analysis of the differential and integral calculus of one and several variables.
*Prerequisites: Permission of department and instructor. For students preparing for graduate study in the mathematical sciences.*

**01:640:421** *Advanced Calculus for Engineering (3)*
Laplace transforms, numerical solution of ordinary differential equations, Fourier series, and separation of variables method applied to the linear partial differential equations of mathematical physics (heat, wave, and Laplace's equation).
*Primarily for mechanical engineering majors. Prerequisite: CALC4. Credit not given for both this course and 01:640:423.*

**01:640:423** *Elementary Partial Differential Equations (3)*
Linear partial differential equations of mathematical physics (heat, wave, and Laplace's equation), separation of variables, Fourier series.
*Prerequisite: CALC4. Credit not given for both this course and 01:640:421.*

**01:640:428** *Graph Theory (3)*
Colorability, connectedness, tournaments, Eulerian and Hamiltonian paths, orientability, and other topics from the theory of finite linear graphs, with an emphasis on applications chosen from social, biological, computer science, and physical problems.
*Prerequisites: CALC3 and 01:640:250.*

**01:640:432** *Introduction to Differential Geometry (3)*
Investigation of the properties of curves and surfaces using methods of analysis.
*Prerequisite: 01:640:311.*

**01:640:435** *Geometry (3)*
Various geometries, including projective and non-Euclidean geometries, and geometric axiom systems.
*Prerequisites: CALC3, 01:640:250 and 300; or permission of department.*

**01:640:436** *History of Mathematics until 1800 (3)*
Selected topics from the history of mathematics including number systems; Euclidean geometry; the development of algebra in China, India, the Islamic world, and Europe; and calculus.
*Prerequisites: 01:640:250 and 01:640:251. Credit not given for both this course and 01:640:437. Recommended to be taken after 01:640:435.*

**01:640:437** *History of Mathematics (3)*
Selected topics from the history of mathematics including number systems; Euclidean geometry; the development of algebra in China, India, the Islamic world, and Europe; and calculus; selected modern topics.
*Prerequisites: 01:640:250 and 01:640:251 or 01:640:291. Recommended to be taken after Geometry. Credit not given for both this course and 01:640:436. Open only to Math (640) and Stats/Math (961) majors.*

**01:640:441-442** *Introductory Topology I,II (3,3)*
Math 441: Introduction to topology with emphasis on the foundations of analysis; Euclidean spaces, metric spaces, topological spaces, and their properties; applications to analysis. Math 442: Basic concepts of algebraic topology, including the fundamental group, plane curves, homotopy, and a brief introduction to homology.
*Prerequisites: CALC4 and either 01:640:311 or permission of department.*

**01:640:451-452** *Abstract Algebra I,II (3,3)*
Rigorous study of abstract algebraic systems including groups, rings, and fields.
*Prerequisites: Permission of department and instructor. For students preparing for graduate study in the mathematical sciences.*

**01:640:453** *Theory of Linear Optimization (3)*
Emphasis on the theory of linear optimization. Topics include convex sets, polyhedra, Farkas lemma, canonical forms, simplex algorithm, duality theory, revised simplex method, primal-dual methods, complementary slackness theorem, maximal flows, transportation problems, and two-person game theory.
*Prerequisite: 01:640:250. Credit not given for both this course and 01:640:354 or 01:711:453. Cross-listed with 01:711:453.*

**01:640:454** *Combinatorics (3)*
Existence and enumeration of designs and patterns such as codes, graphs, and block designs, and extremal problems related to such objects. Emphasis on applications to computer, biological, physical, and social problems.
*Prerequisites: CALC2 and 01:640:250.*

**01:640:461** *Mathematical Logic (3)*
Intuitive and formal development of the sentential and predicate calculus. Special emphasis given to questions of consistency, completeness, and independence. Formal systems; incompleteness and undecidability; theorems of Gödel. Exploration of which properties of structures can be defined in the first-order language.
*Prerequisites: CALC3 and either 01:640:300 or permission of department.*

**01:640:468** *Connecting Advanced Mathematics to High School Content (3)*
Connects math major course content to curricular content of grades 9 through 12. Shows how advanced mathematics justifies and elucidates high school material taught without full justification. Provides connections between concepts and procedures to facilitate recall and application of content knowledge both for exposition and for response to student misconceptions. Focus on applications of reasoning, real analysis, and abstract algebra to high school topics.
***Prerequisite: Permission of instructor. Primarily for fifth-year students in the high school mathematics certification program.***

**01:640:477** *Mathematical Theory of Probability (3)*
Basic probability theory in both discrete and continuous sample spaces, combinations, random variables and their distribution functions, expectations, law of large numbers, central limit theorem.
***Prerequisite: CALC3. Credit not given for both this course and 01:198:206, 14:332:226, 14:332:321, 14:540:210, or 01:960:381.***

**01:640:478** *Introduction to Stochastic Processes (3)*
Markov chains for discrete-time models, Poisson processes, Markov chains for continuous-time models, queueing theory, renewal processes.
***Prerequisites: 01:640:250 and either 01:640:477 or both 01:640:251 and 01:960:381. Credit not given for both this course and 01:640:424.***

**01:640:481** *Mathematical Theory of Statistics (3)*
Fundamental principles of mathematical statistics, sampling distributions, estimation, testing hypotheses, correlation analysis, regression, analysis of variance, nonparametric methods.
***Prerequisites: 01:640:250 and either 01:640:477 or both 01:640:251 and 01:960:381. Credit not given for both this course and 01:960:382.***

**01:640:485** *Introduction to Mathematical Finance (3)*
Study of the mathematical theory and financial concepts used to model and analyze financial derivatives. Topics include martingales, Brownian motion, and stochastic differentials, with applications to discrete and continuous time stochastic models of asset prices, option pricing, the Black-Scholes pricing model, and hedging.
***Prerequisites: 01:640:250, CALC4, and 01:640:477 or 01:960:381 or 14:332:226. Recommended for students interested in economics, statistics, finance, or actuarial mathematics.***

**01:640:486** *Mathematics of Life Contingent Risk Models I (3)*
Survival models, life tables. Valuation of benefits, premiums, and standard single life insurance and annuity products. Covers part of the syllabus for Exam LTAM of the Society of Actuaries.
***Prerequisites: 01:640:285 and (01:640:477 or 01:960:381). May not be used as an elective for the math major. May be used for the math minor.***

**01:640:487** *Mathematics of Life Contingent Risk Models II (3)*
Continuation of Mathematics of Life Contingent Risk Models I. Policy values, multiple state models, pension mathematics, effect of interest rate risk, emerging costs of traditional life insurance. Covers part of the syllabus for Exam LTAM of the Society of Actuaries.
***Prerequisite: C or better in 01:640:486. Credit not given for both this course and 01:640:478.***

**01:640:491,492** ***Undergraduate Mathematics Seminar (1,1)***
Reading, presentation, and discussion of mathematical topics.
***Prerequisite: Permission of department. Pass/no credit only.***

**01:640:493,494** ***Individual Study in Mathematics (1-3 BA,1-3 BA)Prerequisite: Permission of department.***

**01:640:495** ***Selected Topics in Mathematics (3)***

**01:640:496** ***Research in Mathematics (3)***

**01:640:497,498** ***Honors in Mathematics (3,3)***

**01:122:491,492** ***Research in Biomathematics (3,3)***
Research in a selected subject conducted with the supervision of a faculty member. Research proposals must receive prior approval of the director and codirector of the biomathematics program.
***Prerequisite: Permission of program director.***

# Life Sciences (SAS)

## LIFE SCIENCES

Division of Life Sciences, School of Arts and Sciences

**Website:** Here

**Dean:** Lori R. Covey

**Director, Office of Undergraduate Instruction:** Martha Haviland

**Chair, Department of Cell Biology and Neuroscience:** Megerditch Kiledjian

**Chair, Department of Genetics:** Tara C. Matise

**Chair, Department of Kinesiology and Health:** Brandon Alderman

**Chair, Department of Molecular Biology and Biochemistry:** Barth Grant

The following majors are available in the Division of Life Sciences:

**Biological Sciences 119**
**Cell Biology and Neuroscience 146**
**Exercise Science 377**
**Genetics 447**
**Molecular Biology and Biochemistry 694**
**Sport Management 955**

Students interested in the life sciences also may consider related tracks within major programs offered by the Department of Chemistry and Chemical Biology (chemical biology option) and the Department of Psychology (specialization in behavioral neuroscience).

The Division of Life Sciences coordinates, fosters, and integrates the instructional and research activities of a broad range of faculty with interests in the biological sciences. The principal units of the division include four departments: Cell Biology and Neuroscience, Genetics, Kinesiology and Health, and Molecular Biology and Biochemistry, as well as two sections, the biological chemistry section of the Department of Chemistry and Chemical Biology, and the biopsychology and behavioral neuroscience section of the Department of Psychology. The division's primary goal is to provide a high caliber of interdisciplinary teaching and research in the life sciences as it trains the next generation of teachers, researchers, and future health professionals.

Instruction in the life sciences has undergone enormous changes over the past 15 to 20 years. These changes reflect the intellectual revolution of the last two decades, as well as technical advances that have expanded greatly the tools available to life scientists. Today, students majoring in the life sciences at Rutgers University-New Brunswick experience an exciting atmosphere of learning that exposes them to the concepts and methods of these intellectual and technological advances. The students have open to them a plethora of learning avenues, ranging from thought-provoking lecture presentations to original and cutting-edge research opportunities in state-of-the-art laboratories. A first-class faculty and modern laboratory equipment reflect the division's commitment to provide its students with the best learning environment.

The division offers a wide spectrum of majors for students interested in the life sciences. These options range from a division-based major in biological sciences, designed to provide a general life sciences education, to department-based majors in cell biology and neuroscience, exercise science, genetics, molecular biology and biochemistry, and sport management aimed at providing specialized training, with a strong emphasis on research. Graduates of the division will be highly competitive for a range of postbaccalaureate opportunities, including graduate education and research, health-professions training, and biomedical and biotechnological research positions, as well as teaching careers in the sciences.

The first two years of the student's tenure at Rutgers is expected to revolve around the life sciences core curriculum, a series of basic offerings designed to provide the general background required for pursuing upper-division courses in any of the individual majors. Regardless of the major chosen, students are encouraged to participate in independent study within a research laboratory in order to take advantage of the rich expertise of the many life sciences faculty in New Brunswick and Piscataway. The exercise science and the sport management majors require an internship experience. The division also has a highly developed advising system, with dedicated and knowledgeable faculty advisers available to work with individual students in their selection of courses, completion of major requirements, and preparation for future careers.

Students may not major in more than one of the following majors in the Division of Life Sciences: Biological Sciences (119), Cell Biology and Neuroscience (146), Exercise Science (377), Genetics (447), Molecular Biology and Biochemistry (694), or Sport Management (955). Furthermore, students majoring in one of these four majors may not minor in Biological Sciences (119). Life science majors or minors may not be combined as double majors or as major/minors with Biomathematics (122), Biochemistry (115), or Microbiology (680).

No more than 16 credits from among the life science courses required for completion of any Division of Life Sciences major may be fulfilled by credits transferred from any school outside of Rutgers-New Brunswick.

For additional information and announcements about the Division of Life Sciences, please visit the division's website.

# Life Sciences Core Curriculum

# Life Sciences Core Curriculum

The life sciences core curriculum is a set of courses that include a series of introductory- and intermediate-level courses in the physical and life sciences forming a foundation of knowledge necessary to understand modern biology and to prepare for the more advanced courses required for each major. Following are core courses:

1. 01:119:115-116 General Biology (4,4)

2. 01:119:117 Biological Research Laboratory (2)

3. 01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)

4. 01:160:171 Introduction to Experimentation (1)

5. 01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)

6. 01:160:311 Organic Chemistry Laboratory (2)

7. 01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics (3,3)*

8. 01:750:205-206 General Physics Laboratory (1,1)*

9. 01:640:135,136 Calculus for the Life and Social Sciences (4,4) or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)**

10. 01:447:380 Genetics (4)***.

*01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

**Basic Statistics for Research (01:960:401, 3 credits), Basic Probability and Statistics (01:960:379, 3 credits), or Statistics I and II (01:960:211 and 212) may be substituted for the second semester of Calculus.

***Students majoring in genetics must take 01:447:384-385 (4,4) instead of 01:447:380

Life Sciences (SAS)

# Biological Sciences 119

# Biological Sciences 119

**Website:** Here

**Director:** Martha Haviland

**Director of Advising:** Anne Carr-Schmid

**Teaching Professor:**

Martha B. Haviland, B.A., Rutgers; M.S., A.M., Ph.D., Michigan[AC1] [SB2]

**Associate Teaching Professor:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Daniel Stern Cardinale, B.S., College of New Jersey; Ph.D., Rutgers

Monica S. Torres, B.S., National University of La Plata (Argentina); M.S., Ghent (Belgium); Ph.D., Rutgers

**Assistant Teaching Professors:**

Christy A. Beal, B.S., Rutgers; M.S., Ph.D., Delaware

Cominski, Tara, B.S., St. Peter's; M.S., Seton Hall; Ph.D. Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin (Stevens Point); M.S., Kansas State; Ph.D., Wisconsin (Madison)
Anne Keating, B.S., M.S., Ph.D., Rutgers

Lu, Haiyang, B.S., Hebei Univ. (China); M.S., Beijing Normal Univ. (China); Ph.D. City Univ. of NY

Nelson, Cassandra, B.S., Marquette; M.S., Indiana University School of Medicine; Ph.D., Marquette

Soliman, Mai, B.S., M.Sc. Montclair State; Ph.D., Rutgers

Gregg Transue, B.S., Pennsylvania State; M.S., Ph.D., Rutgers

Anthony J. Uzwiak, B.A., Ph.D., Rutgers

Villegas, Gabriel, B.A., Ph.D., Rutgers

Walczak, Alexandra, B.S., Ramapo College, Ph.D., Rutgers

Yu, Calvin, B.A. Skidmore; M.A., New York University; Ed.M. Rutgers


- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Minor Requirements
- Independent Study and Research in Biology
- Departmental Honors Program
- Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)
- Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)
- Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)
- Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)
- Courses

Life Sciences (SAS)

# Learning Goals

# Learning Goals

Our overarching goal for educating our students majoring in biological sciences is to inspire them to want to discover and understand the natural world. In the process of achieving this goal, we expect our students to acquire not only facts and concepts, but also skills and perspectives. We hope that our learning goals will both prepare our students for a variety of career objectives and supply them with the tools to become lifelong learners in the ever-evolving world of biological sciences.

*Learning Goals:*

I. To acquire the appropriate factual and conceptual knowledge that provides students with a foundation to further their education and career in the areas of life science or health science. Students will be able to demonstrate basic knowledge (e.g., identify, define, explain, etc.) of the concepts, practices, and principles that comprise the biological sciences.

II. To develop data analysis and statistical reasoning skills that prepare students for a society increasingly reliant on the use of data and information. Students will be able to interpret/evaluate patterns in data presented in tables, figures, and graphs, as well as be able to organize, summarize, and present data.

III. To develop the ability to use scientific reasoning as embodied by the structured process commonly known as the scientific method to empower students with the ability to generate and refine knowledge. Students will be able to evaluate and apply the practice of science.

IV. To develop critical thinking and problem-solving skills necessary to prepare students to evaluate, synthesize, and generate knowledge that provides them with a competitive advantage to adapt to an evolving, global, and knowledge-based society. Students will be able to demonstrate application of higher-order thinking (e.g., classify, diagnose, evaluate, synthesize, hypothesize, etc.). Students will develop an understanding of not only the connections within biology, but also the connections between biology and other scientific disciplines.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in biological sciences must have completed two semesters of General Biology and Biological Research Laboratory with a grade of C or better in each course. Both semesters of General Biology must have been completed at the same institution or on the same campus at Rutgers. No more than two courses with a grade of D may be used to fulfill the requirements of the major. A 2.0 grade-point average must be maintained in the life sciences core and elective courses applied toward the major. Students must meet with an adviser before they can successfully declare their major.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The program in biological sciences, administered through the Division of Life Sciences Office of Undergraduate Instruction, is intended to provide a broad and comprehensive training in modern biology. This course of study is recommended for those who wish to study biology as part of their liberal arts education, preparing them for a career in one of the health professions, graduate studies in biology, a teaching career in secondary schools (courses in education also are required), as well as employment in various areas of the life sciences. If a student wishes to concentrate his or her studies in a specific area of biology, he or she should consider a major offered by one of the departments in the Division of Life Sciences or in the School of Environmental and Biological Sciences. Faculty advisers are available to assist each student with course selection and program requirements.

A minimum of 20 credits of coursework from among general biology, genetics, and life sciences electives must be completed in residence. In other words, no more than 16 credits in this part of the major requirements may be transferred from any institution outside of Rutgers University-New Brunswick. This rule is intended to assure that students receiving degrees from Rutgers-New Brunswick have taken a minimum number of courses in their major with this faculty. Please keep in mind that although a course may transfer from another institution into one of the Rutgers-New Brunswick schools, it will not necessarily be accepted toward the major in biological sciences. Therefore, all transfer courses must be evaluated and accepted by the advising office of the Office of Undergraduate Instruction in order to count toward the major. As indicated earlier, students must complete both semesters of general biology at the same institution or on the same campus of Rutgers before becoming eligible to declare the biological sciences major. Any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation. Credits for cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major.

The course requirements for the biological sciences major are divided into two sections: the life sciences core courses and the life sciences electives.

***Required Life Sciences Core Courses (47 credits)***

01:119:115-116 General Biology I,II (4,4)
01:119:117 Biological Research Laboratory (2)
01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)
01:160:171 Introduction to Experimentation (1)
01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)*
01:160:311 Organic Chemistry Laboratory (2)
01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics***
01:750:205-206 General Physics Laboratory (1,1)***
01:640:135,~~138~~136 Calculus for the Life and Social Sciences (4,4)** or 01:640:151-152 Calculus for

Mathematical and Physical Sciences (4,4)
01:447:380 Genetics (4)
* With approval from a Biological Sciences Advisor, 01:160:308/316 may be replaced by another elective course. Please meet with an Advisor to discuss.

**01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).
***Calculus II 01:640:1386(4) may be substituted by 01:960:379 Basic Probability and Statistics (3), 01:960:401 Basic Statistics for Research (3), or 01:960:211-212 Statistics I,II (3,3).

*Life Sciences Electives (24 credits)*

It is highly recommended that students meet with a life sciences adviser in the Division of Life Sciences Office of Undergraduate Instruction when planning their elective courses. It is important that the courses taken complement each other as much as possible and are not merely a collection of unrelated topics.

The electives must include at least three laboratory courses, only one of which may be satisfied by research work. Biological Research Laboratory and "library research" do not qualify for this requirement. A minimum of six courses (18 credits) must be at the 300 or 400 level, including at least three separate laboratory courses or three courses with a laboratory component. The laboratory associated with genetics (01:447:382 or equivalent), if taken, may be used to satisfy one of the three laboratory requirements.

No course at the 100 level may be used to satisfy the life sciences elective requirements. A maximum of 6 credits of independent study/research/honors research may be used toward the 24 elective credits. Please keep in mind that a minimum grade-point average of 2.8 is required to enroll in an independent study/research course in biological sciences. Research courses can satisfy only one of the three laboratory requirements, regardless of number of credits. Courses taken on a pass/fail basis may not be used to satisfy requirements for the major in biological sciences. A grade-point average of 2.0 or better in courses credited toward the major is required. No more than two courses with a grade of D may be used to fulfill the requirements of the major.

The elective courses must include at least one course (3 or 4 credits) each from the Departments of Cell Biology and Neuroscience 146, Genetics 447, Molecular Biology and Biochemistry 694, and Ecology, Evolution, and Natural Resources 11:216 at the School of Environmental and Biological Sciences. A list of approved courses in subject areas in addition to those in the Division of Life Sciences (Biological Sciences 119, Cell Biology and Neuroscience 146, Genetics 447, and Molecular Biology and Biochemistry 694) will be published by the advising office of the Office of Undergraduate Instruction. It is strongly recommended that students consult this list, which is available on the website, prior to registering for their courses. Generally, acceptable courses from other departments on any campus of Rutgers University have a year of general biology as a prerequisite; however, there are exceptions. It is imperative for students to consult the published list and meet with an adviser. Credits from cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks if double majoring with another permitted life sciences major, at least four of the 3-4 credit life science courses applied to the Biology major may not overlap with courses used to fulfill second major requirements. Given that biological sciences is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation.

Life Sciences (SAS)

# Minor Requirements

# Minor Requirements

The minor requires four courses of at least 3 credits each in life sciences subjects as well as General Biology and Biological Research Laboratory. Both semesters of General Biology must be completed at the same institution or on the same campus at Rutgers. No other course at the 100 level may be used to satisfy the minor. A minimum of 11 credits must be taken at Rutgers University-New Brunswick. A maximum of 3 credits of research in a life sciences subject may be used toward the minor. A minimum of three courses at the 300 level or above is required. If majoring in a permitted life sciences major, no more than two of the four life science courses applied to the minor requirements may overlap with courses used to fulfill major requirements. Only life sciences courses acceptable for the biological sciences major may be used for the minor. Courses in chemistry, mathematics, or physics do not count toward the minor. A grade-point average of 2.0 or better in courses credited toward the minor is required. No more than one course with a grade of D may be used to fulfill the requirements of the minor.

Life Sciences (SAS)

# Independent Study and Research in Biology

# Independent Study and Research in Biology

A minimum cumulative grade-point average of 2.8 is required for a student to register for an independent study/research course in biological sciences. A maximum of 6 credits of laboratory-based independent study, research, or honors projects may be used to fulfill the elective credits requirement in biology. The independent study/research form, available from the advising office of the Office of Undergraduate Instruction, must be completed and signed by the professor in whose laboratory the student will study prior to initiating the research project. Approval of a research proposal by the director of advising and a special permission number from the Office of Undergraduate Instruction is necessary for registration. Students may not earn academic credit for laboratory projects for which they are being paid. Students wishing to apply research credits from other departments toward the major in biological sciences must get approval from the advising office of the Office of Undergraduate Instruction, Division of Life Sciences, prior to beginning their research project.

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have a cumulative grade-point average of 3.0 or better and an average of 3.4 or better in life sciences core and elective courses credited toward the biological sciences major at the end of the junior year and previous research experience. At that time, the student should apply formally to the advising office of the Office of Undergraduate Instruction. Accepted students are expected to complete at least 6 credits over two semesters in

an independent research project, resulting in a thesis, and to pass an oral examination before a faculty committee in the general field of the student's program of emphasis. If the research is done in a laboratory outside of the Division of Life Sciences, the examination committee must include at least one individual from the Division of Life Sciences faculty. Departmental Honors is completed in the fall and spring of senior year. Students accepted into special programs (e.g. BA/MD) may complete honors during junior year.

Honors students must register either for an honors course sequence in life sciences or for a course sequence in a school honors program. These decisions should be discussed with an adviser. An approval form (available in the advising office) must be completed.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

**Rutgers Undergraduate/Robert Wood Johnson Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

This program is designed for high-achieving premedical students of Rutgers University who are in their sophomore year. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and Robert Wood Johnson Medical School (RWJMS).

Application to this program is open to all undergraduate students enrolled at Rutgers University, New Brunswick. It is not directly associated with any one school within the university but see below for specific restrictions.

Admission is a two-stage and highly competitive process. In the first stage, undergraduate students are admitted into the program by an executive committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools of Rutgers University who have spent at least a year here. Prospective applicants from Rutgers University-Newark and Rutgers University-Camden must transfer to one of the units in New Brunswick for their sophomore year and complete at least 30 credits here. All applicants must have completed 4 semesters of college with a minimum of 60 credits. Applicants with an Associate¿s Degree, regardless of whether it was earned as a dual degree in high school or as a traditional degree after high school, are ineligible to apply for the program. Admitted students will need to complete all of the core requirements of their undergraduate unit and major requirements with the exception of Biological Sciences and Cell Biology and Neuroscience majors, who may apply credit from the first professional year toward the major requirements. During the fourth year, students will be full time at the medical school and elective credits will count towards the undergraduate degree. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second stage occurs typically after the fourth year of study. It is the responsibility of the RWJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the RWJMS Admissions Committee. The purpose of this second, noncompetitive review is to ascertain that the student has maintained adequate academic and nonacademic

qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B (Honors or High Pass) in courses taken at both universities. However, recommendation is not automatic. The final decision rests with the RWJMS Admissions Committee. Upon approval by this admissions committee, the student will be permitted to continue into the fifth year of study and will be matriculated formally as a candidate for the M.D. degree at RWJMS.

Applicants to the B.A./M.D. program must be in their fourth semester at Rutgers University. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers, New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester and sustain it through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers University, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers-New Brunswick (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, two semesters of English, and organic chemistry lab must complete these requirements by the end of the third year of study. Students who did not take the SAT or ACT but who are admitted to the program will be required to take the MCAT by April of the junior year and score competitively with a total score of at least 508 (minimum single sub score of 123). An application form has been developed that allows the student to provide the executive committee with information it deems useful for its deliberations.

The bachelor's degree will be awarded upon completion of the undergraduate college and major requirements, by the end of year four. Upon satisfactory completion of year seven and all RWJMS requirements, the student will receive the medical degree.

Students who wish to pursue a major other than biological sciences must discuss their plans with the appropriate department in order to establish the requirements they need to complete for their major. For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from RWJMS will be applied toward the major (as stipulated below). The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements, usually by the end of year four. The number of credits, however, is not directly translated between the two universities; no more than 4 credits per laboratory course and 3 credits per non-laboratory course taken at RWJMS may be used toward the bachelor's degree at Rutgers.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and Intro to Biochemistry (01:694:301) and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must complete an additional approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick.

Students in the program must meet with advisers at the medical school and at their undergraduate school when planning their elective courses. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers' undergraduate units and RWJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

**Rutgers Undergraduate/New Jersey Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

The Rutgers Undergraduate/New Jersey Medical School joint program started in the fall of 2003. The purpose of the program is to permit students to begin their medical education after their third year or at least 96 degree credits at Rutgers. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and New Jersey Medical School (NJMS).

This program is only open to students enrolled in Rutgers University-New Brunswick schools.

Admission is a two-phase and highly competitive process. In the first phase, undergraduate students are admitted into the program by the Joint Program Executive Committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools at the New Brunswick location of Rutgers University who have been enrolled here for at least one year. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the NJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B in courses taken at Rutgers. Students must complete the Medical College Admission Test (MCAT) by January of the junior year before matriculating at NJMS and be required to be in the competitive range of other accepted NJMS students. This second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the NJMS Admissions Committee. However, recommendation is not automatic. The final decision rests with the Medical School Admissions Committee. Upon approval by the Medical School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the M.D. degree at the New Jersey Medical School.

Applicants for the program must be in their fourth semester at Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have

completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, organic chemistry lab, and two semesters of English must complete these requirements by the end of the third year of study. An application form has been developed that allows the student to provide the committee with information the committee deems useful for its deliberations.

Students will be admitted at the end of the spring semester of year two and be formal members of the program beginning with year three. Prior to leaving the Rutgers undergraduate unit, students must satisfy all college and major requirements, except for the credits which they will receive from NJMS (please see next paragraph). For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from NJMS will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements by the end of year four. Upon satisfactory completion of year seven or eight, as well as all New Jersey Medical School requirements, the student will receive the medical degree.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and NJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

**Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine Joint Bachelor of Arts/Doctor of Medicine in Dentistry (B.A./D.M.D.) Program**

Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine joint program started in the spring of 2002. The purpose of the program is to permit students to begin their dental education after their third year or at least 98 credits at Rutgers. Specially selected students will obtain bachelor's and dental degrees in a seven-year program of study taken at Rutgers undergraduate units and Rutgers School of Dental Medicine.

This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick. The program is administered by the Health Professions Office.

Admission is a two-phase and competitive process. In the first phase, undergraduate students are admitted into the program by the Executive Committee of the Joint Program consisting of faculty from the appropriate units. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the Rutgers School of Dental Medicine Admissions Committee to review the credentials of students recommended by the articulated program executive committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for admission to the dental school. It is expected that students will have grades of A or B in courses taken at Rutgers University. Students must complete the Dental Admissions Test (DAT) and earn scores of 20 or better in Total Science, Academic Average, Organic Chemistry, General Chemistry, and Biology. Students may only take the DAT one time to qualify for this program. The second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the Rutgers School of Dental Medicine Admissions Committee. However, recommendation is not automatic. The final decision rests with the Dental School Admissions Committee. Upon approval by the Dental School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the Doctor of Medicine in Dentistry (D.M.D.) degree at the Rutgers School of Dental Medicine.

Applicants to the program must be in their fourth semester at the School of Arts and Sciences, Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at the School of Arts and Sciences, Rutgers-New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester, which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, two semesters of college-level mathematics (Calc I and either Calc II or an approved Statistics course) and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded

advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). If AP credit was granted for general chemistry, then organic chemistry I and II and laboratory and a course in biochemistry at Rutgers are required. If AP credit was granted for English, upper level English at Rutgers is required with the same amount of credit work. If AP credit was granted for physics, two approved courses from Physics or Kinesiology & Health at Rutgers are required. Those students who are admitted to the program without having two semesters of physics, biochemistry, organic chemistry lab, and two semesters of English, must complete these requirements by the end of the third year of study.

The B.A./D.M.D. program is a seven-year program with year one being the first undergraduate year. Students will be admitted at the end of the spring semester of year two and be formal members of the articulated program beginning with year three. Prior to leaving the School of Arts and Sciences, Rutgers-New Brunswick, students must satisfy all college and major requirements, except for the credits which they will receive from Rutgers School of Dental Medicine (please see below). For a student at the School of Arts and Sciences, Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from Rutgers School of Dental Medicine will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the general education and major requirements by end of year four. Upon satisfactory completion of year seven or eight, as well as all Rutgers School of Dental Medicine requirements, the student will receive the dental degree.

A student enrolled in the joint program completing a major in biological sciences at Rutgers-New Brunswick is required to complete any remaining Life Sciences Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers-New Brunswick, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/ research course may be applied toward the biological sciences major for students in the B.A./D.M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers-New Brunswick and Rutgers School of Dental Medicine.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

**Rutgers School of Arts and Sciences/Rutgers School of Health Professions Joint Bachelor of Arts/Master of Science Degree (B.A./M.S.) Physician Assistant Program**

This is a six-year (3+3) program offered jointly by the School of Arts and Sciences and the School of Health Professions (SHP). The program can be looked at as a two-phase program, an undergraduate phase followed by a professional phase. This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick, who are U.S. citizens, permanent residents of the United States, or international individuals currently on a student visa. At a minimum, applicants must be enrolled for one year at Rutgers-New Brunswick earning at least 30 credits.

The first phase of the program includes three years of undergraduate liberal arts and basic science education. Students may apply to the second (professional) phase in April of their second year by applying to the Physician Assistant (PA) program. Personal interviews will be required of those applicants being considered for admission. The interview will serve to determine the applicant's emotional and intellectual maturity, ability to communicate, and the potential to achieve career satisfaction within the physician assistant role. Applicants must have a cumulative and science GPA of 3.2. In cases where individuals may show high potential by improved performance, exceptions to this requirement may be considered. Please note that acceptance by Rutgers University does not guarantee acceptance by the PA program.

Applicants to the program must have completed the following courses with a grade of C or better: at least one semester (3 credits) of English composition, applied statistics or biostatistics (from Psychology, Biology, or Math departments), General Biology I and II with lab (119:115, 116, and 117, or equivalents); General Chemistry I and II with lab (160:161,162 and 171, or equivalents); and General Psychology (830:101, or equivalent). If the student has been granted AP credit by Rutgers for science courses, additional science courses will be required.

All applications must be received by June 1 and final notices of acceptance will be made by August 1. If the applicant is accepted into the program, it will be contingent on maintaining a 3.2 GPA through the end of the third undergraduate year at Rutgers-New Brunswick, and on all requirements for the undergraduate degree being met before the beginning of the fourth year. Students who are accepted into the second phase of the program will begin this phase at the beginning of their senior year. At the end of the senior year, these students will receive a bachelor of arts degree conferred by the School of Arts and Sciences, Rutgers University-New Brunswick. After completion of the remaining two years of the PA program, graduates will receive a master of science degree awarded by Rutgers School of Health Professions.

Before entering the second (professional) phase, a student accepted by this program must also complete for the PA program, Functional Human Anatomy (01:377:223), General Microbiology (01:447:390), Intro to Biochemistry (01:694:301) and Systems Physiology (01:146:356) (waived if Gen Bio II is completed at Rutgers-NB and not AP credit), and 6-8 additional credits of life science electives. Students majoring in biological sciences are required to have completed, in addition to the School of Arts and Sciences core distribution requirements, the Life Sciences Core requirements, Intro to Biochemistry (01:694:301) and General Microbiology (01:447:390) and one (three credit or more) course from the 216 subject area approved electives. Students with AP or transfer credit of General Biology I and II and lab must take an additional life science elective course for 3 or more credits. A maximum of 14 credits from SHP courses will be accepted toward the biological sciences major. Please be sure to meet with a biological sciences adviser when selecting life sciences elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and SHP.

For a complete description of the requirements for the major in biological sciences, please read the appropriate section under the Division of Life Sciences in this catalog.

For more information about this program, you may contact the PA program office at the School of Health Professions, 675 Hoes Lane, Piscataway, NJ 08854, at 732-235-4444; or the Division of Life Sciences, Health Professions Office at Rutgers University, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Courses

# Courses

With the exception of 01:119:115,116, and 117 General Biology I and II and Biological Research Laboratory, courses numbered at the 100 level may not be used for major credit in any of the majors within the Division of Life Sciences.

**01:119:098** ***Foundations for Biological Science (E2)***
Selected topics in general biology: introduction to cellular organization, metabolism, genetics, reproduction, and organ systems. Development of analytical reasoning and science-oriented study techniques.
***Preparation for college-level general biology.***

**01:119:103** ***Principles of Biology (4)***
Selected topics in general biology, including cell structure, genetics, plant and animal diversity, basic plant and animal biology, ecology, and evolution.
***Lec. 3 hrs., lab. 3 hrs. Designed for students who must take a one-semester laboratory course in introductory biology to meet major requirements. Credit not given for this course if student has already completed 01:119:115. Not for life sciences major credit.***

**01:119:109,110** ***Biology Practice Group (1,1)***
Students will work actively to (1) organize the lecture content, (2) identify what they are expected to do with that content (outcomes), (3) prepare and explain study aids (organizers) to ensure that they correctly understand the week¿s content, and (4) begin the self-evaluation process to gauge exam preparedness. Discussion of the basic methods and principles.
***Corequisite for 109 is 01:119:115; corequisite for 110 is 01:119:116.***

**01:119:111,112** ***Reading in General Biology (1,1)***
Discussion and reading providing extensive and advanced coverage of selected topics.
***Corequisite for 111 is 01:119:115; corequisite for 112 is 01:119:116.***

**01:119:115** ***General Biology I (4)***
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics. Lec. 3 hrs., Wkshp. 80 min.
***Prerequisite has two parts: writing (prerequisite of 01:355:101, 01:355:103, or 01:355:104, or placement into 355:101 or 355:104) and math (prerequisite of 01:640:026 or placement into 640:CMA, 640:PCA, 640:CLG, or 640:CLS).***

**01:119:116** *General Biology II (4)*
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics.
*Lec. 3 hrs., Wkshp. 80 min. Prerequisite: 01:119:115 with a grade of C or better. Credit not given for both this course and 01:119:102.*

**01:119:117** *Biological Research Laboratory (2)*
Laboratory designed to introduce and explore principles of research in the biological sciences by engaging in semester-long research projects requiring students to analyze data, synthesize new experiments, and evaluate findings.
*Prerequisite: 01:119:115 with a grade of C or better. Corequisite: 01:119:116.*

**01:119:120** *STEM Success Seminar (1.5)*
Increases ability to control academic success and improve transition to the university environment in furtherance of educational and career goals. Reflection on recent and current academic experience and career aspirations. Setting of priorities and alignment of time and effort towards those ends.
*By special permission only.*

**01:119:127-128** *Anatomy and Physiology: Health Sciences (4,4)*
Structure and function of human organ systems. Some microanatomy and biochemical aspects of physiology included.
*Lec. 3 hrs., lab. 3 hrs. For nursing, medical technology, physical therapy, and other professional students. Not for life sciences major credit.*

**01:119:131** *Microbiology for the Health Sciences (3)*
Introduction to microbes with emphasis on the nature and behavior of microorganisms, the interrelationships between microbes and the human host in health and disease, and the principles of prevention and control of infectious disease.
*Not open to students who have taken 01:447:390. For nursing and other professional students. Not for life sciences major credit. Prerequisites: 01:199:115-116 or 01:119:127-128.*

**01:119:132** *Microbiology for the Health Sciences Laboratory (1)*
Laboratory to accompany 01:119:131.
*Lab. 3 hrs. Pre- or corequisite: 01:119:131.*

**01:119:140** *The DNA Revolution (Honors) (3)*
Introduction to fundamentals of molecular genetics, biotechnology, and modern genetics, including a laboratory research project using molecular biology and bioinformatics techniques. Intended primarily for nonscience majors, but may also appeal to prospective chemists, physicists, engineers, and computer scientists.
*Restricted to first-year and sophomore students in the School of Arts and Sciences Honors Program or the Honors College. Credit not given for both this course and 01:119:140 or 01:694:215 or 315, or 01:447:315. Not for life sciences major credit.*

**01:119:148** *Moving Bodies: The Biology of Movement (3)*
Considers fundamental processes that allow humans and other animals to move, including structural basis (bones and muscles), control (brain and nervous system), conversion of food into energy (digestion and nutrition),

movement of food and oxygen to muscles (circulation), and some common and familiar injuries and illnesses and their treatments.
*Credit not given for both this course and 01:119:100, 103, 115-116, or 127-128. Not for life sciences major credit.*

**01:119:150** *Biology, Society, and Biomedical Issues (3)*
Discussion of current topics and issues in human health and medicine from a biological perspective.
*Credit not given for both this course and 11:115:100. Not for life sciences major credit.*

**01:119:154** *Genetics, Law, and Social Policy (3)*
Principles of human and behavioral genetics and their legal, ethical, and social implications. Topics include genetic screening, counseling, and engineering; reproductive regulation; and human behavior genetics.
*Prerequisite: Sophomore standing. Not for life sciences major credit or related major.*

**1:119:155** *Human Genetics (3)*
How our genes influence our development and health, how both normal traits and diseases are transmitted through families, how genetics is used in forensics and personalized medicine, and the genetic tests that are offered directly to consumers.
*Not for life sciences major credit.*

**01:119:156** *Genetics, Evolution, and Human Health (4)*
The human body and human behavior, shaped by more than four billion years of evolutionary processes. Scientific and social implications of current ideas and controversies of evolution and genetics.
*Not for life sciences major credit.*

**01:119:160** *Biology, Society, and Ecological Issues (3)*
Ecological and evolutionary ideas affecting space ecology; population increase, food supply, air and water pollution, war, and nuclear energy.
*Not for life sciences major credit or related major.*

**01:119:182** *Essentials of Human Reproduction (3)*
Anatomical and physiological bases of human sexuality; biological and cultural aspects of sexual differentiation and psychosexual development, contraception, venereal disease, and sexual lifestyles.
*Not for life sciences major credit or related major.*

**01:119:195** *Brain, Mind, and Behavior (3)*
Honors course discussing the interrelationship between the brain, the mind, and behavior.
*Open to students in the School of Arts and Sciences Honors Program or the Honors College. Not for life sciences major credit or related major.*

**01:119:199** *Preparation for General Biology (4)*
For first- and second-year students planning science majors. Enrollment based on placement scores. Selected concepts in biology, proven learning strategies for college science courses, and instruction in the scientific method. Prepares students for success in the General Biology sequence (01:119:115-117).
*Lec./rec. 3 hrs., lab. 3 hrs. Enrollment restricted by placement. Not for life sciences major credit.*

**01:119:201-202** ***Independent Study in Biology (1-3,1-3)***
Independent study under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. May not be used to fulfill a laboratory requirement.***

**01:119:204** ***Outreach in Biology (1)***
Introduction to the basic principles and best practices of outreach in the biological sciences. Emphasis on understanding how to translate technical concepts and techniques to lay audiences incorporating best practices in active learning, public speaking and curriculum development. Recommended for students interested in teaching careers and related positions in science communication.
***Prerequisites: 01:119:115, 01:119:116, and 01:119:117. By special permission.***

**01:119:205** ***Internship in Life Sciences (3)***
Development of experience and knowledge regarding the expectations, qualifications, competencies and responsibilities of professionals working within the life sciences through an internship experience with academic component. Integration of knowledge from life science coursework with the internship experience, development of new skills, and reflection on the learning experience.
***Prerequisites: 01:119:116 and 01:119:117. Open only to 119 Biology Majors.***

**01:119:307-308** ***Research in Biology (1-3,1-3)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to students majoring (or minoring) in biological sciences.***

**01:119:310** ***Communication in Biology (1)***
Effective skills for communicating science to a variety of audiences in a variety of forms including papers, grant proposals, teaching, and presentations to scientists and others. Provides support for students completing the 10-page research paper required for Research in Biology.
***Prerequisites: 01:119:307, 308, 407, or 408. Corequisites: 01:119:307, 308, 407, or 408.***

**01:119:311** ***Current Topics in Life Sciences (1)***
Directed readings and discussion of selected scientific topics and career stories with Rutgers Life Sciences Alumni.
***Junior or senior status and Division of Life Sciences major (subject code: 119, 146, 694, 447).***

**01:119:401** ***Clinical Practicum in the Health Professions (3)***
Development of advanced knowledge of and reflection on the qualifications, competencies, and responsibilities of physician health care providers through an internship experience and academic component integrating knowledge from life science coursework and the health care setting.
***Prerequisites: 3.4 science GPA. By special permission of the Office of Undergraduate Instruction only.***

**01:119:406-407** ***Research in Biology (1-4,1-4)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report is required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to seniors majoring (or minoring) in biological sciences.***

**01:119:408-409** ***Honors in Biology (3-6,3-6)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written thesis, oral presentation, and defense are required.
***Prerequisites: Declared biological sciences major. Permission of the Office of Undergraduate Instruction. Open only to seniors majoring in biological sciences who meet the requirements for departmental honors.***

**01:119:410** ***Honors Communication in Biological Sciences (1)***
Instruction on effective communication of scientific ideas and findings for both the scientific community as well as the general public. Support in writing honors theses and preparing for oral thesis defenses.
***Prerequisite: 01:119:408. Corequisite: 01:119:409.***

Life Sciences (SAS)

# Cell Biology and Neuroscience 146

# Cell Biology and Neuroscience 146

Department of Cell Biology and Neuroscience, School of Arts and Sciences

**Website:** Here

**Chair:** Megerditch Kiledjian

**Vice Chair and Undergraduate Director:** Gabriella D'Arcangelo

**Distinguished Professors:**

Joanna Burger, B.S., SUNY (Albany); M.S., Cornell; Ph.D., Minnesota

Megerditch Kiledjian, B.A., Rutgers; Ph.D., University of Pennsylvania

Melitta Schachner, Diploma in Biochemistry, Tübingen (Germany); Ph.D., Max-Planck Institut für Biochemie (Germany)

Wise Young, B.A., Reed; Ph.D., Iowa; M.D., Stanford

**Professors:**

Lori R. Covey, B.S., California (Riverside); Ph.D., Columbia

Gabriella D'Arcangelo, B.S., Bari (Italy); Ph.D., SUNY (Stony Brook)

Robin L. Davis, B.S., Pennsylvania State; M.A., San Diego State; Ph.D., Stanford

Bonnie Firestein, B.S., Michigan; Ph.D., California (San Diego)

Martin Grumet, B.S., Cooper Union; Ph.D., Johns Hopkins

Ronald P. Hart, B.S., Connecticut; Ph.D., Michigan

Arnold G. Hyndman, A.B., Princeton; Ph.D., California (Los Angeles)

Alice Y.-C. Liu, B.S., Chinese University of Hong Kong (China); Ph.D., Mount Sinai School of Medicine

Gary F. Merrill, B.S., Weber State; Ph.D., Michigan State

Kathleen M. Scott, B.A., Brown; Ph.D., Yale

**Associate Professors:**

Qian Cai, M.D., Shanghai Railway Med College (China); Ph.D., National Institutes of Health-Shanghai Second Medical University

Wei Dai, B.S., M.S., Beijing Normal (China); M.S., Texas Health Science Center; Ph.D., Baylor College of Medicine

Dunne Fong, B.S., Massachusetts; M.A., Ph.D., Princeton

Shu-Chan Hsu, B.S., Ph.D., British Columbia

Peng Jiang, B.S., Soochow (China); Ph.D., University of Science and Technology of China

Kelvin Y. Kwan, B.S., California Institute of Technology; Ph.D., Harvard

David Margolis, B.S., Brown; Ph.D., Washington (Seattle)

Ping Xie, B.S., Nanjing (China); Ph.D., Hong Kong University of Science and Technology

**Assistant Professors:**

Victoria Abraira, B.S., Southern California; Ph.D., Harvard

Santiago Cuesta, B.A., M.S., Ph.D., National University of Rosario (Argentina)

Brian Daniels, B.A., B.S., Southern Wesleyan (Central); Ph.D., Washington (Seattle)

Rafiq Huda, B.A., Carleton College; Ph.D., Northwestern University (Chicago)

Natasha O¿Brown, B.S., Davidson College; Ph.D., Stanford

Max Tischfield, B.A., Rutgers; Ph.D., Harvard

**Associate Research Professors:**
Xinfu Jiao, B. S., Xinxiang Medical College (China); M.S., Tongji Medical University (China); Ph.D., Shanghai Institute of Hematology (China)

Patricia Morton, B.S., Northwestern University; M.S., Ph.D., University of Wisconsin

**Assistant Research Professor:**

Dongming Sun, B.S., Beijing Medical University (China); Ph.D., Columbia University

**Assistant Teaching Professors:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Tara Cominski, B.S. St. Peter's University; Ph.D., Rutgers

Anne Keating, B.S., M.S., Ph.D., Rutgers

- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Options
- Departmental Honors Program
- Courses

Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Cell Biology and Neuroscience offers a course of study that provides fundamental and comprehensive training in the areas of cell biology and neuroscience. The major objective of this program is to prepare students for graduate studies in cell biology and neuroscience; entry into professional schools in medicine, dentistry, or other health-related fields; or employment in industrial and pharmaceutical companies.

*Learning Goals*

Students will:

I. master factual and conceptual knowledge in cell biology and neuroscience that will provide a solid foundation for success in advanced training and professional careers;

II. develop an ability to summarize, integrate, and organize information; and

III. use scientific reasoning to evaluate the potential for current research and new discoveries to improve our understanding of cell biology and neuroscience and its relevance to human health and to our society.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

The major in the Department of Cell Biology and Neuroscience is open to students after their first year who have completed Fundamentals of Neurobiology (01:146:245) or Fundamentals of Cell Biology (01:146:270), with a grade of C or better. Departmental approval is required.

A grade of C or better in all courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The Department of Cell Biology and Neuroscience offers a program of study from which students can select one of two tracks, depending upon particular interests and career goals: a general track (default) and an honors track. Students can apply to enter the honors track at the beginning of the senior year. This track requires a minimum GPA of 3.4 in courses credited toward the major, and departmental approval. A number of core courses are required of all students in the cell biology and neuroscience major, regardless of the chosen track. No more than 16 credits from among the life science courses required for completion of the cell biology and neuroscience major may be fulfilled by credits transferred from any school outside of Rutgers University-New Brunswick. Any life science courses applied to the major should be taken within 10 years of graduating.

***Required Core Courses (65 or more credits)***

01:119:115-116 General Biology (4,4)

01:119:117 Biological Research Laboratory (2)

01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)

01:160:171 Introduction to Experimentation (1)

01:160:307-308 or 01:160:315-316 Organic Chemistry (4,4)

01:160:311 Organic Chemistry Laboratory (2)

01:750:203-204 General Physics (3,3) or 01:750:193-194 Physics for the Sciences(4,4)*or 01:750:271-272 Honors Physics (3,3)

01:750:205-206 General Physics Laboratory (1,1)

01:640:135,136 or 01:640:151-152 Calculus I and II (4,4) or 01:640:135 and 01:960:401 Basic Stat for Research (3) or 01:960:379 Basic Prob and Stat or 01:640:135 and 01:960:212 Statistics II (3)**

01:447:380 Genetics (4)

01:146:245 Fundamentals of Neurobiology (3)

01:146:270 Fundamentals of Cell Biology (3)

01:694:395 Biochemistry for Life Sciences (3) or 01:694:407 Biochemistry (3)

Advanced Cell Biology and Neuroscience Courses: choose three of the following:

01:146:445 Synapses, Neurons, and Circuits (3)

01:146:447 Clinical Neurobiology (3)

01:146:465 Neurobiology of Pain and Addiction (3)

01:146:472 Developmental Biology (3)

01:146:473¿ Genetic Regulation in Cell Biology¿(3)

01:146:474 Immunology (3) or 01:146:476¿ Honors Immunology (3)

01:146:481 Protein Dynamics in Cell Biology (3)

* with approval from the Undergraduate Director or CBN Advisor 01:160:308 may be replaced by an additional elective course.
** Students who take who take Physics for the Sciences 01:750:193-194 (4,4) do not need an additional Physics laboratory.
*** Students with AP statistics equivalent of 01:960:211, transfer credit for 01:960:211, or who have taken 01:960:211 at Rutgers must take 01:960:212.

Life Sciences (SAS)

# Options

# Options

*General Track; 4 credits*

This track is for students who, upon graduation, seek immediate employment or plan to attend professional schools in health-related fields. In addition to the required core courses, students must take the following courses:

1. One elective lecture courses at the 300-400 level in the life sciences area (equaling 36 or more credits)
2. One laboratory or research course (1-3 credits). Students can take a lecture course with an associated laboratory component (3-4 credits) to satisfy both requirements, or a stand-alone lecture plus a laboratory or research course.

*Honors Track; 12 credits*

This area of concentration is for students interested in research who, upon graduation, plan to attend graduate school or professional schools in health-related fields. A student must qualify for admission into the honors track. See the departmental honors program page in this catalog for student qualifications. In addition to the required core courses, students must complete the following courses, produce a written research thesis and an oral thesis presentation:

1. One elective lecture course at the 300-400 level in the life sciences area (3 or more credits).
2. 01:146:405 Honors Seminar (3).
3. 01:146:408-409 Honors Research (3,3).

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

Honors in cell biology and neuroscience are awarded to students who have successfully completed the honors track course requirements, submitted a written research thesis, and defended the thesis orally. To qualify for the honors track, a student must have attained a grade-point average of 3.4 or better in courses required for the major. The student should apply formally to the department for acceptance into the honors program by the end of the second semester of the junior year.

Life Sciences (SAS)

# Courses

# Courses

**01:146:201,202** *Independent Study in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. May not be used to fulfill a laboratory requirement. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:245** *Fundamentals of Neurobiology (3)*
Introduction to the biology of the nervous system. Topics covered include nerve cell signaling, sensory and motor systems, and higher brain processes.
***Prerequisites: 01:119:115-116.***

**01:146:270** *Fundamentals of Cell Biology (3)*
Principles of cell biology. Structure, function, and macromolecular organization of cellular organelles.
***Prerequisites: 01:119:115-116.***

**01:146:295** *Essentials of Cell Biology and Neuroscience (3)*
Provides a background in the biology of neural cells and cognition.
***Prerequisites: 01:119:115-116. Not intended for cell biology and neuroscience majors.***

**01:146:307,308** *Research in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research on an original problem under the direction of a member of the Rutgers faculty.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:322** *Human Histology (4)*
Structure of the tissues and organs of the human body. Lec. 3 hrs., lab. 3 hrs.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:328** ***Human Parasitology (3)***
Cell biology, epidemiology, pathogenesis, and clinical manifestations of human parasitic diseases.
***Prerequisites: 01:119:115-116.***

**01:146:329** ***Human Parasitology Laboratory (1)***
Laboratory to accompany the Human Parasitology lecture course 01:146:328. Lab. 3 hrs.
***Pre- or corequisite: 01:146:328.***

**01:146:340** ***Virology (3)***
Principles of virology including the molecular and cellular events that occur during virus replication, the host cell response, and pathogenesis. Emphasis on animal viruses that impact human health and disease. Strategies for controlling viruses.
***Prerequisite: 01:146:270.***

**01:146:350** ***Introduction to Light Microscopy for the Life Sciences (1, minicourse)***
This course offers a comprehensive exploration of advanced imaging techniques essential for studying tissues, cells, and organelles in the life sciences.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:356** ***Systems Physiology (3)***
Comprehensive study of the principal organ systems of laboratory animals and humans.
***Prerequisites: 01:119:115-116 and 01:160:161-162 or 163-164, and 171 Credit not given for both this course and 11:067:300.***

**01:146:357** ***Systems Physiology Laboratory (1)***
Laboratory to accompany the Systems Physiology lecture course 01:146:356. Lab. 3 hrs.
***Pre- or corequisite: 01:146:356.***

**01:146:405** ***Honors Seminar (3)***
This course is intended to help students prepare a written research thesis and practice the oral thesis presentation.
***Requires departmental permission. Open only to senior honors students majoring in cell biology and neuroscience. This course fulfills the SAS WCd core requirement.***

**01:146:406, 407** ***Research in Cell Biology and Neuroscience (1-3,1-3)***
Research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. Open only to students majoring in cell biology and neuroscience.***

**01:146:408-409** ***Honors Research (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member. Written report and oral presentation required. Culminates in a written thesis and oral thesis defense.
***Permission of department and an instructor willing to sponsor the student are required. Open only to seniors majoring in cell biology and neuroscience who meet the requirements for the departmental honors program.***

**01:146:410-411** ***Research Thesis in CBN I and II (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member and the course coordinator.
***Prerequisites: 01:146:307 or 01:146:308. Requires departmental permission and acceptance by a faculty mentor who will***

*host the student in the laboratory. Requires submission of a written thesis draft (I = Fall semester), and submission of a final written thesis and oral defense (II = Spring semester). Open to senior students majoring in cell biology and neuroscience who are not enrolled in the departmental honors program.*

**01:146:445** *Synapses, Neurons, and Circuits (3)*
Cellular and systems features of neurons and the fundamental unit of signaling in the nervous system, focusing on a small number of advanced topics. Focus on how to test hypotheses related to the topics addressed: intra- and inter- cellular communication; construction of neuronal networks; protein interactions at the synapse; and signal transduction pathways.
*Prerequisites: 01:146:245 and 01:146:270.*

**01:146:447** *Clinical Neurobiology (3)*
Development and function of the nervous system with an emphasis on diseases and disorders. Topics include neurodevelopment, demyelination, tumors, and viral infections; neurological disorders/diseases; injury to the spinal cord and brain and repair; and clinical trials and the future of spinal cord and brain trauma.
*Prerequisites: 01:146:245 and 01:146:270. Intended for senior students majoring in cell biology and neuroscience.*

**01:146:456** *Advanced Physiology (3)*
Preparation for advanced graduate study in physiology and for medical physiology (first-year medical school). Focus on mammalian physiology and the whole animal (whole organ) approach to classical experimental physiology.
*Prerequisites: 01:146:356. Intended for senior and junior students.*

**01:146:464** *Topics in Cell Biology and Neuroscience (3)*
Directed readings and discussion of selected topics in cell biology and neuroscience.
*Prerequisites: 01:146:245 and 01:146:270. Open to junior or senior students majoring in cell biology and neuroscience.*

**01:146:471** *Advanced Cell Biology Laboratory (3)*
Advanced laboratory methods in cell biology. Emphasis on light and electron microscopy, imaging, immunocytochemical techniques, tissue culture, and methods of identifying and separating macromolecules.
*Prerequisite: 01:146:270 or permission of instructor.*

**01:146:472** *Developmental Biology (3)*
Genetic, molecular and cellular processes that lead from egg to embryo to mature organism.
*Prerequisite: 01:146:270 or 01:447:380 or 01:447:384.*

**01:146:473** *Genetic Regulation in Cell Biology (3)*
Advanced topics in cell biology, focusing on genetic animal models, genomics, chromatin function, gene expression, and RNA biology.
*Prerequisite: 01:146:270.*

**01:146:474** *Immunology (3)*
Fundamental principles of immunology with emphasis on antibody formation, immunoglobulin molecules and genes, hypersensitivity reactions, and the cellular basis for the immune response.
*Prerequisites: 01:119:115-116 and 01:447:380 or 01:447:384. Recommended: 01:447:390.*

**01:146:475** ***Laboratory in Immunology (1)***
Biochemical and molecular analysis of immune cell function. Application of immunological techniques to the examination of normal and diseased states.
***Pre- or corequisite: 01:146:474.***

**01:146:476** ***Honors Immunology (3)***
Introduction to the immune system, with a focus on mammalian organisms (particularly humans). Focus on critical thinking and problem-solving abilities, as well as introduction to primary research addressing contemporary immunological questions. Open only to students enrolled in the Honors College, SAS Honors Program or CBN Honors Program.
***Prerequisites: 01:447:380 or 01:447:384. Credit not given for both this course and Immunology 01:146:474.***

**01:146:481** ***Protein Dynamics in Cell Biology (3)***
Advanced topics in cell biology, focusing on signal transduction (module 1), cell adhesion and protein transport (module 2) and cytoskeletal dynamics controlling cell movement (module 3).
***Prerequisite: 01:146:270.***

Life Sciences (SAS)

# Genetics 447

# GENETICS 447

Department of Genetics, School of Arts and Sciences

**Website:** Here

**Chair:** Tara C. Matise

**Vice-Chair & Undergraduate Director**: Gary A. Heiman

**Distinguished Professors:**

Maureen M. Barr, B.A., Rutgers; Ph.D., Columbia

James A. Knowles, B.S., Michigan; M. Sc., M.D., Ph.D., Albert Einstein Medicine

Tara C. Matise, B.S., Cornell; M.S., Ph.D., Pittsburgh

Jay A. Tischfield, B.S., City University of New York; M.Phil., Ph.D., Yale

Lei Yu, B.S., Jiangnan University (China); M.S., Institute of Genetics, National Academy of Sciences (China); Ph.D., California Institute of Technology

**Professors**:

Gary A. Heiman, B.A., Boston Univ.; M.Sc., Sarah Lawrence; Ph.D., Columbia

Kim S. McKim, B.A., Simon Fraser; Ph.D., British Columbia

Bryce E. Nickels, B.S., Miami; Ph.D., Harvard

Christopher G. Rongo, B.A., University of California, San Diego; Ph.D., Massachusetts Institute of Technology

Gleb P. Shumyatsky, B.A., Moscow State University; Ph.D., Institute of Molecular Biology (Moscow, Russia)

Andrew W. Singson, B.S., University of California, Davis; Ph.D., University of California, San Diego

Karen Schindler, B.S., Loyola; Ph.D., Thomas Jefferson

Michael Verzi, B.A., The College of New Jersey; Ph.D., University of California, San Francisco

Jinchuan Xing, B.S., Nankai (China); Ph.D., Louisiana State

**Associate Professors:**

Chris Ellison, B.A., Lewis and Clark; Ph.D., University of California, Berkeley

Derek Gordon, B.A., Rochester; Ph.D., State University of New York at Stony Brook

**Assistant Professors:**

Christina M. Bergey, B.A., M.A., Ph.D., New York University

Devanshi Jain, B.Sc. Hons., Ph.D., University College, London

Tetsuya Nakamura, B.S., Ph.D., Osaka (Japan)

Srujana Samhita Yadavalli, B. Tech., Anna University (India); Ph.D., Ohio State

Jiekun Yang B.S., Renmin University (China), M.S. UW-Madison, Ph.D. University of Virginia

**Associate Research Professors:**

Juan Wang, B.S., Ph.D., China Agricultural University (Beijing)

**Assistant Research Professors:**

Marco Azaro, B.A., Ph.D., Brown

**Teaching Professor:**

Martha Haviland, B.A. Rutgers; MS, AM, Ph.D. Michigan

**Associate Teaching Professor:**

Jessica Rispoli, B.S., Richmond; M.G.C., Maryland

Christine Seymour, B.S., Scranton; M.S. Arcadia University

**Associate Research Professor:**

Oleg Evgrafov, B.S., Moscow Physical Engineering Institute; M.S., Moscow Physical Engineering Institute; Ph.D,. Institute of General Genetics (Moscow); D.Sc., Research Center for Med. Genetics (Moscow)

**Assistant Teaching Professors:**

Tara P. Cominski, B.S, Saint Peter's; M.S., Seton Hall; Ph.D., Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin; M.S., Kansas State; Ph.D., Wisconsin

Anne Keating, B.S., Ph.D., Rutgers

Haiyang Lu, B.S., Hebei University, China; M.S., Beijing Normal University, China; Ph.D., City University of New York

Shama Khan, B.A., Rutgers University; M.P.H., Tulane; M.S. Epidemiology, Tulane University; M.S. Genetic Counseling, Arcadia University

Mai Soliman, B.S., M.Sc., Montclair State; Ph.D., Rutgers

Zainab Tanvir, B.A. Stonybrook University, M.S. Univ. Delaware, Ph.D., Rutgers

Alexandra Walczak, B.S., Ramapo College of NJ, Ph.D., Rutgers

**Faculty Emeriti:**

David E. Axelrod

Linda Brzustowicz

Terry McGuire

Howard C. Passmore

Amrik S. Sahota

Lee D. Simon

Navin K. Sinha

Ann C. St. John


- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Elective Courses
- Departmental Honors
- Undergraduate Certificate Programs
- Courses

# Learning Goals

# Learning Goals

**Learning Goals:**

The Department of Genetics is committed to teaching science through the way we do science: through the process of doing research. The curriculum of the Department of Genetics is centered around four main goals. These goals shape our innovative courses and provide the basis for lifelong learning.

I. Knowledge specific goals: Know the terms, concepts, and theories of genetics.

II. Integrate the material from multiple courses and research to think holistically and to see the whole as well as the parts.

III. Use genetic information and ideas to critically analyze published research articles in genetics.

IV. At the end of four years, all of our students will be able to design an experiment, carry out the research using the appropriate laboratory techniques, and analyze and interpret their data. They will also be able to communicate their discoveries through a written article appropriate for publication in a peer-reviewed genetics journal, and through talks or posters appropriate for scientific meetings.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in this department must have been enrolled at Rutgers for at least one semester. In addition, students must:

1. Be an SAS student

2. Have a cumulative GPA of at least 2.00, and a GPA of at least 2.8 at the time of taking research for credit.

3. Have earned a C or better in these prerequisite courses or equivalents (25-26 credits):

a. General Biology I 01:119:115

b. General Biology II 01:119:116

c. General Biology Lab 01:119:117

d. General Chemistry I either 01:160:161 or 01:160:163

e. General Chemistry II either 01:160:162 or 01:160:164

f. Calculus I either 01:640:135 or 01:640:151

g. Calculus II or Statistic either 01:640:136, or 01:640:152, or 01:640:192, or 01:960:401, or 01:960:212, or 01:960:379

4. Students with an overall GPA < 3.0 must meet with the UGD before declaring the major.

a. Genetics is a credit-intensive major and has a requirement of a 2.80 GPA at the time of taking research for credit

b. Students entering the major with a GPA of < 3.0 may struggle to complete the major on time

5. Watch a Genetics Major Declaration Video

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The department offers a major with a strong emphasis on research. A minimum of 20 credits of coursework in the life sciences must be completed in residence. Genetics is a credit-intensive major. Excluding the prerequisite courses (25-26 credits) to get into the major (see above), there are between 54-56 credits to complete the major (60-62 for honors). A grade of "C" or better in courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades. Students may not double major in two Division of Life Sciences majors.

The requirements of the major consist of:

**A. Life Science Core Courses (19-21 credits)** - Required for all DLS Majors (Approved AP and Transfer credits may be substituted)

a. Intro to Experimentation 01:160:171

b. Organic Chemistry I 01:160:307 or 01:160:315

c. General Physics I (01:750:203 + 205 lab), or (01:750:271 + 275 lab), or 01:750:193, or 01:750 201
Note: 193 & 201 have integrated lab

d. General Physics II (01:750:204 + 206 lab) or (01:750:272 + 276 lab) or 01:750:194 or 01:750:202
Note: 194 & 202 have integrated lab

**B. Genetics Core (17 credits) -** Required for all Genetics Majors- All below credits must be completed at Rutgers

a. Genetic Analysis I 01:447:384

b. Genetic Analysis II 01:447:385

c. Lab Course Req. 01:447:315, or 01:447:302, or 01:447:203, or 01:447:303, or 01:694:214, or 01:694:215, or 01:694:316

d. Biochemistry for the Life Sciences 01:694:395 or 01:694:407

e. Communications in Genetics 01:447:430 or 01:447:414 + 01:447:415 (Honors, Thesis Writing senior year)

**C. Genetics Independent Scholarship (minimum 6 credits but 12 credits for honors**

Note: 2.8 minimum GPA to register for research

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

**D. Genetics Electives (6 credits)**

Fifty percent must be taken within the Genetics Major (i.e.; 01:447)

a. Genetics Electives See electives table

b. Genetics Electives See electives table

c. Genetics Electives See electives table

**E. Electives OR Independent Scholarship (6 credits)**

Note: Additional Genetics Lab may be used as an elective

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

c. Genetics Electives See electives table below

**Lab Note:** 01:694:214 and 01:694:215 are only offered to first-year students with AP Biology credit and AP General Chemistry credits (or taking General Chemistry concurrently). 01:447:203 is only offered to first-year students in the SAS Honors Program or the Honors College. Students cannot receive credit for both 01:447:203 and 01:447:302.

**Organic Chemistry Note:** If you are planning to pursue a graduate degree in which a full year of organic chemistry is suggested/required (e.g., med/dental school), we strongly recommend taking Organic Chemistry II + lab as an elective (6 credits)

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# Elective Courses

# Elective Courses

**Approved Genetics Electives**

(01:160:308 or 01:160:316) and (01:160:311 or 01:160:314-15) Organic Chemistry II + lab (6)

01:198:111 Introduction to Computer Science (4)

01:198:112 Data Structures (4)

01:447:203 Honors Computational Genetics (Honors) (3)

01:447:216 Analysis of Scientific Literature (Honors) (3)

01:447:245 Intro to Cancer (3)

01:447:302 Quantitative Biology and Bioinformatics (3)

01:447:303 Computational Genetics of Big Data (3)

01:447:315 Introduction to Research in Genetics (3)

01:447:354 Social, Legal, and Ethical Implications of the New Genetics (3)

01:447:356 Evolutionary Medicine (3)

01:447:370 Developmental Genetics (3)

01:447:390 General Microbiology (3)

01:447:392 Pathogenic Microbiology (3)

01:447:451 Genomes (3)

01:447:460 Genetics of Compulsive Behavior (3)

01:447:465 Genetic Approaches & Research Analysis (3)

01:447:470 Evolutionary Developmental Biology (3)

01:447:478 Special Topics in Genetics (3)

01:447:479 Special Topics in Genetics (3)

01:447:480 Topics in Molecular Genetics (3)

01:447:484 Behavioral and Neural Genetics (3)

01:694:411 Molecular Pathways and Signal Transduction (3)

01:694:412 Proteomics and Functional Genomics (3)

01:694:413 Chromatin and Epigenomics (3)

01:694:420 Membrane Dynamics in Health and Disease (3)

01:694:421 Spec. Top. Mol. Bio. & Biochem (3)

01:694:492 Gene Regulation in Cancer and Development (3)

11:126:427 Methods and Applications in Molecular Biology (4)

11:126:483 Nucleotide Sequence Analysis (3)

11:126:485 Bioinformatics (3)

11:680:480 Microbial Genetics and Genomics (3)

16:681:535 Human Genetics (3)

Life Sciences (SAS)

# Departmental Honors

# Departmental Honors

**Departmental Honors**

The Department of Genetics recognizes graduating students who have made outstanding academic achievements by awarding **departmental honors**. The department awards two types of departmental honors (see below) and these are awarded at the discretion of the Genetics Honors Committee. To be considered, students must meet all criteria for that type of honors and submit the honors request application by the deadline (April 1st of senior year).

The two types of departmental honors and their criteria are as follows:

**1. GENETICS HONORS- RESEARCH**

a. GPA requirement: a student must have attained, at the end of the junior year, a cumulative GPA of at least 3.4 and a Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete 6 or more credits of Honors in Genetics (01:447:408-409) during senior year

c. Complete a total of 12 or more research credits (including the 6 credits of 01:447:408-409)

d. Complete Honors Thesis and Communication in Genetics 447:414 and 415 during senior year

e. Complete and defend a research thesis before a faculty committee (see Thesis Guidelines)

f. Present at Honors Day

Students can apply to do an Honors thesis by completing the relevant sections of the Independent Scholarship Form. Students must register either for an Honors course sequence in Genetics (01:447: 408 and 409) or for a course sequence in a college Honors Program (See Handbook). These decisions should be discussed with an advisor and approved by the Department Vice Chair. Accepted students are expected to complete at least 12 credits in an independent research project, resulting in a thesis. Students may do research with Rutgers faculty outside of the Department with the approval of their advisor and the Vice Chair. Students will prepare a thesis and present an oral defense to a committee of three faculty. At least one member of the committee must come from the Department of Genetics. Students will present their research at a Departmental Symposium in April. Students contemplating an Honors thesis should refer to the much more detailed instructions and details in Section IX and Section X of the Student Handbook. For information on the thesis, see Thesis Guidelines.

**Level of Honors:** In determining the level of honors, the honors/awards committee takes into consideration multiple factors in aggregate, including but not limited to (1) cumulative GPA, (2) thesis defense committee recommendation, (3) research mentor evaluation, (4) faculty evaluation of presentation at Honors Day, and (5) whether or not the student took the honors versions of Genetic Analysis 1 and/or 2 (i.e., 01:447:384:H1 and/or 01:447:385:H1) and the grades received in those courses.

**2. Genetics Honors - Certificate Program**

a. GPA requirement: A student must have attained, by April 1st of senior year, a cumulative GPA of at least 3.4 and Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete a departmental certification program (i.e.; CompGen, Cancer or Genetic Counseling).

c. By April 1st, the student must formally apply to request consideration for Certificate Honors by completing the Genetics Honors- Certificate Program Form

* *The honors committee may award Honors, High Honors or Highest Honors*

Life Sciences (SAS)

# Undergraduate Certificate Programs

# Undergraduate Certificate Programs

The Department of Genetics offers two certificate programs. Students who complete one of these Certificates are eligible to receive Departmental Honors.

1) Genetic Counseling Certificate Program

The Department of Genetics offers an undergraduate **Genetic Counseling Certificate Program (GCCP).** The GCCP program is intended for a select group of students interested in applying to the masters-level programs in genetic counseling. The goal is to provide students with guidance, coursework, and relevant clinical experience to improve their graduate school applications. This is a highly competitive option and is **only open to declared genetics majors**. Not all applicants will be accepted. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in genetics and does not replace minors. The certificate is NOT in lieu of completing the masters-level programs in genetic counseling. At the end of the program students will:

- understand genetic counseling as a profession ·
- understand application requirements for masters-level programs
- gain experience in talking with people who are in crisis
- gain experience in a clinical genetic counseling clinic

2) Certificate in Computational Genetics

The Department of Genetics offers a Certificate in Computational Genetics (CCG) for Genetics majors. The volume of data being generated in Genetics and related life science fields has been expanding tremendously in recent years, and career opportunities for geneticists with computational and quantitative expertise are simultaneously growing. This certificate program is intended for students who are either interested in applying to graduate-level programs,

or planning careers, in Computational Genetics/Biology, Statistical Genetics, Bioinformatics, or other programs in quantitative biomedical related research. The goal of the CCG is to provide students with guidance, coursework, and relevant data design and analysis experience to prepare them for graduate studies in the field or entry-level informatics jobs. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained competence in genetic data analysis using basic computer programming and statistical analysis.
- Be prepared to apply to M.S. or Ph.D. graduate programs in the areas of Computational Genetics and Bioinformatics.
- Be prepared to apply for career positions in industry, biotech companies, pharmaceutical companies, medical centers, or universities

3) Cancer Research Certificate

The Department of Genetics offers a Certificate in Cancer Research (CCR) for Genetics majors. Completion of the Certificate in Cancer Research will provide an advantage when applying to MD, PhD, and MS programs and facilitate transitions to careers with Cancer-related missions. The goal of the CCR is to provide students with a rigorous and Cancer-specialized curriculum. Students will do at least one year of research in a nation-leading Cancer Research Lab and students will be expected to participate in community engagement and develop skills to build community outside of academia. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained knowledge in Cancer Genetics with an expanded curriculum focused on Cancer biology.
- Have at least one year of experience conducting laboratory research in a Cancer research lab.
- Be prepared to apply to M.S., MD, or Ph.D. graduate programs in the areas of Cancer Genetics or for career positions in industry, biotech companies, pharmaceutical companies, medical centers, policy-driving institutes, or universities.

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# Courses

# Courses

**01:447:203** ***Honors Computational Genetics (Honors) (3)***
Honors computational genetics is a computer-based laboratory course that introduces students to the use of computers in biological research. This course is for students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. In the first half of the course, students will receive instruction in introductory computer programming (Python). In the second half of the course, students will practice writing code in Python via in-depth computational projects in genetics and genomics. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on

assignments. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and genomic data analysis. Prior experience with computer programming is neither necessary nor is it expected for students who enroll in this course.

This course is for freshman or sophomore Honors students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major.The course fulfills the laboratory requirement for the Genetics major.
***Prerequisites: Students must be in their first or second year at Rutgers in an approved Honors program (e.g., the Honors College or the SAS Honors Program). General Biology I (01:119:115) and be at least co-registered for General Biology II (01:119:116)) or have placed out of these two courses (e.g., through AP credit or approved transfer credit). Credit not given for both 01:447:203 and 01:447:302.***

**01:447:216** ***Analysis of Scientific Literature (Honors) (3)***
A systematic approach to the reading, analyzing, and understanding of primary literature in genetics; emphasis will be placed on data analysis and experimental design and demystifying the process of reading a scientific journal article.
***Prerequisites: 01:119:115-116. Highly recommended: 01:694:215. Open only to freshmen and sophomores in the SAS or SEBS Honors Program. By permission only.***

**01:447:245** ***Introduction to Cancer (3)***
Introduction to Cancer provides the student with an overview of conventional and state-of-the-art aspects of oncogenesis. Students will become familiar with the process involved in neoplastic transformation to the cancer phenotype through aspects of epidemiology, pathophysiology, virology, in vitro and in vivo cellular transformation and genetics. They will then apply these aspects to the understanding of classic therapeutic modalities and new state-of-the-art rational therapies. This comprehensive course will concentrate on the human disease process by applying clinical aspects of oncogenesis during a series of Grand Rounds discussions that will include recent patient clinical cases and their outcomes.
***Prerequisites: 01:119:115-116. Credit not given for both this course and 01:447:495.***

**01:447:302** ***Quantitative Biology and Bioinformatics (3)***
Introduction to the use of computers and computer programming to develop applications for research in genetics and molecular biology. Application topics will include evolutionary genetics, association analysis and genetics mapping, and structural biology.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill an elective requirement or taken instead of 01:447:315 Introduction to Research in Genetics by students majoring in Genetics. Credit not given for both 01:447:203 and 01:447:302***

**01:447:303** ***Computational Genetics of Big Data (3)***
The main focus of this course is the application of R programming to the analysis of genetic data, particularly big data sets with multiple measurements. The primary data sets considered will contain RNA-seq and/or other expression data for multiple/all genes in a given set of individuals. This course is for junior or senior students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. Students will learn how to acquire such data, format it for R, plot the data, and perform statistical analyses. In addition, students will learn how to simulate data under different hypotheses, and how to perform power and sample size calculations

for different statistical methods applied to real or simulated data. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on assignments. Guest investigators will frequently make short presentations (in person or by skype) to provide illustrations of how programming and informatics is critical for their research. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and data analysis.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course.***

**01:447:315** *Introduction to Research in Genetics (3)*
Basic principles and methods of research with microbial model systems used in the analysis and manipulation of genes, followed by a research project in molecular genetics.
***Prerequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 (or equivalent) or 01:160:163-164, 171. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course. Credit not given for both this course and 01:694:315. Open only to genetics majors***

**01:447:354** *Social, Legal, and Ethical Implications of the New Genetics (3)*
Social, legal, and ethical implications of new modern genetic techniques, for example: genetic screening, stem cells and cloning, forensic genetics, genetic engineering of plants, animals, and humans, genetic enhancement, gene therapy, and the new eugenics.
***Prerequisites: Genetics (01:447:380) or Genetics Analysis (01:447:384)***

**01:447:356** *Evolutionary Medicine (3)*
In this course, we examine human health from an evolutionary perspective, exploring the impact that our evolutionary heritage has on modern human diseases, both chronic and infectious. We will learn how the framework of evolutionary biology and modern genetic tools can inform our understanding of issues relevant to clinical and public health. Rather than focus on the immediate mechanisms underlying disease, we will endeavor to understand the ultimate factors that influence susceptibility, such as past natural selection. The course topics are wide-ranging, but particular attention is paid to emerging infectious diseases, as well as non-communicable diseases that may be exacerbated by facets of modern lifestyles.

Through lectures, critical analysis of the primary literature and popular science news, and class discussions, students will learn how evolutionary principles can be practically applied to medicine. Key readings each session will focus on genetic techniques for understanding evolutionary medicine, while additional readings will incorporate perspectives from diverse fields.

By fully participating in this course, students will be able to appreciate how modern susceptibility to non-communicable and infectious diseases has been influenced by past evolutionary processes; critically evaluate evolutionary hypotheses related to health and medicine, including those found in popular science articles; and know how genetic techniques are applied within an evolutionary framework to understand ultimate reasons for disease.
***Prerequisites: (01:447:380 or 384) AND (01:960:401 or 01:960:212).***

**01:447:370** *Developmental Genetics (3)*
How genes influence the developmental processes of an organism. Topics include gene regulatory networks, signaling pathways, stem cell biology, and the role of developmental genetics in human disease.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:380** *Genetics (4)*
Introduction to the mechanisms of heredity and evolution. Mechanisms of Mendelian inheritance, meiosis, recombination, gene mutation, and mapping, and an introduction to modern biochemical, molecular, and population genetics.
*Lec. 3 hrs., rec. 1 hr. Prerequisites: 01:119:115-116 and 01:160:161-162 or 01:160:163-164. Credit not given for both this course and 01:447:384-385 or 11:067:328 or 11:776:305.*

**01:447:382** *Genetics Laboratory (1)*
Laboratory to accompany 01:447:380. Not accepted for elective credit for Genetics majors.
*Lab. 3 hrs. Pre- or corequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)*

**01:447:384-385** *Genetic Analysis I,II (4,4)*
Experimental methods and concepts in genetics, with emphasis on their application to genetic research. Part I covers transmission genetics and breeding analyses, basic molecular genetics, isolation and characterization of mutations, and chromosome structure and function. Part II covers mathematical genetics, recombinant DNA, genomics, and special topics relevant to modern genetic research.
*Open only to majors in genetics or by permission of instructor. Credit not given for both this course and 01:447:380 or 11:067:328 or 11:776:305. Prerequisites for 01:447:384 are 01:119:115-116 (General Biology I & II) or 01:160:161-162 or 01:160:163-164 (General Chemistry I & II). Prerequisite for 01:447:385 is 01:447:384.*

**01:447:390** *General Microbiology (4 includes laboratory)*
Microorganisms are an essential component of the human environment and are significant not only for the disease they cause, but also for their ecological, agricultural, pharmaceutical, and industrial benefits. This course will introduce students to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms and their applications. The lab component of the course will introduce microscopy and staining techniques, the growth cycle and generation of a standard curve, physiological characteristics of microorganisms, and bacterial transformation. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include: History and Overview of Microbiology, Cell Structure and function, Microbial Growth, Nutrition, culture, and metabolism, Virology, Bacterial genetics, Microbial evolution and systematics, Bacteria and Archaea, Nutrient cycles, Genetic Engineering and Biotechnology, Waste treatment, Anaerobic respiration and Nitrogen fixation, Antibiotics and chemotherapeutic agents, Normal Flora, Virulence, Toxins, Epidemiology, and Microbial Diseases.

This is an upper-level course that focuses on the basic principles of microbiology. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include:
*Prerequisites: General Biology 01:119:115-116-117 or 01:119:101-102 and General Chemistry 01:160:161-162-171 (or higher) and Organic Chemistry 01:160:307. Credit not given for both this course and 11:680:390.*

**01:447:392** *Pathogenic Microbiology (3)*
This course will integrate basic microbiology and infectious diseases. The first quarter of the course will provide the conceptual basis of microbial morphology, metabolism and growth, heredity and variation, pathogenicity and antimicrobial chemotherapy. Then this course will introduce the students to one real life patient case study each week, moving the course toward an understanding of specific human diseases (e.g., pharyngitis, meningitis) as might be expected in a clinical environment. Each case will include a patient history, differential diagnosis, clinical cues, laboratory data, pathogenesis, treatment and prevention, additional points and references. The objective is not to attempt to cover every infectious disease or microorganism, but rather to use examples that would stress the key

principles of microbial pathogenesis, differential diagnosis and appropriate treatment and prevention. This course is intended for Life Science majors or those with a strong background in the Biological Sciences.
***Prerequisites: General Biology (01:119:115-117), General Chemistry (01:160:161-162-171), and Organic Chemistry (01:160:305. and 01:160:315. Systems Physiology is recommended.***

**01:447:406-407** ***Research in Genetics (3)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Permission of department and cumulative grade-point average of 2.8 or better. Open only to students majoring in Genetics.***

**01:447:408-409** ***Honors in Genetics (3-6,3-6)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Open by permission to seniors majoring in genetics who meet the requirements for the departmental honors program. Corequisite: 01:447:414 (fall) and 415 (spring).***

**01:447:410** ***Research in Genetics - Writing Intensive (3)***
Research in Genetics- Writing Intensive is intended to provide you with an opportunity to engage in original laboratory research under the direct supervision of a faculty mentor, usually in the faculty member¿s research laboratory. You are expected to carry out your own research project. NOTE: this research requires a heavy commitment of time and effort and can impact your performance in coursework, especially if you have not yet managed the foundational material for the discipline. Fulfills the writing and communication requirements of the SAS Core Curriculum.
***Prerequisites: 01:447:302, 447:315, or permission of department. Registration is by special permission only. Cumulative grade-point average of 2.8 or better. Declared genetics major.***

**01:447:414** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods, and reference sections of their thesis and outline the results and discussion.
***Corequisites: 01:447:408. For seniors completing departmental honors; by special permission only.***

**01:447:415** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods and reference sections of their thesis and outline the results and discussion.
***Prerequisite: 01:447:408. Corequisite: 01:447:409. For seniors completing departmental honors; by special permission only.***

**01:447:430** ***Effective Communication Skills in Genetics (3)***
Communication is an essential part of science. Whether it is communicating research findings to other scientists or conveying complex concepts to a lay audience, a scientist must be able to effectively communicate their research to succeed. Communication in science is typically through publications, posters, or oral presentations. The goal of this course is to provide students practice in effectively communicating scientific findings. This includes preparing and revising an introduction for scientific papers, writing a research description for general audience, and preparing and

giving presentations (both oral and poster).
***Prerequisites: Declared major in Genetics; must have completed one semester of Research in Genetics, Advanced Independent Study, or Genetic Counseling Rotation. By special permission only.***

**01:447:451** *Genomes (3)*
This course will focus on Genomics, Proteomics and Bioinformatics from a Genetics perspective. Special attention will be given to the organization and functioning of the human genome.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:460** *Genetics of Compulsive Behavior (3)*
Compulsive urge can be channeled toward productive endeavors such as a strong drive to succeed in competitions, schooling, and career. On the other hand, improper handling of compulsive urge may lead to problematic behaviors such as alcoholism, drug use, gambling, and other undesirable behaviors. There are also conditions that are medically defined as disorders, with certain types of compulsive behaviors as part of the diagnostic symptoms, such as OCD and ADD/ADHD. There is evidence that genetics contribute to compulsive behavior in humans, and research in animal models has begun to uncover the molecular factors that underlie the genetic basis of compulsive behavior. Discussion of primary literature and other scientific publications that deal with the molecular and genetic basis of compulsive behavior. Emphasis will be placed on the development of skills for critical thinking and effective writing.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:465** *Genetic Approaches and Research Analysis (3)*
This class will teach students how to read, interpret and analyze research articles. The class will follow an active learning format, where we will discuss seminal and recent research articles in depth: What was the scientific question or problem? What methods and strategies were used to address it? What were the findings and conclusions? What are the alternative interpretations and methods that could have been applied? What questions are remaining?
This class will expose students to a diverse selection of research literature, involving genetic and molecular analyses in model organisms such as mice, worms, flies and yeast. The class series will begin with a research article presented by the teacher. During the majority of the class series, students will be divided into groups of 4-5. Each group will be assigned one research article and be required to work together to a) interpret, b) analyze and c) present the article in the form of an oral presentation to the class. Students will be graded on their ability to perform each of these tasks and on active participation during presentations by other groups. All groups will also be required to complete and be graded on a written discussion summary assignment at the end of each article discussion. This summary assignment may take many forms, e.g., preparation of a graphical abstract, subway advert, or other creative forms of expression.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:470** *Evolutionary Developmental Biology (3)*
Evolutionary origins of the vertebrate body plan are major problems in biology. While paleontology and comparative anatomy have revealed the evolutionary trajectories of the organs, recent genetics, genomics and embryology are becoming powerful tools to answer classical questions. The goals of this course are twofold; 1) obtain fundamental knowledge of anatomy, embryology, and the latest genomics and 2) learn how to integrate genetics, genomics and embryology to answer evolutionary questions through active discussion in the classroom. The training to discover and answer scientific questions in animal diversity will be performed at the American Museum of Natural History.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:478,479** ***Special Topics in Genetics (3,3)***
Directed readings and discussion of selected topics of special interest in genetics. Topics will vary according to semester and/or instructor.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:480** ***Topics in Molecular Genetics (3)***
Current research topics in microbial and molecular genetics. Lectures, discussions, and critical analyses of journal articles.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:484** ***Behavioral and Neural Genetics (3)***
Influence of genetics on the nervous system and behavior of various organisms. Overview of field including experimental analysis of behavior, development of the nervous system, and sensory systems. Emphasis on reading and interpreting original research,
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:488** ***Genetic Counseling Rotation (3)***
The goal of this course is to provide students with an understanding of the genetic counseling career. Students will be placed at a local Genetic Counseling clinic to shadow a genetic counselor for one semester. During the semester, the student is expected to spend 8-9 hours a week at the rotation plus meet weekly with course director (attendance is mandatory). Course grade will be based on 1) Case presentation to Genetic Counseling group 2) ten Genetic Counseling case summary logs, and 3) evaluation by the clinical supervisor.
***Prerequisites: Declared Genetics major, cumulative GPA of 2.8 or greater, and accepted into the undergraduate Genetic Counseling Certificate Program (GCCP).***

**01:447:489,490** ***Advanced Independent Study in Genetics (3,3)***
Advanced independent study in Genetics is an opportunity for students to complete a scholarly project under the direct supervision of a faculty mentor. Projects are varied; e.g. library research on a topic of mutual interest to both the student and the faculty member, computer simulations, informative website design, or development of teaching materials. This course may not used for laboratory research.
***Prerequisites: 01:447:384 and permission of department. Open only to students majoring in Genetics***

Life Sciences (SAS)

# Molecular Biology and Biochemistry 694

# MOLECULAR BIOLOGY AND BIOCHEMISTRY 694

Department of Molecular Biology and Biochemistry, School of Arts and Sciences

**Website:** Here

**Chair:** Barth Grant

**Undergraduate Chair:** Samuel Gunderson

**Professors:**

Gyan Bhanot, B.S., Baroda (India); Ph.D., Cornell

Steven J. Brill, B.S., Maryland; Ph.D., SUNY (Stony Brook)

Monica Driscoll, B.A., Rutgers; Ph.D., Harvard

Isaac Edery, B.S., Ph.D., McGill (Canada)

Barth Grant, B.A., Virginia; Ph.D., Princeton

Kenneth D. Irvine, B.A., Williams College; Ph.D., Stanford

Fumio Matsumura, B.A., Tokyo; Ph.D., Nagoya (Japan)

Konstantin V. Severinov, M.Sc., Moscow State; Ph.D., Russian Academy of Sciences

Ruth Steward, B.S., Ph.D., Basel (Switzerland)

Andrew K. Vershon, B.A., Bennington College; Ph.D., Massachusetts Institute of Technology

Eileen P. White, B.S., Rensselaer Polytechnic Institute; Ph.D., SUNY (Stony Brook)

**Associate Professors:**

Stephen Anderson, A.B., Ph.D., Harvard

Sam Bunting, B.A., Oxford; Ph.D., Cambridge

Guoping (Sam) Gu, B.A., Peking (China); Ph.D., California (Santa Cruz)

Samuel I. Gunderson, B.S., Minnesota; Ph.D., University of Wisconsin, Madison

Mikel Zaratiegui, B.S., Ph.D., Navarra (Spain)

**Assistant Professors:**

Annika Barber, B.S., Bryn Athyn College; Ph.D., Thomas Jefferson

Jia Fei, B.S., Yunnan (China); Ph.D., Zurich (Switzerland)

Tina Liu, B.S. Yale; Ph.D. Harvard

Yang Lyu, B.S. Beijing, China; Ph.D. Guangzhou, China

Kevin Monahan, B.S., Haverford; Ph.D., Harvard

**Assistant Teaching Professor:**

Gabe Villegas B.A., Rutgers; Ph.D., Rutgers


- Learning Goals
- Entry Requirements of the Major
- Major Requirements

- Course Requirement Options
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Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Molecular Biology and Biochemistry offers a course of study in which traditional and modern biochemistry are integrated with studies in molecular biology. In addition to traditional courses, students are required to carry out undergraduate research work in a Rutgers professor¿s lab who serves as the host and mentor. This course of study prepares students for graduate studies in molecular biology and biochemistry and related fields, entry into professional schools in medicine or other health professions, or employment in industries (e.g., biotechnology, pharmaceuticals) in which molecular biology and biochemistry skills are in demand. The same learning goals are also used for nonmajor students taking molecular biology and biochemistry courses.

*Learning Goals:*

I. Students should demonstrate an understanding of the knowledge that is needed to begin biomedical research and that is required for postgraduate exams and studies.

II. Students should demonstrate the ability to find and evaluate information about specific biological systems or problems.

III. Students should demonstrate the ability to design experiments and critically analyze data.

IV. Students should demonstrate the ability to communicate their research and findings orally through seminar and poster presentations and through written research papers.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

The molecular biology and biochemistry (MBB) major is open to students beyond their first year who have a 2.0 cumulative grade-point average and have received grades of C or better in courses taken toward the major, except by special permission of the department undergraduate chair. The MBB major is also open to first year students with AP credits. In all cases, students interested in the MBB major should contact the Undergraduate Director, Sam Gunderson.  A grade of C or better in all courses credited toward the major is required for graduation and each course may be repeated only once to replace D/F grades.

Departmental approval is required to declare the major in molecular biology and biochemistry. Students who want to register for the MBB major must first meet with the Undergraduate Chair Sam Gunderson, Nelson lab, Room A322/A320 (848-445-1016 gunderson@dls.rutgers.edu) to discuss details about the major.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

A core of courses is required for completion of the major in molecular biology and biochemistry. Students supplement the core with additional required and elective courses in one of three options. Given that molecular biology and biochemistry is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life science courses applied to the major in molecular biology and biochemistry should be taken within 10 years of graduating. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major. Returning students must meet with their adviser to discuss their path to graduation. All students are required to write research reports and present them at a seminar.

***Required Core Courses (58 credits)***

01:119:115-116 General Biology (4,4)*
01:119:117 Biological Research Laboratory (2)*
01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)*
01:160:171 Introduction to Experimentation (1)*
01:160:309 Organic Chemistry Laboratory (2) (recommended)* or 01:160:311 Organic Chemistry Laboratory (2)
01:160:315-316 Principles of Organic Chemistry (4,4) (recommended)* or 01:160:307-308 Organic Chemistry (4,4)
01:447:380 Genetics (4)*
01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4) *(recommended) or 01:640:135-136 Calculus for the Life and Social Sciences I,II (4,4)**
01:694:407 Molecular Biology and Biochemistry (3) or 01:694:395 Biochemistry for the Life Sciences (3)
01:694:315 Introduction to Molecular Biology and Biochemistry Research (3) or 01:694:215 Honors Introduction to Molecular Biology and Biochemistry Research (4) or 01:694:214 Introduction to Molecular Biology Research (3) or 01:694:316 Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)
01:694:408 Molecular Biology and Biochemistry (3)
01:694:383 Molecular Biology and Biochemistry Seminar: Careers in Science (1)
01:694:484 Molecular Biology and Biochemistry Seminar: Research Presentations (1)
01:750:203-204 General Physics (3,3)***

01:750:205-206 General Physics Laboratory (1,1)***

*Life sciences core course
**01:960:401 Basic Statistics for Research (3) or 01:960:211-212 Statistics I,II (3,3) may be substituted for the second semester of calculus.
***01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

Life Sciences (SAS)

# Course Requirement Options

# Course Requirement Options

In addition to the required core courses, the Department of Molecular Biology and Biochemistry (MBB) offers two course options to students to fulfill the requirements for the major. Course option one comprises taking advanced electives and is intended to expose MBB students to different current topics in molecular biology and biochemistry. Course option two is for students interested in biophysical questions and research and comprises taking Physical Chemistry and Multivariable Calculus. Students completing course option two will also receive a minor in chemistry are encouraged to take the physical chemistry courses as they will fulfill the minor requirements. Course option two is intended to expose MBB students to different current topics in molecular biology and biochemistry.

*Course Option One (13 credits)*

Two 3-credit courses offered by the MBB department from the following list: 01:694:230; 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

One 400-level, 3-credit elective course offered by any department in the Division of Life Sciences or approved by the MBB department. See degree navigator or the MBB department website for a list of approved courses.

*Course Option Two (9 credits)*

01:160:341-342 Physical Chemistry: Biochemical Systems (3,3) or 01:160:327-328 Physical Chemistry (3,3) (requires 01:640:251 as a prerequisite). Other combinations of Physical Chemistry are possible so see degree navigator for further details.

01:640:251 Multivariable Calculus (4)

One 3-credit course offered by the MBB department from the following list: 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

*Electives*

Because the list of approved electives is changing, students should discuss their elective options directly with their departmental faculty advisers and with the MBB Undergraduate Director, Sam Gunderson. A list of currently approved electives can be found on the MBB department website. In addition to the undergraduate courses listed, advanced students are encouraged to choose electives from the School of Graduate Studies.

Life Sciences (SAS)

# Research Options

# Research Options

The Department of Molecular Biology and Biochemistry (MBB) offers two laboratory research options (laboratory option one and laboratory option two), as well as a nonlaboratory research option (nonlaboratory option). In all cases, students must take one of the Introduction to Molecular Biology and Biochemistry Research courses (01:694:214, 01:694:215, 01:694:315, or 01:694:316) and 01:694:383, 484 Seminars in Molecular Biology and Biochemistry. Course 01:694:215 is only for first-year honors students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:214 is for first-year students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:315 is for either qualified sophomores or junior students in the major. Course 01:694:316 is for either qualified sophomores or junior honors students in the major.

*Laboratory Option One (>12 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6,2-6)

01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (6,6)

A minimum of 12 credits is required in research courses. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Laboratory Option Two (6 to 11 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6) or 01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (4-6,4-6)

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

A minimum accumulation of 6 credits is required in research courses. Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Note that students applying for honors must complete 4 up to 6 credits of honors coursework per semester for two semesters. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Nonlaboratory Option (9 credits)*

01:694:489,490 Literature Research in Molecular Biology and Biochemistry (3,3). This non-lab option is almost never used and will need approval from the Undergraduate Director, Sam Gunderson

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Students taking this option may not apply for departmental honors.

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have attained, at the end of the junior year, a cumulative grade-point average of at least 3.4 and a grade-point average of 3.4 or better in courses required for the major. Exceptional students not meeting these criteria but wishing to apply for honors research may petition the Department of Molecular Biology and Biochemistry at the beginning of their senior year. Students accepted into the program are expected to complete two semesters (6 credits per semester) of honors coursework. A written honors thesis and an oral thesis presentation are required. Students enrolled in 01:694:495,496 Honors Laboratory Research or any of the various school honors programs are eligible to receive departmental honors at the time of graduation.

Life Sciences (SAS)

# Courses

# Courses

**01:694:214** ***Introduction to Molecular Biology Research (3)***
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities available to undergraduates at the university.
***Prerequisites: For first-year students only who have placed out of General Biology (01:119:115,116, and 117) with AP credits, and 01:160:161 or 01:160:163. Corequisite: 01:160:162 or 164.***

**01:694:215** ***Honors Introduction to Molecular Biology and Biochemistry Research (4)***
Basic principles and methods of research, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisite: Limited only to first-year SAS Honors Program or Honors College students who have placed out of General Biology (01:119:115,116, and 117) with AP credits. Corequisites: 01:160:161 or 01:160:163 (or AP credits) and 01:640:135 or 01:640:151 (or AP credits).***

**01:694:230** ***Analytical Methods in Biology (3)***
Mathematical methods and tools to analyze and interpret biological and biomedical data, including probability theory; Bayes Theorem; the binomial, Poisson, and normal distributions; limit theorems; error analysis; tests of statistical significance; parameter estimation; curve fitting; sampling techniques; random number generation; and Monte Carlo methods. Analysis of sequencing and microarray data, such as sequence alignment, phylogeny inference, population structure, selection, and human migration.
***Prerequisites: 01:119:115-116 and 01:640:135 or 151.***

**01:694:281,282** *Sophomore Laboratory Research (2-6,2-6). 281 is Fall, 282 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Credits in this course cannot be used toward the required research credits for laboratory option. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:283** *01:694:283 Undergraduate Laboratory Research (2-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
Typically for rising Juniors and Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

***Prerequisite: Students must complete a special permission form and have it signed by their research and MBB faculty mentors before they can register of the course.***

**01:694:301** *Introductory Biochemistry and Molecular Biology (3)*
Chemistry and metabolism of proteins, carbohydrates, lipids, nucleic acids, and other biologically important compounds.
***Prerequisite: 01:160:209 or 307. Not for students majoring in molecular biology and biochemistry. Credit not given for both this course and 01:694:407, 11:115:301, or 11:115:403.***

**01:694:313** *Introductory Biochemistry Laboratory (1)*
Techniques used in research, clinical, and food laboratories, including tests of biological materials, methods of separation, and determination of enzyme activities.
***Lab. 3 hrs. Pre- or corequisite: 01:694:301. Not for students majoring in molecular biology and biochemistry.***

**01:694:315** *Introduction to Molecular Biology and Biochemistry Research (3)*
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities at the university available to undergraduates.
***Pre- or corequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 or 01:160:163-164, 171. Credit not given for both this course and 01:447:315, 01:694:214, 215, or 316. Open only to MBB majors.***

**01:694:316** *Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)*
Basic principles and methods of research in molecular biology, biochemistry, and genetics, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisites: 01:119:116 and (01:160:162 or 01:160:164). For MBB or genetics majors only or those planning on being MBB or genetics majors. Special permission required.***

**01:694:381,382** *Undergraduate Laboratory Research (3-6,3-6). 381 is Fall, 382 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:383** *Molecular Biology and Biochemistry Seminar: Careers in Science (1)*
Discussion of career options in the life sciences, finding a research laboratory, performing literature searches, reading a scientific paper, and creating posters and abstracts. This course should be taken in the beginning of the third year.
*Open to MBB majors only.*

**01:694:384** *Undergraduate Laboratory Research (1-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

*For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.*

**01:694:385** *MBB Research and Writing (3)*

Research project in the laboratory of a faculty member. Seminar on science communication. Written and oral reports of research carried out during the semester required.

*Prerequisites: MBB majors only. Students need a GPA of 2.8 or better to enroll in research.*

**01:694:390** *Introductory Computational Biology (3)*
Disciplines of biochemistry and molecular biology and genomics all include collection and analysis of large data sets. Hands on use in a computer lab will permit students to learn and apply computer languages such as Python and R to analyze large data including for example DNA mutations and structural variations (SVs), RNA-seq and ChIP-seq as part of understanding genes and gene regulation.
*Prerequisite: 01:447:380 or 01:447:384*

**01:694:395** *Biochemistry for Life Sciences (3)*
The course is intended for life science majors and takes a holistic approach to Biochemistry. You will learn the basics of proteins, enzymology, nucleic acids and metabolism and use these as foundations to discuss exemplary metabolic pathways for their importance to homeostasis and, when dysregulated, to disease including observable phenotypes and what current strategies are used to treat these disorders. Coursework will consist of quizzes, homework, exams and one graded paper.

*Prerequisites: 01:160:307 or 01:160:315*

**01:694:407** *Biochemistry (3)*
Protein structure and function, structure of lipids, membranes and carbohydrates, catalysis of biochemical reactions, intermediary metabolism, oxidative phosphorylation, membrane transport, lipid metabolism, signal transduction, photosynthesis, protein secretion, targeting and turnover, nitrogen, amino acid, and nucleotide metabolism.
*Pre- or corequisites: 01:160:307-308 or 315-316. Credit not given for both 01:694:407 and 01:694:301, 11:115:301, or 11:115:403.*

**01:694:408** *Molecular Biology and Biochemistry (3)*
Disciplines of biochemistry and molecular biology as interlocking and mutually complementary fields of study. Lectures on structure of DNA, RNA, recombinant DNA approaches, DNA replication, repair and recombination, mobile genetic elements, transcription, gene regulation, RNA splicing, translation, and viral gene expression.
***Prerequisite: 01:694:407 or 01:694:301 or 01:694:395 or 11:115:403. Credit not given for both 01:694:408 and 01:146:478 or 11:126:481.***

**01:694:411** *Molecular Pathways and Signal Transduction (3)*
Lectures and discussion of current research areas of advanced molecular and structural biology: transcription, posttranscriptional regulation, cell cycle, neurobiology, protein folding, macromolecular recognition, and molecular virology.
***Pre- or corequisites: 01:694:407 and 408, or 01:447:384-385 or 11:115:403-404 or 11:126:481.***

**01:694:412** *Proteomics and Functional Genomics (3)*
Survey of modern techniques of protein biochemistry, bioinformatics, proteomics, and functional genomics, including basic concepts of protein structure and function, protein folding, protein characterization and purification, enzyme kinetics, NMR and X-ray crystallography, mass spectrometry, yeast two hybrid, and various techniques and approaches to functional and structural genomics.
***Prerequisites: [(01:694:301 OR 01:694:407 OR 01:694:395) AND (01:447:380) OR (01:447:384)]***

**01:694:413** *Chromatin and Epigenomics (3)*

Introduction to chromatin dynamics, particularly the structural and biochemical modifications of chromatin that underlie epigenetic states and their effects on gene expression and development.

***Pre- or corequisites: Prerequisite: 01:694:408 or 01:146:478 or 01:447:385.***

**01:694:420,421** *Special Topics in Molecular Biology and Biochemistry (3,3)*
Directed reading and discussion of selected topics of special interest in molecular biology and biochemistry. Topics will vary according to semester and/or instructor.
***Pre- or corequisites: [(01:694:301 or 01:694:407) and (01:447:380 or (01:447:384)] or equivalent.***

**01:694:481,482** *Advanced Undergraduate Laboratory Research (BA, BA). 481 is Fall, 482 is Spring.*
Research project in the laboratory of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484.

**01:694:484** *Molecular Biology and Biochemistry Seminar: Research Presentations (1)*
Oral presentation of student's own research results and the research interests of the laboratory with which the student is associated. Presentation at a required poster session.
***Students should take this course in the spring semester of their senior year. MBB majors only.***

**01:694:489,490** *Literature Research in Molecular Biology and Biochemistry (1-3,1-3)*
Literature research projects on a selected subject under the direction of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484. This course is rarely used, therefore contact the Undergraduate Director if you are considering to take this course.
***Prerequisites: 01:694:214, 215 or 315, 407, 408, and 383.***

**01:694:492** ***Gene Regulation: Clocks to Cancer (3)***
Explanation of MBB as an experimental science and how molecular biologists know what they know. Covers all aspects of gene regulation from transcription to protein modification to explain how 25,000 human genes can make millions of different protein isoforms and mRNA and ncRNA. Mechanisms of molecular clocks and cancer addressed in terms of gene regulation complexity,feedback loops and rate-limiting steps with emphasis on the methods, experimental design,
***Prerequisites:(01:694:407 BIOCHEM) OR (01:447:384 GEN ANALY) OR (11:126:481 MOLE GEN) OR (11:115:403 GEN BIOCHEM) OR (01:694:395 BioChem LS)***

**01:694:495,496** ***Honors Laboratory Research (BA)***
Two-semester-long Honors research project in the laboratory of a faculty member. In the Fall semester, 01:694:495 students are required to attend a seminar each week on writing a thesis and preparing an oral thesis presentation. In the Spring semester, students take 01:694:496 where they complete their Honors thesis and give their oral presentation to their honors committee.

# Biotechnology 126 (SEBS)

## BIOTECHNOLOGY 126

**Degree:** B.S.

**Director:** Paul Meers (paul.meers@rutgers.edu)

**Program Website:** Here

The field of biotechnology has emerged as a major contributor to the advancement of agriculture, medicine, and environmental sciences. Recent developments in biotechnology, particularly molecular biology, promise major improvements in agricultural productivity, breakthroughs in human health care, and new solutions to environmental problems.

The biotechnology curriculum is designed to provide students with fundamental knowledge and laboratory skills in biotechnology, including applied genetics, molecular biology, biochemistry and a firm foundation in biology and the physical sciences. The primary objectives of the program are to broadly educate students for positions in the rapidly developing biotechnology industry and to prepare students for graduate and graduate/professional study in the life sciences. The strong life and physical sciences foundation of the curriculum involves extensive laboratory and coursework and research experience, as well as specializations in the following fields: animal biotechnology, microbial biotechnology, plant biotechnology, bioinformatics, and bioscience policy and management.

# Learning Goals

# Learning Goals

As a biotechnology major, each student will:

1. be able to describe the basic molecular concepts essential for understanding the field of biotechnology and the applications of biotechnology;
2. demonstrate proficiency in using the tools of biotechnology in an applied laboratory setting;
3. be able to find and read published scientific research in biotechnology and summarize and communicate that research effectively and critically;
4. acquire knowledge of ethical aspects of biotechnology and be able to analyze alternate viewpoints; and
5. learn to work as a team in the laboratory setting or group presentations.

By achieving these goals the student will have the knowledge base, technical proficiency, and communication skills for postbaccalaureate employment in the biotechnology field or for graduate/professional advanced education.

Biotechnology 126 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

To take biotechnology (11:126) courses, students must have completed 01:119:115 General Biology and 01:160:161 General Chemistry with grades of C or better and achieved a cumulative grade-point average of 2.0 or higher. Students whose cumulative grade-point average falls below 2.0 will be allowed one semester to restore the average to 2.0 or higher.

Biotechnology 126 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of biotechnology major requirements, courses, and course sequences please refer to the program webpage.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EBE]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent [WC] and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

## Major Requirements for All Students Regardless of Matriculation Date

**Proficiency in Biotechnology (70-74 credits)**

**Courses usually taken first year that are prerequisites for many required biotechnology courses (22):**

- 01:355:101 Expository Writing (3) - required before or concurrently with General Biology 1
- 01:119:115 General Biology 1 (4) and 01:119:116 General Biology 2 (4)
- 01:119:117 General Biology Laboratory (2)
- 01:160:161 General Chemistry 1 (4) and 01:160:162 General Chemistry 2 (4)
- 01:160:170 Introduction to Experimentation (1)

**Further courses for proficiency in biotechnology:**

**Quantitative Skills (7-8)**

- 01:640:135 Calculus 1 (4)
- 01:960:401 Basic Statistics for Research (3)* or 01:640:136 Calculus 2 (4) or 01:960:212 Statistics II (3) (this course has prereqs)

*Basic Statistics for Research 01:960:401 (or equivalent - 01:960:212) required for bioinformatics option (see below)

**Computer and information technology competence (3)**

- 11:126:383 Nucleotide Sequence Analysis (3)

**Professional Ethics (1.5)**

- 11:126:111 Ethical and Scientific Challenges in Biotechnology (3)** or with approval,11:126:110 Concepts and Issues in Biotechnology (1.5)

***11:126:111 is certified in SEBS core curriculum categories NS-1 and -2 (natural science) and CCO-2 (contemporary challenges)*

**Other biotechnology required courses:**

- 01:447:380 Genetics (4) or 11:776:305 Plant Genetics (4) (only for plant biotechnology option)
- 11:680:390 General Microbiology (4)
- 01:750:193-194 Physics for the Sciences (4,4) or equivalent**
- 01:160:307-308 Organic Chemistry (4,4)**
- 11:115:403-404 General Biochemistry (4,3) or equivalent
- 11:115:313 Introductory Biochemistry Laboratory (1)
- 11:126:481 Molecular Genetics (3)
- 11:126:482 Molecular Genetics Laboratory (4)
- 11:126:401 Seminar in Biotechnology (1.5)
- 11:126:427 Methods and Applications in Molecular Biology (4)

**If Basic Statistics for Research is chosen to satisfy the Quantitative Skills requirement, it cannot also be used as an option elective.*

***Physics for the Sciences requires coregistration in a 0-credit laboratory section. If students opt for the 01:750:203-204 General Physics 1 and 2 sequence instead, they must also take a corresponding lab section in 01:750:205 and 206. Students intending to apply to medical or dental school and certain Ph.D. programs should be aware that many professional schools and some graduate schools require two semesters of calculus and 01:160:311 Organic Chemistry Laboratory and a physics laboratory.*

**B. OPTIONS (14-18)**

**General Biotechnology (15-17)**

*Required Courses*
*Choose one of the following:*
11:067:430 Animal Microtechniques and Tissue Culture (4)
or
11:776:452 Plant Tissue Culture (3)

*Choose one of the following courses (3):*
01:146:474 Immunology (3)
11:115:421 Biochemistry of Cancer (3)
11:115:422 Biochemical Mechanisms of Toxicology (3)
11:115:436 Molecular Toxicology Lab (3)
11:115:452 Biochemical Separations (3)
11:126:407 Comparative Virology (3)
11:126:484 Tools for Bioinformatic Analysis (3)
11:126:485 Bioinformatics (3)
11:126:486 Analytical Methods in Microbiology (3)

11:680:480 Microbial Genomics (3)
11:776:410 Plants for Bioenergy (3)
11:776:486 Functional Genomics for Research (3)

*Electives (9-10)*
Three additional electives from the required and elective courses listed in each of the
six biotechnology curriculum options. One to three credits of Research in Biotechnology may be substituted for an equal number of credits of elective work.

**Animal Biotechnology (16-17)**

*Required Courses (7)*
*Two courses:*
11:067:300 Integrative Physiology (3) or
11:067:492 Molecular and Cellular Physiology (3)
11:067:430 Animal Microtechniques and Tissue Culture (4)

*Electives (9-10) - Choose from the following courses:*
11:067:327 Animal Reproduction (3)
11:067:450 Endocrinology (3)
11:067:492 Molecular and Cellular Physiology (3)
11:126:407 Comparative Virology (3)
11:126:410 Process Biotechnology (3)
11:126:484 Tools for Bioinformatic Analysis (3)
11:126:485 Bioinformatics (3)
11:709:400 Advanced Nutrition I (3)
11:709:401 Advanced Nutrition II (3)
11:146:474 Immunology (3) with or without 01:146:475 Immunology Lab (1)
01:447:451 Genomes (3)
01:447:481 Topics in Human Genetics (3)
01:447:486 Evolutionary Genetics (3)
01:447:495 Cancer (3)
01:694:412 Proteomics and Functional Genomics (3)
01:694:492 Gene Regulation of Cancer and Development (3)
01:960:401 Basic Statistics for Research (3)
11:115:421 Biochemistry of Cancer (3)
11:115:422 Biochemical Mechanisms of Toxicology (3)
11:115:436 Molecular Toxicology Lab (3)
11:115:452 Biochemical Separations (3)
11:776:486 Functional Genomics for Research (3)

*One to three additional credits of research in biotechnology may be substituted for an equal number of credits of elective work.*

**Bioinformatics (17)**

Bioinformatics option students should take 01:640:135 Calculus 1 and 01:960:401 Basic Statistics for Research to satisfy their quantitative skills requirement.

*Required Courses (17)*
01:198:111 Introduction to Computer Science (4) or equivalent
01:198:112 Data Structures (4)
11:126:484 Tools for Bioinformatic Analysis (3) or 11:776:486 Functional Genomics for Research (3)
11:126:485 Bioinformatics (3)

*Elective (3)*
Choose from the general biotechnology electives or one approved programming course (suggested). Students in the option who would like to take Calculus 2 to meet medical school or graduate school requirements may use that course for this elective.

**Bioscience Policy and Management (18)**

*Required Courses (15)*
11:373:121 Principles and Applications of Microeconomics (3)
11:373:231 Introduction to Marketing (3)
11:373:241 Introduction to Management (3)
11:373:403 Innovation and Entrepreneurship (3)
11:373:404 Bioscience Policy (3) or suitable alternative

*Electives (3)*
One course from **either** of the following areas of concentration:

Business Management Concentration:
11:373:351 Business Finance I (3)
11:373:352 Economics of Futures Markets (3)
11:373:402 Global Marketing (3)
11:373:451 Business Finance II (3)
*OR*
Bioscience Policy Concentration:
11:373:323 Public Policy toward the Food Industry (3)
11:374:341 Social and Ecological Aspects of Health and Disease (3)
11:373:371 Food Health and Safety Policy (3)

**Microbial Biotechnology (15.5-17)**

*Required courses (7)*
11:680:494 Applied Microbiology (4)
and at least one from the list:
11:680:480 Microbial Genetics and Genomics (3)
or

11:680:481 Microbial Physiology (3)
or
11:680:491 Microbial Ecology and Diversity (3)

*Electives (8.5-10)*
01:146:328 Human Parasitology (3)
01:146:329 Human Parasitology Laboratory (1)
01:146:470 Advanced Cell Biology (3)
01:146:474 Immunology (3)
01:146:475 Laboratory in Immunology (1)
01:447:495 Cancer (3)
11:067:430 Animal Microtechniques and Tissue Culture (4)
11:067:492 Molecular and Cellular Physiology (3)
11:115:452 Biochemical Separations (3)
11:126:407 Comparative Virology (3)
11:126:410 Process Biotechnology (3)
11:126:486 Analytical Methods in Microbiology (4)
11:375:411 Environmental Microbiology (3)
11:400:419 Food Physical Systems (3)
11:400:423 Food Microbiology (3)
11:400:424 Food Microbiology Laboratory (1)
11:680:480 Microbial Genomics (3)
11:680:481 Microbial Physiology (3)
11:680:491 Microbial Ecology and Diversity (3)
11:680:492 Microbial Ecology and Diversity Laboratory (2)
11:126:484 Tools for Bioinformatic Analysis (3)
11:126:485 Bioinformatics (3)
11:776:486 Functional Genomics for Research (3)

*One to three additional credits of research in biotechnology may be substituted for an equal number of credits of elective work.*

**Plant Biotechnology (15-16)**

*Required courses (6)*
11:776:242 Plant Science (3)
11:776:452 Plant Tissue Culture and Engineering (3)

*Electives, three courses (9-10):*
01:146:470 Advanced Cell Biology (3)
01:694:492 Gene Regulation of Cancer and Development (3)
01:960:401 Basic Statistics for Research (3)
11:115:452 Biochemical Separations (3)
11:126:407 Comparative Virology (3)
11:126:410 Process Biotechnology (3)

11:126:413 Plant Molecular Biology (3)
11:400:419 Food Physical Systems (3)
11:680:486 Analytical Methods in Microbiology (3)
11:680:491 Microbial Ecology and Diversity (3)
11:776:310 Plant Propagation (3)
11:776:312 Medicinal Plants (3)
11:776:406 Plant Physiology (4)
11:776:405 Plant Biosecurity (3)
11:776:406 Plant Breeding (3)
11:776:410 Plants for Bioenergy (3)
11:776:452 Plant Tissue Culture and Engineering (3)
11:776:486 Functional Genomics for Research (3)

*One to three additional credits of research in biotechnology may be substituted for an equal number of credits of elective work.*

# 136 Business Analytics and Information Technology (BAIT) (RBS-NB)

## 136 Business Analytics and Information Technology (BAIT)

Major requirements for students who entered RBS ***prior to the fall 2023 semester***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (junior or senior year 33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required BAIT Courses**

33:136:388 Foundations of Business Programming (3)
33:136:485 Time Series Modeling for Business (3) (prerequisite: 33:136:385)
33:136:470 Business Data Management (3) (prerequisites: 33:136:370 or 33:010:458; and 33:136:388)
33:136:400 Business Decision Analytics under Uncertainty (3) (prerequisite: 33:136:386)

**Three BAIT electives (9),** 3 credits of which must be from the Department of Management Science and Information Systems (136).

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS *in the fall 2024 semester or later:* **Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required BAIT Courses**

33:136:388 Foundations of Business Programming (3)
33:136:485 Time Series Modeling for Business (3) (prerequisite: 33:136:385)
33:136:470 Business Data Management (3) (prerequisites: 33:136:370 or 33:010:458; and 33:136:388)
33:136:400 Business Decision Analytics under Uncertainty (3) (prerequisite: 33:136:386)

**Three BAIT electives (9),** 3 credits of which must be from the Department of Management Science and Information Systems (136).

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

# Programs of Study: Majors and Minors (RBS-NB)

## PROGRAMS OF STUDY: MAJORS AND MINORS

The business studies program is only part of the student's academic program. Students will complement their professional education with coursework in the humanities, mathematics, natural sciences, and social and behavioral sciences. In order to design an integrated academic program, full-time students should plan their program over four years. During the first three semesters, the student should formulate a schedule that is comprised of the six prerequisite courses and liberal arts core curriculum requirements. During the remaining five semesters, the schedule focuses on completing the remaining credits required of the business major. Students should also plan to take additional general elective credits to ensure that their total degree credits equals 120, the number of credits needed for the bachelor of science degree. Business majors should consult with a Rutgers Business School: Undergraduate-New Brunswick advisor when they are planning their academic program.

The following are prerequisite courses that students must complete during their first three (four at most) semesters and before they are eligible to take additional business courses:

**Prerequisite Courses (19 credits)**
01:198:170 Computer Applications for Business (3)
01:220:102 Introduction to Microeconomics (3)
01:220:103 Introduction to Macroeconomics (3)
01:640:135 Calculus I (4)
01:960:285 Introductory Statistics for Business (3)
33:010:272 Introduction to Financial Accounting (3)

**Liberal Arts Core Curriculum Requirements (minimum 27 credits)**
In addition to the six eligibility courses and courses that are required for the major, all Rutgers Business School: Undergraduate-New Brunswick students must complete the following liberal arts core curriculum requirements:

1) Contemporary Challenges (two courses)
2) Areas of Inquiry (six courses)
3) Cognitive Skills and Processes (five courses).
All courses must be at least 3 credits and must be taken for degree credit. Pass/no credit courses may not be used to fulfill these requirements. Students should see Degree Navigator for specific courses and conditions.

**Major Requirements (56-62 credits)**
The major requirements for Rutgers Business School: Undergraduate-New Brunswick programs of study can be divided into two parts: business core course requirements that all students must complete regardless of their choice of major program (accounting, business analytics and information technology, finance, leadership and management, marketing, or supply chain management), and a combination of required and elective courses that students take according to their choice of major. Students must complete the requirements of the major that are in effect at the time of their admission into the major. All core courses and required courses specific to the major must be completed with a grade of C or better.

- 010 Accounting
- 136 Business Analytics and Information Technology (BAIT)
- 390 Finance
- 605 Leadership and Management
- 630 Marketing
- 799 Supply Chain Management
- 135 Business Administration Minor
- 382 Entrepreneurship Minor

# Life Sciences (SAS)

## LIFE SCIENCES

Division of Life Sciences, School of Arts and Sciences

**Website:** Here

**Dean:** Lori R. Covey

**Director, Office of Undergraduate Instruction:** Martha Haviland

**Chair, Department of Cell Biology and Neuroscience:** Megerditch Kiledjian

**Chair, Department of Genetics:** Tara C. Matise

**Chair, Department of Kinesiology and Health:** Brandon Alderman

**Chair, Department of Molecular Biology and Biochemistry:** Barth Grant

The following majors are available in the Division of Life Sciences:

**Biological Sciences 119**
**Cell Biology and Neuroscience 146**
**Exercise Science 377**
**Genetics 447**
**Molecular Biology and Biochemistry 694**
**Sport Management 955**

Students interested in the life sciences also may consider related tracks within major programs offered by the Department of Chemistry and Chemical Biology (chemical biology option) and the Department of Psychology (specialization in behavioral neuroscience).

The Division of Life Sciences coordinates, fosters, and integrates the instructional and research activities of a broad range of faculty with interests in the biological sciences. The principal units of the division include four departments: Cell Biology and Neuroscience, Genetics, Kinesiology and Health, and Molecular Biology and Biochemistry, as well as two sections, the biological chemistry section of the Department of Chemistry and Chemical Biology, and the biopsychology and behavioral neuroscience section of the Department of Psychology. The division's primary goal is to provide a high caliber of interdisciplinary teaching and research in the life sciences as it trains the next generation of teachers, researchers, and future health professionals.

Instruction in the life sciences has undergone enormous changes over the past 15 to 20 years. These changes reflect the intellectual revolution of the last two decades, as well as technical advances that have expanded greatly the tools available to life scientists. Today, students majoring in the life sciences at Rutgers University-New Brunswick experience an exciting atmosphere of learning that exposes them to the concepts and methods of these intellectual and technological advances. The students have open to them a plethora of learning avenues, ranging from thought-provoking lecture presentations to original and cutting-edge research opportunities in state-of-the-art laboratories. A first-class faculty and modern laboratory equipment reflect the division's commitment to provide its students with the best learning environment.

The division offers a wide spectrum of majors for students interested in the life sciences. These options range from a division-based major in biological sciences, designed to provide a general life sciences education, to department-based majors in cell biology and neuroscience, exercise science, genetics, molecular biology and biochemistry, and sport management aimed at providing specialized training, with a strong emphasis on research. Graduates of the division will be highly competitive for a range of postbaccalaureate opportunities, including graduate education and research, health-professions training, and biomedical and biotechnological research positions, as well as teaching careers in the sciences.

The first two years of the student's tenure at Rutgers is expected to revolve around the life sciences core curriculum, a series of basic offerings designed to provide the general background required for pursuing upper-division courses in any of the individual majors. Regardless of the major chosen, students are encouraged to participate in independent study within a research laboratory in order to take advantage of the rich expertise of the many life sciences faculty in New Brunswick and Piscataway. The exercise science and the sport management majors require an internship experience. The division also has a highly developed advising system, with dedicated and knowledgeable faculty advisers available to work with individual students in their selection of courses, completion of major requirements, and preparation for future careers.

Students may not major in more than one of the following majors in the Division of Life Sciences: Biological Sciences (119), Cell Biology and Neuroscience (146), Exercise Science (377), Genetics (447), Molecular Biology and Biochemistry (694), or Sport Management (955). Furthermore, students majoring in one of these four majors may not minor in Biological Sciences (119). Life science majors or minors may not be combined as double majors or as major/minors with Biomathematics (122), Biochemistry (115), or Microbiology (680).

No more than 16 credits from among the life science courses required for completion of any Division of Life Sciences major may be fulfilled by credits transferred from any school outside of Rutgers-New Brunswick.

For additional information and announcements about the Division of Life Sciences, please visit the division's website.

Life Sciences (SAS)

# Life Sciences Core Curriculum

# Life Sciences Core Curriculum

The life sciences core curriculum is a set of courses that include a series of introductory- and intermediate-level courses in the physical and life sciences forming a foundation of knowledge necessary to understand modern biology and to prepare for the more advanced courses required for each major. Following are core courses:

1. 01:119:115-116 General Biology (4,4)

2. 01:119:117 Biological Research Laboratory (2)

3. 01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)

4. 01:160:171 Introduction to Experimentation (1)

5. 01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)

6. 01:160:311 Organic Chemistry Laboratory (2)

7. 01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics (3,3)*

8. 01:750:205-206 General Physics Laboratory (1,1)*

9. 01:640:135,136 Calculus for the Life and Social Sciences (4,4) or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)**

10. 01:447:380 Genetics (4)***.

*01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

**Basic Statistics for Research (01:960:401, 3 credits), Basic Probability and Statistics (01:960:379, 3 credits), or Statistics I and II (01:960:211 and 212) may be substituted for the second semester of Calculus.

***Students majoring in genetics must take 01:447:384-385 (4,4) instead of 01:447:380

Life Sciences (SAS)

# Biological Sciences 119

# Biological Sciences 119

**Website:** Here

**Director:** Martha Haviland

**Director of Advising:** Anne Carr-Schmid

**Teaching Professor:**

Martha B. Haviland, B.A., Rutgers; M.S., A.M., Ph.D., Michigan[AC1] [SB2]

**Associate Teaching Professor:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Daniel Stern Cardinale, B.S., College of New Jersey; Ph.D., Rutgers

Monica S. Torres, B.S., National University of La Plata (Argentina); M.S., Ghent (Belgium); Ph.D., Rutgers

**Assistant Teaching Professors:**

Christy A. Beal, B.S., Rutgers; M.S., Ph.D., Delaware

Cominski, Tara, B.S., St. Peter's; M.S., Seton Hall; Ph.D. Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin (Stevens Point); M.S., Kansas State; Ph.D., Wisconsin (Madison)
Anne Keating, B.S., M.S., Ph.D., Rutgers

Lu, Haiyang, B.S., Hebei Univ. (China); M.S., Beijing Normal Univ. (China); Ph.D. City Univ. of NY

Nelson, Cassandra, B.S., Marquette; M.S., Indiana University School of Medicine; Ph.D., Marquette

Soliman, Mai, B.S., M.Sc. Montclair State; Ph.D., Rutgers

Gregg Transue, B.S., Pennsylvania State; M.S., Ph.D., Rutgers

Anthony J. Uzwiak, B.A., Ph.D., Rutgers

Villegas, Gabriel, B.A., Ph.D., Rutgers

Walczak, Alexandra, B.S., Ramapo College, Ph.D., Rutgers

Yu, Calvin, B.A. Skidmore; M.A., New York University; Ed.M. Rutgers

- Learning Goals

- Entry Requirements of the Major
- Major Requirements
- Minor Requirements
- Independent Study and Research in Biology
- Departmental Honors Program
- Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)
- Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)
- Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)
- Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)
- Courses


Life Sciences (SAS)

# Learning Goals

# Learning Goals

Our overarching goal for educating our students majoring in biological sciences is to inspire them to want to discover and understand the natural world. In the process of achieving this goal, we expect our students to acquire not only facts and concepts, but also skills and perspectives. We hope that our learning goals will both prepare our students for a variety of career objectives and supply them with the tools to become lifelong learners in the ever-evolving world of biological sciences.

*Learning Goals:*

I. To acquire the appropriate factual and conceptual knowledge that provides students with a foundation to further their education and career in the areas of life science or health science. Students will be able to demonstrate basic knowledge (e.g., identify, define, explain, etc.) of the concepts, practices, and principles that comprise the biological sciences.

II. To develop data analysis and statistical reasoning skills that prepare students for a society increasingly reliant on the use of data and information. Students will be able to interpret/evaluate patterns in data presented in tables, figures, and graphs, as well as be able to organize, summarize, and present data.

III. To develop the ability to use scientific reasoning as embodied by the structured process commonly known as the scientific method to empower students with the ability to generate and refine knowledge. Students will be able to evaluate and apply the practice of science.

IV. To develop critical thinking and problem-solving skills necessary to prepare students to evaluate, synthesize, and generate knowledge that provides them with a competitive advantage to adapt to an evolving, global, and knowledge-based society. Students will be able to demonstrate application of higher-order thinking (e.g., classify, diagnose, evaluate, synthesize, hypothesize, etc.). Students will develop an understanding of not only the connections within biology, but also the connections between biology and other scientific disciplines.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in biological sciences must have completed two semesters of General Biology and Biological Research Laboratory with a grade of C or better in each course. Both semesters of General Biology must have been completed at the same institution or on the same campus at Rutgers. No more than two courses with a grade of D may be used to fulfill the requirements of the major. A 2.0 grade-point average must be maintained in the life sciences core and elective courses applied toward the major. Students must meet with an adviser before they can successfully declare their major.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The program in biological sciences, administered through the Division of Life Sciences Office of Undergraduate Instruction, is intended to provide a broad and comprehensive training in modern biology. This course of study is recommended for those who wish to study biology as part of their liberal arts education, preparing them for a career in one of the health professions, graduate studies in biology, a teaching career in secondary schools (courses in education also are required), as well as employment in various areas of the life sciences. If a student wishes to concentrate his or her studies in a specific area of biology, he or she should consider a major offered by one of the departments in the Division of Life Sciences or in the School of Environmental and Biological Sciences. Faculty advisers are available to assist each student with course selection and program requirements.

A minimum of 20 credits of coursework from among general biology, genetics, and life sciences electives must be completed in residence. In other words, no more than 16 credits in this part of the major requirements may be transferred from any institution outside of Rutgers University-New Brunswick. This rule is intended to assure that students receiving degrees from Rutgers-New Brunswick have taken a minimum number of courses in their major with this faculty. Please keep in mind that although a course may transfer from another institution into one of the Rutgers-New Brunswick schools, it will not necessarily be accepted toward the major in biological sciences. Therefore, all transfer courses must be evaluated and accepted by the advising office of the Office of Undergraduate Instruction in order to count toward the major. As indicated earlier, students must complete both semesters of general biology at the same institution or on the same campus of Rutgers before becoming eligible to declare the biological sciences major. Any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation. Credits for cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major.

The course requirements for the biological sciences major are divided into two sections: the life sciences core courses and the life sciences electives.

*Required Life Sciences Core Courses (47 credits)*

01:119:115-116 General Biology I,II (4,4)
01:119:117 Biological Research Laboratory (2)
01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)
01:160:171 Introduction to Experimentation (1)
01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)*
01:160:311 Organic Chemistry Laboratory (2)
01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics***
01:750:205-206 General Physics Laboratory (1,1)***
01:640:135,~~138~~136 Calculus for the Life and Social Sciences (4,4)** or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)
01:447:380 Genetics (4)
* With approval from a Biological Sciences Advisor, 01:160:308/316 may be replaced by another elective course. Please meet with an Advisor to discuss.

**01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).
***Calculus II 01:640:13~~8~~6(4) may be substituted by 01:960:379 Basic Probability and Statistics (3), 01:960:401 Basic Statistics for Research (3), or 01:960:211-212 Statistics I,II (3,3).

*Life Sciences Electives (24 credits)*

It is highly recommended that students meet with a life sciences adviser in the Division of Life Sciences Office of Undergraduate Instruction when planning their elective courses. It is important that the courses taken complement each other as much as possible and are not merely a collection of unrelated topics.

The electives must include at least three laboratory courses, only one of which may be satisfied by research work. Biological Research Laboratory and "library research" do not qualify for this requirement. A minimum of six courses (18 credits) must be at the 300 or 400 level, including at least three separate laboratory courses or three courses with a laboratory component. The laboratory associated with genetics (01:447:382 or equivalent), if taken, may be used to satisfy one of the three laboratory requirements.

No course at the 100 level may be used to satisfy the life sciences elective requirements. A maximum of 6 credits of independent study/research/honors research may be used toward the 24 elective credits. Please keep in mind that a minimum grade-point average of 2.8 is required to enroll in an independent study/research course in biological sciences. Research courses can satisfy only one of the three laboratory requirements, regardless of number of credits. Courses taken on a pass/fail basis may not be used to satisfy requirements for the major in biological sciences. A grade-point average of 2.0 or better in courses credited toward the major is required. No more than two courses with a grade of D may be used to fulfill the requirements of the major.

The elective courses must include at least one course (3 or 4 credits) each from the Departments of Cell Biology and Neuroscience 146, Genetics 447, Molecular Biology and Biochemistry 694, and Ecology, Evolution, and Natural Resources 11:216 at the School of Environmental and Biological Sciences. A list of approved courses in subject areas in addition to those in the Division of Life Sciences (Biological Sciences 119, Cell Biology and Neuroscience 146, Genetics 447, and Molecular Biology and Biochemistry 694) will be published by the advising office of the Office of Undergraduate Instruction. It is strongly recommended that students consult this list, which is available

on the website, prior to registering for their courses. Generally, acceptable courses from other departments on any campus of Rutgers University have a year of general biology as a prerequisite; however, there are exceptions. It is imperative for students to consult the published list and meet with an adviser. Credits from cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks if double majoring with another permitted life sciences major, at least four of the 3-4 credit life science courses applied to the Biology major may not overlap with courses used to fulfill second major requirements. Given that biological sciences is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation.

Life Sciences (SAS)

# Minor Requirements

# Minor Requirements

The minor requires four courses of at least 3 credits each in life sciences subjects as well as General Biology and Biological Research Laboratory. Both semesters of General Biology must be completed at the same institution or on the same campus at Rutgers. No other course at the 100 level may be used to satisfy the minor. A minimum of 11 credits must be taken at Rutgers University-New Brunswick. A maximum of 3 credits of research in a life sciences subject may be used toward the minor. A minimum of three courses at the 300 level or above is required. If majoring in a permitted life sciences major, no more than two of the four life science courses applied to the minor requirements may overlap with courses used to fulfill major requirements. Only life sciences courses acceptable for the biological sciences major may be used for the minor. Courses in chemistry, mathematics, or physics do not count toward the minor. A grade-point average of 2.0 or better in courses credited toward the minor is required. No more than one course with a grade of D may be used to fulfill the requirements of the minor.

Life Sciences (SAS)

# Independent Study and Research in Biology

# Independent Study and Research in Biology

A minimum cumulative grade-point average of 2.8 is required for a student to register for an independent study/research course in biological sciences. A maximum of 6 credits of laboratory-based independent study, research, or honors projects may be used to fulfill the elective credits requirement in biology. The independent study/research form, available from the advising office of the Office of Undergraduate Instruction, must be completed and signed by the professor in whose laboratory the student will study prior to initiating the research project. Approval of a research proposal by the director of advising and a special permission number from the Office of Undergraduate Instruction is necessary for registration. Students may not earn academic credit for laboratory projects for which they are being paid. Students wishing to apply research credits from other departments toward the major in biological sciences must get approval from the advising office of the Office of Undergraduate Instruction, Division of Life Sciences, prior to beginning their research project.

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have a cumulative grade-point average of 3.0 or better and an average of 3.4 or better in life sciences core and elective courses credited toward the biological sciences major at the end of the junior year and previous research experience. At that time, the student should apply formally to the advising office of the Office of Undergraduate Instruction. Accepted students are expected to complete at least 6 credits over two semesters in an independent research project, resulting in a thesis, and to pass an oral examination before a faculty committee in the general field of the student's program of emphasis. If the research is done in a laboratory outside of the Division of Life Sciences, the examination committee must include at least one individual from the Division of Life Sciences faculty. Departmental Honors is completed in the fall and spring of senior year. Students accepted into special programs (e.g. BA/MD) may complete honors during junior year.

Honors students must register either for an honors course sequence in life sciences or for a course sequence in a school honors program. These decisions should be discussed with an adviser. An approval form (available in the advising office) must be completed.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

**Rutgers Undergraduate/Robert Wood Johnson Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

This program is designed for high-achieving premedical students of Rutgers University who are in their sophomore year. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and Robert Wood Johnson Medical School (RWJMS).

Application to this program is open to all undergraduate students enrolled at Rutgers University, New Brunswick. It is not directly associated with any one school within the university but see below for specific restrictions.

Admission is a two-stage and highly competitive process. In the first stage, undergraduate students are admitted into the program by an executive committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools of Rutgers University who have spent at least a year here. Prospective applicants from Rutgers University-Newark and Rutgers University-Camden must transfer to one of the units in New Brunswick for their sophomore year and complete at least 30 credits here. All applicants must have completed 4 semesters of college with a minimum of 60 credits. Applicants with an Associate¿s Degree, regardless of whether it was earned as a dual degree in high school or as a traditional degree after high school,

are ineligible to apply for the program. Admitted students will need to complete all of the core requirements of their undergraduate unit and major requirements with the exception of Biological Sciences and Cell Biology and Neuroscience majors, who may apply credit from the first professional year toward the major requirements. During the fourth year, students will be full time at the medical school and elective credits will count towards the undergraduate degree. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second stage occurs typically after the fourth year of study. It is the responsibility of the RWJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the RWJMS Admissions Committee. The purpose of this second, noncompetitive review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B (Honors or High Pass) in courses taken at both universities. However, recommendation is not automatic. The final decision rests with the RWJMS Admissions Committee. Upon approval by this admissions committee, the student will be permitted to continue into the fifth year of study and will be matriculated formally as a candidate for the M.D. degree at RWJMS.

Applicants to the B.A./M.D. program must be in their fourth semester at Rutgers University. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers, New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester and sustain it through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers University, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers-New Brunswick (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, two semesters of English, and organic chemistry lab must complete these requirements by the end of the third year of study. Students who did not take the SAT or ACT but who are admitted to the program will be required to take the MCAT by April of the junior year and score competitively with a total score of at least 508 (minimum single sub score of 123). An application form has been developed that allows the student to provide the executive committee with information it deems useful for its deliberations.

The bachelor's degree will be awarded upon completion of the undergraduate college and major requirements, by the end of year four. Upon satisfactory completion of year seven and all RWJMS requirements, the student will receive the medical degree.

Students who wish to pursue a major other than biological sciences must discuss their plans with the appropriate department in order to establish the requirements they need to complete for their major. For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from RWJMS will be applied toward the major (as stipulated below). The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements, usually by the end of year four. The number of credits, however, is not directly translated between the two universities; no more than 4 credits per laboratory course and 3 credits per non-laboratory course taken at RWJMS may be used toward the bachelor's degree at Rutgers.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and Intro to Biochemistry (01:694:301) and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must complete an additional approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick.

Students in the program must meet with advisers at the medical school and at their undergraduate school when planning their elective courses. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers' undergraduate units and RWJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

**Rutgers Undergraduate/New Jersey Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

The Rutgers Undergraduate/New Jersey Medical School joint program started in the fall of 2003. The purpose of the program is to permit students to begin their medical education after their third year or at least 96 degree credits at Rutgers. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and New Jersey Medical School (NJMS).

This program is only open to students enrolled in Rutgers University-New Brunswick schools.

Admission is a two-phase and highly competitive process. In the first phase, undergraduate students are admitted into the program by the Joint Program Executive Committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools at the New Brunswick location of Rutgers University who have been enrolled here for at least one year. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the NJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B in courses taken at Rutgers. Students must complete the Medical College Admission Test (MCAT) by January of the junior year before matriculating at NJMS and be required to be in the competitive range of other accepted NJMS students. This second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the NJMS Admissions Committee. However, recommendation is not automatic. The final decision

rests with the Medical School Admissions Committee. Upon approval by the Medical School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the M.D. degree at the New Jersey Medical School.

Applicants for the program must be in their fourth semester at Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, organic chemistry lab, and two semesters of English must complete these requirements by the end of the third year of study. An application form has been developed that allows the student to provide the committee with information the committee deems useful for its deliberations.

Students will be admitted at the end of the spring semester of year two and be formal members of the program beginning with year three. Prior to leaving the Rutgers undergraduate unit, students must satisfy all college and major requirements, except for the credits which they will receive from NJMS (please see next paragraph). For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from NJMS will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements by the end of year four. Upon satisfactory completion of year seven or eight, as well as all New Jersey Medical School requirements, the student will receive the medical degree.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and NJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

**Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine Joint Bachelor of Arts/Doctor of Medicine in Dentistry (B.A./D.M.D.) Program**

Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine joint program started in the spring of 2002. The purpose of the program is to permit students to begin their dental education after their third year or at least 98 credits at Rutgers. Specially selected students will obtain bachelor's and dental degrees in a seven-year program of study taken at Rutgers undergraduate units and Rutgers School of Dental Medicine.

This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick. The program is administered by the Health Professions Office.

Admission is a two-phase and competitive process. In the first phase, undergraduate students are admitted into the program by the Executive Committee of the Joint Program consisting of faculty from the appropriate units. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the Rutgers School of Dental Medicine Admissions Committee to review the credentials of students recommended by the articulated program executive committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for admission to the dental school. It is expected that students will have grades of A or B in courses taken at Rutgers University. Students must complete the Dental Admissions Test (DAT) and earn scores of 20 or better in Total Science, Academic Average, Organic Chemistry, General Chemistry, and Biology. Students may only take the DAT one time to qualify for this program. The second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the Rutgers School of Dental Medicine Admissions Committee. However, recommendation is not automatic. The final decision rests with the Dental School Admissions Committee. Upon approval by the Dental School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the Doctor of Medicine in Dentistry (D.M.D.) degree at the Rutgers School of Dental Medicine.

Applicants to the program must be in their fourth semester at the School of Arts and Sciences, Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at the School of Arts and Sciences, Rutgers-New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester, which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, two semesters of college-level mathematics (Calc I and either Calc II or an approved Statistics course) and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded

advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). If AP credit was granted for general chemistry, then organic chemistry I and II and laboratory and a course in biochemistry at Rutgers are required. If AP credit was granted for English, upper level English at Rutgers is required with the same amount of credit work. If AP credit was granted for physics, two approved courses from Physics or Kinesiology & Health at Rutgers are required. Those students who are admitted to the program without having two semesters of physics, biochemistry, organic chemistry lab, and two semesters of English, must complete these requirements by the end of the third year of study.

The B.A./D.M.D. program is a seven-year program with year one being the first undergraduate year. Students will be admitted at the end of the spring semester of year two and be formal members of the articulated program beginning with year three. Prior to leaving the School of Arts and Sciences, Rutgers-New Brunswick, students must satisfy all college and major requirements, except for the credits which they will receive from Rutgers School of Dental Medicine (please see below). For a student at the School of Arts and Sciences, Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from Rutgers School of Dental Medicine will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the general education and major requirements by end of year four. Upon satisfactory completion of year seven or eight, as well as all Rutgers School of Dental Medicine requirements, the student will receive the dental degree.

A student enrolled in the joint program completing a major in biological sciences at Rutgers-New Brunswick is required to complete any remaining Life Sciences Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers-New Brunswick, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/ research course may be applied toward the biological sciences major for students in the B.A./D.M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers-New Brunswick and Rutgers School of Dental Medicine.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

**Rutgers School of Arts and Sciences/Rutgers School of Health Professions Joint Bachelor of Arts/Master of Science Degree (B.A./M.S.) Physician Assistant Program**

This is a six-year (3+3) program offered jointly by the School of Arts and Sciences and the School of Health Professions (SHP). The program can be looked at as a two-phase program, an undergraduate phase followed by a professional phase. This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick, who are U.S. citizens, permanent residents of the United States, or international individuals currently on a student visa. At a minimum, applicants must be enrolled for one year at Rutgers-New Brunswick earning at least 30 credits.

The first phase of the program includes three years of undergraduate liberal arts and basic science education. Students may apply to the second (professional) phase in April of their second year by applying to the Physician Assistant (PA) program. Personal interviews will be required of those applicants being considered for admission. The interview will serve to determine the applicant's emotional and intellectual maturity, ability to communicate, and the potential to achieve career satisfaction within the physician assistant role. Applicants must have a cumulative and science GPA of 3.2. In cases where individuals may show high potential by improved performance, exceptions to this requirement may be considered. Please note that acceptance by Rutgers University does not guarantee acceptance by the PA program.

Applicants to the program must have completed the following courses with a grade of C or better: at least one semester (3 credits) of English composition, applied statistics or biostatistics (from Psychology, Biology, or Math departments), General Biology I and II with lab (119:115, 116, and 117, or equivalents); General Chemistry I and II with lab (160:161,162 and 171, or equivalents); and General Psychology (830:101, or equivalent). If the student has been granted AP credit by Rutgers for science courses, additional science courses will be required.

All applications must be received by June 1 and final notices of acceptance will be made by August 1. If the applicant is accepted into the program, it will be contingent on maintaining a 3.2 GPA through the end of the third undergraduate year at Rutgers-New Brunswick, and on all requirements for the undergraduate degree being met before the beginning of the fourth year. Students who are accepted into the second phase of the program will begin this phase at the beginning of their senior year. At the end of the senior year, these students will receive a bachelor of arts degree conferred by the School of Arts and Sciences, Rutgers University-New Brunswick. After completion of the remaining two years of the PA program, graduates will receive a master of science degree awarded by Rutgers School of Health Professions.

Before entering the second (professional) phase, a student accepted by this program must also complete for the PA program, Functional Human Anatomy (01:377:223), General Microbiology (01:447:390), Intro to Biochemistry (01:694:301) and Systems Physiology (01:146:356) (waived if Gen Bio II is completed at Rutgers-NB and not AP credit), and 6-8 additional credits of life science electives. Students majoring in biological sciences are required to have completed, in addition to the School of Arts and Sciences core distribution requirements, the Life Sciences Core requirements, Intro to Biochemistry (01:694:301) and General Microbiology (01:447:390) and one (three credit or more) course from the 216 subject area approved electives. Students with AP or transfer credit of General Biology I and II and lab must take an additional life science elective course for 3 or more credits. A maximum of 14 credits from SHP courses will be accepted toward the biological sciences major. Please be sure to meet with a biological sciences adviser when selecting life sciences elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and SHP.

For a complete description of the requirements for the major in biological sciences, please read the appropriate section under the Division of Life Sciences in this catalog.

For more information about this program, you may contact the PA program office at the School of Health Professions, 675 Hoes Lane, Piscataway, NJ 08854, at 732-235-4444; or the Division of Life Sciences, Health Professions Office at Rutgers University, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Courses

# Courses

With the exception of 01:119:115,116, and 117 General Biology I and II and Biological Research Laboratory, courses numbered at the 100 level may not be used for major credit in any of the majors within the Division of Life Sciences.

**01:119:098** ***Foundations for Biological Science (E2)***
Selected topics in general biology: introduction to cellular organization, metabolism, genetics, reproduction, and organ systems. Development of analytical reasoning and science-oriented study techniques.
***Preparation for college-level general biology.***

**01:119:103** ***Principles of Biology (4)***
Selected topics in general biology, including cell structure, genetics, plant and animal diversity, basic plant and animal biology, ecology, and evolution.
***Lec. 3 hrs., lab. 3 hrs. Designed for students who must take a one-semester laboratory course in introductory biology to meet major requirements. Credit not given for this course if student has already completed 01:119:115. Not for life sciences major credit.***

**01:119:109,110** ***Biology Practice Group (1,1)***
Students will work actively to (1) organize the lecture content, (2) identify what they are expected to do with that content (outcomes), (3) prepare and explain study aids (organizers) to ensure that they correctly understand the week¿s content, and (4) begin the self-evaluation process to gauge exam preparedness. Discussion of the basic methods and principles.
***Corequisite for 109 is 01:119:115; corequisite for 110 is 01:119:116.***

**01:119:111,112** ***Reading in General Biology (1,1)***
Discussion and reading providing extensive and advanced coverage of selected topics.
***Corequisite for 111 is 01:119:115; corequisite for 112 is 01:119:116.***

**01:119:115** ***General Biology I (4)***
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics. Lec. 3 hrs., Wkshp. 80 min.
***Prerequisite has two parts: writing (prerequisite of 01:355:101, 01:355:103, or 01:355:104, or placement into 355:101 or 355:104) and math (prerequisite of 01:640:026 or placement into 640:CMA, 640:PCA, 640:CLG, or 640:CLS).***

**01:119:116** *General Biology II (4)*
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics.
*Lec. 3 hrs., Wkshp. 80 min. Prerequisite: 01:119:115 with a grade of C or better. Credit not given for both this course and 01:119:102.*

**01:119:117** *Biological Research Laboratory (2)*
Laboratory designed to introduce and explore principles of research in the biological sciences by engaging in semester-long research projects requiring students to analyze data, synthesize new experiments, and evaluate findings.
*Prerequisite: 01:119:115 with a grade of C or better. Corequisite: 01:119:116.*

**01:119:120** *STEM Success Seminar (1.5)*
Increases ability to control academic success and improve transition to the university environment in furtherance of educational and career goals. Reflection on recent and current academic experience and career aspirations. Setting of priorities and alignment of time and effort towards those ends.
*By special permission only.*

**01:119:127-128** *Anatomy and Physiology: Health Sciences (4,4)*
Structure and function of human organ systems. Some microanatomy and biochemical aspects of physiology included.
*Lec. 3 hrs., lab. 3 hrs. For nursing, medical technology, physical therapy, and other professional students. Not for life sciences major credit.*

**01:119:131** *Microbiology for the Health Sciences (3)*
Introduction to microbes with emphasis on the nature and behavior of microorganisms, the interrelationships between microbes and the human host in health and disease, and the principles of prevention and control of infectious disease.
*Not open to students who have taken 01:447:390. For nursing and other professional students. Not for life sciences major credit. Prerequisites: 01:199:115-116 or 01:119:127-128.*

**01:119:132** *Microbiology for the Health Sciences Laboratory (1)*
Laboratory to accompany 01:119:131.
*Lab. 3 hrs. Pre- or corequisite: 01:119:131.*

**01:119:140** *The DNA Revolution (Honors) (3)*
Introduction to fundamentals of molecular genetics, biotechnology, and modern genetics, including a laboratory research project using molecular biology and bioinformatics techniques. Intended primarily for nonscience majors, but may also appeal to prospective chemists, physicists, engineers, and computer scientists.
*Restricted to first-year and sophomore students in the School of Arts and Sciences Honors Program or the Honors College. Credit not given for both this course and 01:119:140 or 01:694:215 or 315, or 01:447:315. Not for life sciences major credit.*

**01:119:148** *Moving Bodies: The Biology of Movement (3)*
Considers fundamental processes that allow humans and other animals to move, including structural basis (bones and muscles), control (brain and nervous system), conversion of food into energy (digestion and nutrition),

movement of food and oxygen to muscles (circulation), and some common and familiar injuries and illnesses and their treatments.
*Credit not given for both this course and 01:119:100, 103, 115-116, or 127-128. Not for life sciences major credit.*

**01:119:150** *Biology, Society, and Biomedical Issues (3)*
Discussion of current topics and issues in human health and medicine from a biological perspective.
*Credit not given for both this course and 11:115:100. Not for life sciences major credit.*

**01:119:154** *Genetics, Law, and Social Policy (3)*
Principles of human and behavioral genetics and their legal, ethical, and social implications. Topics include genetic screening, counseling, and engineering; reproductive regulation; and human behavior genetics.
*Prerequisite: Sophomore standing. Not for life sciences major credit or related major.*

**1:119:155** *Human Genetics (3)*
How our genes influence our development and health, how both normal traits and diseases are transmitted through families, how genetics is used in forensics and personalized medicine, and the genetic tests that are offered directly to consumers.
*Not for life sciences major credit.*

**01:119:156** *Genetics, Evolution, and Human Health (4)*
The human body and human behavior, shaped by more than four billion years of evolutionary processes. Scientific and social implications of current ideas and controversies of evolution and genetics.
*Not for life sciences major credit.*

**01:119:160** *Biology, Society, and Ecological Issues (3)*
Ecological and evolutionary ideas affecting space ecology; population increase, food supply, air and water pollution, war, and nuclear energy.
*Not for life sciences major credit or related major.*

**01:119:182** *Essentials of Human Reproduction (3)*
Anatomical and physiological bases of human sexuality; biological and cultural aspects of sexual differentiation and psychosexual development, contraception, venereal disease, and sexual lifestyles.
*Not for life sciences major credit or related major.*

**01:119:195** *Brain, Mind, and Behavior (3)*
Honors course discussing the interrelationship between the brain, the mind, and behavior.
*Open to students in the School of Arts and Sciences Honors Program or the Honors College. Not for life sciences major credit or related major.*

**01:119:199** *Preparation for General Biology (4)*
For first- and second-year students planning science majors. Enrollment based on placement scores. Selected concepts in biology, proven learning strategies for college science courses, and instruction in the scientific method. Prepares students for success in the General Biology sequence (01:119:115-117).
*Lec./rec. 3 hrs., lab. 3 hrs. Enrollment restricted by placement. Not for life sciences major credit.*

**01:119:201-202** ***Independent Study in Biology (1-3,1-3)***
Independent study under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. May not be used to fulfill a laboratory requirement.***

**01:119:204** ***Outreach in Biology (1)***
Introduction to the basic principles and best practices of outreach in the biological sciences. Emphasis on understanding how to translate technical concepts and techniques to lay audiences incorporating best practices in active learning, public speaking and curriculum development. Recommended for students interested in teaching careers and related positions in science communication.
***Prerequisites: 01:119:115, 01:119:116, and 01:119:117. By special permission.***

**01:119:205** ***Internship in Life Sciences (3)***
Development of experience and knowledge regarding the expectations, qualifications, competencies and responsibilities of professionals working within the life sciences through an internship experience with academic component. Integration of knowledge from life science coursework with the internship experience, development of new skills, and reflection on the learning experience.
***Prerequisites: 01:119:116 and 01:119:117. Open only to 119 Biology Majors.***

**01:119:307-308** ***Research in Biology (1-3,1-3)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to students majoring (or minoring) in biological sciences.***

**01:119:310** ***Communication in Biology (1)***
Effective skills for communicating science to a variety of audiences in a variety of forms including papers, grant proposals, teaching, and presentations to scientists and others. Provides support for students completing the 10-page research paper required for Research in Biology.
***Prerequisites: 01:119:307, 308, 407, or 408. Corequisites: 01:119:307, 308, 407, or 408.***

**01:119:311** ***Current Topics in Life Sciences (1)***
Directed readings and discussion of selected scientific topics and career stories with Rutgers Life Sciences Alumni.
***Junior or senior status and Division of Life Sciences major (subject code: 119, 146, 694, 447).***

**01:119:401** ***Clinical Practicum in the Health Professions (3)***
Development of advanced knowledge of and reflection on the qualifications, competencies, and responsibilities of physician health care providers through an internship experience and academic component integrating knowledge from life science coursework and the health care setting.
***Prerequisites: 3.4 science GPA. By special permission of the Office of Undergraduate Instruction only.***

**01:119:406-407** ***Research in Biology (1-4,1-4)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report is required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to seniors majoring (or minoring) in biological sciences.***

**01:119:408-409** ***Honors in Biology (3-6,3-6)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written thesis, oral presentation, and defense are required.
***Prerequisites: Declared biological sciences major. Permission of the Office of Undergraduate Instruction. Open only to seniors majoring in biological sciences who meet the requirements for departmental honors.***

**01:119:410** ***Honors Communication in Biological Sciences (1)***
Instruction on effective communication of scientific ideas and findings for both the scientific community as well as the general public. Support in writing honors theses and preparing for oral thesis defenses.
***Prerequisite: 01:119:408. Corequisite: 01:119:409.***



# Cell Biology and Neuroscience 146

# Cell Biology and Neuroscience 146

Department of Cell Biology and Neuroscience, School of Arts and Sciences

**Website:** Here

**Chair:** Megerditch Kiledjian

**Vice Chair and Undergraduate Director:** Gabriella D'Arcangelo

**Distinguished Professors:**

Joanna Burger, B.S., SUNY (Albany); M.S., Cornell; Ph.D., Minnesota

Megerditch Kiledjian, B.A., Rutgers; Ph.D., University of Pennsylvania

Melitta Schachner, Diploma in Biochemistry, Tübingen (Germany); Ph.D., Max-Planck Institut für Biochemie (Germany)

Wise Young, B.A., Reed; Ph.D., Iowa; M.D., Stanford

**Professors:**

Lori R. Covey, B.S., California (Riverside); Ph.D., Columbia

Gabriella D'Arcangelo, B.S., Bari (Italy); Ph.D., SUNY (Stony Brook)

Robin L. Davis, B.S., Pennsylvania State; M.A., San Diego State; Ph.D., Stanford

Bonnie Firestein, B.S., Michigan; Ph.D., California (San Diego)

Martin Grumet, B.S., Cooper Union; Ph.D., Johns Hopkins

Ronald P. Hart, B.S., Connecticut; Ph.D., Michigan

Arnold G. Hyndman, A.B., Princeton; Ph.D., California (Los Angeles)

Alice Y.-C. Liu, B.S., Chinese University of Hong Kong (China); Ph.D., Mount Sinai School of Medicine

Gary F. Merrill, B.S., Weber State; Ph.D., Michigan State

Kathleen M. Scott, B.A., Brown; Ph.D., Yale

**Associate Professors:**

Qian Cai, M.D., Shanghai Railway Med College (China); Ph.D., National Institutes of Health-Shanghai Second Medical University

Wei Dai, B.S., M.S., Beijing Normal (China); M.S., Texas Health Science Center; Ph.D., Baylor College of Medicine

Dunne Fong, B.S., Massachusetts; M.A., Ph.D., Princeton

Shu-Chan Hsu, B.S., Ph.D., British Columbia

Peng Jiang, B.S., Soochow (China); Ph.D., University of Science and Technology of China

Kelvin Y. Kwan, B.S., California Institute of Technology; Ph.D., Harvard

David Margolis, B.S., Brown; Ph.D., Washington (Seattle)

Ping Xie, B.S., Nanjing (China); Ph.D., Hong Kong University of Science and Technology

**Assistant Professors:**

Victoria Abraira, B.S., Southern California; Ph.D., Harvard

Santiago Cuesta, B.A., M.S., Ph.D., National University of Rosario (Argentina)

Brian Daniels, B.A., B.S., Southern Wesleyan (Central); Ph.D., Washington (Seattle)

Rafiq Huda, B.A., Carleton College; Ph.D., Northwestern University (Chicago)

Natasha O¿Brown, B.S., Davidson College; Ph.D., Stanford

Max Tischfield, B.A., Rutgers; Ph.D., Harvard

**Associate Research Professors:**
Xinfu Jiao, B. S., Xinxiang Medical College (China); M.S., Tongji Medical University (China); Ph.D., Shanghai Institute of Hematology (China)

Patricia Morton, B.S., Northwestern University; M.S., Ph.D., University of Wisconsin

**Assistant Research Professor:**

Dongming Sun, B.S., Beijing Medical University (China); Ph.D., Columbia University

**Assistant Teaching Professors:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Tara Cominski, B.S. St. Peter's University; Ph.D., Rutgers

Anne Keating, B.S., M.S., Ph.D., Rutgers

- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Options
- Departmental Honors Program
- Courses

Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Cell Biology and Neuroscience offers a course of study that provides fundamental and comprehensive training in the areas of cell biology and neuroscience. The major objective of this program is to prepare students for graduate studies in cell biology and neuroscience; entry into professional schools in medicine, dentistry, or other health-related fields; or employment in industrial and pharmaceutical companies.

*Learning Goals*

Students will:

I. master factual and conceptual knowledge in cell biology and neuroscience that will provide a solid foundation for success in advanced training and professional careers;

II. develop an ability to summarize, integrate, and organize information; and

III. use scientific reasoning to evaluate the potential for current research and new discoveries to improve our understanding of cell biology and neuroscience and its relevance to human health and to our society.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

The major in the Department of Cell Biology and Neuroscience is open to students after their first year who have completed Fundamentals of Neurobiology (01:146:245) or Fundamentals of Cell Biology (01:146:270), with a grade of C or better. Departmental approval is required.

A grade of C or better in all courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The Department of Cell Biology and Neuroscience offers a program of study from which students can select one of two tracks, depending upon particular interests and career goals: a general track (default) and an honors track. Students can apply to enter the honors track at the beginning of the senior year. This track requires a minimum GPA of 3.4 in courses credited toward the major, and departmental approval. A number of core courses are required of all students in the cell biology and neuroscience major, regardless of the chosen track. No more than 16 credits from among the life science courses required for completion of the cell biology and neuroscience major may be fulfilled by credits transferred from any school outside of Rutgers University-New Brunswick. Any life science courses applied to the major should be taken within 10 years of graduating.

***Required Core Courses (65 or more credits)***

01:119:115-116 General Biology (4,4)

01:119:117 Biological Research Laboratory (2)

01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)

01:160:171 Introduction to Experimentation (1)

01:160:307-308 or 01:160:315-316 Organic Chemistry (4,4)

01:160:311 Organic Chemistry Laboratory (2)

01:750:203-204 General Physics (3,3) or 01:750:193-194 Physics for the Sciences(4,4)*or 01:750:271-272 Honors Physics (3,3)

01:750:205-206 General Physics Laboratory (1,1)

01:640:135,136 or 01:640:151-152 Calculus I and II (4,4) or 01:640:135 and 01:960:401 Basic Stat for Research (3) or 01:960:379 Basic Prob and Stat or 01:640:135 and 01:960:212 Statistics II (3)**

01:447:380 Genetics (4)

01:146:245 Fundamentals of Neurobiology (3)

01:146:270 Fundamentals of Cell Biology (3)

01:694:395 Biochemistry for Life Sciences (3) or 01:694:407 Biochemistry (3)

Advanced Cell Biology and Neuroscience Courses: choose three of the following:

01:146:445 Synapses, Neurons, and Circuits (3)

01:146:447 Clinical Neurobiology (3)

01:146:465 Neurobiology of Pain and Addiction (3)

01:146:472 Developmental Biology (3)

01:146:473¿ Genetic Regulation in Cell Biology¿(3)

01:146:474 Immunology (3) or 01:146:476¿ Honors Immunology (3)

01:146:481 Protein Dynamics in Cell Biology (3)

* with approval from the Undergraduate Director or CBN Advisor 01:160:308 may be replaced by an additional elective course.
** Students who take who take Physics for the Sciences 01:750:193-194 (4,4) do not need an additional Physics laboratory.
*** Students with AP statistics equivalent of 01:960:211, transfer credit for 01:960:211, or who have taken 01:960:211 at Rutgers must take 01:960:212.

Life Sciences (SAS)

# Options

# Options

*General Track; 4 credits*

This track is for students who, upon graduation, seek immediate employment or plan to attend professional schools in health-related fields. In addition to the required core courses, students must take the following courses:

1. One elective lecture courses at the 300-400 level in the life sciences area (equaling 36 or more credits)
2. One laboratory or research course (1-3 credits). Students can take a lecture course with an associated laboratory component (3-4 credits) to satisfy both requirements, or a stand-alone lecture plus a laboratory or research course.

*Honors Track; 12 credits*

This area of concentration is for students interested in research who, upon graduation, plan to attend graduate school or professional schools in health-related fields. A student must qualify for admission into the honors track. See the departmental honors program page in this catalog for student qualifications. In addition to the required core courses, students must complete the following courses, produce a written research thesis and an oral thesis presentation:

1. One elective lecture course at the 300-400 level in the life sciences area (3 or more credits).
2. 01:146:405 Honors Seminar (3).
3. 01:146:408-409 Honors Research (3,3).

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

Honors in cell biology and neuroscience are awarded to students who have successfully completed the honors track course requirements, submitted a written research thesis, and defended the thesis orally. To qualify for the honors track, a student must have attained a grade-point average of 3.4 or better in courses required for the major. The student should apply formally to the department for acceptance into the honors program by the end of the second semester of the junior year.

Life Sciences (SAS)

# Courses

# Courses

**01:146:201,202** *Independent Study in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. May not be used to fulfill a laboratory requirement. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:245** *Fundamentals of Neurobiology (3)*
Introduction to the biology of the nervous system. Topics covered include nerve cell signaling, sensory and motor systems, and higher brain processes.
***Prerequisites: 01:119:115-116.***

**01:146:270** *Fundamentals of Cell Biology (3)*
Principles of cell biology. Structure, function, and macromolecular organization of cellular organelles.
***Prerequisites: 01:119:115-116.***

**01:146:295** *Essentials of Cell Biology and Neuroscience (3)*
Provides a background in the biology of neural cells and cognition.
***Prerequisites: 01:119:115-116. Not intended for cell biology and neuroscience majors.***

**01:146:307,308** *Research in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research on an original problem under the direction of a member of the Rutgers faculty.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:322** *Human Histology (4)*
Structure of the tissues and organs of the human body. Lec. 3 hrs., lab. 3 hrs.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:328** ***Human Parasitology (3)***
Cell biology, epidemiology, pathogenesis, and clinical manifestations of human parasitic diseases.
***Prerequisites: 01:119:115-116.***

**01:146:329** ***Human Parasitology Laboratory (1)***
Laboratory to accompany the Human Parasitology lecture course 01:146:328. Lab. 3 hrs.
***Pre- or corequisite: 01:146:328.***

**01:146:340** ***Virology (3)***
Principles of virology including the molecular and cellular events that occur during virus replication, the host cell response, and pathogenesis. Emphasis on animal viruses that impact human health and disease. Strategies for controlling viruses.
***Prerequisite: 01:146:270.***

**01:146:350** ***Introduction to Light Microscopy for the Life Sciences (1, minicourse)***
This course offers a comprehensive exploration of advanced imaging techniques essential for studying tissues, cells, and organelles in the life sciences.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:356** ***Systems Physiology (3)***
Comprehensive study of the principal organ systems of laboratory animals and humans.
***Prerequisites: 01:119:115-116 and 01:160:161-162 or 163-164, and 171 Credit not given for both this course and 11:067:300.***

**01:146:357** ***Systems Physiology Laboratory (1)***
Laboratory to accompany the Systems Physiology lecture course 01:146:356. Lab. 3 hrs.
***Pre- or corequisite: 01:146:356.***

**01:146:405** ***Honors Seminar (3)***
This course is intended to help students prepare a written research thesis and practice the oral thesis presentation.
***Requires departmental permission. Open only to senior honors students majoring in cell biology and neuroscience. This course fulfills the SAS WCd core requirement.***

**01:146:406, 407** ***Research in Cell Biology and Neuroscience (1-3,1-3)***
Research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. Open only to students majoring in cell biology and neuroscience.***

**01:146:408-409** ***Honors Research (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member. Written report and oral presentation required. Culminates in a written thesis and oral thesis defense.
***Permission of department and an instructor willing to sponsor the student are required. Open only to seniors majoring in cell biology and neuroscience who meet the requirements for the departmental honors program.***

**01:146:410-411** ***Research Thesis in CBN I and II (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member and the course coordinator.
***Prerequisites: 01:146:307 or 01:146:308. Requires departmental permission and acceptance by a faculty mentor who will***

*host the student in the laboratory. Requires submission of a written thesis draft (I = Fall semester), and submission of a final written thesis and oral defense (II = Spring semester). Open to senior students majoring in cell biology and neuroscience who are not enrolled in the departmental honors program.*

**01:146:445** *Synapses, Neurons, and Circuits (3)*
Cellular and systems features of neurons and the fundamental unit of signaling in the nervous system, focusing on a small number of advanced topics. Focus on how to test hypotheses related to the topics addressed: intra- and inter- cellular communication; construction of neuronal networks; protein interactions at the synapse; and signal transduction pathways.
*Prerequisites: 01:146:245 and 01:146:270.*

**01:146:447** *Clinical Neurobiology (3)*
Development and function of the nervous system with an emphasis on diseases and disorders. Topics include neurodevelopment, demyelination, tumors, and viral infections; neurological disorders/diseases; injury to the spinal cord and brain and repair; and clinical trials and the future of spinal cord and brain trauma.
*Prerequisites: 01:146:245 and 01:146:270. Intended for senior students majoring in cell biology and neuroscience.*

**01:146:456** *Advanced Physiology (3)*
Preparation for advanced graduate study in physiology and for medical physiology (first-year medical school). Focus on mammalian physiology and the whole animal (whole organ) approach to classical experimental physiology.
*Prerequisites: 01:146:356. Intended for senior and junior students.*

**01:146:464** *Topics in Cell Biology and Neuroscience (3)*
Directed readings and discussion of selected topics in cell biology and neuroscience.
*Prerequisites: 01:146:245 and 01:146:270. Open to junior or senior students majoring in cell biology and neuroscience.*

**01:146:471** *Advanced Cell Biology Laboratory (3)*
Advanced laboratory methods in cell biology. Emphasis on light and electron microscopy, imaging, immunocytochemical techniques, tissue culture, and methods of identifying and separating macromolecules.
*Prerequisite: 01:146:270 or permission of instructor.*

**01:146:472** *Developmental Biology (3)*
Genetic, molecular and cellular processes that lead from egg to embryo to mature organism.
*Prerequisite: 01:146:270 or 01:447:380 or 01:447:384.*

**01:146:473** *Genetic Regulation in Cell Biology (3)*
Advanced topics in cell biology, focusing on genetic animal models, genomics, chromatin function, gene expression, and RNA biology.
*Prerequisite: 01:146:270.*

**01:146:474** *Immunology (3)*
Fundamental principles of immunology with emphasis on antibody formation, immunoglobulin molecules and genes, hypersensitivity reactions, and the cellular basis for the immune response.
*Prerequisites: 01:119:115-116 and 01:447:380 or 01:447:384. Recommended: 01:447:390.*

**01:146:475** ***Laboratory in Immunology (1)***
Biochemical and molecular analysis of immune cell function. Application of immunological techniques to the examination of normal and diseased states.
***Pre- or corequisite: 01:146:474.***

**01:146:476** ***Honors Immunology (3)***
Introduction to the immune system, with a focus on mammalian organisms (particularly humans). Focus on critical thinking and problem-solving abilities, as well as introduction to primary research addressing contemporary immunological questions. Open only to students enrolled in the Honors College, SAS Honors Program or CBN Honors Program.
***Prerequisites: 01:447:380 or 01:447:384. Credit not given for both this course and Immunology 01:146:474.***

**01:146:481** ***Protein Dynamics in Cell Biology (3)***
Advanced topics in cell biology, focusing on signal transduction (module 1), cell adhesion and protein transport (module 2) and cytoskeletal dynamics controlling cell movement (module 3).
***Prerequisite: 01:146:270.***

Life Sciences (SAS)

# Genetics 447

# GENETICS 447

Department of Genetics, School of Arts and Sciences

**Website:** Here

**Chair:** Tara C. Matise

**Vice-Chair & Undergraduate Director**: Gary A. Heiman

**Distinguished Professors:**

Maureen M. Barr, B.A., Rutgers; Ph.D., Columbia

James A. Knowles, B.S., Michigan; M. Sc., M.D., Ph.D., Albert Einstein Medicine

Tara C. Matise, B.S., Cornell; M.S., Ph.D., Pittsburgh

Jay A. Tischfield, B.S., City University of New York; M.Phil., Ph.D., Yale

Lei Yu, B.S., Jiangnan University (China); M.S., Institute of Genetics, National Academy of Sciences (China); Ph.D., California Institute of Technology

**Professors**:

Gary A. Heiman, B.A., Boston Univ.; M.Sc., Sarah Lawrence; Ph.D., Columbia

Kim S. McKim, B.A., Simon Fraser; Ph.D., British Columbia

Bryce E. Nickels, B.S., Miami; Ph.D., Harvard

Christopher G. Rongo, B.A., University of California, San Diego; Ph.D., Massachusetts Institute of Technology

Gleb P. Shumyatsky, B.A., Moscow State University; Ph.D., Institute of Molecular Biology (Moscow, Russia)

Andrew W. Singson, B.S., University of California, Davis; Ph.D., University of California, San Diego

Karen Schindler, B.S., Loyola; Ph.D., Thomas Jefferson

Michael Verzi, B.A., The College of New Jersey; Ph.D., University of California, San Francisco

Jinchuan Xing, B.S., Nankai (China); Ph.D., Louisiana State

**Associate Professors:**

Chris Ellison, B.A., Lewis and Clark; Ph.D., University of California, Berkeley

Derek Gordon, B.A., Rochester; Ph.D., State University of New York at Stony Brook

**Assistant Professors:**

Christina M. Bergey, B.A., M.A., Ph.D., New York University

Devanshi Jain, B.Sc. Hons., Ph.D., University College, London

Tetsuya Nakamura, B.S., Ph.D., Osaka (Japan)

Srujana Samhita Yadavalli, B. Tech., Anna University (India); Ph.D., Ohio State

Jiekun Yang B.S., Renmin University (China), M.S. UW-Madison, Ph.D. University of Virginia

**Associate Research Professors:**

Juan Wang, B.S., Ph.D., China Agricultural University (Beijing)

**Assistant Research Professors:**

Marco Azaro, B.A., Ph.D., Brown

**Teaching Professor:**

Martha Haviland, B.A. Rutgers; MS, AM, Ph.D. Michigan

**Associate Teaching Professor:**

Jessica Rispoli, B.S., Richmond; M.G.C., Maryland

Christine Seymour, B.S., Scranton; M.S. Arcadia University

**Associate Research Professor:**

Oleg Evgrafov, B.S., Moscow Physical Engineering Institute; M.S., Moscow Physical Engineering Institute; Ph.D,. Institute of General Genetics (Moscow); D.Sc., Research Center for Med. Genetics (Moscow)

**Assistant Teaching Professors:**

Tara P. Cominski, B.S, Saint Peter's; M.S., Seton Hall; Ph.D., Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin; M.S., Kansas State; Ph.D., Wisconsin

Anne Keating, B.S., Ph.D., Rutgers

Haiyang Lu, B.S., Hebei University, China; M.S., Beijing Normal University, China; Ph.D., City University of New York

Shama Khan, B.A., Rutgers University; M.P.H., Tulane; M.S. Epidemiology, Tulane University; M.S. Genetic Counseling, Arcadia University

Mai Soliman, B.S., M.Sc., Montclair State; Ph.D., Rutgers

Zainab Tanvir, B.A. Stonybrook University, M.S. Univ. Delaware, Ph.D., Rutgers

Alexandra Walczak, B.S., Ramapo College of NJ, Ph.D., Rutgers

**Faculty Emeriti:**

David E. Axelrod

Linda Brzustowicz

Terry McGuire

Howard C. Passmore

Amrik S. Sahota

Lee D. Simon

Navin K. Sinha

Ann C. St. John


- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Elective Courses
- Departmental Honors
- Undergraduate Certificate Programs
- Courses

# Learning Goals

# Learning Goals

**Learning Goals:**

The Department of Genetics is committed to teaching science through the way we do science: through the process of doing research. The curriculum of the Department of Genetics is centered around four main goals. These goals shape our innovative courses and provide the basis for lifelong learning.

I. Knowledge specific goals: Know the terms, concepts, and theories of genetics.

II. Integrate the material from multiple courses and research to think holistically and to see the whole as well as the parts.

III. Use genetic information and ideas to critically analyze published research articles in genetics.

IV. At the end of four years, all of our students will be able to design an experiment, carry out the research using the appropriate laboratory techniques, and analyze and interpret their data. They will also be able to communicate their discoveries through a written article appropriate for publication in a peer-reviewed genetics journal, and through talks or posters appropriate for scientific meetings.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in this department must have been enrolled at Rutgers for at least one semester. In addition, students must:

1. Be an SAS student

2. Have a cumulative GPA of at least 2.00, and a GPA of at least 2.8 at the time of taking research for credit.

3. Have earned a C or better in these prerequisite courses or equivalents (25-26 credits):

a. General Biology I 01:119:115

b. General Biology II 01:119:116

c. General Biology Lab 01:119:117

d. General Chemistry I either 01:160:161 or 01:160:163

e. General Chemistry II either 01:160:162 or 01:160:164

f. Calculus I either 01:640:135 or 01:640:151

g. Calculus II or Statistic either 01:640:136, or 01:640:152, or 01:640:192, or 01:960:401, or 01:960:212, or 01:960:379

4. Students with an overall GPA < 3.0 must meet with the UGD before declaring the major.

a. Genetics is a credit-intensive major and has a requirement of a 2.80 GPA at the time of taking research for credit

b. Students entering the major with a GPA of < 3.0 may struggle to complete the major on time

5. Watch a Genetics Major Declaration Video

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The department offers a major with a strong emphasis on research. A minimum of 20 credits of coursework in the life sciences must be completed in residence. Genetics is a credit-intensive major. Excluding the prerequisite courses (25-26 credits) to get into the major (see above), there are between 54-56 credits to complete the major (60-62 for honors). A grade of "C" or better in courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades. Students may not double major in two Division of Life Sciences majors.

The requirements of the major consist of:

**A. Life Science Core Courses (19-21 credits)** - Required for all DLS Majors (Approved AP and Transfer credits may be substituted)

a. Intro to Experimentation 01:160:171

b. Organic Chemistry I 01:160:307 or 01:160:315

c. General Physics I (01:750:203 + 205 lab), or (01:750:271 + 275 lab), or 01:750:193, or 01:750 201
Note: 193 & 201 have integrated lab

d. General Physics II (01:750:204 + 206 lab) or (01:750:272 + 276 lab) or 01:750:194 or 01:750:202
Note: 194 & 202 have integrated lab

**B. Genetics Core (17 credits) -** Required for all Genetics Majors- All below credits must be completed at Rutgers

a. Genetic Analysis I 01:447:384

b. Genetic Analysis II 01:447:385

c. Lab Course Req. 01:447:315, or 01:447:302, or 01:447:203, or 01:447:303, or 01:694:214, or 01:694:215, or 01:694:316

d. Biochemistry for the Life Sciences 01:694:395 or 01:694:407

e. Communications in Genetics 01:447:430 or 01:447:414 + 01:447:415 (Honors, Thesis Writing senior year)

**C. Genetics Independent Scholarship (minimum 6 credits but 12 credits for honors**

Note: 2.8 minimum GPA to register for research

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

**D. Genetics Electives (6 credits)**

Fifty percent must be taken within the Genetics Major (i.e.; 01:447)

a. Genetics Electives See electives table

b. Genetics Electives See electives table

c. Genetics Electives See electives table

**E. Electives OR Independent Scholarship (6 credits)**

Note: Additional Genetics Lab may be used as an elective

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

c. Genetics Electives See electives table below

**Lab Note:** 01:694:214 and 01:694:215 are only offered to first-year students with AP Biology credit and AP General Chemistry credits (or taking General Chemistry concurrently). 01:447:203 is only offered to first-year students in the SAS Honors Program or the Honors College. Students cannot receive credit for both 01:447:203 and 01:447:302.

**Organic Chemistry Note:** If you are planning to pursue a graduate degree in which a full year of organic chemistry is suggested/required (e.g., med/dental school), we strongly recommend taking Organic Chemistry II + lab as an elective (6 credits)

Life Sciences (SAS)

# Elective Courses

# Elective Courses

**Approved Genetics Electives**

(01:160:308 or 01:160:316) and (01:160:311 or 01:160:314-15) Organic Chemistry II + lab (6)

01:198:111 Introduction to Computer Science (4)

01:198:112 Data Structures (4)

01:447:203 Honors Computational Genetics (Honors) (3)

01:447:216 Analysis of Scientific Literature (Honors) (3)

01:447:245 Intro to Cancer (3)

01:447:302 Quantitative Biology and Bioinformatics (3)

01:447:303 Computational Genetics of Big Data (3)

01:447:315 Introduction to Research in Genetics (3)

01:447:354 Social, Legal, and Ethical Implications of the New Genetics (3)

01:447:356 Evolutionary Medicine (3)

01:447:370 Developmental Genetics (3)

01:447:390 General Microbiology (3)

01:447:392 Pathogenic Microbiology (3)

01:447:451 Genomes (3)

01:447:460 Genetics of Compulsive Behavior (3)

01:447:465 Genetic Approaches & Research Analysis (3)

01:447:470 Evolutionary Developmental Biology (3)

01:447:478 Special Topics in Genetics (3)

01:447:479 Special Topics in Genetics (3)

01:447:480 Topics in Molecular Genetics (3)

01:447:484 Behavioral and Neural Genetics (3)

01:694:411 Molecular Pathways and Signal Transduction (3)

01:694:412 Proteomics and Functional Genomics (3)

01:694:413 Chromatin and Epigenomics (3)

01:694:420 Membrane Dynamics in Health and Disease (3)

01:694:421 Spec. Top. Mol. Bio. & Biochem (3)

01:694:492 Gene Regulation in Cancer and Development (3)

11:126:427 Methods and Applications in Molecular Biology (4)

11:126:483 Nucleotide Sequence Analysis (3)

11:126:485 Bioinformatics (3)

11:680:480 Microbial Genetics and Genomics (3)

16:681:535 Human Genetics (3)

Life Sciences (SAS)

# Departmental Honors

# Departmental Honors

**Departmental Honors**

The Department of Genetics recognizes graduating students who have made outstanding academic achievements by awarding **departmental honors**. The department awards two types of departmental honors (see below) and these are awarded at the discretion of the Genetics Honors Committee. To be considered, students must meet all criteria for that type of honors and submit the honors request application by the deadline (April 1st of senior year).

The two types of departmental honors and their criteria are as follows:

**1. GENETICS HONORS- RESEARCH**

a. GPA requirement: a student must have attained, at the end of the junior year, a cumulative GPA of at least 3.4 and a Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete 6 or more credits of Honors in Genetics (01:447:408-409) during senior year

c. Complete a total of 12 or more research credits (including the 6 credits of 01:447:408-409)

d. Complete Honors Thesis and Communication in Genetics 447:414 and 415 during senior year

e. Complete and defend a research thesis before a faculty committee (see Thesis Guidelines)

f. Present at Honors Day

Students can apply to do an Honors thesis by completing the relevant sections of the Independent Scholarship Form. Students must register either for an Honors course sequence in Genetics (01:447: 408 and 409) or for a course sequence in a college Honors Program (See Handbook). These decisions should be discussed with an advisor and approved by the Department Vice Chair. Accepted students are expected to complete at least 12 credits in an independent research project, resulting in a thesis. Students may do research with Rutgers faculty outside of the Department with the approval of their advisor and the Vice Chair. Students will prepare a thesis and present an oral defense to a committee of three faculty. At least one member of the committee must come from the Department of Genetics. Students will present their research at a Departmental Symposium in April. Students contemplating an Honors thesis should refer to the much more detailed instructions and details in Section IX and Section X of the Student Handbook. For information on the thesis, see Thesis Guidelines.

**Level of Honors:** In determining the level of honors, the honors/awards committee takes into consideration multiple factors in aggregate, including but not limited to (1) cumulative GPA, (2) thesis defense committee recommendation, (3) research mentor evaluation, (4) faculty evaluation of presentation at Honors Day, and (5) whether or not the student took the honors versions of Genetic Analysis 1 and/or 2 (i.e., 01:447:384:H1 and/or 01:447:385:H1) and the grades received in those courses.

**2. Genetics Honors - Certificate Program**

a. GPA requirement: A student must have attained, by April 1st of senior year, a cumulative GPA of at least 3.4 and Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete a departmental certification program (i.e.; CompGen, Cancer or Genetic Counseling).

c. By April 1st, the student must formally apply to request consideration for Certificate Honors by completing the Genetics Honors- Certificate Program Form

* *The honors committee may award Honors, High Honors or Highest Honors*

Life Sciences (SAS)

# Undergraduate Certificate Programs

# Undergraduate Certificate Programs

The Department of Genetics offers two certificate programs. Students who complete one of these Certificates are eligible to receive Departmental Honors.

1) Genetic Counseling Certificate Program

The Department of Genetics offers an undergraduate **Genetic Counseling Certificate Program (GCCP).** The GCCP program is intended for a select group of students interested in applying to the masters-level programs in genetic counseling. The goal is to provide students with guidance, coursework, and relevant clinical experience to improve their graduate school applications. This is a highly competitive option and is **only open to declared genetics majors**. Not all applicants will be accepted. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in genetics and does not replace minors. The certificate is NOT in lieu of completing the masters-level programs in genetic counseling. At the end of the program students will:

- understand genetic counseling as a profession ·
- understand application requirements for masters-level programs
- gain experience in talking with people who are in crisis
- gain experience in a clinical genetic counseling clinic

2) Certificate in Computational Genetics

The Department of Genetics offers a Certificate in Computational Genetics (CCG) for Genetics majors. The volume of data being generated in Genetics and related life science fields has been expanding tremendously in recent years, and career opportunities for geneticists with computational and quantitative expertise are simultaneously growing. This certificate program is intended for students who are either interested in applying to graduate-level programs,

or planning careers, in Computational Genetics/Biology, Statistical Genetics, Bioinformatics, or other programs in quantitative biomedical related research. The goal of the CCG is to provide students with guidance, coursework, and relevant data design and analysis experience to prepare them for graduate studies in the field or entry-level informatics jobs. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained competence in genetic data analysis using basic computer programming and statistical analysis.
- Be prepared to apply to M.S. or Ph.D. graduate programs in the areas of Computational Genetics and Bioinformatics.
- Be prepared to apply for career positions in industry, biotech companies, pharmaceutical companies, medical centers, or universities

3) Cancer Research Certificate

The Department of Genetics offers a Certificate in Cancer Research (CCR) for Genetics majors. Completion of the Certificate in Cancer Research will provide an advantage when applying to MD, PhD, and MS programs and facilitate transitions to careers with Cancer-related missions. The goal of the CCR is to provide students with a rigorous and Cancer-specialized curriculum. Students will do at least one year of research in a nation-leading Cancer Research Lab and students will be expected to participate in community engagement and develop skills to build community outside of academia. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained knowledge in Cancer Genetics with an expanded curriculum focused on Cancer biology.
- Have at least one year of experience conducting laboratory research in a Cancer research lab.
- Be prepared to apply to M.S., MD, or Ph.D. graduate programs in the areas of Cancer Genetics or for career positions in industry, biotech companies, pharmaceutical companies, medical centers, policy-driving institutes, or universities.

Life Sciences (SAS)

# Courses

# Courses

**01:447:203** ***Honors Computational Genetics (Honors) (3)***
Honors computational genetics is a computer-based laboratory course that introduces students to the use of computers in biological research. This course is for students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. In the first half of the course, students will receive instruction in introductory computer programming (Python). In the second half of the course, students will practice writing code in Python via in-depth computational projects in genetics and genomics. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on

assignments. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and genomic data analysis. Prior experience with computer programming is neither necessary nor is it expected for students who enroll in this course.

This course is for freshman or sophomore Honors students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major.The course fulfills the laboratory requirement for the Genetics major.
***Prerequisites: Students must be in their first or second year at Rutgers in an approved Honors program (e.g., the Honors College or the SAS Honors Program). General Biology I (01:119:115) and be at least co-registered for General Biology II (01:119:116)) or have placed out of these two courses (e.g., through AP credit or approved transfer credit). Credit not given for both 01:447:203 and 01:447:302.***

**01:447:216** ***Analysis of Scientific Literature (Honors) (3)***
A systematic approach to the reading, analyzing, and understanding of primary literature in genetics; emphasis will be placed on data analysis and experimental design and demystifying the process of reading a scientific journal article.
***Prerequisites: 01:119:115-116. Highly recommended: 01:694:215. Open only to freshmen and sophomores in the SAS or SEBS Honors Program. By permission only.***

**01:447:245** ***Introduction to Cancer (3)***
Introduction to Cancer provides the student with an overview of conventional and state-of-the-art aspects of oncogenesis. Students will become familiar with the process involved in neoplastic transformation to the cancer phenotype through aspects of epidemiology, pathophysiology, virology, in vitro and in vivo cellular transformation and genetics. They will then apply these aspects to the understanding of classic therapeutic modalities and new state-of-the-art rational therapies. This comprehensive course will concentrate on the human disease process by applying clinical aspects of oncogenesis during a series of Grand Rounds discussions that will include recent patient clinical cases and their outcomes.
***Prerequisites: 01:119:115-116. Credit not given for both this course and 01:447:495.***

**01:447:302** ***Quantitative Biology and Bioinformatics (3)***
Introduction to the use of computers and computer programming to develop applications for research in genetics and molecular biology. Application topics will include evolutionary genetics, association analysis and genetics mapping, and structural biology.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill an elective requirement or taken instead of 01:447:315 Introduction to Research in Genetics by students majoring in Genetics. Credit not given for both 01:447:203 and 01:447:302***

**01:447:303** ***Computational Genetics of Big Data (3)***
The main focus of this course is the application of R programming to the analysis of genetic data, particularly big data sets with multiple measurements. The primary data sets considered will contain RNA-seq and/or other expression data for multiple/all genes in a given set of individuals. This course is for junior or senior students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. Students will learn how to acquire such data, format it for R, plot the data, and perform statistical analyses. In addition, students will learn how to simulate data under different hypotheses, and how to perform power and sample size calculations

for different statistical methods applied to real or simulated data. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on assignments. Guest investigators will frequently make short presentations (in person or by skype) to provide illustrations of how programming and informatics is critical for their research. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and data analysis.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course.***

**01:447:315** *Introduction to Research in Genetics (3)*
Basic principles and methods of research with microbial model systems used in the analysis and manipulation of genes, followed by a research project in molecular genetics.
***Prerequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 (or equivalent) or 01:160:163-164, 171. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course. Credit not given for both this course and 01:694:315. Open only to genetics majors***

**01:447:354** *Social, Legal, and Ethical Implications of the New Genetics (3)*
Social, legal, and ethical implications of new modern genetic techniques, for example: genetic screening, stem cells and cloning, forensic genetics, genetic engineering of plants, animals, and humans, genetic enhancement, gene therapy, and the new eugenics.
***Prerequisites: Genetics (01:447:380) or Genetics Analysis (01:447:384)***

**01:447:356** *Evolutionary Medicine (3)*
In this course, we examine human health from an evolutionary perspective, exploring the impact that our evolutionary heritage has on modern human diseases, both chronic and infectious. We will learn how the framework of evolutionary biology and modern genetic tools can inform our understanding of issues relevant to clinical and public health. Rather than focus on the immediate mechanisms underlying disease, we will endeavor to understand the ultimate factors that influence susceptibility, such as past natural selection. The course topics are wide-ranging, but particular attention is paid to emerging infectious diseases, as well as non-communicable diseases that may be exacerbated by facets of modern lifestyles.

Through lectures, critical analysis of the primary literature and popular science news, and class discussions, students will learn how evolutionary principles can be practically applied to medicine. Key readings each session will focus on genetic techniques for understanding evolutionary medicine, while additional readings will incorporate perspectives from diverse fields.

By fully participating in this course, students will be able to appreciate how modern susceptibility to non-communicable and infectious diseases has been influenced by past evolutionary processes; critically evaluate evolutionary hypotheses related to health and medicine, including those found in popular science articles; and know how genetic techniques are applied within an evolutionary framework to understand ultimate reasons for disease.
***Prerequisites: (01:447:380 or 384) AND (01:960:401 or 01:960:212).***

**01:447:370** *Developmental Genetics (3)*
How genes influence the developmental processes of an organism. Topics include gene regulatory networks, signaling pathways, stem cell biology, and the role of developmental genetics in human disease.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:380** *Genetics (4)*
Introduction to the mechanisms of heredity and evolution. Mechanisms of Mendelian inheritance, meiosis, recombination, gene mutation, and mapping, and an introduction to modern biochemical, molecular, and population genetics.
*Lec. 3 hrs., rec. 1 hr. Prerequisites: 01:119:115-116 and 01:160:161-162 or 01:160:163-164. Credit not given for both this course and 01:447:384-385 or 11:067:328 or 11:776:305.*

**01:447:382** *Genetics Laboratory (1)*
Laboratory to accompany 01:447:380. Not accepted for elective credit for Genetics majors.
*Lab. 3 hrs. Pre- or corequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)*

**01:447:384-385** *Genetic Analysis I,II (4,4)*
Experimental methods and concepts in genetics, with emphasis on their application to genetic research. Part I covers transmission genetics and breeding analyses, basic molecular genetics, isolation and characterization of mutations, and chromosome structure and function. Part II covers mathematical genetics, recombinant DNA, genomics, and special topics relevant to modern genetic research.
*Open only to majors in genetics or by permission of instructor. Credit not given for both this course and 01:447:380 or 11:067:328 or 11:776:305. Prerequisites for 01:447:384 are 01:119:115-116 (General Biology I & II) or 01:160:161-162 or 01:160:163-164 (General Chemistry I & II). Prerequisite for 01:447:385 is 01:447:384.*

**01:447:390** *General Microbiology (4 includes laboratory)*
Microorganisms are an essential component of the human environment and are significant not only for the disease they cause, but also for their ecological, agricultural, pharmaceutical, and industrial benefits. This course will introduce students to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms and their applications. The lab component of the course will introduce microscopy and staining techniques, the growth cycle and generation of a standard curve, physiological characteristics of microorganisms, and bacterial transformation. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include: History and Overview of Microbiology, Cell Structure and function, Microbial Growth, Nutrition, culture, and metabolism, Virology, Bacterial genetics, Microbial evolution and systematics, Bacteria and Archaea, Nutrient cycles, Genetic Engineering and Biotechnology, Waste treatment, Anaerobic respiration and Nitrogen fixation, Antibiotics and chemotherapeutic agents, Normal Flora, Virulence, Toxins, Epidemiology, and Microbial Diseases.

This is an upper-level course that focuses on the basic principles of microbiology. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include:
*Prerequisites: General Biology 01:119:115-116-117 or 01:119:101-102 and General Chemistry 01:160:161-162-171 (or higher) and Organic Chemistry 01:160:307. Credit not given for both this course and 11:680:390.*

**01:447:392** *Pathogenic Microbiology (3)*
This course will integrate basic microbiology and infectious diseases. The first quarter of the course will provide the conceptual basis of microbial morphology, metabolism and growth, heredity and variation, pathogenicity and antimicrobial chemotherapy. Then this course will introduce the students to one real life patient case study each week, moving the course toward an understanding of specific human diseases (e.g., pharyngitis, meningitis) as might be expected in a clinical environment. Each case will include a patient history, differential diagnosis, clinical cues, laboratory data, pathogenesis, treatment and prevention, additional points and references. The objective is not to attempt to cover every infectious disease or microorganism, but rather to use examples that would stress the key

principles of microbial pathogenesis, differential diagnosis and appropriate treatment and prevention. This course is intended for Life Science majors or those with a strong background in the Biological Sciences.
***Prerequisites: General Biology (01:119:115-117), General Chemistry (01:160:161-162-171), and Organic Chemistry (01:160:305. and 01:160:315. Systems Physiology is recommended.***

**01:447:406-407** ***Research in Genetics (3)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Permission of department and cumulative grade-point average of 2.8 or better. Open only to students majoring in Genetics.***

**01:447:408-409** ***Honors in Genetics (3-6,3-6)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Open by permission to seniors majoring in genetics who meet the requirements for the departmental honors program. Corequisite: 01:447:414 (fall) and 415 (spring).***

**01:447:410** ***Research in Genetics - Writing Intensive (3)***
Research in Genetics- Writing Intensive is intended to provide you with an opportunity to engage in original laboratory research under the direct supervision of a faculty mentor, usually in the faculty member¿s research laboratory. You are expected to carry out your own research project. NOTE: this research requires a heavy commitment of time and effort and can impact your performance in coursework, especially if you have not yet managed the foundational material for the discipline. Fulfills the writing and communication requirements of the SAS Core Curriculum.
***Prerequisites: 01:447:302, 447:315, or permission of department. Registration is by special permission only. Cumulative grade-point average of 2.8 or better. Declared genetics major.***

**01:447:414** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods, and reference sections of their thesis and outline the results and discussion.
***Corequisites: 01:447:408. For seniors completing departmental honors; by special permission only.***

**01:447:415** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods and reference sections of their thesis and outline the results and discussion.
***Prerequisite: 01:447:408. Corequisite: 01:447:409. For seniors completing departmental honors; by special permission only.***

**01:447:430** ***Effective Communication Skills in Genetics (3)***
Communication is an essential part of science. Whether it is communicating research findings to other scientists or conveying complex concepts to a lay audience, a scientist must be able to effectively communicate their research to succeed. Communication in science is typically through publications, posters, or oral presentations. The goal of this course is to provide students practice in effectively communicating scientific findings. This includes preparing and revising an introduction for scientific papers, writing a research description for general audience, and preparing and

giving presentations (both oral and poster).
***Prerequisites: Declared major in Genetics; must have completed one semester of Research in Genetics, Advanced Independent Study, or Genetic Counseling Rotation. By special permission only.***

**01:447:451** *Genomes (3)*
This course will focus on Genomics, Proteomics and Bioinformatics from a Genetics perspective. Special attention will be given to the organization and functioning of the human genome.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:460** *Genetics of Compulsive Behavior (3)*
Compulsive urge can be channeled toward productive endeavors such as a strong drive to succeed in competitions, schooling, and career. On the other hand, improper handling of compulsive urge may lead to problematic behaviors such as alcoholism, drug use, gambling, and other undesirable behaviors. There are also conditions that are medically defined as disorders, with certain types of compulsive behaviors as part of the diagnostic symptoms, such as OCD and ADD/ADHD. There is evidence that genetics contribute to compulsive behavior in humans, and research in animal models has begun to uncover the molecular factors that underlie the genetic basis of compulsive behavior. Discussion of primary literature and other scientific publications that deal with the molecular and genetic basis of compulsive behavior. Emphasis will be placed on the development of skills for critical thinking and effective writing.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:465** *Genetic Approaches and Research Analysis (3)*
This class will teach students how to read, interpret and analyze research articles. The class will follow an active learning format, where we will discuss seminal and recent research articles in depth: What was the scientific question or problem? What methods and strategies were used to address it? What were the findings and conclusions? What are the alternative interpretations and methods that could have been applied? What questions are remaining?
This class will expose students to a diverse selection of research literature, involving genetic and molecular analyses in model organisms such as mice, worms, flies and yeast. The class series will begin with a research article presented by the teacher. During the majority of the class series, students will be divided into groups of 4-5. Each group will be assigned one research article and be required to work together to a) interpret, b) analyze and c) present the article in the form of an oral presentation to the class. Students will be graded on their ability to perform each of these tasks and on active participation during presentations by other groups. All groups will also be required to complete and be graded on a written discussion summary assignment at the end of each article discussion. This summary assignment may take many forms, e.g., preparation of a graphical abstract, subway advert, or other creative forms of expression.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:470** *Evolutionary Developmental Biology (3)*
Evolutionary origins of the vertebrate body plan are major problems in biology. While paleontology and comparative anatomy have revealed the evolutionary trajectories of the organs, recent genetics, genomics and embryology are becoming powerful tools to answer classical questions. The goals of this course are twofold; 1) obtain fundamental knowledge of anatomy, embryology, and the latest genomics and 2) learn how to integrate genetics, genomics and embryology to answer evolutionary questions through active discussion in the classroom. The training to discover and answer scientific questions in animal diversity will be performed at the American Museum of Natural History.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:478,479** ***Special Topics in Genetics (3,3)***
Directed readings and discussion of selected topics of special interest in genetics. Topics will vary according to semester and/or instructor.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:480** ***Topics in Molecular Genetics (3)***
Current research topics in microbial and molecular genetics. Lectures, discussions, and critical analyses of journal articles.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:484** ***Behavioral and Neural Genetics (3)***
Influence of genetics on the nervous system and behavior of various organisms. Overview of field including experimental analysis of behavior, development of the nervous system, and sensory systems. Emphasis on reading and interpreting original research,
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:488** ***Genetic Counseling Rotation (3)***
The goal of this course is to provide students with an understanding of the genetic counseling career. Students will be placed at a local Genetic Counseling clinic to shadow a genetic counselor for one semester. During the semester, the student is expected to spend 8-9 hours a week at the rotation plus meet weekly with course director (attendance is mandatory). Course grade will be based on 1) Case presentation to Genetic Counseling group 2) ten Genetic Counseling case summary logs, and 3) evaluation by the clinical supervisor.
***Prerequisites: Declared Genetics major, cumulative GPA of 2.8 or greater, and accepted into the undergraduate Genetic Counseling Certificate Program (GCCP).***

**01:447:489,490** ***Advanced Independent Study in Genetics (3,3)***
Advanced independent study in Genetics is an opportunity for students to complete a scholarly project under the direct supervision of a faculty mentor. Projects are varied; e.g. library research on a topic of mutual interest to both the student and the faculty member, computer simulations, informative website design, or development of teaching materials. This course may not used for laboratory research.
***Prerequisites: 01:447:384 and permission of department. Open only to students majoring in Genetics***

Life Sciences (SAS)

# Molecular Biology and Biochemistry 694

# MOLECULAR BIOLOGY AND BIOCHEMISTRY 694

Department of Molecular Biology and Biochemistry, School of Arts and Sciences

**Website:** Here

**Chair:** Barth Grant

**Undergraduate Chair:** Samuel Gunderson

**Professors:**

Gyan Bhanot, B.S., Baroda (India); Ph.D., Cornell

Steven J. Brill, B.S., Maryland; Ph.D., SUNY (Stony Brook)

Monica Driscoll, B.A., Rutgers; Ph.D., Harvard

Isaac Edery, B.S., Ph.D., McGill (Canada)

Barth Grant, B.A., Virginia; Ph.D., Princeton

Kenneth D. Irvine, B.A., Williams College; Ph.D., Stanford

Fumio Matsumura, B.A., Tokyo; Ph.D., Nagoya (Japan)

Konstantin V. Severinov, M.Sc., Moscow State; Ph.D., Russian Academy of Sciences

Ruth Steward, B.S., Ph.D., Basel (Switzerland)

Andrew K. Vershon, B.A., Bennington College; Ph.D., Massachusetts Institute of Technology

Eileen P. White, B.S., Rensselaer Polytechnic Institute; Ph.D., SUNY (Stony Brook)

**Associate Professors:**

Stephen Anderson, A.B., Ph.D., Harvard

Sam Bunting, B.A., Oxford; Ph.D., Cambridge

Guoping (Sam) Gu, B.A., Peking (China); Ph.D., California (Santa Cruz)

Samuel I. Gunderson, B.S., Minnesota; Ph.D., University of Wisconsin, Madison

Mikel Zaratiegui, B.S., Ph.D., Navarra (Spain)

**Assistant Professors:**

Annika Barber, B.S., Bryn Athyn College; Ph.D., Thomas Jefferson

Jia Fei, B.S., Yunnan (China); Ph.D., Zurich (Switzerland)

Tina Liu, B.S. Yale; Ph.D. Harvard

Yang Lyu, B.S. Beijing, China; Ph.D. Guangzhou, China

Kevin Monahan, B.S., Haverford; Ph.D., Harvard

**Assistant Teaching Professor:**

Gabe Villegas B.A., Rutgers; Ph.D., Rutgers


- Learning Goals
- Entry Requirements of the Major
- Major Requirements

- Course Requirement Options
- Research Options
- Departmental Honors Program
- Courses


Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Molecular Biology and Biochemistry offers a course of study in which traditional and modern biochemistry are integrated with studies in molecular biology. In addition to traditional courses, students are required to carry out undergraduate research work in a Rutgers professor¿s lab who serves as the host and mentor. This course of study prepares students for graduate studies in molecular biology and biochemistry and related fields, entry into professional schools in medicine or other health professions, or employment in industries (e.g., biotechnology, pharmaceuticals) in which molecular biology and biochemistry skills are in demand. The same learning goals are also used for nonmajor students taking molecular biology and biochemistry courses.

*Learning Goals:*

I. Students should demonstrate an understanding of the knowledge that is needed to begin biomedical research and that is required for postgraduate exams and studies.

II. Students should demonstrate the ability to find and evaluate information about specific biological systems or problems.

III. Students should demonstrate the ability to design experiments and critically analyze data.

IV. Students should demonstrate the ability to communicate their research and findings orally through seminar and poster presentations and through written research papers.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

The molecular biology and biochemistry (MBB) major is open to students beyond their first year who have a 2.0 cumulative grade-point average and have received grades of C or better in courses taken toward the major, except by special permission of the department undergraduate chair. The MBB major is also open to first year students with AP credits. In all cases, students interested in the MBB major should contact the Undergraduate Director, Sam Gunderson.  A grade of C or better in all courses credited toward the major is required for graduation and each course may be repeated only once to replace D/F grades.

Departmental approval is required to declare the major in molecular biology and biochemistry. Students who want to register for the MBB major must first meet with the Undergraduate Chair Sam Gunderson, Nelson lab, Room A322/A320 (848-445-1016 gunderson@dls.rutgers.edu) to discuss details about the major.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

A core of courses is required for completion of the major in molecular biology and biochemistry. Students supplement the core with additional required and elective courses in one of three options. Given that molecular biology and biochemistry is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life science courses applied to the major in molecular biology and biochemistry should be taken within 10 years of graduating. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major. Returning students must meet with their adviser to discuss their path to graduation. All students are required to write research reports and present them at a seminar.

***Required Core Courses (58 credits)***

01:119:115-116 General Biology (4,4)*
01:119:117 Biological Research Laboratory (2)*
01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)*
01:160:171 Introduction to Experimentation (1)*
01:160:309 Organic Chemistry Laboratory (2) (recommended)* or 01:160:311 Organic Chemistry Laboratory (2)
01:160:315-316 Principles of Organic Chemistry (4,4) (recommended)* or 01:160:307-308 Organic Chemistry (4,4)
01:447:380 Genetics (4)*
01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4) *(recommended) or 01:640:135-136 Calculus for the Life and Social Sciences I,II (4,4)**
01:694:407 Molecular Biology and Biochemistry (3) or 01:694:395 Biochemistry for the Life Sciences (3)
01:694:315 Introduction to Molecular Biology and Biochemistry Research (3) or 01:694:215 Honors Introduction to Molecular Biology and Biochemistry Research (4) or 01:694:214 Introduction to Molecular Biology Research (3) or 01:694:316 Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)
01:694:408 Molecular Biology and Biochemistry (3)
01:694:383 Molecular Biology and Biochemistry Seminar: Careers in Science (1)
01:694:484 Molecular Biology and Biochemistry Seminar: Research Presentations (1)
01:750:203-204 General Physics (3,3)***

01:750:205-206 General Physics Laboratory (1,1)***

*Life sciences core course
**01:960:401 Basic Statistics for Research (3) or 01:960:211-212 Statistics I,II (3,3) may be substituted for the second semester of calculus.
***01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

Life Sciences (SAS)

# Course Requirement Options

# Course Requirement Options

In addition to the required core courses, the Department of Molecular Biology and Biochemistry (MBB) offers two course options to students to fulfill the requirements for the major. Course option one comprises taking advanced electives and is intended to expose MBB students to different current topics in molecular biology and biochemistry. Course option two is for students interested in biophysical questions and research and comprises taking Physical Chemistry and Multivariable Calculus. Students completing course option two will also receive a minor in chemistry are encouraged to take the physical chemistry courses as they will fulfill the minor requirements. Course option two is intended to expose MBB students to different current topics in molecular biology and biochemistry.

*Course Option One (13 credits)*

Two 3-credit courses offered by the MBB department from the following list: 01:694:230; 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

One 400-level, 3-credit elective course offered by any department in the Division of Life Sciences or approved by the MBB department. See degree navigator or the MBB department website for a list of approved courses.

*Course Option Two (9 credits)*

01:160:341-342 Physical Chemistry: Biochemical Systems (3,3) or 01:160:327-328 Physical Chemistry (3,3) (requires 01:640:251 as a prerequisite). Other combinations of Physical Chemistry are possible so see degree navigator for further details.

01:640:251 Multivariable Calculus (4)

One 3-credit course offered by the MBB department from the following list: 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

*Electives*

Because the list of approved electives is changing, students should discuss their elective options directly with their departmental faculty advisers and with the MBB Undergraduate Director, Sam Gunderson. A list of currently approved electives can be found on the MBB department website. In addition to the undergraduate courses listed, advanced students are encouraged to choose electives from the School of Graduate Studies.

Life Sciences (SAS)

# Research Options

# Research Options

The Department of Molecular Biology and Biochemistry (MBB) offers two laboratory research options (laboratory option one and laboratory option two), as well as a nonlaboratory research option (nonlaboratory option). In all cases, students must take one of the Introduction to Molecular Biology and Biochemistry Research courses (01:694:214, 01:694:215, 01:694:315, or 01:694:316) and 01:694:383, 484 Seminars in Molecular Biology and Biochemistry. Course 01:694:215 is only for first-year honors students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:214 is for first-year students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:315 is for either qualified sophomores or junior students in the major. Course 01:694:316 is for either qualified sophomores or junior honors students in the major.

*Laboratory Option One (>12 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6,2-6)

01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (6,6)

A minimum of 12 credits is required in research courses. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Laboratory Option Two (6 to 11 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6) or 01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (4-6,4-6)

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

A minimum accumulation of 6 credits is required in research courses. Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Note that students applying for honors must complete 4 up to 6 credits of honors coursework per semester for two semesters. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Nonlaboratory Option (9 credits)*

01:694:489,490 Literature Research in Molecular Biology and Biochemistry (3,3). This non-lab option is almost never used and will need approval from the Undergraduate Director, Sam Gunderson

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Students taking this option may not apply for departmental honors.

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have attained, at the end of the junior year, a cumulative grade-point average of at least 3.4 and a grade-point average of 3.4 or better in courses required for the major. Exceptional students not meeting these criteria but wishing to apply for honors research may petition the Department of Molecular Biology and Biochemistry at the beginning of their senior year. Students accepted into the program are expected to complete two semesters (6 credits per semester) of honors coursework. A written honors thesis and an oral thesis presentation are required. Students enrolled in 01:694:495,496 Honors Laboratory Research or any of the various school honors programs are eligible to receive departmental honors at the time of graduation.

Life Sciences (SAS)

# Courses

# Courses

**01:694:214** ***Introduction to Molecular Biology Research (3)***
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities available to undergraduates at the university.
***Prerequisites: For first-year students only who have placed out of General Biology (01:119:115,116, and 117) with AP credits, and 01:160:161 or 01:160:163. Corequisite: 01:160:162 or 164.***

**01:694:215** ***Honors Introduction to Molecular Biology and Biochemistry Research (4)***
Basic principles and methods of research, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisite: Limited only to first-year SAS Honors Program or Honors College students who have placed out of General Biology (01:119:115,116, and 117) with AP credits. Corequisites: 01:160:161 or 01:160:163 (or AP credits) and 01:640:135 or 01:640:151 (or AP credits).***

**01:694:230** ***Analytical Methods in Biology (3)***
Mathematical methods and tools to analyze and interpret biological and biomedical data, including probability theory; Bayes Theorem; the binomial, Poisson, and normal distributions; limit theorems; error analysis; tests of statistical significance; parameter estimation; curve fitting; sampling techniques; random number generation; and Monte Carlo methods. Analysis of sequencing and microarray data, such as sequence alignment, phylogeny inference, population structure, selection, and human migration.
***Prerequisites: 01:119:115-116 and 01:640:135 or 151.***

**01:694:281,282** *Sophomore Laboratory Research (2-6,2-6). 281 is Fall, 282 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Credits in this course cannot be used toward the required research credits for laboratory option. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:283** *01:694:283 Undergraduate Laboratory Research (2-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
Typically for rising Juniors and Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

***Prerequisite: Students must complete a special permission form and have it signed by their research and MBB faculty mentors before they can register of the course.***

**01:694:301** *Introductory Biochemistry and Molecular Biology (3)*
Chemistry and metabolism of proteins, carbohydrates, lipids, nucleic acids, and other biologically important compounds.
***Prerequisite: 01:160:209 or 307. Not for students majoring in molecular biology and biochemistry. Credit not given for both this course and 01:694:407, 11:115:301, or 11:115:403.***

**01:694:313** *Introductory Biochemistry Laboratory (1)*
Techniques used in research, clinical, and food laboratories, including tests of biological materials, methods of separation, and determination of enzyme activities.
***Lab. 3 hrs. Pre- or corequisite: 01:694:301. Not for students majoring in molecular biology and biochemistry.***

**01:694:315** *Introduction to Molecular Biology and Biochemistry Research (3)*
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities at the university available to undergraduates.
***Pre- or corequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 or 01:160:163-164, 171. Credit not given for both this course and 01:447:315, 01:694:214, 215, or 316. Open only to MBB majors.***

**01:694:316** *Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)*
Basic principles and methods of research in molecular biology, biochemistry, and genetics, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisites: 01:119:116 and (01:160:162 or 01:160:164). For MBB or genetics majors only or those planning on being MBB or genetics majors. Special permission required.***

**01:694:381,382** *Undergraduate Laboratory Research (3-6,3-6). 381 is Fall, 382 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:383** *Molecular Biology and Biochemistry Seminar: Careers in Science (1)*
Discussion of career options in the life sciences, finding a research laboratory, performing literature searches, reading a scientific paper, and creating posters and abstracts. This course should be taken in the beginning of the third year.
*Open to MBB majors only.*

**01:694:384** *Undergraduate Laboratory Research (1-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

*For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.*

**01:694:385** *MBB Research and Writing (3)*

Research project in the laboratory of a faculty member. Seminar on science communication. Written and oral reports of research carried out during the semester required.

*Prerequisites: MBB majors only. Students need a GPA of 2.8 or better to enroll in research.*

**01:694:390** *Introductory Computational Biology (3)*
Disciplines of biochemistry and molecular biology and genomics all include collection and analysis of large data sets. Hands on use in a computer lab will permit students to learn and apply computer languages such as Python and R to analyze large data including for example DNA mutations and structural variations (SVs), RNA-seq and ChIP-seq as part of understanding genes and gene regulation.
*Prerequisite: 01:447:380 or 01:447:384*

**01:694:395** *Biochemistry for Life Sciences (3)*
The course is intended for life science majors and takes a holistic approach to Biochemistry. You will learn the basics of proteins, enzymology, nucleic acids and metabolism and use these as foundations to discuss exemplary metabolic pathways for their importance to homeostasis and, when dysregulated, to disease including observable phenotypes and what current strategies are used to treat these disorders. Coursework will consist of quizzes, homework, exams and one graded paper.

*Prerequisites: 01:160:307 or 01:160:315*

**01:694:407** *Biochemistry (3)*
Protein structure and function, structure of lipids, membranes and carbohydrates, catalysis of biochemical reactions, intermediary metabolism, oxidative phosphorylation, membrane transport, lipid metabolism, signal transduction, photosynthesis, protein secretion, targeting and turnover, nitrogen, amino acid, and nucleotide metabolism.
*Pre- or corequisites: 01:160:307-308 or 315-316. Credit not given for both 01:694:407 and 01:694:301, 11:115:301, or 11:115:403.*

**01:694:408** *Molecular Biology and Biochemistry (3)*
Disciplines of biochemistry and molecular biology as interlocking and mutually complementary fields of study. Lectures on structure of DNA, RNA, recombinant DNA approaches, DNA replication, repair and recombination, mobile genetic elements, transcription, gene regulation, RNA splicing, translation, and viral gene expression.
***Prerequisite: 01:694:407 or 01:694:301 or 01:694:395 or 11:115:403. Credit not given for both 01:694:408 and 01:146:478 or 11:126:481.***

**01:694:411** *Molecular Pathways and Signal Transduction (3)*
Lectures and discussion of current research areas of advanced molecular and structural biology: transcription, posttranscriptional regulation, cell cycle, neurobiology, protein folding, macromolecular recognition, and molecular virology.
***Pre- or corequisites: 01:694:407 and 408, or 01:447:384-385 or 11:115:403-404 or 11:126:481.***

**01:694:412** *Proteomics and Functional Genomics (3)*
Survey of modern techniques of protein biochemistry, bioinformatics, proteomics, and functional genomics, including basic concepts of protein structure and function, protein folding, protein characterization and purification, enzyme kinetics, NMR and X-ray crystallography, mass spectrometry, yeast two hybrid, and various techniques and approaches to functional and structural genomics.
***Prerequisites: [(01:694:301 OR 01:694:407 OR 01:694:395) AND (01:447:380) OR (01:447:384)]***

**01:694:413** *Chromatin and Epigenomics (3)*

Introduction to chromatin dynamics, particularly the structural and biochemical modifications of chromatin that underlie epigenetic states and their effects on gene expression and development.

***Pre- or corequisites: Prerequisite: 01:694:408 or 01:146:478 or 01:447:385.***

**01:694:420,421** *Special Topics in Molecular Biology and Biochemistry (3,3)*
Directed reading and discussion of selected topics of special interest in molecular biology and biochemistry. Topics will vary according to semester and/or instructor.
***Pre- or corequisites: [(01:694:301 or 01:694:407) and (01:447:380 or (01:447:384)] or equivalent.***

**01:694:481,482** *Advanced Undergraduate Laboratory Research (BA, BA). 481 is Fall, 482 is Spring.*
Research project in the laboratory of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484.

**01:694:484** *Molecular Biology and Biochemistry Seminar: Research Presentations (1)*
Oral presentation of student's own research results and the research interests of the laboratory with which the student is associated. Presentation at a required poster session.
***Students should take this course in the spring semester of their senior year. MBB majors only.***

**01:694:489,490** *Literature Research in Molecular Biology and Biochemistry (1-3,1-3)*
Literature research projects on a selected subject under the direction of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484. This course is rarely used, therefore contact the Undergraduate Director if you are considering to take this course.
***Prerequisites: 01:694:214, 215 or 315, 407, 408, and 383.***

**01:694:492** *Gene Regulation: Clocks to Cancer (3)*
Explanation of MBB as an experimental science and how molecular biologists know what they know. Covers all aspects of gene regulation from transcription to protein modification to explain how 25,000 human genes can make millions of different protein isoforms and mRNA and ncRNA. Mechanisms of molecular clocks and cancer addressed in terms of gene regulation complexity,feedback loops and rate-limiting steps with emphasis on the methods, experimental design,
*Prerequisites:(01:694:407 BIOCHEM) OR (01:447:384 GEN ANALY) OR (11:126:481 MOLE GEN) OR (11:115:403 GEN BIOCHEM) OR (01:694:395 BioChem LS)*

**01:694:495,496** *Honors Laboratory Research (BA)*
Two-semester-long Honors research project in the laboratory of a faculty member. In the Fall semester, 01:694:495 students are required to attend a seminar each week on writing a thesis and preparing an oral thesis presentation. In the Spring semester, students take 01:694:496 where they complete their Honors thesis and give their oral presentation to their honors committee.

# Chemistry 160 (SAS)

## CHEMISTRY 160

Department of Chemistry and Chemical Biology, School of Arts and Sciences

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**Vice Chair, Curriculum and Undergraduate Advising:** Ralf Warmuth

**Vice Chair, Instruction and Graduate Advising:** Alan Goldman

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Kenneth J. Breslauer, B.S., Wisconsin; M.Phil., Ph.D., Yale

Gerard C. Dismukes, B.S., Lowell Technological Institute; M.S., Ph.D., Wisconsin (Madison)

Eric L. Garfunkel, B.S., Haverford; Ph.D., California (Berkeley)

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Sidney Toby , B.S., London; Ph.D., McGill

Chemistry 160 (SAS)

# Learning Goals

# Learning Goals

Students will demonstrate mastery of the body of knowledge specified by the core chemistry curriculum. Students at the upper level will apply what they have learned to problems that require the evaluation of the scientific literature and the design of studies to test hypotheses. Students will use quantitative methods, both analytical and statistical, for modeling and interpreting the behavior of chemical systems. Students will be familiar with the basic experimental methods of organic, inorganic, analytical, and physical chemistry. Students will communicate clearly, both orally and in writing, the methods used in chemical scholarship and research and the results obtained with them.

Chemistry 160 (SAS)

# Entry Requirements for the Major and Minor in Chemistry

# Entry Requirements for the Major and Minor in Chemistry

Students wishing to declare a major or minor in chemistry must have successfully completed one semester of a general chemistry course for science majors (01:160:159, 161, 163, or the equivalent) with a grade of C or better. A score of 4 or 5 on the Advanced Placement test or appropriate transfer credit from another institution is also acceptable. Petitions for exceptions may be addressed to the vice chair of the undergraduate program.

Chemistry 160 (SAS)

# Major Requirements

# Major Requirements

The Department of Chemistry and Chemical Biology offers a program of study that provides broad and comprehensive training in all areas of modern chemistry. A certain core of courses is required for completion of the major in chemistry. Included is coursework in the four major subdisciplines of chemistry--inorganic, organic, physical, and analytical--as well as work in mathematics and physics. A minimum grade-point average of 2.0 in all chemistry courses is required for graduation.

Within the program, the following six options permit students to select an area of concentration that reflects their particular interests and career goals:

- core option (A)
- general American Chemical Society option (B)
- chemical biology option (C)
- environmental option (D)
- business/law option (E)
- chemical physics option (F)
- and forensic chemistry option (G)

Normally, this selection is made in consultation with a chemistry adviser in the semester that the major is declared.

The required core courses for option A are listed below. Completion of these courses satisfies the requirements in chemistry for graduation. Additional advanced and research courses are required in options B, C, and D, each of which leads to a degree certified by the American Chemical Society (ACS). Degree options also are available for students interested in using chemistry as a basis for interdisciplinary training (options E, F). For options E and F, courses marked with an asterisk (*) or two (**) in the core are substituted by appropriate courses from other disciplines. The required additional courses or substitutions are described under the individual options.

Some options require upper-level courses in disciplines other than chemistry. These courses may have as prerequisites lower-level courses in those other disciplines. When planning the courses for an option, students should make sure to research the prerequisites well in advance to avoid being prevented from entering a particular course.

An advanced chemistry course is a course that is not part of the core and has a major portion of the 160 (Chemistry) curriculum as a prerequisite, including physical chemistry, in most cases. All 400-level courses offered by the department are considered advanced courses.

*Career Options:* The curriculum is designed to permit the student a wide range of career choices, including, but not limited to, chemistry, medicine, law, business, chemical physics, environmental science, and secondary school teaching.

**Required Courses for All Major Options**

01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4)

01:160:171 Introduction to Experimentation (1)

01:160:251 Analytical Chemistry (3)

01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)

01:160:309-310 Organic Chemistry Laboratory (2.5,2.5) *

01:160:327-328 Physical Chemistry (4,4) or 01:160:341-342 Physical Chemistry: Biochemical Systems (3,3)***

01:160:329 Experimental Physical Chemistry (2.5)

01:160:348 Instrumental Analysis (3)

01:160:351 Inorganic Chemistry 1 (3)

01:160:352 Inorganic Chemistry 2 (1.5) or 01:160:353 Inorganic Chemistry 3 (1.5)

01:160:491-492 Seminar in Chemistry (1,1)

01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)

01:640:250 Introductory Linear Algebra (3)*

01:640:251 Multivariable Calculus (4)

01:750:203-204 General Physics (3,3)**

01:750:205-206 General Physics Laboratory (1,1)**

**Core Option (A).** For students who plan to seek immediate employment as chemists, and who do not seek certification by the American Chemical Society.

*Required:* Chemistry core courses

**General ACS Option (B).** For students who seek to find immediate employment as chemists, or who plan to attend graduate or medical school. Leads to a degree certified by the American Chemical Society.

*Required:* In addition to the chemistry core courses, 4 credits of senior-level research, one semester of biochemistry [01:694:407 Molecular Biology and Biochemistry (3) or 11:115:403 General Biochemistry (4)], and one advanced course in chemistry

**Chemical Biology Option (C).** For students whose interests are in the application of chemistry to the solution of biological problems. Appropriate for students who plan to attend graduate school in chemistry or related biological sciences or medical school, or who plan to seek immediate employment. Leads to a degree certified by the American Chemical Society.

*Required:* In addition to the chemistry core courses, 4 credits of senior-level research, one semester of biochemistry [01:694:407 Molecular Biology and Biochemistry (3) or 11:115:403 General Biochemistry (4)], and one course from the following:

01:160:418 Bioorganic Mechanisms (3) or 11:115:412 Protein and Enzyme Chemistry (3)

01:160:437 Physical Chemistry of Biological Systems (3) or 11:115:410 Physical Biochemistry (3)

01:160:476 Bioinorganic Chemistry (3)

01:694:408 Molecular Biology and Biochemistry (3) or 11:115:404 General Biochemistry (3)

**Environmental Option (D).** For students whose interests are in the application of chemistry to environmental problems, who plan to seek employment in environmentally related areas, or who plan to attend graduate school. Leads to a degree certified by the American Chemical Society if one additional course in biochemistry is taken [01:694:407 Molecular Biology and Biochemistry (3) or 11:115:403 General Biochemistry (4)].

*Required:* In addition to the core courses, 4 credits of senior-level research and two courses from the following:

01:160:415 Theory and Interpretation of Organic Spectra (3)

01:160:451 Analytical Spectroscopy (3)

01:460:304 Introduction to Geochemistry (4)

01:460:417 Environmental Geochemistry (3)

11:375:422 Air Sampling and Analysis (3)

11:375:444 Water Chemistry (3)

11:628:472 Chemical Oceanography (4)

**Business/Law Option (E).** For students who seek business or law careers that require a scientific background. Appropriate for those seeking nonlaboratory employment in industry as well as those planning to attend graduate school in business or law.

*Required substitutions in the core curriculum:* For the following two courses from the list of core courses, 01:160:310 Organic Chemistry Laboratory (2.5) and 01:640:250 Introductory Linear Algebra (3), substitute three business or business-related courses. One of the three courses must be chosen from the following:

01:355:302 Scientific and Technical Writing (3)

01:830:373 Organizational and Personnel Psychology (3)

33:010:272 Introduction to Financial Accounting (3)

The remaining courses must be at the 200 level or above and offered in accounting, communication, economics, finance, management, or marketing. Students electing this option should consult with the vice chair of the undergraduate program in chemistry as early as possible for assistance in selecting the courses for the option and in meeting professional or graduate school requirements.

**Chemical Physics Option (F).** For students whose interests are in chemical physics and who plan to attend graduate school.

*Required substitutions in the core curriculum:* For 01:750:203-204 General Physics (3,3), substitute either 01:750:123-124 Analytical Physics (2,2) and 01:750:227-228 Analytical Physics IIA, IIB (3,3) or 01:750:271-272-273 Honors Physics (3,3,3). For 01:750:205-206 General Physics Laboratory (1,1), substitute either 01:750:229-230 Analytical Physics II Laboratory (1,1) or 01:750:275-276 Classical Physics Laboratory (1,1). For 01:160:310 Organic Chemistry Laboratory (2.5) and 01:160:348 Instrumental Analysis (3), substitute 01:640:252 Elementary Differential Equations (3) and 01:750:381 Mechanics (3) and 01:750:385 Electromagnetism (3).

Students who choose the chemical physics option only after having taken 01:750:203-204 General Physics (3,3) and 01:750:205-206 General Physics Laboratory (1,1) normally should take 01:750:323 Advanced General Physics (3) before enrolling in either 01:750:381 Mechanics (3) or 01:750:385 Electromagnetism (3). A physics adviser should be consulted if there is uncertainty about the proper preparation for any physics course in this option.

*Required advanced courses:* Two courses chosen from the following:

01:160:421 Atomic and Molecular Structure (3) or 01:750:361 Quantum Mechanics and Atomic Physics (3)

01:160:425 Thermodynamics I (3)

01:160:434 Kinetics (3)

01:750:406 Introductory Solid State Physics (3)

01:750:417 Intermediate Quantum Mechanics (3)

Two semesters of senior-level research of at least 3 credits each may be used as a substitute for one advanced course.

The major in chemistry provides an excellent basis for those students who wish to teach in secondary school. Additional requirements for students interested in certification as teachers are set by the Graduate School of Education, which should be consulted for details.

**Forensic Chemistry Option (G).** The forensic chemistry option is intended for undergraduate students with a strong career interest in forensic science.

*Required substitutions in the core curriculum:*

For 01:160:327-328 Physical Chemistry (4,4) or 341-342 Physical Chemistry Biological Systems (3,3), substitute 01:119:115 General Biology (4) and either 01:694:407 Molecular Biology and Biochemistry (3) or 11:115:403 General Biochemistry (4)

For 01:640:251 Multivariable Calculus (4), 01:640:250 Linear Algebra (3), and 01:640:252 Elementary Differential Equations (3), substitute 01:960:379 Statistics (3).

For 01:160:329 Experimental Physical Chemistry (2.5), substitute 01:160:348 Instrumental Analysis (3).

*Required additions to the core curriculum:* The following courses in the criminal justice program: 01:202:201 Criminal Justice (3); 01:202:202 Police (3); 01:202:205 Criminal Procedure (3); 01:202:351,352 Forensic Science (3,3).

Those students whose needs are not met by any of these options may plan an individual program through consultation with a departmental adviser. Individual programs require written approval of the department chair.

*This course requires a substitute course in option E.
**This course requires a substitute course in option F.
***This course is recommended in option C.

# Minor Requirements

# Minor Requirements

A core of courses is required for a minor in chemistry. The core includes general introductory and organic chemistry. Additional laboratory work and upper-level courses in either inorganic or physical chemistry are required for completion of the minor.

**Required Core Courses**

The following courses are required of all chemistry minors:

01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4)

01:160:171 Introduction to Experimentation (1)

01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)

*Inorganic Chemistry Option*

The following courses are required for the inorganic chemistry option:

01:160:311 Organic Chemistry Laboratory (2) or 01:160:309 Organic Chemistry Laboratory (2.5)

01:160:351 Inorganic Chemistry 1 (3)

01:160:352 Inorganic Chemistry 2 (1.5) or 01:160:353 Inorganic Chemistry 3 (1.5)

*Physical Chemistry Option*

The following courses are required for the physical chemistry option:

01:160:311 Organic Chemistry Laboratory (2) or 01:160:309 Organic Chemistry Laboratory (2.5) or 01:160:251 Analytical Chemistry (3)

01:160:327-328 Physical Chemistry (4,4) or 01:160:341-342 Physical Chemistry: Biochemical Systems (3,3)

*Chemistry Education Option*

The following chemistry courses are required for the chemistry education option:

01:160:311 Organic Chemistry Laboratory (2) or 01:160:309 Organic Chemistry Laboratory (2.5)

6 credits from 01:160:251 Analytical Chemistry (3), 01:160:327-328 Physical Chemistry (4,4), 01:160:341-342 Physical Chemistry: Biochemical Systems (3,3), 01:160:351 Inorganic Chemistry 1 (3), 01:160:352 Inorganic Chemistry 2 (1.5), or 01:160:353 Inorganic Chemistry 3 (1.5)

01:160:387 Introduction to Chemistry Education (3)

01:160:499 Introduction to Teaching Chemistry Lab (3)

The physics requirement for the chemistry education option consists of one semester of physics lecture and one semester of physics laboratory:

01:750:193 Physics for the Sciences (4) or 01:750:201 Extended General Physics (5) or 01:750:203 General Physics (3) or 01:750:271 Honors Physics I (3) and 01:750:205 General Physics Laboratory (1) or 01:750:275 Classical Physics Laboratory (1)

Chemistry 160 (SAS)

# Certificate in Chemistry Education

# Certificate in Chemistry Education

A selection of courses and activities leading to a certificate in chemistry education offers high-achieving students who are interested in the sciences and education the opportunity to receive valuable training and experience in chemistry education. This certificate is available to both chemistry majors and nonmajors; is offered to top-performing students in general chemistry and organic chemistry; and is an excellent opportunity to work closely with professors who may then provide informed letters of recommendation. The certificate is a credential that demonstrates outreach and leadership skills important for students pursuing a career path in chemistry, education, or the health sciences.

The certificate requires coursework in general chemistry, organic chemistry, and the teaching pedagogy of peer instruction. It also requires two courses that provide firsthand chemistry teaching experiences. Participants will learn to use modern online tools for teaching, plan and execute a chemistry lecture demonstration to a live class in coordination with the Rutgers Chemistry Lecture Demonstration Facility, and videotape themselves teaching in front of a large classroom. Each participant receives written and oral feedback on his or her teaching from students, peers, and professors, and discusses experiences and ways to teach better.

By the end of the certificate program, students will develop and refine their teaching-related skills including critical thinking, teamwork, communication, and problem solving. They will improve their mastery of general and organic chemistry. Finally, each participant in the certificate program will create a teaching portfolio that contains a record of chemistry education training and teaching experience that may become a permanent part of his or her professional credentials.

**Chemistry Course Requirements**

- 01:160:161-162 or 163-164 General Chemistry I,II (4,4) (8 credits total)
- 01:160:171 Introduction to Experimentation (1)
- 01:160:307-308 or 315-316 Organic Chemistry I,II (4,4) (8 credits total)
- 01:160:311 Organic Chemistry Laboratory (2)

**Education and Experiential Course Requirements**

- 01:090:322 Pedagogy of Peer-Led Learning (3)
- 01:160:493-494 Internship in Chemistry (variable) (2 credits total required)
- 01:160:499 Introduction to Teaching Chemistry Lab (3)

*Notes:* A total of 2 credits of 01:160:493-494 are required. An internship in chemistry can be taken for one or more credits, and students can select an internship in either general chemistry or organic chemistry. A total of 2 credits must be taken, but students have flexibility to take either general chemistry or organic chemistry internships, or both. These 2 credits may be taken over two semesters (1 credit each semester), or in the same semester. If an internship is taken for multiple credits in a semester, students should enroll for only one internship, either general chemistry or organic chemistry.

**Written Requirements**

*Weekly Reflections*
Participants in the certificate program are expected to post a blog for each week that they teach. These blog posts will serve as a reflection on what worked well and what could be improved. The blogs also serve as a basis for peer discussion. Teaching interns (TI) and lab teaching assistants (TA) are expected to read the blogs, comment on them, and engage in discussion. These reflections will be monitored by professors and the head TI and lab TA, who will also make comments and give advice where needed.

*Teaching Portfolio*
Students must create and maintain a portfolio detailing their different teaching experiences and their outcomes. At the end of each semester of teaching, students must submit an updated portfolio, including a summary of all feedback and evaluations, for review. Examples of teaching portfolios will be given to each participant, who will be guided in the development of his or her own portfolio. Each participant keeps the final teaching portfolio as part of their professional portfolio.

Chemistry 160 (SAS)

# Departmental Honors Program

# Departmental Honors Program

**Qualification.** To qualify, a student must have attained at the end of the junior year a cumulative grade-point average of at least 3.0 and a grade-point average of at least 3.4 in courses required for the major. Preferably by the end of the junior year, but no later than the first week of the senior year, the student should apply formally to the chemistry undergraduate vice chair for admittance to the chemistry honors program. A student with an undergraduate cumulative grade-point average of at least 3.0 and a grade-point average between 3.0 and 3.4 in courses required for the major also may be admitted upon review by the Undergraduate Research and Honors Committee.

**Honors in Chemistry.** In order to graduate with honors in chemistry, accepted candidates are expected to:

- maintain a grade-point average of at least 3.4 in courses required for the major;
- complete at least 3 credits per semester in an independent senior research project (01:160:497-498); and
- make an oral presentation at the end of the senior year.

**Honors Thesis.** In order to graduate with high honors or highest honors in chemistry, accepted candidates are expected to fulfill the honors requirements listed above and, in addition, write a thesis based on their independent research in chemistry and defend this thesis before a committee comprised of their research adviser and one additional faculty member selected from the Undergraduate Research and Honors Committee. A successful defense of the thesis satisfies requirement for an oral presentation.

The designations of high honors and highest honors will normally require grade-point averages greater than 3.6 and 3.8, respectively, in courses required for the major. If the thesis defense is sufficiently meritorious, the thesis committee may recommend high or highest honors for a student who has excelled in research and has a lower grade-point average than listed above. In all cases, the final recommendation will be made by the Undergraduate Research and Honors Committee.

Students in the School of Arts and Sciences (SAS) will be designated SAS Paul Robeson Scholars. An outstanding thesis qualifies a student to be considered for a Henry Rutgers Scholars Award. (See here for more details.)

As an alternate path to departmental honors, students in the School of Environmental and Biological Sciences may elect to apply to the George H. Cook Scholars Program. (See here for program and deadline information.)

Chemistry 160 (SAS)

## Courses

## Courses

# Chinese 165 (SAS)

## CHINESE 165

Department of Asian Languages and Cultures, School of Arts and Sciences

**Website:** Here

**Chair:** Wendy Swartz

**Director of Undergraduate Studies:** Satoru Saito

**Professor:**

Wendy Swartz, B.A., California (San Diego); Ph.D., California (Los Angeles)

**Associate Professors:**

Jessey Choo, B.A., Rochester; M.A., Ph.D., Princeton

Weijie Song, B.S., Xi'an Jiaotong (China); M.A., Ph.D., Peking; Ph.D., Columbia

Xiaojue Wang, B.A., M.A., Peking; Ph.D., Columbia

**Associate Teaching Professor:**

Yuan-Chen Jenny Yang, B.A., National Taiwan; M.A., University College London; Ph.D., Yale

**Assistant Teaching Professor:**

Peng Liu, B.A., M.A., Soochow; Ph.D., Fudan; Ph.D., Columbia

**Teaching Instructor:**

Jane Huang, B.A., Penn State; M.A., Rutgers

**Faculty Emeriti:**

Richard VanNess Simmons, B.A., M.A., Ph.D., Washington

Ching-I Tu, B.A., National Taiwan; Ph.D., Washington



# Major Program Learning Goals and Requirements

# Major Program Learning Goals and Requirements

**Learning Goals**

Majors in Chinese will acquire in-depth knowledge of the Chinese language as well as the literature and culture of China. Majors will be able to demonstrate oral, reading, and written proficiency in the language and develop critical skills in analyzing and interpreting literary, historical, and cultural texts. Students will acquire the literary, cultural, and linguistic competency necessary for continuing onto postgraduate study or employment requiring such cultural knowledge and/or linguistic skill. Students will learn the cultural heritage of China within the larger context of East Asia through a wide and coherent curriculum, which includes courses in the following humanities and social science disciplines: literature, visual culture, history, religion, language, and linguistics.

**Requirements**

The major in Chinese requires 36 credits distributed as follows:

1. Six courses in Chinese language above the 100 level, including at least one course in classical Chinese.
2. Four courses in Chinese literature, history, and/or culture (under subject code 165).
3. One course chosen from East Asian Civilizations: Traditional Era (098:241) OR East Asian Civilizations: Modern Era (098:242) OR Global East Asia (098:250).
4. Capstone Seminar on East Asian Societies (098:444).

# Minor Program Learning Goals and Requirements

# Minor Program Learning Goals and Requirements

**Learning Goals**

Minors will be introduced to the cultural heritage of China through courses on literature, history, visual culture, language, and linguistics. Minors will be able to communicate effectively (listening, speaking, and writing) in standard Chinese (Mandarin) and will learn critical skills in analyzing and interpreting literary and cultural materials appropriate to the student's area of specialization. Students will achieve advanced linguistic competency and be able to demonstrate practical skills in using Chinese for translation and interpretation. Students will be able to relate relevant issues to other areas in the humanities.

**Requirements**

The minor in Chinese consists of four courses in Chinese above the 100 level, in both modern and classical Chinese, plus two additional elective courses (of 3 credits or more) in the area of concentration (subject code 165). The elective courses may be language courses or culture courses.

Chinese 165 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have a cumulative grade-point average of 3.0 or better and a grade-point average of 3.4 or better in the major at the end of the junior year. At that time, the student should formally apply to the chair for admission to the honors program. In addition to completing all requirements of the Chinese major, candidates are required to register for 01:165:497-498 Honors in Chinese, write an honors paper under the guidance of an assigned faculty member, and take a comprehensive examination at the end of their senior year.

Chinese 165 (SAS)

# Chinese Culture Courses

# Chinese Culture Courses

**01:165:210** ***The Chinese Language: Description and History (3)***
Phonology, grammar, and the writing system of Mandarin Chinese; brief discussion of other major dialects of China; the influence of the Chinese language on Asian languages; and the role of language in Chinese culture.

**01:165:211** ***Language and Identity in Modern Chinese Societies (3)***
Introduction to fundamental concepts in sociolinguistics and current issues in language and society in China and the Chinese diaspora, including language and ethnic identity, migrant identity, gender identity, national identity, and language and identity under modernization and globalization.

**01:165:215** ***Introduction to Chinese Civilization (3)***
Material and cultural achievements of Chinese civilization, including such areas as the fine arts, literature, religion, and thought, with emphasis on individuals, institutions, events, and ideas that shaped Chinese history.

**01:165:220** ***Chinese Classics and Thought: Confucianism, Daoism, and Buddhism (3)***
Introduction to Confucianism, Daoism, and Chinese Buddhism, with emphasis on their origins and interrelations, their influence on Chinese culture, and their values in the modern world.

**01:165:241** ***Classical Chinese Prose and Poetry in Translation (3)***
Introduction to classical Chinese literature, with an emphasis on the prose and poetry of the Tang and Song dynasties (618-1279), as well as their cultural and historical contexts.

**01:165:242** ***Classical Chinese Popular Fiction and Drama in Translation (3)***
Chinese literature from the 14th century to the present, with emphasis on traditional fiction and drama.

**01:165:262** ***Chinese Cinema (3)***
Cinematic developments in China in the past two decades. Topics reflecting the emergence of a new aesthetic, and recent political, social, and cultural changes.

**01:165:264** ***Chinese Drama and Performing Arts (3)***
Survey of Chinese dramatic performance from traditional times to the present, including opera, storytelling, and shadow plays, focusing on regional origins and variations.

**01:165:310** ***Modern Chinese Literature in Translation (3)***
Reading selections from four historical moments: enlightenment, revolution, socialism and post-Mao according to the standards that each piece can offer a wealth of information about their periods.

**01:165:341,342** ***Major Traditions in Chinese Thought (3,3)***
Rise and development of pristine Confucianism, Mohism, Taoism, Legalism, the School of Names, Sinicized Buddhism, and Neo-Confucianism; their influences on Chinese civilization, and their reevaluation in the light of new tendencies of thought after contact with the West.

**01:165:350** ***Chinese Martial Arts Film and Culture (3)***
Introduction to Chinese martial arts literature, film, history, and culture.

**01:165:461** ***History of Chinese Literature: Beginnings to 1300 (3)***
Introduction to traditional Chinese literature from its beginnings through the Song dynasty (960-1279), with emphasis on major narrative and poetic genres, as well as their cultural and historical contexts.

**01:165:462** ***History of Chinese Literature: 1300 to 1900 (3)***
Introduction to traditional Chinese literature from the Yuan through Qing dynasties (1300-1900), with emphasis on major narrative and dramatic genres, as well as their cultural and historical contexts.

**01:165:463** ***Nature in Chinese Literature (3)***
An examination of the representations of nature in major Chinese literary genres and human relations to nature during the early and medieval periods. Special attention paid to general shifts in conceptions of nature as well as larger questions of experience, perception, and representation.

**01:165:470** ***The City in Modern Chinese Literature and Film (3)***
Modern literary and cinematic imagination of Chinese cities.

**01:165:471** ***Early China in the World - Cosmography, Epistemology, and Encountering the Strange (3)***
An interdisciplinary examination of the perspectives from which early Chinese perceived themselves, their realm, the world, and beyond from High Antiquity to the medieval period.

**01:165:473** ***The Silk Road: A History of Cultural and Material Exchanges (3)***
An interdisciplinary introduction to the history of the Silk Road with a focus on the cultural and material exchanges between the peoples and cultures it connected over the period 500 BCE to 1500 CE.
***Credit not give for both this course and 01:098:473.***

**01:165:476** ***Women in Premodern China (3)***
An interdisciplinary seminar on women in premodern China with a focus on their roles in shaping Chinese cultural, political, religious, and social practices.

**01:165:480** ***Cultural Memory in Contemporary China (3)***
Examines the representation of cultural memories in contemporary Chinese-speaking communities. Study of key primary, theoretical, and methodological texts on cultural memory.

**01:165:482** ***Cold War Chinese Literature and Film (3)***
Examines Chinese literary modernity from the vantage point of the 1949 Cold War division in East Asia. Explores questions of revolution, migration, diaspora, colonialism, socialist realism, the captive mind, and the cultural Cold War through literature and film.

**01:165:484** ***Youth Culture in Global Chinese Films (3)***
Through film analysis and criticism, this course examines youth as a particular cultural category to explore rapid changes that mark contemporary global Chinese-language communities.

**01:165:486** ***Women in Modern Chinese Literature and Film (3)***
This course examines the representation of gender and sexuality in modern Chinese literature and film from the early 20th century to the present by discussing a wide range of key literary and filmic texts created in mainland China, Taiwan, and Hong Kong.

**01:165:493,494** ***Independent Study (3,3)***
Supervised independent reading and study of a topic selected by the student and approved by the instructor.
***Prerequisites: Permission of instructor and department.***

**01:165:497-498** ***Honors in Chinese (6,6)***
***Both semesters must be completed to receive credit.***

# Chinese Language Courses

# Chinese Language Courses

**01:165:101,102** ***Elementary Chinese (4,4)***
Introduction to sounds, structure, and the writing system of modern Chinese (Mandarin); practice in speaking and reading.
***Prerequisite for 01:165:102: 01:165:101 or equivalent.***

**01:165:103** ***Elementary Chinese Conversation (2)***
Guided conversation practice, and vocabulary review and enhancement. Builds on and consolidates foundation of student in elementary and intermediate Chinese; develops speaking skills. Texts and discussion topics related to college life and Chinese daily life and culture.
***Prerequisite: 01:165:101 or equivalent.***

**01:165:107,108** ***Basic Spoken Chinese (4,4)***
Introduces the fundamentals of spoken Chinese. Focuses on pronunciation, mastery of basic spoken vocabulary, and conversational fluency. Does not teach written Chinese.

**01:165:111,112** ***Chinese Calligraphy (2,2)***
Principles, techniques, and art of Chinese calligraphy; techniques of using the Chinese writing brush, writing styles, and construction of Chinese characters.
***No previous knowledge of Chinese necessary. For Chinese language students, recommended to be taken simultaneously with 01:165:101,102. Prerequisite: 01:165:111 for 01:165:112.***

**01:165:121** ***Beginning Chinese Reading and Writing for Mandarin Speakers (3)***
Development of foundation in standard Chinese orthography, grammar, and vocabulary. Practice in reading, writing, and oral skills.
***Credit not given for both this course and 01:165:101 or 01:165:102. Prerequisite: Speaking proficiency in Chinese.***

**01:165:201,202** ***Intermediate Chinese (4,4)***
Development of language skills: vocabulary building, oral proficiency, listening, and reading comprehension.
***Prerequisite: 01:165:102 or equivalent for 01:165:201; 01:165:201 or equivalent for 01:165:202.***

**01:165:205** ***Intermediate Chinese in China (4)***
Consolidation and development of elementary Chinese conversation, reading, and writing skills through immersion in a Chinese setting on-site in China. Topics and activities related to Chinese society and culture.
***Prerequisite: 01:165:102 or equivalent.***

**01:165:207,208** ***Intermediate Spoken Chinese (4,4)***
Continuing development of proficiency in modern standard Chinese (Mandarin) through Pinyin Romanization; development of speaking and oral-aural skills for students who wish to acquire a working competence in the language for communicative purposes. No instruction in reading or writing Chinese characters.
***Prerequisite: 01:165:108 or equivalent for 01:165:207; 01:165:207 or equivalent for 01:165:208. Not open for credit to heritage speakers of Chinese (Mandarin).***

**01:165:222** ***Intermediate Chinese Reading and Writing for Mandarin Speakers (3)***
Continued study of standard Chinese orthography, grammar, and vocabulary. Practice in reading, writing, and oral skills.
***Prerequisite: 01:165:121 or equivalent. Credit not given for both this course and 01:165:201 or 01:165:202.***

**01:165:301,302** ***Advanced Modern Chinese (3,3)***
Readings in a variety of literary styles with introduction to simplified characters; written and oral exercises.
***Prerequisite: 01:165:202 or 01:165:222 or equivalent for 01:165:301; 01:165:301 or equivalent for 01:165:302.***

**01:165:305** ***Advanced Chinese in China (4)***
Consolidation and development of intermediate to advanced Chinese conversation, reading, and writing skills through immersion in a Chinese setting on-site in China. Topics and activities related to Chinese society and culture.
***Prerequisite: 01:165:202 or 222 or equivalent.***

**01:165:321,322** ***Introduction to Classical Chinese (3,3)***
Grammar and analysis of classical Chinese (wen-yan or literary Chinese) and reading of basic texts in the language.
***Prerequisite: 01:165:202 or 222.***

**01:165:361** ***Business Chinese (3)***
Fundamental principles governing commercial organizations and foreign trade in China, Taiwan, Hong Kong, and other Chinese-speaking regions in East Asia; practice in business correspondence.
***Prerequisite: 01:165:301 or 321 or equivalent.***

**01:165:362** ***Business Chinese II (3)***
Continuation of 01:165:361 with emphasis on practice in advanced business correspondence.
***Prerequisite: 01:165:361 or equivalent.***

**01:165:371** ***Contemporary Expository Chinese (3)***
Reading and discussion of selections from scholarly writings on history, philosophy, and political and social issues in modern Chinese prose. Analysis of structural patterns and practice in writing.
***Prerequisite: 01:165:301 or 321 or equivalent.***

**01:165:393** ***Guided Research in China: Global and Local (3)***
Guided reading, study, and analysis of a topic on China in the 21st century selected by the student and approved by the instructor.
***Prerequisite: 01:165:102.***

**01:165:401** ***Advanced Chinese Conversation and Composition (3)***
Practice of speech conversation, discussion, and composition in Mandarin Chinese; exercises in Chinese grammar and rhetoric.
***Prerequisite: 01:165:302 or 322 or equivalent.***

**01:165:402** ***Advanced Chinese Conversation and Composition II (3)***
Continuation of 01:165:401 with emphasis on composition and speechmaking in Mandarin Chinese and exercises in Chinese grammar and rhetoric.
***Prerequisite: 01:165:401 or equivalent.***

**01:165:410** ***Classic Chinese Novels (3)***
Analysis of such classic Chinese novels as *San-kuo yen-i* (*The Romance of the Three Kingdoms*), *Shui-hu chuan* (*Water Margin*), *Hsi-yu-chi* (*Monkey*), and *Hung-lou meng* (*Dream of the Red Chamber*).
***Prerequisite: 01:165:302 or 322 or equivalent.***

**01:165:412** ***Chinese Poetry: Major Themes and Texts (3)***
Reading, analysis, and discussion of Chinese poetry in various forms from the classical period to the present.
***Prerequisite: 01:165:302 or 322 or equivalent.***

**01:165:419,420** ***Readings in Classical Chinese Literature (3,3)***
Such major literary works as *Shih-ching*, Mencius, *Shih-chi*, T'ang poetry, Sung tz'u, Yuan drama, and Ming-Ch'ing fiction.
***Prerequisite: 01:165:302 or 322 or equivalent.***

**01:165:424** ***The Origin and Development of Chinese Writing (3)***
Investigation of the early evolution of Chinese writing within the context of the beginnings of Chinese civilization. Emphasis on textual understanding of the oracle bone inscriptions of the Shang period (ca. 1700 to 1100 BC).
***Pre- or corequisite: 01:165:302 or 322 or equivalent.***

**01:165:425** ***Chinese Dialects (3)***
Introduction to and description of Chinese dialects with an emphasis on their relationships, historical origins, and development from earliest evidence of diversity to present.
***Prerequisite: 01:165:302 or 322 or equivalent.***

**01:165:430** ***Advanced Chinese Grammar (3)***
Analysis and discussion of Chinese grammar. Explanation of linguistic concepts through problem-solving exercises on Chinese word formation, sentence grammar, and paragraph structure.
***Prerequisite: 01:165:302 or equivalent.***

**01:165:451,452** ***Readings in Modern Chinese Literature (3,3)***
Selections from representative literary, historical, and ideological works of modern China; emphasis on stylistic and linguistic variations.
***Prerequisite: 01:165:302 or 322 or equivalent.***

**01:165:490** ***Seminar in Chinese Literature and Thought (3)***
Readings and research on topics in Chinese literature and thought of either the classical or modern period.
***Prerequisite: Permission of instructor.***

**01:165:493,494** ***Independent Study (3,3)***
Supervised independent reading and study of a topic selected by the student and approved by the instructor.
***Prerequisites: Permission of instructor and department.***

**01:165:497-498** ***Honors in Chinese (6,6)***
***Both semesters must be completed to receive credit.***

# Cinema Studies 175 (SAS)

## CINEMA STUDIES 175

School of Arts and Sciences

**Website:** Here

**Program Director:** Susan Martin-Márquez

**Faculty:**

Sandy Flitterman-Lewis, English; Ph.D., California (Berkeley)

David Fresko, Cinema Studies; Ph.D., Stanford

Regina Karl, German; Ph.D., Yale

Susan Martin-Márquez, Spanish and Portuguese; Ph.D., Pennsylvania

Albert G. Nigrin, Cinema Studies; M.F.A., Rutgers

Meheli Sen, AMESALL; Ph.D., Emory

Cinema Studies 175 (SAS)

# Learning Goals

# Learning Goals

Majors and minors will achieve mastery of the close textual analysis of moving image media, a crucial form of visual literacy in the 21st century. They will be able to demonstrate knowledge of the history of the film medium and major international film movements and creative figures, and will gain familiarity with the conventions of narrative and genre in the cinema, as well as with more experimental forms of filmmaking. Majors and minors will employ critical thinking and basic theoretical concepts to achieve an understanding of the interrelationship of film with shifting social, political, and cultural trends. They will also develop their critical writing skills, and produce an extended analytical and/or research paper in a seminar setting in the program's capstone course.

Cinema Studies 175 (SAS)

# Major Program

# Major Program

The interdisciplinary major in cinema studies consists of 11 courses, completed with the grade of C or better, and with a minimum of five courses at the 300 level or above. All majors must complete the following core requirements:

1. Both semesters of 01:175:201,202 Introduction to Film I,II (01:175:210 may be substituted for either 01:175:201 or 202);

2. Three electives, from the list of preapproved electives or from among other courses approved by the program director; and

3. Senior Seminar in Cinema Studies (01:175:425) or the Seminar: Film Theory (01:175:420).

A flyer listing qualifying elective courses is circulated during each preregistration period, and course descriptions are posted on the program's website. Cinema studies majors are encouraged to complete other courses in film history, analysis, or theory before enrolling in a filmmaking/production course.

Please note that cinema studies courses generally include an additional mandatory weekly meeting time for screenings, or require students to view films outside of class.

Courses that are primarily about film and may count as credits toward the major and minor are listed under the subject codes 175 (Cinema Studies), 354 (English/Film Studies), 013 (AMESALL), 050 (American Studies), 082 (Art History), 195 (Comparative Literature), 420 (French), 470 (German), 560 (Italian), 565 (Japanese), 563 (Jewish Studies), 940 (Spanish and Portuguese), and 988 (Women's, Gender, and Sexuality Studies).

01:175:210 may be substituted for either 01:175:201 or 202. No course may be used to fulfill more than two requirements.

Transfer students and study-abroad students must obtain approval of courses for the major from the program director. Students are urged to consult the program director for further information.

Grades of C or better must be earned in all courses used to fulfill the requirements of the major.

Cinema Studies 175 (SAS)

# Major Requirements and Options

# Major Requirements and Options

**Major Requirements**

The major consists of a minimum of 11 courses and offers two options, one in history and theory and one in production and criticism. Please see the program director for an up-to-date list of preapproved electives.

All majors must complete the following core requirements:

1. Both semesters of 01:175:201,202 Introduction to Film I,II (01:175:210 may be substituted for either 01:175:201 or 202);

2. Three electives, from the list of preapproved electives; and

3. Senior Seminar in Cinema Studies or Seminar: Film Theory.

**Options within the Major**

The program offers two options by which to structure the major. Each option requires students to complete 11 courses, including the core requirements listed above. Please see the program director for an up-to-date list of preapproved electives.

*A. History and Theory Option*

In addition to the requirements listed under Major Requirements above, this option requires the following:

1. Survey courses: American Cinema I (01:175:315) and American Cinema II (01:175:316) OR World Cinema I (01:175:320) and World Cinema II (01:175:321);

2. Non-U.S. cinemas: two courses selected from a preapproved list; and

3. One theory course: Seminar in Film Theory (01:175:420) OR Theories of Women in Film (01:354:385).

Students may include as electives additional courses listed as non-U.S. or theory, if they are not used to fulfill core or option requirements.

*B. Production and Criticism Option*

In addition to the core requirements listed under Major Requirements above, this option requires the following:

1. Two survey courses: World Cinema I (01:175:320) and World Cinema II (01:175:321)

2. One course in auteur and genre studies, from list below or from other preapproved courses:

01:175:350 Major Filmmakers I (3)

01:175:351 Major Filmmakers II (3)

01:175:352 Hitchcock and Beyond (3)

01:175:390 Global Horror (3)

01:175:370 Film Genres I (3) (may take twice, if different subtitles)

01:354:372 Film Genres II (3) (may take twice, if different subtitles)

01:354:360 Film Noir (4)

01:354:371 Film Melodrama (4)

01:354:374 Science Fiction Film (4)

01:560:320 Mafia Movies: Approaches to Genre Italian and American Film (3)

3. Two production courses, from list below or from other preapproved courses:

01:351:220 Writing for Experimental Film (3)

01:351:303 Creative Writing: Screenwriting for Film (3)

01:351:309 Creative Writing: Digital Composition (3)

01:351:314 Documentary Filmmaking for Writers (3)

01:354:308 The Craft of Screenwriting (3)

07:081:243 Media I-A Introduction to Media Art: Screen/Image/Sound (4)

07:081:244 Media I-B Experimental Practices and Techniques (4)

07:081:343 Media II-A Media Art Installation and Expanded Cinema (4)

07:081:344 Media II-B Media and Performance (4)

07:211:120 Cinematography (3)

07:211:230 2-D Animation

Students may include as electives additional production courses, or courses listed as non-U.S., auteur/genre, or theory, if they are not used to fulfill core or option requirements.

Cinema Studies 175 (SAS)

# Minor Program

# Minor Program

The interdisciplinary minor in cinema studies consists of seven courses, completed with a grade of C or better, and with a minimum of three courses at the 300 level or above. The courses must be distributed as follows: 1) three required courses, both semesters of 01:175: 201,202 Introduction to Film I,II (01:175:210 may be substituted for either 01:175:201 or 202), and Senior Seminar in Cinema Studies, 01:175:425 (01:175:420 may be substituted for 01:175:425); and 2) four elective courses, chosen from the list below, or from among other courses approved in advance by the program director. A flyer listing qualifying elective courses is circulated during each preregistration period, and posted on the program's website. Please note that only one production/filmmaking course may be counted toward the minor. Cinema studies minors are encouraged to complete several other courses in film history, analysis, or theory before enrolling in a filmmaking course.

Students pursuing a minor in cinema studies must select five courses for the minor that are outside their major. Exception: English majors who pursue a cinema studies minor may include more than two 01:354 courses in their minor program, but only two of those may be counted toward the major.

Please note that cinema studies courses generally include an additional mandatory weekly meeting time for screenings, or require students to view films outside of class.

**Required Courses:**

01:175:201 Introduction to Film I (3)

01:175:202 Introduction to Film II (3)

As indicated above, 01:175:210 Close Readings of Cinema (3) may be substituted for Introduction to Film I OR Introduction to Film II (01:175:201 or 202)

01:175:425 Senior Seminar in Cinema Studies (3)

As indicated above, 01:175:420 Seminar: Film Theory (3) may be substituted for Senior Seminar in Cinema Studies (01:175:425)

Cinema Studies 175 (SAS)

# Courses

# Courses

**01:175:201** ***Introduction to Film I (3)***
Film study, with emphasis on basic concepts of film analysis (narrative, editing, mise-en-scène, sound) and the historical development of cinema as an institution.

**01:175:202** ***Introduction to Film II (3)***
Film study, with emphasis on commercial cinema as an institution (genres, directors, stars) and on nonnarrative types of film (documentary, experimental).

**01:175:210** ***Close Readings of Cinema (3)***
Formal analyses of six or seven individual films; emphasis on visual track, soundtrack, and scenario-narrative construction.

**01:175:265** ***American Experimental Film and Video (3)***
Survey course focusing on the history and development of the various American experimental cinema movements from its beginnings to the present. In-depth analyses of the structure and content of films by Andy Warhol, Maya Deren, Stan Brakhage, Sidney Peterson, Kenneth Anger, Bruce Baillie, Yoko Ono, and others.
***Credit not given for both this course and 01:050:265.***

**01:175:266** ***Cult Films in American Culture (3)***
The cult film from its origins in the 1920s to its evolution in American culture. Close analyses of cult films paired with readings by J. Hoberman and Jonathan Rosenbaum, Sigmund Freud, and others.
***Credit not given for both this course and 01:050:266.***

**01:175:267** ***American Film Directors (3)***
In-depth analyses of the structure and content of films of Stanley Kubrick, Orson Welles, John Frankenheimer, David Lynch, Val Lewton, Andy Warhol, and others. Emphasis on the mise-en-scène, narrative form, set design, sound, and special effects in the films of these celebrated filmmakers.
***Credit not given for both this course and 01:050:267.***

**01:175:268** *David Lynch and the American Film Avant-Garde (3)*
Focuses on the surreal films of David Lynch and the American Film Avant-Garde. Includes in-depth analyses of the structure and content of many of Lynch's bizarre and unique films including *Eraserhead*, *Mulholland Drive*, and *Blue Velvet*.
***Credit not given for both this course and 01:050:268.***

**01:175:306** *Modern French Cinema (in English) (3)*
Survey of the development of French cinema from World War II to the present day. Emphasis on the historical, sociopolitical, and aesthetic context of films screened.
***Credit not given for both this course and 01:420:306.***

**01:175:320** *World Cinema I (3)*
Developments in French, Italian, British, Russian, and other national cinemas from 1896 to World War II; also examines cross-influences between foreign and American cinema.
***Credit not given for both this course and 01:195:320 or 01:354:320.***

**01:175:321** *World Cinema II (3)*
Major developments in global filmmaking from the 1950s to the present, with an emphasis on specific national and transnational cultures and their industrial and artistic practices.
***Credit not given for both this course and 01:195:321 or 01:354:321.***

**01:175:352** *Hitchcock and Beyond (3)*
A close examination of the films of Alfred Hitchcock and the influence they have cast upon other filmmakers.

**01:175:360** *Classics of German Cinema: From Haunted Screen to Hyperreality (3)*
Canonical films of the Weimar, Nazi, and post-war period. Focuses on class, gender, nation, cultural context, and the changing sociopolitical and historical climates in which they arose. Special attention to the issue of film style and to the question of what constitutes the film canon in particular in the case of recent works.
***Credit not given for both this course and 01:470:360.***

**01:175:365** *Bollywood (3)*
A broad overview of the Bollywood industry and its cinematic productions over the years.
***Credit not given for both this course and 01:013:365.***

**01:175:377** *Topics in World Cinema (3)*
Study of a particular region, time period, movement, or theme in world cinema.
***Credit not given for both this course and 01:195:377. May be taken more than once, if content is different.***

**01:175:390** *Global Horror (3)*
Engaging with the horror genre both as a local and transnational phenomenon, interrogation of a vast range of horror films from the 1930s to the present, in order to understand how the often-dismissed genre articulates and amplifies an array of issues.

**01:175:398** *Internship in Cinema Studies (3)*
Professional, supervised work in an approved organization or agency; an appropriately designed academic project required.
***Prerequisite: Permission of the program before registration. NOTE: This internship is for enrichment and may not be used as elective credit toward the cinema studies major or minor.***

**01:175:420** ***Seminar: Film Theory (3)***
Major developments in film theory from the silent era to the present; writings on film by Eisenstein, Kracauer, Bazin, Metz, Barthes, and others; practice in different methods to analyze films.

**01:175:425** ***Senior Seminar in Cinema Studies (3)***
One or more topics selected for their relevance to the interdisciplinary study of film. Emphasis on advanced problems and issues together with methodology and theory. Extended research paper required on a topic chosen in consultation with the instructor.
***Prerequisite: Permission of program director.***

**01:175:477** ***Advanced Topics in World Cinema (3)***
Intensive study of a particular issue in world cinema, with special attention paid to theoretical approaches. Specific topic announced at preregistration time.
***Prerequisite: Permission of instructor. Credit not given for both this course and 01:195:477. May be taken more than once, if content is different.***

Cinema Studies 175 (SAS)

# Elective Courses (other courses may be preapproved for elective credit)

# Elective Courses (other courses may be preapproved for elective credit)

01:175:210 Close Readings of Cinema (3)

01:175:265 American Experimental Film and Video (3)

01:175:266 Cult Films in American Culture (3)

01:175:267 American Film Directors (3)

01:175:268 David Lynch and the American Film Avant-Garde (3)

01:175:315,316 American Cinema I,II (3,3)

01:175:320,321 World Cinema I,II (3,3)

01:175:350,351 Major Filmmakers I,II (3,3)

01:175:352 Hitchcock and Beyond (3) (cannot count alongside 354:250 The Films of Alfred Hitchcock)

01:175:360 Classics of German Cinema: From Haunted Screen to Hyperreality (3)

01:175:365 Bollywood (3)

01:175:370 Film Genres (3)

01:175:373 The Documentary (3)

01:175:377 Topics in World Cinema (3)

01:175:390 Global Horror (3)

01:175:420 Seminar: Film Theory (3)

01:050:315 American Documentary (3)

01:175:477 Advanced Topics in World Cinema (3)

01:351:303 Creative Writing: Screenwriting for Film (3)

01:354:205 Cinema Today (4)

01:354:250 Films of Alfred Hitchcock (4) (cannot count alongside 175:352 Hitchcock and Beyond)

01:354:270 American Screen Comedy (4)

01:354:301 Digital Cinema (4)

01:354:308 The Craft of Screenwriting (3)

01:354:318 Films from Here: The Cinema of New York and New Jersey (4)

01:354:330,331 Critical Methodology in Film (3,3)

01:354:335 Film Sound (4)

01:354:355 Films of John Ford (4)

01:354:356 Films of Jean Renoir and Fritz Lang (4)

01:354:360 Film Noir (4)

01:354:370 Film Genres (3)

01:354:371 Film Melodrama (4)

01:354:374 Science Fiction Film (4)

01:354:375 Film and Society (3)

01:354:385 Theories of Women and Film (3)

01:354:391,392 Special Topics in Film Studies (3,3)

01:420:306 Modern French Cinema (in English) (3)

01:420:307,308 The French Film in French (3,3)

01:420:371,372 Topics in French Cinema (3,3)

01:420:471,472 Advanced Topics in French Cinema (3,3)

01:470:349 Contemporary German Cinema (3)

01:560:320 Mafia Movies: Approaches to Genre Italian and American Film (3)

01:560:345 Classics of Italian Cinema (3)

01:560:346 Contemporary Italian Cinema (3)

01:940:345,346 Spanish Film - English (3)

01:940:347,348 Latin American Cinema - English (3)

# Classics (SAS)

## CLASSICS

(Classical Humanities 190, Greek 190b, Greek and Latin 190c, Latin 190d)

Department of Classics, School of Arts and Sciences

**Website:** Here

**Chair:** Serena Connolly

**Undergraduate Director:** Emily Allen-Hornblower

**Distinguished Professor:**

Thomas J. Figueira, B.A., Fordham; Ph.D., Pennsylvania

**Professors:**

T. Corey Brennan, B.A., Pennsylvania; M.A., Oxford; Ph.D., Harvard

Serena Connolly, B.A., Cambridge; M.A., Ph.D., Yale

James McGlew, B.A., M.A., Ph.D., Chicago

Azzan Yadin-Israel, B.A., Hebrew; Ph.D., California (Berkeley) and Graduate Theological Union

**Associate Professors:**

Emily Allen-Hornblower, B.A., Sorbonne, École Normale Supérieure; M.A., Ph.D., Harvard

Timothy Power, B.A., Yale; M.A., Ph.D., Harvard

**Assistant Professors:**

Bice Peruzzi, B.A., Perugia (Italy); M.A., Padova (Italy); M.A., Ph.D., Cincinnati

Jeffrey Ulrich, B.A., Rutgers; M.A., Ph.D., Pennsylvania

**Associate Teaching Professor:**

Kristina Chew, B.A., Princeton; Ph.D., Yale

John Fisher, B.A., Kean College; M.A., Richard Stockton College; Ph.D., Princeton¿

**Assistant Teaching Professors:**

Salam Al Kuntar, B.A., Damascus University; M.A., University of Liverpool; Ph.D., University of Cambridge

The department offers a major in classics with options in classical humanities, Greek, Greek and Latin, and Latin. Selected courses in history, philosophy, and art history also may count for credit toward the classics major. Students with a strong interest in ancient history may pursue the ancient history and classics option within the history major (see the history section of this catalog). Minors are offered in ancient Greek, Latin, and classical humanities. For more information, consult the departmental website.

Classics (SAS)

# Learning Goals

# Learning Goals

See here.

- Classics is a broad discipline, characterized by its interdisciplinary nature. Pursuing classics means acquiring fundamental language skills in ancient classical languages (Greek, Latin, and, to a lesser degree, Sanskrit), along with a wide-ranging knowledge of the ancient world.
- Studying classics involves coming to grips with the ancient Greek and Roman civilizations: their myths and literature; their social, military, political, and cultural history; their philosophy; and aspects of their material culture. At every stage, students are led to reflect on the many connections of classics to the modern world, and how these ancient civilizations contributed to shape it.
- As many other humanities disciplines do, classics combines language study with the exploration of questions central to many social sciences. Classics students are led to ponder the mechanisms of human psychology, social organization, and historical evolution, and given an opportunity to appreciate the ways in which the individual and the community relate to, shape, and affect one another.

Classics (SAS)

# Major Requirements

# Major Requirements

Classics majors choose one of four options. Those who wish to concentrate on one or both ancient languages may choose an option in ancient Greek and Latin, ancient Greek, or Latin. The classical humanities option is for those who wish to pursue a general study of the history, literature, and culture of the classical world. All courses applied to the major must be completed with a grade of C or better.

*Classical Humanities Option (Classical Humanities 190).* A major who pursues the classical humanities option must complete 36 credits in the department. (Credits from approved classical humanities courses in other departments may be counted among these, as well as courses with a 190, 490, or 580 subject code.) The following are required of every classical humanities major: 1) one course in the Greek or Latin language at the 200 level or above; 2) at least six courses at the 300-level or above.

*Greek Option (Greek 190b).* A student majoring in classics with emphasis on Greek must take 35 credits in the department, of which 26 credits must be in the ancient Greek language (including at least six courses at the 300 level or above).

*Greek and Latin Option (Greek and Latin 190c).* A student majoring in classics with emphasis on Greek and Latin must take 35 credits in the department, of which at least 29 credits must be in the ancient Greek and Latin languages. The credits may be distributed between the two languages, but at least 11 credits must be taken in each language. At least six courses must be at the 300 level.

*Latin Option (Latin 190d).* A student majoring in classics with emphasis on Latin must take 35 credits in the department, of which at least 26 credits must be in the Latin language (including at least six courses at the 300 level or above).

Classics (SAS)

# Minor Requirements

# Minor Requirements

Classics minors choose one of three options. Those who wish to concentrate on one of the ancient languages may choose an ancient Greek or Latin minor. The classical humanities minor is for those who wish to pursue a general study of the history, literature, and culture of the classical world. All courses applied to the minor must be completed with a grade of C or better.

*Classical Humanities (190).* A minor in classical humanities requires a minimum of seven courses in the department. (Credits from approved classical humanities courses in other departments may be counted among these, as well as courses with a 190, 490, or 580 subject code.) Of these seven courses, at least three courses must be at the 300 level or above.

*Latin (580).* A minor in Latin requires a minimum of six courses in the Latin language, including three at or above the 300 level.

*Greek (490).* A minor in ancient Greek requires a minimum of six courses in the Latin language, including three at or above the 300 level.

Classics (SAS)

# Teacher Certification

# Teacher Certification

Classics majors interested in earning eligibility for teacher certification (K-12) in New Jersey should contact advisers in the Graduate School of Education and in the Department of Classics in their first year, or as soon as possible thereafter.

Classics (SAS)

# Departmental Honors Program

# Departmental Honors Program

Honors in Classics may be earned by eligible students who wish to write a senior thesis with the help of an adviser. To qualify, students must have a cumulative grade-point average (GPA) of 3.2 or better and a GPA of 3.6 or better in the major at the end of their junior year. At that time, students should complete the required application form, before the deadline of May 2 of their junior year. See the classics website under Honors & Glory for the honors thesis application form.

Note: Students writing theses must enroll in 01:190:495, 496 (8 credits total) in their senior year. Students who are interested in a topic that spans more than one academic discipline should consider the School of Arts and Sciences interdisciplinary honors thesis option: Here.

Honors in Classics may also be earned by classics majors who:

1. Maintain a 3.5 in the major

2a. Have earned 12 credits at the 300 level or above in Greek OR Latin courses

OR

2b. Have earned 6 credits in BOTH Greek and Latin at the level of 300 or above

3. Submit two papers representative of their work in classics (they may be revised versions of class papers), which a panel of two faculty members deem worthy of honors using the rubric that we have developed for senior assessment purposes.

4. Sit for a sight translation exam in the spring of senior year and pass with honors

To be eligible for honors without a thesis, the grades in the Greek and Latin courses must be at an average of 3.5 or above; for high honors, 3.7 or above; for highest honors, 3.9 or above. Highest honors will be reserved for those students who, in addition to meeting the GPA requirement, have performed at the highest level on the sight exam and paper requirement. Students should inform the undergraduate director by the fall of senior year if they would like to be considered for honors in the major.

Classics (SAS)

# Courses in Classical Humanities (190)

# Courses in Classical Humanities (190)

Courses in classical humanities are open to students without a knowledge of the Greek or Latin language.

**01:190:101** ***Word Power (3)***
Systematic study of the basic Greek and Latin derivatives in English. Emphasis is on Greek and Latin elements in current scientific and literary use.

**01:190:102** ***Medical Terminology (1.5)***
Systematic study of scientific terminology based on ancient Greek and Latin elements, with emphasis on the field of medicine.
***May be taken concurrently with 01:190:101.***

**01:190:200** ***Ancient Near East (3)***
Origins and development of the societies of Mesopotamia, Egypt, Asia Minor, and Palestine, through the period of the Persian Empire.
***Credit not given for both this course and 01:563:200, 01:508:200, or 01:685:200.***

**01:190:201** ***Ancient Greece (3)***
Civilization of the eastern Mediterranean world in ancient times, with emphasis on the origins of Western civilization and the Greek contribution to Western culture.
***Credit not given for both this course and 01:510:201.***

**01:190:205** ***Greek Civilization (3)***
Survey of Greek thought and literature. Readings include Homer, the lyric poets, the Athenian dramatists, and selected readings from historians and philosophers. Artistic material may be included.

**01:190:206** ***Roman Civilization (3)***
Surveys Roman thought and literature. Readings include Virgil, Ovid, Livy, Cicero, Tacitus, and Petronius. Artistic material may be included.

**01:190:207** ***Greek and Roman Mythology (3)***
Examination of the nature, meaning, and continued vitality of the principal classical myths through reading, lectures, and slide presentations.

**01:190:208** ***Philosophy of the Greeks (3)***
Introduction to the major philosophical thinkers of the ancient Greek world with special emphasis on Plato and Aristotle.
***Credit not given for both this course and 01:730:208.***

**01:190:209** ***Ancient Rome (3)***
The Roman Republic and the empire, with emphasis on the rise and decline of a Mediterranean world civilization under Roman leadership.
***Credit not given for both this course and 01:510:202.***

**01:190:211** ***Greek and Roman Religion (3)***
Study of pagan gods and goddesses, and cults and practices of the classical Greek world, Roman Republic, and Roman Empire.

**01:190:212** ***Classical World in Film (3)***
Survey of film depictions of the classical world of Greece and Rome, with readings from literary, historical, and critical sources. Topics include "sword and sandals" genre and its history; parallels between America and Greece/ Rome; spectacle and empire; and the uses of history in popular historical films.

**01:190:213** ***Science and Technology in Ancient Greece and Rome (3)***
Explores the nature and development of science in ancient Greece and Rome, focusing on medicine, biology, physics, and mathematics.

**01:190:214** ***Sexuality in Ancient Greece and Rome (3)***
Investigates how the ancient Greeks and Romans categorized, depicted, and reacted to different sexual behaviors and identities through the study of visual and literary sources ranging from Homeric Greece to Imperial Rome.

**01:190:215** ***Introduction to Greek and Roman Archaeology (3)***
Introductory survey of the archaeology, architecture, and material culture of the Mediterranean world from the Bronze Age throughout the transformation of the Roman Empire following the reign of Constantine. Consideration given to chronological developments, Greek and Roman artistic production in its social and cultural settings, and Classical Art.
***Credit not given for this course and 01:070:113.***

**01:190:220** ***Greek Food from Antiquity to Today (3)***
Food and foodways of Greek-speaking peoples from ancient times to the present, with special emphasis on problems of continuity and change.
***Credit not given for this course and 01:489:220, 01:510:222, 01:685:220, or 667:220.***

**01:190:251** ***Papal Rome and Its People, 1500-Present: A Select History (3)***
Case-study approach toward select aspects of the social, cultural, intellectual, and political history of the early modern and modern popes, with a particular focus on their relationship to the city of Rome. Highlights the reign of Pope Gregory XIII Boncompagni (1572-1585) and Gregory XV Ludovisi (1621-1623), and their subsequent family history to the present day.
***Credit not given for both this course and 01:556:251.***

**01:190:254** ***The Presocratic Philosophers (3)***
Introductory survey of the Presocratic philosophers. Emphasizes exposure to the teachings of these thinkers through the remaining fragments, while also engaging scholarly writings that introduce and contextualize the sources.
***Credit not given for this course and 01:730:254.***

**01:190:300** ***Greek and Roman Slavery (3)***
Social, economic, legal, and political aspects of slavery in ancient Greece and Rome. The sources and numbers of slaves, forms of servitude, manumission, and slave labor.

**01:190:301** ***Food and Drink in the Ancient World (3)***
This course provides students an opportunity to understand the social history of the ancient Mediterranean world through an exploration of the production, preparation, and consumption of food and drink and (re)presentations of them in word and image.

**01:190:303** ***Hellenistic World (3)***
Expansion and development of Greek culture from Alexander through the successor kingdoms in Greece, Egypt, Syria-Palestine, and Asia Minor.
***Credit not given for both this course and 01:510:303.***

**01:190:305** ***The Crisis of the Roman Republic (3)***
Roman political, social, and cultural history during the crisis of the late republic from 133 BC.

**01:190:306** ***Roman Empire (3)***
Political, social, and intellectual developments of the imperial period until the age of Constantine, with emphasis on the first two centuries AD.
***Credit not given for both this course and 01:510:306.***

**01:190:309** ***Greek and Roman Athletics (3)***
Examines the ideology and cultural context of ancient athletic competition. Topics include the Olympic and other Panhellenic games, Roman chariot racing and gladiator combat, and women athletes.

**01:190:310** ***Augustan Rome (3)***
The cultural renaissance under Augustus (44 BC-AD 14): the writings of Virgil, Horace, Livy, Ovid, and the elegiac poets; the building program at Rome; and artistic trends.
***May be jointly taught (in part) with 01:580:310. Students wishing to earn language credit in Latin should enroll in 01:580:310. Credit not given for both this course and 01:580:310.***

**01:190:312** ***The Search for the Historical Socrates (3)***
Portraits of Socrates in Plato, Xenophon, Aeschines of Sphettus, and Aristophanes. Birth of the philosophical dialogue and other genres; life and thought of Socrates; and later Socratic movements.
***Prerequisite: One course in ancient Greek history, culture, or philosophy; or permission of instructor. May be jointly taught (in part) with 01:490:312. Students wishing to earn language credit in Greek should enroll in 01:490:312. Credit not given for both this course and 01:490:312.***

**01:190:314** ***The Etruscans (3)***
Study of the social history, material culture, and artistic expression of the Etruscans. Survey of urbanism and architecture, trade, funerary practices, painted decoration, sculpture, and minor arts between the 9th and 2nd centuries BC.
***Credit not offered for this course and 01:082:314.***

**01:190:315** ***Latin Poets in English (3)***
Selections from the Augustan poets Horace, Virgil, and Propertius. Translations by Dryden, Ezra Pound, and others, with close reference to the Latin original. Theories of translation.
***Prerequisite: One year of Latin or permission of instructor.***

**01:190:317** ***Ancient Painting (3)***
Survey of Greek, Etruscan, and Roman painting from the eighth century BC through the Roman Empire. Emphasis on the development of style and on the cultural significance of painted images in different social contexts.
***Credit not given for this course and 01:082:317.***

**01:190:318** ***Cleopatra (3)***
Examines the historical Cleopatra and the reception of her image from antiquity to the present in literature, art, and film. Issues considered include female power in a man's world, East versus West, and politics and propaganda.
***Credit not given for both this course and 01:510:312 or 01:988:321.***

**01:190:320** ***Women in Antiquity (3)***
Women in the ancient societies of Greece and Rome. Their roles and images in the social, legal, political, domestic, philosophical, and artistic spheres examined using primary sources.
***Credit not given for both this course and 01:510:251.***

**01:190:321** ***Classical Rhetoric (3)***
Origins and development of rhetorical theory: persuasive argument, emotional appeal, good style, and delivery.

**01:190:323** ***Criminals and Saints: Power in Greek Political Life and Imagination (3)***
Unlimited power, tyranny, democracy. Explores the ancient Greeks' ambivalent conceptions and perceptions of autocratic versus collective power through time.
***Prerequisite: 01:190:205 or permission of instructor.***

**01:190:324** ***Race and Ethnicity in the Classical World (3)***
Examination of ancient Greek and Roman understanding of physically different and geographically alien individuals. Consideration of the origins of our culture's beliefs about race, ethnicity, and human difference in classical world's views of strangers, foreigners, and barbarians and how our ideas about race and difference have evolved.

**01:190:325** ***Cults, Magic, and Witchcraft (3)***
Magic and witchcraft in the everyday life of antiquity, from pagan to Christian times; how individuals tried to control the unknown. Literary and material sources.

**01:190:328** ***Ancient Law in Action (3)***
Explores Greek and Roman constitutions and legal systems in their social contexts. Illustrates procedural elements of ancient criminal and civil law through mock trials.

**01:190:350** ***Greek Society (3)***
Social and economic life of the Greeks from the Mycenaean period through the Hellenistic age. Written and material evidence employed.
***Recommended: 01:510:201. Credit not given for both this course and 01:510:350.***

**01:190:352** ***Plato (3)***
Philosophy of Plato through close reading of selected dialogues, supplemented by relevant readings on other ancient and contemporary philosophers.
***Credit not given for both this course and 01:490:352 or 01:730:352.***

**01:190:353** ***Aristotle (3)***
Philosophy of Aristotle through his selected works, supplemented by relevant readings in Plato and in modern philosophers.
***Prerequisite: One course in ancient Greek history, culture, or philosophy; or permission of instructor. May be jointly taught (in part) with 01:490:353. Students wishing to earn language credit in Greek should enroll in 01:490:353. Credit not given for both this course and 01:490:353.***

**01:190:355** ***Ancient Mythology and Society (3)***
Social history and practical utilization of ancient myth (with emphasis on Greek myths), applying historical, religious, sociological, and literary-critical perspectives.

**01:190:356** ***Oedipus: A Survey of the Myth from Antiquity to Freud (3)***
Survey of the Oedipus myth in earliest, pre-Sophoclean evidence; in Greek and Roman tragedy; in the Middle Ages and the Renaissance; and in the 19th and 20th centuries (with special emphasis on Oedipus in art and music).

**01:190:358** ***Odysseus in Literature, Drama & Film (3)***
Evolving images of Odysseus from ancient literature through medieval poetry and modern novels, poetry, plays, and films. Significance of Odysseus as an enduring literary icon.
***Credit not given for both this course and 01:195:358 or 01:489:358.***

**01:190:370** ***Greek Film: Love, Eros & Death (3)***
Masterpieces of modern Greek film, 1914 to present, exploring interplay of love, the erotic, and death.
***Credit not given for this course and 01:489:370. Taught in English.***

**01:190:372** ***Cities of the Classical World (3)***
Study of urban development in antiquity, focusing on Athens and Rome, and synthesizing the evidence of literary, historical, and archaeological sources.
***Credit not given for both this course and 01:512:311.***

**01:190:373** ***Pompeii: The Life and Death of a Roman Town (3)***
Pompeii and Herculaneum, as laboratories for the study of Roman life: the economy and society; public and private architecture, art, and inscriptions; and the birth of archaeology.
***Prerequisite: One course in Roman history or culture, Latin or ancient art, or permission of instructor. Credit not given for both this course and 01:510:310.***

**01:190:375** ***Masterpieces of Greek and Roman Art (3)***
Analyses of selected monuments of architecture, sculpture, and painting from 800 BC to AD 500.

**01:190:377** ***The Hero in Ancient Greece and Rome (3)***
Explores the ancient Greek and Roman hero from literary, religious, mythical, and comparative narrative points of view. Readings drawn mostly from ancient sources.

**01:190:381** ***Greek Drama in Translation (3)***
Readings in English of the major Greek tragedies and comedies; emphasis on the dramatic structure, literary analysis, and the theatrical conventions of the ancient stage.

**01:190:391** ***Roman Drama in Translation (3)***
Readings in English of the comedies of Plautus and Terence and the tragedies of Seneca to emphasize the contributions of Latin authors to the dramatic genre and their influence on European and English drama.

**01:190:393** ***Greek and Roman Satire (3)***
Readings in English of classical satire from its origins in the Greek world through the fourth century AD. Emphasis on the significance of ancient satire for comedy and satire in Western culture.

**01:190:395** ***Transgression in Ancient Greek Society and Culture (3)***
Violence. Obscenity. Gender roles. Punishment. Violations of cultural norm in ancient Greek practical, civic, religious, and intellectual life, through close critical analysis of their myths, literature, laws, and rituals.
***Prerequisite: 01:190:205 or permission of instructor.***

**01:190:397** ***The Ancient Novel in Context (3)***
Readings from Greek and Roman novels of the Imperial period, with attention to their place in the literary and cultural history of the ancient world.

**01:190:421** ***Indo-European Origins of the Classical Languages (3)***
Comparative survey of Latin and Greek grammar, with historical analysis of those features that the two languages share due to their common origin as Indo-European languages. Reference to the major characteristics of Indo-European languages in general.
***Open only to advanced undergraduates in classics and linguistics and to graduate students with some knowledge of Latin and/or Greek.***

**01:190:440** ***Cultural Heritage and Preservation Studies (CHAPS): Museums, Collecting, and Preservation (3)***
Examines the history of museums, modes of collecting, and the preservation of the past, and considers these activities in the context of contemporary political issues.
***Credit not given for this course and 01:082:440.***

**01:190:491,492** ***Independent Study in Classics (3,3)***
Directed reading and research on an assigned topic in classics under the supervision of a member of the department. An extensive essay required, reflecting in-depth research on the assigned topic.
***Open only to juniors and seniors majoring in classics. Permission of the undergraduate director required.***

**01:190:493,494** ***Special Topics Seminar (3,3)***
Advanced study of a problem, topic, or theme in Greek and Roman studies.
***Open only to junior or senior majors in classics or by permission of instructor.***

**01:190:495,496** ***Honors Project (4,4)***
Independent or team projects resulting in a written paper, a performance, or some other appropriate form of public presentation such as drama, poetry, narrative prose, or museum excavation materials.
***Open only to honors students in one of the fields in classics.***

# Classical Humanities Courses in Other Departments

# Classical Humanities Courses in Other Departments

01:013:180 Elementary Sanskrit I (4)

01:013:181 Elementary Sanskrit II (4)

01:082:301 Ancient Architecture (3)

01:082:306 Roman Art (3)

01:082:317 Ancient Painting (3)

01:082:342 Early Greek Art (3)

01:082:343 Later Greek Art (3)

01:510:201 Ancient Greece (3)

01:510:202 Ancient Rome (3)

01:510:205 The History of the Byzantine Empire (3)

01:510:207 Byzantine Civilization (3)

01:510:301 Early Greece (3)

01:510:302 Classical Greece (3)

01:510:303 Hellenistic World (3)

01:510:304 The Rise of the Roman Republic (3)

01:510:305 The Crisis of the Roman Republic (3)

01:510:306 Roman Empire (3)

01:510:307 The Roman World in Late Antiquity (3)

01:510:310 Pompeii: The Life and Death of a Roman Town (3)

01:510:320 Women in Antiquity (3)

01:510:350 Greek Society (3)

01:510:403 Ancient Warfare and Diplomacy (3)

01:730:302 Plato and Aristotle (3)

01:730:352 Plato (3)

01:730:401 Plato (3)

01:730:402 Aristotle (3)

01:730:403 Ancient Philosophy after Aristotle (3)

Classics (SAS)

# Courses in Greek, Ancient (490)

# Courses in Greek, Ancient (490)

**01:490:101** ***Elementary Greek I (4)***
Intensive study of ancient Greek grammar in conjunction with readings in simple Greek prose.

**01:490:102** ***Elementary Greek II (4)***
Continued study of Greek grammar in conjunction with readings.
***Prerequisite: 01:490:101 or permission of instructor.***

**01:490:206,207** ***Intermediate Greek Prose (3,3)***
Study of Greek prose through the reading of a work of Plato, Lysias, Herodotus, or other authors.
***Prerequisite: 01:490:102 or permission of instructor.***

**01:490:208,209** ***Intermediate Greek Poetry (3,3)***
Study of Greek poetry through the reading of a work of Euripides, Sophocles, Homer, or other authors.
***Prerequisite: 01:490:102 or permission of instructor.***

**01:490:211** ***Introduction to New Testament Greek (3)***
Introduction to grammar and syntax of Greek in conjunction with readings from the Gospels, Acts, or Epistles.
***Prerequisite: 01:490:207 or permission of instructor.***

**01:490:304** ***Aristophanes (3)***
Reading of *Clouds* and one other comedy; comparison of the Aristophanic with the Platonic Socrates; study of relation of Old Comedy to Athenian life.
***Prerequisites: 01:490:207 or 208 or permission of instructor.***

**01:490:305** ***Greek Drama (3)***
Readings in the works of fifth-century Greek dramatists with special emphasis on Sophocles.
***Prerequisite: 01:490:207 or 208 or permission of instructor.***

**01:490:306** ***From Athens to Alexandria (3)***
Major works of the literature of Greece from the fourth century BC into the Hellenistic Age.
***Prerequisite: 01:490:207 or 305 or permission of instructor.***

**01:490:308** ***Greek Historical Writings (3)***
Readings of selected narratives in Herodotus and of main speeches, excursuses, and parts of books six and seven of Thucydides. Comparative study of historical method.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:309** ***Lyric Poetry (3)***
Survey of the main poets of the "lyric age" of Greece (Alcman, Sappho, Alcaeus, Archilochus, Solon, Theognis, and Anacreon); reading of an ode of Pindar.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:310** ***Greek Heroic Poetry (3)***
Studies in the poetry and culture of Homeric Greece. Selections from the *Iliad* or *Odyssey*.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:311** ***New Testament Greek (3)***
Selections from the Gospels, Acts, and Epistles, supplemented by a review of grammar and syntax.

**01:490:312** ***Socratic Literature (3)***
Portraits of Socrates in Plato, Xenophon, Aeschines of Sphettus, and Aristophanes, with emphasis on the reading, in Greek, of selections from the writings of these authors.
***Prerequisite: 01:490:207 or 208 or permission of instructor. May be jointly taught (in part) with 01:190:312. Students wishing to earn language credit in Greek should enroll in 01:490:312. Credit not given for both this course and 01:190:312.***

**01:490:315** ***Menander (3)***
Study of *Dyskolos* and *Samia* as examples of New Comedy; their relation to Athenian life at the end of the fourth century.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:335** ***Greek Prose Composition (3)***
Review of syntax, composition in Greek, and translation from English to Greek of continuous passages adapted from classical authors.
***Prerequisite: 01:490:207 or 208.***

**01:490:352** ***Readings in Plato (3)***
Reading of one or more Platonic dialogues (or thematically related selections from several) in the original Greek.
***Prerequisites: 01:490:207, 208, or permission of instructor. May be jointly taught (in part) with 01:190:352; separate meetings for readings in Greek. Credit not given for both this course and 01:190:352 or 01:730:352.***

**01:490:353** ***Readings in Aristotle (3)***
Reading of one or more treatises by Aristotle (or thematically related selections from several) in the original Greek.
***Prerequisites: 01:490:207, 208, or permission of instructor. May be jointly taught (in part) with 01:190:353; separate meetings for readings in Greek. Credit not given for both this course and 01:190:353.***

**01:490:391** ***Readings in Greek Prose (3)***
Readings in selected ancient Greek prose authors or genres.
***Prerequisites: 01:490:305, 306, or permission of instructor.***

**01:490:392** ***Readings in Greek Poetry (3)***
Readings in the works of selected Greek poets or poetic genres.
***Prerequisites: 01:490:305, 306, or permission of instructor.***

**01:490:400** ***Demosthenes (3)***
Reading of one public and one private oration; study of Demosthenes as orator; as source for Athenian law, commerce, and private life; and as statesman.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:402** ***Plato and Aristotle (3)***
Reading of one Platonic dialogue followed by selected portions of an Aristotelian treatise. Attention to prose style and also to common problems and diverging solutions.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

Classics (SAS)

# Courses in Latin (580)

# Courses in Latin (580)

**01:580:101** ***Elementary Latin I (4)***
Beginning course in Latin, introducing the Latin language and its grammar and syntax.

**01:580:102** ***Elementary Latin II (4)***
Continued beginning instruction in Latin, introducing Latin language, grammar, and syntax.
***Prerequisite: 01:580:101 or permission of instructor.***

**01:580:203** ***Intermediate Latin Prose (3)***
Selections from prose authors of the late Republican and/or early empire, e.g., Caesar, Cicero, Livy; development of skill in reading continuous passages of Latin prose.
***Prerequisite: 01:580:102 or permission of instructor.***

**01:580:204** ***Intermediate Latin Poetry (3)***
Representative poems of Catullus, Horace, and Ovid, read and studied with a view to their style, imagery, and topicality. Introduction to Latin metrics.
***Prerequisite: 01:580:102 or permission of instructor.***

**01:580:302** ***Medieval Latin (3)***
Readings in major Latin writings and documents of the Middle Ages.
***Prerequisite: 01:580:203 or 204 or permission of instructor.***

**01:580:303** ***Cicero: Philosophical Writings (3)***
Selected philosophical dialogues and rhetorical treatises of Cicero.
***Prerequisites: 01:580:203, 204.***

**01:580:304** ***Cicero: Orations (3)***
Selected orations of Cicero, with emphasis on the development of Cicero's style and the significance of historical and biographical background.
***Prerequisites: 01:580:203, 204.***

**01:580:310** ***Prose and Poetry in the Age of Augustus (3)***
The cultural renaissance under Augustus (44 BC-AD 14), with emphasis on the reading, in Latin, of selections from the writings of Virgil, Horace, Livy, Ovid, and the elegiac poets.
***Prerequisite: 01:580:203 or 204 or permission of instructor. May be jointly taught (in part) with 01:190:310. Students wishing to earn language credit in Latin should enroll in 01:580:310. Credit not given for both this course and 01:190:310.***

**01:580:321** ***Roman Comedy (3)***
Study of the principal meters, the theater, and the staging of plays through the reading of plays of Plautus and Terence.
***Prerequisites: 01:580:203, 204.***

**01:580:323** ***Lucretius (3)***
Readings from Lucretius' *De Rerum Natura* with analysis of its place within the literary and philosophical traditions of Rome and Greece.
***Prerequisites: 01:580:203, 204.***

**01:580:324** ***Sallust (3)***
Readings from Sallust's *Jugurthine War*, *Histories*, and *Catiline*, with a study of selected problems from the historical periods relevant to those works.
***Prerequisites: 01:580:203, 204.***

**01:580:325** ***The History of Livy (3)***
Readings from Livy's *Ab Urbe Condita* with a study of selected problems in Roman Republican history.
***Prerequisites: 01:580:203, 204.***

**01:580:327** ***Latin Elegy (3)***
Survey of Latin poetry written in elegiac meter, with selections from Catullus, Tibullus, Sulpicia, Propertius, and/or Ovid.
***Prerequisites: 01:580:203, 204.***

**01:580:328** ***Roman Satire (3)***
Selected poems of Horace, Martial, and Juvenal and a study of their interrelationship.
***Prerequisites: 01:580:203, 204.***

**01:580:329** ***Tacitus (3)***
Reading of a minor work of Tacitus and/or selections from the *Annals of Tacitus* with an investigation of their value as sources for Imperial history in the first century AD.
***Prerequisites: 01:580:203, 204.***

**01:580:335** ***Latin Prose Composition (3)***
Review of syntax and prose style; composition in Latin and translation into Latin of continuous passages of prose.
***Prerequisites: 01:580:203, 204.***

**01:580:369,370** ***The Seminar in Latin (3,3)***
Extensive and rapid reading in Latin literature from the early Roman Republic to the empire.
***Primarily for juniors and seniors majoring in classical humanities; open to others with permission of instructor.***

**01:580:401** ***Advanced Study of the Poetry of Ovid (3)***
Readings and interpretation of selected works of Ovid. A study of the poet's contribution to Roman literature and his importance in the Western literary tradition.
***Prerequisites: 01:580:203, 204.***

**01:580:402** ***Advanced Study of Vergil's Aeneid (3)***
Readings of Vergil's *Aeneid* with an analysis of selected problems in its interpretation.
***Prerequisites: 01:580:203, 204.***

**01:580:403** ***Readings in Latin Literature I: Literature of the Republic (3)***
Prose and poetry of Rome from its beginnings in the third century BC to the end of the republic in the first century BC. Extensive selections from epic, drama, lyric, elegy, pastoral, and other poetry and from history, rhetoric, and oratory.
***Prerequisites: 01:580:203, 204.***

**01:580:404** ***Readings in Latin Literature II: Literature of the Empire (3)***
Prose and poetry of imperial Rome. Extensive selections from epic, history, satire, the novel, and other genres, with emphasis on writers of the Augustan and Neronian ages.
***Prerequisites: 01:580:203, 204.***

**01:580:407** ***Advanced Study of the Poetry of Horace (3)***
Intensive reading of Horace's poems with emphasis on the variety of style and content.
***Prerequisites: 01:580:203, 204.***

# Cognitive Science 185 (SAS)

## COGNITIVE SCIENCE 185

Rutgers University Center for Cognitive Science (RuCCS), School of Arts and Sciences

**Website:** Here

**Center Faculty Director:** John McGann

**Undergraduate Director:** Mimi Phan

**Program Faculty:**

Mark Baker, Linguistics, RuCCS; Ph.D., Massachusetts Institute of Technology

Kostas Bekris, Computer Science; Ph.D., Rice

Kasia M. Bieszczad, Psychology, RuCCS; Ph.D., University of California (Irvine)

Kristin Dana, Electrical and Computer Engineering; Ph.D., Columbia

Ahmed Elgammal, Computer Science; Ph.D., Maryland

Jacob Feldman, Psychology, RuCCS; Ph.D., Massachusetts Institute of Technology

Michael Glanzberg, Philosophy; Ph.D., Harvard

Stephen Jose Hanson, Psychology (Newark); Ph.D., Arizona State

Pernille Hemmer, Psychology, RuCCS; Ph.D., University of California (Irvine)

Michelle Hurst, Psychology, RuCCS; Ph.D., Boston College

Zoe Jenkin, Philosophy, RuCCS; Ph.D., Harvard

Alan Leslie, Psychology, RuCCS; Ph.D., Oxford

Michael Lewis, Pediatrics; Ph.D., Pennsylvania

John McGann, Psychology, RuCCS; Ph.D., Yale

Brian McLaughlin, Philosophy, RuCCS; Ph.D., North Carolina

Melchi Michel, Psychology; Ph.D., Rochester

Konstantinos Michmizos, Computer Science, Ph.D., National Technical University of Athens

Julien Musolino, Psychology, RuCCS; Ph.D., Maryland

Vladimir Pavlovic, Computer Science; Ph.D., Illinois (Urbana-Champaign)

Philip Parker, Psychology, RuCCS; Ph.D., University of California (San Francisco)

Mimi Phan, RuCCS; Ph.D., University of California (Davis)

Paul Pietroski, Philosophy, RuCCS; Ph.D., Massachusetts Institute of Technology

James Quilty-Dunn, Philosophy, RuCCS; Ph.D., CUNY

Ryan Rhodes, RuCCS; Ph.D., University of Delaware

Susanna Schellenberg, Philosophy; Ph.D., Pittsburgh

Manish Singh, Psychology, RuCCS; Ph.D., University of California (Irvine)

Matthew Stone, Computer Science, RuCCS; Ph.D., Pennsylvania

Karin Stromswold, Psychology, RuCCS; Ph.D., Massachusetts Institute of Technology; M.D., Harvard Medical School

Kristen Syrett, Linguistics, RuCCS; Ph.D., Northwestern

Bruce Tesar, Linguistics, RuCCS; Ph.D., Colorado

Elizabeth Torres, Psychology, RuCCS; Ph.D., University of California (San Diego)

David Vicario, Psychology; Ph.D., Rockefeller

Jenling (Jenny) Wang, Psychology, RuCCS; Ph.D., Johns Hopkins

David Zald, RWJ-Psychiatry Research; Ph.D., University of Minnesota

Qiong Zhang, Psychology, RuCCS; Ph.D., Carnegie Mellon University

**Emeritus Faculty**

Alex Borgida, Computer Science

Frances Egan, Philosophy

Jerry Fodor, Philosophy, RuCCS

Charles R. Gallistel, Psychology, RuCCS

Rochel Gelman, Psychology, RuCCS

Liia Gleitmen, RuCCS

Alvin Goldman, Philosophy, RuCCS

Jane Grimshaw, Linguistics, RuCCS

L.Thorne McCarthy, Computer Science

Thomas V. Papathomas, Biomedical Engineering, Lab of Vision Research, RuCCS

Alan Prince, Linguistics, RuCCS

Zenon Pylyshyn, *RuCCS Founding Director

Kenneth Safir, Linguistics, RuCCS

Charles Schmidt, Psychology, Computer Science

Stephen Stich, Philosophy, RuCCS

Mark West, Psychology

Jerome Williams, Newark Business School

Terry Wilson, Psychology

**Additional Associate Faculty**

For a list of additional faculty associated with the program, consult the cognitive science webpage here.

# Major Program

# Major Program

The Rutgers Center for Cognitive Science (RuCCS) offers a Bachelor of Arts degree in cognitive science. The major offers an opportunity for exceptional students to explore multidisciplinary approaches to the study of the brain, behavior, and computation, including how people, animals, and computers think, act, and learn.

There are five possible tracks for the major: (1) cognitive neuroscience, (2) decision-making, (3) language, (4) mind, machines, and computation, and (5) perception. Each track is structured into five segments: (i) quantitative reasoning, (ii) foundational, (iii) distributional, (iv) topics courses, and (v) capstone. Each track will have the same two requirements in logical and statistical reasoning, the same foundational course in cognitive science, a set of three distributional requirements in cognate areas, and one capstone course involving independent research or an approved course substitute (such as 01:185:411). The selection of courses that satisfy the topic electives segment will vary by track.

**Requirements for the Major**

The major must consist of a minimum of 36 credits:

1. Students will be required to complete a minimum of four courses in cognitive science (curriculum code 185).
2. Grades of C or better must be earned in all courses counted toward the major.
3. At least two-thirds of the total credits must be from courses offered by the School of Arts and Sciences.
4. At least two-thirds of the total credits must be at the 300 level or above.
5. No more than four courses from philosophy and no more than four courses from computer science may be counted toward the major.
6. No more than three courses from any other department (not listed above) may be counted toward the major.

Currently, there are 38 jointly appointed faculty advisers and an additional 49 faculty affiliates housed in various departments. Most play an active role in the life of the center.

If interested in the cognitive science major, students are encouraged to check out the following website here to view the major requirements and to learn how to apply.

If an individual wants honors, they needs to meet the honors requirement for the university.

If an individual wants honors, he or she they need to meet the honors requirement for the university. For additional information about the major, send an email to undergrad@ruccs.rutgers.edu; or consult the cognitive science major webpage.

Cognitive Science 185 (SAS)

# Minor Program

# Minor Program

Cognitive science is an interdisciplinary area of scholarship concerned with understanding the nature and development of such intelligent capacities as perception, language, reasoning, planning, problem solving, and related skills, whether these capacities are instantiated in biological or artificial systems. The goal of the cognitive science minor is to provide a structured way for undergraduates to study and carry out research in cognitive science with guidance from faculty members in the cognitive science center. Any undergraduate may pursue a minor in cognitive science, regardless of his or her major. The interdisciplinary cognitive science minor is likely to be of particular interest to undergraduates majoring in fields that are directly related to cognitive science (e.g., computer science, linguistics, philosophy, psychology, anthropology, biological sciences, mathematics, statistics, biomathematics, communication, biological anthropology, and engineering).

Students interested in the cognitive science minor are encouraged to visit the following website here.

**Requirements for the Minor**

The interdisciplinary minor in cognitive science consists of a minimum of 18 credits, distributed as follows:
1. At least three of the following cognitive science courses:
01:185:201 Cognitive Science: A Multidisciplinary Introduction (4)
01:185:253 Human Nature and Diversity (4)
01:185:301 Cognition and Decision-Making (4)
01:185:310 The Concept of Concepts in Cognitive Science (3)
01:185:320 Research Methods in Cognitive Science (3)
01:185:325 From Data to Science Communication in R (3)
01:185:330 Meaning and Numbering (3)
01:185:335 Neural Structure of Language (3)
01:185:340 Language and Cognition (3)
01:185:345 Person Perception and Social Cognition (3)
01:185:350 Fundamentals of Cognitive Neuroscience (3)
01:185:360 Origins of Cognition (3)
01:185:395/396 Research in Cognitive Science (3 credits each)
01:185:401 Visual Intelligence (3)
01:185:411 Advanced Topics in Cognitive Science I (4) (offered each spring semester only)
01:185:412 Advanced Topics in Cognitive Science II (3) (only 1 section may be taken per semester)
01:185:413 Advanced Topics in Cognitive Science: Cog Neuro (3)
01:185:414 Advanced Topics in Cognitive Science: Decision Making/Behavioral Game Theory (3)
01:185:415 Advanced Topics in Cognitive Science: Language (3)
01:185:416 Advanced Topics in Cognitive Science: Minds, Machines & Computation (3)
01:185:417 Advanced Topics in Cognitive Science: Perception (3)
01:185:420 Learning in Humans and Machines (3)
01:185:430 Cognitive Neuroscience through Case Studies (4)
01:185:495/496 Senior Honors Thesis (3 credits each)

2. A minimum of 3 credits in formal/analytic methods used in cognitive science. The following courses automatically count toward the formal/analytic requirement:

01:198:107 Computing for Math and the Sciences (3)

01:198:111 Introduction to Computer Science (4)

01:198:112 Data Structures (4)

01:198:205 Introduction to Discrete Structures I (4)

01:198:206 Introduction to Discrete Structures II (4)

01:615:305 Syntax (3)

01:615:315 Phonology (3)

01:615:325 Semantics (3)

01:615:411 Morphology (3)

01:640:300 Introduction to Mathematical Reasoning (3)

01:640:338 Discrete and Probabilistic Models in Biology (3)

01:640:339 Math Models in the Social Sciences (3)

01:640:361 Set Theory (3)

01:640:428 Graph Theory (3)

01:640:454 Combinatorics (3)

01:640:461 Mathematical Logic (3)

01:640:477 Mathematical Theory of Probability (3)

01:640:478 Probability II (3)

01:640:481 Mathematical Theory of Statistics (3)

01:730:201 Introduction to Logic (3)

01:730:315 Applied Symbolic Logic (3)

01:730:407 Intermediate Logic I (3)

01:730:408 Intermediate Logic II (3)

01:830:200 Quantitative Methods in Psychology (4)

01:830:400 Advanced Statistical Methods in Psychology (3)

01:960:379 Basic Probability and Statistics (3)

01:960:381 Theory of Probability (3)

01:960:382 Theory of Statistics (3)

01:960:401 Basic Statistics for Research (3)

3. A minimum of an additional 6 elective credits. Any courses listed as approved "formal/analytic" courses may be counted as electives. If you take more than the required three courses offered by cognitive science in requirement #1, any additional course will be counted as an elective. The following additional courses automatically count toward the elective requirement:

following additional courses automatically count toward the elective requirement:

01:119:195 Brain, Mind, and Behavior (3)

01:146:245 Fundamentals of Neurobiology (3) (cell biology and neuroscience [CBN] majors)

01:146:295 Essentials of Cell Biology and Neuroscience (3) (non-CBN majors)

01:146:445 Synapses, Neurons, and Circuits (3)

01:146:447 Clinical Neurobiology (3)

01:185: --- Any Cognitive Science Course

01:198:314 Principles of Programming Languages (4)

01:198:344 Design and Analysis of Computer Algorithms (4)

01:198:405 Seminar in Computers and Society (3)

01:198:415 Compilers (4)

01:198:424 Modeling and Simulation of Continuous Systems (4)

01:198:428 Introduction to Computer Graphics (4)

01:198:440 Introduction to Artificial Intelligence (4)

01:198:452 Formal Languages and Automata (3)
01:447:380 Genetics (4)
01:447:384 Genetic Analysis I (4)
01:447:385 Genetic Analysis II (4)
01:447:410 Research in Genetics - Writing Intensive (3)
01:447:484 Behavioral and Neural Genetics (3)

01:615:201 Introduction to Linguistic Theory (3)

01:615:330 Historical Linguistics (3)

01:615:350 Pragmatics (3)

01:615:360 Theories of Language (3)

01:615:371 Psychology of Language (3)

01:615:373 Language Acquisition (3)

01:615:421 Language Typology (3)

01:615:431 Investigations into an Unfamiliar Language (3)
01:615:435 Experimental Methodologies in Language Acquisition (3)
01:615:440 Language Development (3)
01:615:441 Linguistics and Cognitive Science (3)
01:615:445 Language and Cognition (3)
01:615:451 Phonetics (3)
01:615:455 Computational Linguistics (3)
01:615:465 Introduction to Prosody (3)3
01:615:471 Selected Topics in Linguistics (3)
01:615:491 Linguistics Practicum (3)
01:730:210 Philosophy of Language (3)
01:730:220 Theory of Knowledge (3)

01:730:253 Human Nature and Human Diversity (4)

01:730:328 Philosophy of Psychology (3)

01:730:329 Minds, Machines, and Persons (3)

01:730:360 Philosophical Aspects of Cognitive Science (3)

01:730:412 Epistemology (3)

01:730:418 Philosophy of Mind (3)

01:730:419 Philosophy of Perception (3)

01:730:420 Philosophy of Language (3)

01:730:422 Philosophy of Logic (3)

01:730:424 The Logic of Decision (3)

01:730:425 Philosophy of Science (3)

01:730:428 Topics in the Philosophy of Psychology (3)

01:830:301 Sensation and Perception (3)

01:830:303 Memory (3)

01:830:305 Cognition (3)

01:830:307 Perception in Cognitive Science (3)

01:830:310 Neuropsychology (3)

01:830:311 Conditioning and Learning (3)

01:830:313 Physiological Psychology (3)

01:830:351 Psychology of Language I (3)

01:830:361 Developmental Psychobiology (3)

01:830:401 Advanced Topics in Human Cognition (3)

01:830:402 Advanced Topics in Human Cognition - Writing Intensive (3)

01:830:410 Advanced Topics in Psychobiology (3)

01:830:411 Advanced Topics in Psychobiology - Writing Intensive (3)

01:830:412 Neuropsychopharmacology (3)

01:830:463 Behavioral Pharmacology (3)

01:830:480 Advanced Topics in Visual Perception (3)
01:830:484 Language Acquisition (3)
01:940:363 Bilingualism in the Spanish-Speaking World (3)
01:940:368 The Bilingual Mind (3)
01:960:384 Intermediate Statistical Analysis (3)

14:125:405 Introduction to Neural Processes (3)

14:125:410 Sensory Processes, Mechanisms, and Computer Models (3)

**Additional Requirements for the Minor**

1. Grades of C or better must be earned in all courses counted toward the minor.

2. No more than 4 credits at the 100 level may be counted toward the minor.

3. At least half of the credits used toward the minor must be at the 300 level or above.

4. The same course cannot be used to fulfill both the formal/analytic and elective requirements.

5. No more than two courses from any one department (major or nonmajor curriculum) may count toward the minor with the exception of cognitive science (curriculum 185).

Students who wish to declare a minor in cognitive science should do so either at the same time or after they have declared a major field of study. Either before or immediately after declaring the cognitive science minor, students must take a formal/analytic methods course, at least three cognitive science courses, and at least 6 credits of upper-division electives. Students should be aware that many of the courses listed have prerequisites and not all of the courses are offered each semester. Students should contact the departments that offer courses to learn about prerequisites and course schedules.

The cognitive science program committee, under the direction of the undergraduate program director(s), will advise students about selection of courses, mentors, and research/independent study projects. Students may petition the undergraduate program director to have alternate courses count as formal/analytic or elective courses.

For additional information about the cognitive science minor, please mail the undergraduate director(s) at undergrad@ruccs.rutgers.edu; or consult the cognitive science undergraduate webpage.

Cognitive Science 185 (SAS)

# Courses

# Courses

**01:185:201** ***Cognitive Science: A Multidisciplinary Introduction (4)***
Introduction to computational, linguistic, philosophical, and psychological approaches taken within cognitive science, through a survey of topics such as reasoning, language, and vision.
***Pre- or corequisite: A course in computer science, linguistics, philosophy, psychology; or permission of instructor.***

**01:185:253** ***Human Nature and Human Diversity (4)***

A lecture course. The first goal of this course is to introduce students to some of the central ideas and theories in cognitive science that have been used to explain both human diversity and universal features of human nature. The second goal is to explore the implications of those ideas for a range of important philosophical questions. The course is organized around four areas where questions about human nature and human diversity are of great importance in contemporary society: i) Mating (sex, love and parenting); (ii) morality; (iii) religion; (iv) race.

**NOTE:** *Course satisfies the Core Curriculum: 21st Century Challenges [21C] and Arts and Humanities [AHo]*

**01:185:301** ***Cognition and Decision-Making (4)***
A lecture/recitation course taught by a single instructor. This course introduces students to the subjects of reasoning and decision-making as a means of exploring a number of issues central to the field of cognitive science

**NOTE:** *Course satisfies Core Curriculum: Quantitative and Formal Reasoning (QQ).*

***Prerequisite: Introduction to Cognitive Science (01:185:201).***

**01:185:310** ***The Concept of Concepts in Cognitive Science (3)***
A lecture course taught by a single instructor. This course introduces students to the study of concepts from a broad interdisciplinary point of view, surveying how concepts are understood in psychology, philosophy, computer

science, and neuroscience. Emphasis is on both differences in how these various disciplines view concepts as well as commonalities in the underlying ideas.
*Prerequisite: Introduction to Cognitive Science (01:185:201)*

**01:185:320** *Research Methods in Cognitive Science (3)*
A lecture course taught by a single instructor. This course introduces students to a foundation for thinking critically about research in cognitive science. Topics may include the scientific method and consideration of strengths and weaknesses of a range of approaches, statistical reasoning and principles for ethical conduct of research.
*Prerequisite: 01:185:201 or 01:185:301 or 01:185:411*

**01:185:325** *From Data to Science Communication in R (3)*

This course is an introduction to using R, the open-source programming environment, for data organization, wrangling, visualization, and communication. We will build these skills in the context of research questions and datasets often found in the interdisciplinary field of Cognitive Science. Throughout the course, we will highlight the relations between research questions, data structure, and decisions about data visualization and communication.

*Prerequisite: 01:185:201. Credit not given for this course and 01:960:295.*

**01:185:330** *Meaning and Numbering (3)*
Central issues in cognitive science and strategies for addressing questions about the contributions of innate endowment and individual experience (a.k.a., nature/nurture) to mature cognition through discussion and comparison of the human capacity to understand linguistic expressions and the apparently more widespread capacity to make numerical comparisons.
*Prerequisite: 01:185:201. Credit not given for both this course and 01:730:327.*

**01:185:335** *Neural Structure of Language (3)*
Examines how linguistic structure is represented and processed in the brain, and how the computational machinery that generates language intersects with different cognitive capacities and brain structures. Focuses on neural evidence of linguistic structures and structure-building; major brain regions associated with language and competing models of their functions; and the underlying cognitive resources necessary for producing and comprehending language.
*Prerequisite: 01:185:201.*

**01:185:340** *Language and Cognition (3)*

A lecture course taught by a single instructor. Topics may include speech perception, language acquisition, priming, disorders, speech errors, sentence processing, memory, color, and numerosity.

NOTE: This course satisfies the Core Curriculum Quantitative and Formal Reasoning (QQ).

*Prerequisite: 01:185:201 AND Introduction to Linguistic Theory (01:615:201). Credit not given for both his course and 01:615:445*

**01:185:345** *Person Perception and Social Cognition (3)*
Survey of major topics in social cognition which is the study of how we understand ourselves and others as social agents and draws from psychology, neuroscience, and philosophy. Three main units: cognitive architecture, social capacities, and the social world, introduce contemporary debates in social cognition.
***Prerequisite: 01:185:201.***

**01:185:350** *Fundamentals of Cognitive Neuroscience (3)*
Explores the cognitive and neural processes that support attention, learning, memory, language, and guided behaviors with an emphasis on the neural mechanisms that form the substrates of human cognition. Introduces basic neuroanatomy, functional imaging techniques, and behavioral measures of cognition, and discusses methods by which inferences about the brain bases of cognition are made.
***Prerequisite: 01:185:201.***

**01:185:360** *Origins of Cognition (3)*
Exploration of the origins and development of human knowledge across three different time scales: ontological development, evolutionary development, and historical/cultural change. Topics include: depth, space, number, language, music, social understanding and learning & plasticity. Findings and ideas from multiple disciplines, including developmental science, comparative psychology, neuroscience, information theory, anthropology, and history of science will be included.
***Prerequisite: 01:185:201.***

**01:185:395** *Research in Cognitive Science (1-3)*
A supervised research internship in cognitive science. May include laboratory/library research. Final written report required.
Prerequisite: 01:185:201 AND Permission of instructor and the program.
Only faculty who are Executive Committee members or Affiliates in the Center for Cognitive Science can oversee research courses in Cognitive Science.

***Prerequisite: 01:185:201 AND Permission of instructor and the program.***

**01:185:396** *Research in Cognitive Science (1-3)*

A supervised research internship in cognitive science. May include laboratory/library research. Final written report required.

Prerequisites: 01:185:201, 01:185:395 and permission of instructor and the program.

Only faculty who are Executive Committee members or Affiliates in the Center for Cognitive Science can oversee research courses in Cognitive Science.

***Prerequisites: 01:185:201, 01:185:395 and permission of instructor and the program.***

**01:185:401** *Visual Intelligence (3)*
Seminar on visual processing with special focus on the fundamental problem of vision, Bayesian approaches, perceptual organization, and visually-guided motor behavior.
***Prerequisites: 01:830:301 and 01:960:211 Corequisite: 830:301***

**01:185:411** ***Undergraduate Seminar in Cognitive Science (4)***
Seminar on computational, linguistic, philosophical, and psychological approaches taken within cognitive sciences through a survey of topics such as reasoning, language, vision, and cognitive development.
***Pre- or corequisite: A course in computer science, linguistics, philosophy, psychology; or permission of instructor. Prerequisite: 01:185:201.***

**01:185:412** ***Advanced Topics in Cognitive Science II (3)***
Seminar on computational, linguistic, philosophical, and psychological approaches taken within cognitive sciences through a survey of topics such as reasoning, language, vision, and cognitive development.
***Prerequisite: 01:185:201***

**01:185:413** ***Advanced Topics in Cognitive Science: Cognitive Neuroscience (3)***
Investigation of advanced problems and issues in cognitive neuroscience.
***Prerequisite: 01:185:201***

**01:185:414** ***Advanced Topics in Cognitive Science: Decision-Making (3)***
Investigation of advanced problems and issues in cognitive science and decision-making.
***Prerequisite: 01:185:201.***

**01:185:415** ***Advanced Topics in Cognitive Science: Language (3)***
Investigation of advanced problems and issues in cognitive science and language.
***Prerequisite: 01:185:201.***

**01:185:416** ***Advanced Topics in Cognitive Science: Minds, Machines & Computation (3)***

A topical course with each section investigating advanced problems and issues in cognitive science, including topics such as the computational theory of mind. Check the Center's Upcoming Courses webpage for titles, descriptions, and requirements of any sections being offered

NOTE: This course satisfies the upper-division electives for the Minds, Machines & Computation track of the Cognitive Science major

***Prerequisite: 01:185:201.***

**01:185:417** ***Advanced Topics in Cognitive Science: Perception (3)***
Investigation of advanced problems and issues in cognitive science and perception.
***Prerequisite: 01:185:201.***

**01:185:420** ***Learning in Humans and Machines (3)***

An interdisciplinary seminar course exploring the parallels between human learning and machine learning focusing on the set of shared computational problems faced by humans and machines which includes making complex decisions; predicting future events; storing and retrieving information efficiently; and generalizing knowledge to new situations.

***Prerequisite: 01:185:201.***

**01:185:430** *Cognitive Neuroscience through Case Studies (4)*
Structure and function of the human brain through case studies of people with developmental and acquired brain disorders.
*Pre- or corequisites: 01:185:201 or 01:830:101.*

**01:185:495** *Senior Honors Thesis (3)*

Thesis research under the direction of a faculty adviser.

Prerequisite: 01:185:201 and eligibility for departmental honors and approval of thesis topic by faculty adviser and director of undergraduate studies.

Only faculty who are Executive Committee members or Affiliates in the Center for Cognitive Science can oversee research courses in Cognitive Science

*Prerequisite: 01:185:201 and eligibility for departmental honors and approval of thesis topic by faculty adviser and director of undergraduate studies.*

**01:185:496** *Senior Honors Thesis (3)*

01:185:496 Senior Honors Thesis (3)

Thesis research under the direction of a faculty adviser.

Prerequisite: 01:185:201, 01:185:495, and eligibility for departmental honors and approval of thesis topic by faculty adviser and director of undergraduate studies.

Only faculty who are Executive Committee members or Affiliates in the Center for Cognitive Science can oversee research courses in Cognitive Science.
*Prerequisite: 01:185:201, 01:185:495, and eligibility for departmental honors and approval of thesis topic by faculty adviser and director of undergraduate studies.*

# Communication (SC&I-U)

## COMMUNICATION

The Department of Communication is dedicated to advancing knowledge about communication and its practice in society. The department examines how meaning is created and negotiated in human interaction to address the personal, professional, and public communication challenges and opportunities posed by 21st century life. Students become leaders in private, public and civil sectors by developing a deep and practical appreciation of how communication shapes the world in which we live. Research from SC&I's renowned faculty experts examines the complexity of communication processes.

The undergraduate major in communication provides a broad education, covering ideas and applications in preparation for communication careers in business, education, or government, for the pursuit of graduate degrees in communication and other social science fields, or as a supplement for students whose primary interests are in other areas such as political science, computer science, business, human resources, health care, and more.

Available concentrations allow students to demonstrate targeted skills in the job market. They include:

- Communication and Technology
- Health and Wellness Communication
- Leadership in Organizations and Community
- Relationship and Family Communication
- Strategic Public Communication and Public Relations

Graduates from the undergraduate program in communication gain:

- Competency in written communication in varied settings (including interpersonal, family, group, health, organizational, or mediated settings).
- Ability to use communication theories and concepts to analyze human behavior (including interpersonal, family, group, health, organizational, or mediated settings)
- Ability to apply communication theories and concepts to social and professional life (including issues of diversity, ethics, and civic engagement)
- Understanding of fundamental communication perspectives, theories, and concepts
- Proficiency in gathering and using evidence to study and understand communication processes and consequences (including asking questions and systematically attempting to answer them, understanding the value and limitations of the research processes and conclusions)
- Competency in oral communication in varied settings (including interpersonal, family, group, health, organizational, or mediated settings)

**Career Opportunities**

Communication graduates find opportunities in a wide variety of careers in business, education, government, and the nonprofit sectors. Skills in oral and written communication are some of the most sought-after characteristics all employers look for when hiring. Radio and TV, advertising and public relations, publishing, sales, and financial services are but a few of the many areas in which these graduates find employment. Any work that involves communicating as its focal point is a potential career field. The communications industry is a competitive one, however, and experience gives everyone an extra advantage. The communication program offers internship opportunities for credit. In addition, an advanced degree can offer an edge, and the school offers a five-year bachelor's/master's program; for more information, see below.

**Admission to the Major**

Admission to the communication major is competitive; meeting the minimum requirements does not guarantee acceptance. Minimum requirements for admission include

- completion of at least 15 credits at Rutgers, or 15 transfer credits, with a grade-point average of 2.0 or better;
- a grade of C or better in the required prerequisite course 04:189:101 Introduction to Communication and Information Processes (or an equivalent transfer course);
- a grade of C or better in Expository Writing or an equivalent course or placement; and
- completion of the application including a well-written personal statement.

The admissions committee seeks the following when reviewing student essays: (a) evidence of your interest in the major; (b) your future plans and their relationship to the major; (c) your strength as a writer; and (d) any other qualities that make you a strong candidate for admission to the communication major. Applications are available on the school's website. Students may be admitted for the fall, spring, and summer semesters; check the website for application deadlines each year. Students are strongly encouraged to consult the school's website for up-to-date information regarding admissions procedures.

**Major Requirements**

*Prerequisite survey course required before admission to the major (3 credits):*

04:189:101 Introduction to Communication and Information Processes (3)

*SC&I interdisciplinary requirement (3 credits):*

Either
04:189:102 Introduction to Media Systems and Processes (3)
or
04:189:103 Information Technology and Informatics (3)

Requirements for the remaining credits in the major include:

*Core Requirements (15 credits):*

04:192:200 Communication Theory (3)
04:192:201 Communication in Relationships (3)
04:192:300 Communication Research (3)
04:192:380 Public Speaking (3)
*At least one of the following four classes:*
04:192:354 Communication and Technology (3) or
04:192:355 Interpersonal Communication (3) or
04:192:357 Organizational Communication (3) or
04:192:359 Persuasive Communication (3)

*Upper-level electives (15 credits):*

Upper-level elective courses may include all 300- and 400-level courses and must include at least two 400-level courses except those completed as part of the core requirements. Courses 04:192:491,492 Independent Study in Communication and 04:192:495 Applied Study in Communication may not be used to fulfill this or the total credit requirement in the major. Students should check the communication website or undergraduate handbook to determine prerequisites for 300- and 400-level courses and should speak with an adviser for help in planning coursework for the major.

*Optional specializations:*

- Communication and Technology
- Health and wellness communication
- Leadership in organizations and community
- Relationship and family communication

- Strategic public communication and public relations

The specializations are designed to provide essential knowledge of communication methods and techniques and help students build the necessary skills to start a career. The specializations require the same credits as the communication major in general, but are focused in one of the areas above. Specializations can be combined with additional coursework to better create a narrative around a student's skills and knowledge. Combining specializations can expand career opportunities further. See the webpage for the most current information and additional details: Here.

Students must earn a grade of C or better in all 04:192 courses in order for those courses to count toward the major.

**Internships and Other Educational Opportunities**

The department encourages students to pursue internship experiences that complement their studies and potential career choices. Students must be accepted into the communication major in order to enroll in the internship. Students may apply up to 3 internship course credits toward their upper-division course electives in the major. Additional internship credits may be earned but do not apply to the communication major. Note that each four-year school in the university sets its own limits regarding the number of experiential credits a student may apply toward graduation.

Further information about the internship and about other educational opportunities such as specializations in the major is available at the communication program website.

**Course Transfers**

Courses that students have taken at other New Jersey colleges, which are articulated through the NJ Transfer system and recorded on a student's transcript with a communication course number, will be counted toward the major.

Students who wish to have a course they have taken elsewhere at Rutgers or externally at another university considered as one of their required or elective courses in the communication major must submit a request for transfer equivalency in writing to the SC&I Office of Student Services. To submit such a request, the letter of petition must include a copy of the full syllabus of the course, a copy of the student's transcript showing the grade achieved, a note which communication course it is requested to replace, and the reasons for consideration. The courses are evaluated in terms of their very close match of content and skills to the communication course, the level of the course, and the grade achieved, which should typically be a C or better. Students will be notified in writing of the outcome of the petition.

**Dual-Bachelor's/Master's Degree Program for Communication Majors**

Communication majors in their junior or senior year may apply to the master's program in communication and media (M.C.M.) for a dual-B.A./M.C.M. program that allows completion of both degrees in as little as five years. If accepted, students may enroll in up to four M.C.M. courses during their senior year that will count toward both the undergraduate degree and the master's. Once the bachelor's degree is completed, students will be in the master's program and complete the requirements. Two to three semesters of full-time study, or four semesters of part-time study, would allow a student to complete the remainder of the master's program.

Admission requirements for the dual degree program are the same as for all M.C.M. applicants. Details about the application process and degree requirements are on the school's website.

# Planning and Public Policy Major (762, 762D) and Minor (EJB-U)

## PLANNING AND PUBLIC POLICY MAJOR (762, 762D) AND MINOR

### Planning and Public Policy Major (37 credits)

The Planning and Public Policy major (762, 762D) provides students with a foundation in areas such as city dynamics, environmental aspects of cities, community health, urban poverty, public policy, housing issues, social concerns, fiscal matters, and land use planning. Students are prepared for entry-level professional management and planning positions focused on overseeing and improving public programs, such as transportation, housing, planning, the environment, finance, economic development, and urban renewal. These career paths can be found in business, government, education, banking, and nonprofit settings. This program also prepares students for graduate education in public administration, public policy, and urban planning.

Upon completing all degree requirements, the student will receive the bachelor of arts (B.A.) degree.

### Rutgers School of Arts and Sciences and School of Environmental and Biological Sciences Students

This program is designed to accommodate the needs of traditional students at Rutgers University-New Brunswick.

Students in the School of Arts and Sciences (SAS) and students in the School of Environmental and Biological Sciences (SEBS) who wish to remain in their primary unit must apply for admission prior to declaring the major.

SAS students may pursue Planning and Public Policy as their first major and remain within SAS. SEBS students may pursue Planning and Public Policy as a second major to remain within SEBS.

Students can apply for the Planning and Public Policy major during one of our application cycles listed here. Applicants must have a minimum grade of 'C' or better in each of the prerequisite courses and be in good academic standing. The application may be found on the school's website.

Students are advised to declare the Planning and Public Policy major no later than their first semester of junior year to ensure completion of the major by their anticipated graduation date. **A minor program is required for this major.**

Only courses with a 'C' or better may be counted towards the major, and students must complete the core curriculum requirements of their primary school.

The most current information for the Planning and Public Policy major may be found on the Bloustein School website here.

## Transfer Students

This program is designed to accommodate the needs of transfer, adult, and nontraditional students.

Students seeking the Planning and Public Policy major must have at least 30 credits before applying to the Bloustein School. Successful applicants will have completed the prerequisite courses with a grade of 'C' or better, and have achieved an overall GPA of at least 2.5.

Current Rutgers students seeking a school-to-school transfer from another Rutgers unit, or students transferring to Rutgers from another college or university, must apply via the Rutgers Office of Undergraduate Admissions. Contact ugadmissions@ejb.rutgers.edu for more information.

Transfer students from New Jersey community colleges are encouraged to complete lower-division prerequisite courses and the associate's degree to benefit from the NJ Statewide Transfer Agreement.

Only courses with a 'C' or better may be counted towards the major. **A minor program is required for this major.**

For more information about transferring, please see the school's website.

## PLANNING AND PUBLIC POLICY MAJOR REQUIREMENTS (762, 762D)

(37 credits)

*Prerequisite Courses (9-10 credits)*

- 01:355:101 College Writing (3)
- 10:775:205 Basic Statistical Methods (4) or equivalent (3-4)
- 01:220:102 Introduction to Microeconomics (3)

***Major Requirements (762, 762D) (37 credits)***
***Core Courses (16 credits)***

- One of the following (3):
    - 01:220:103 Introduction to Macroeconomics (3)
    - 01:790:104 American Government (3)
    - 10:833:210 Principles of Public Policy (3)
    - 10:971:201 Intro to Urban Planning and Design (3)
- One of the following intensive writing courses (3):
    - 10:775:300 Writing for Professionals (3)
    - 01:355:302 Scientific and Technical Writing (3)
    - 01:355:303 Writing for Business and the Professions (3)

    - 01:355:315 Writing Grant Proposals (3)
- 10:775:395 Research Methods (4) *Open to majors only*
- 10:762:400 Internship with Seminar* (3) *Open to majors only*
- 10:762:499 Senior Seminar* (3) Open to majors only with at least 100 credits **and** no outstanding core requirements

** Students qualifying for departmental honors may replace 10:762:400 and 10:762:499 with 10:762:497, 498 Bloustein Honors Research.*

***Required Electives (21 credits)***

- 21 credits of electives from Bloustein School undergraduate courses, 15 credits of which must be at the 300-level or higher

Students interested in specific career paths should consider clustering their electives and seek advising early in their program of study.

## Joint BA/MCRP or BS/MCRP Program

Exceptional, well-prepared students from any Rutgers University-New Brunswick matriculating unit with a GPA of 3.5 or higher, exceptional GRE scores, a dedication to public service and outstanding recommendations who wish to study urban planning are encouraged to seek advising about the 3-1-1 master of city and regional planning (M.C.R.P.) program. Contact ugadmissions@ejb.rutgers.edu for more information.

## Planning and Public Policy Minor (18 credits)

The Bloustein School welcomes current and prospective Rutgers-New Brunswick students to consider the Planning and Public Policy minor. Students should declare a minor with their matriculating school. They need not apply for minor status with the Bloustein School. Only courses with a grade of 'C' or better can be counted toward the minor program of study.

This minor is well-matched to majors in economics; labor studies & employment relations; political science; geography; sociology; urban planning and design; as well as the pre-law track.

Students seeking the Planning and Public Policy minor must complete three core courses and five elective courses in course code 762, excluding those designated for 'majors only'.

- 10:775:101 Introduction to Planning, Policy and Health (3)
- Five electives selected from all the undergraduate Bloustein courses that are open to non-majors. At least four of the five must be 300 or 400-level.

For the most current configuration of courses for the Planning and Public Policy minor, please see the school's website here.

## Planning and Public Policy Certificate Programs

The Bloustein School currently offers four Planning and Public Policy certificates open to all Rutgers-New Brunswick undergraduates. Certificate programs are open to students in any major and are awarded with, or subsequent to, a bachelor's degree. Only courses with a C or better may be applied toward a certificate program.

*Certificates do not qualify as a minor.* **Students must declare their intention to pursue a certificate program with the Bloustein School before their last semester of study in order to qualify to receive a certificate.** Awarded certificates appear on the student's final transcript.

For the most current configuration of courses for each certificate, please see the school's website here.

- Community Development Certificate (24 credits)
- Community Sustainability Certificate (18 credits)
- Urban Planning Certificate (24 credits)
- Historic Preservation Certificate (15 credits)

# Comparative Literature 195 (SAS)

## COMPARATIVE LITERATURE 195

Program in Comparative Literature, School of Arts and Sciences

**Website:** http://complit.rutgers.edu

**Chair:** Ben Sifuentes-Jáuregui

**Undergraduate Director:** Karen Elizabeth Bishop

**Program Coordinator:** Fatimah Fischer

**Core Faculty:**

Ousseina Alidou, B.A., Niamey (Africa); M.A., Ph.D., Indiana

Nicola Behrmann, M.A., Free University Berlin; Ph.D., New York

Karen Elizabeth Bishop, B.A., Ph.D., California (Santa Barbara)

Lauren Goodlad[KS1] , B.A., Cornell; M.A. NYU; Ph.D., Columbia

Martha Helfer, B.A., Washington (St. Louis); M.A., Wisconsin (Madison); Ph.D., Stanford

E. Khayyat, B.A. Istanbul; M.A. Istanbul & Columbia; Ph.D., Columbia

Jeffrey Lawrence[KS2] , B.A. Amherst College; Ph.D. Princeton

Michael Levine, B.A., Cornell; M.A., Ph.D., Johns Hopkins

Preetha Mani, B.A., Tufts; Ph.D., California (Berkeley)

Jorge Marcone, B.A., Pontificia Universidad Católica del Perú; M.A., Ph.D., Texas

Susan Martin-Márquez, B.A., M.A., Chicago; Ph.D., Pennsylvania

Anaïs Maurer, B.A. Sorbonne; M.A. Sorbonne & Tulane; Ph.D. Columbia

Anjali Nerlekar, B.A., M.A., M.Phil., Pune (India); Ph.D., Kansas

Andrew Parker, B.A., Princeton; M.A., Ph.D., Chicago

Nicholas Rennie, B.A., Princeton; Ph.D., Yale

Richard Serrano, B.A., Stanford; M.A., Ph.D., California (Berkeley)

Ben Sifuentes-Jáuregui, B.A., M.Phil., Ph.D., Yale

James Swenson, B.A., Brown; M.A., Ph.D., Yale

Emily Van Buskirk, B.A., Princeton; Ph.D., Harvard

Alessandro Vettori, Dottore in Lettere, Firenze (Italy); Ph.D., Yale

Janet Walker, B.A., Wisconsin; M.A., Ph.D., Harvard

Xiaojue Wang, B.A. Peking (China); M.A, Peking (China); M.Phil, Ph.D., Columbia

**Affiliate Faculty:**

Ed Cohen, A.B., Georgetown; Ph.D., Stanford

Paola Gambarota, Ph.D., Pavia (Italy); Ph.D., Yale

Jae Won Edward Chung, B.A., Swarthmore; M.A., Ph.D., Columbia

Daniel Da Silva, Ph.D., Columbia

Ryan James Kernan, A.B., Princeton; Ph.D., California (Los Angeles)

Pavel Khazanov, B.A., California (Los Angeles); M.A., London; Ph.D., Pennsylvania

Chloe Kitzinger, B.A., Yale; M.A., Middlebury; Ph.D., California (Berkeley)

Benjamin Koerber, B.A., Indiana; M.A., Ph.D., Texas

Julie Rajan, B.A., Johns Hopkins; M.A., Rutgers; M.L.A., Pennsylvania; Ph.D., Rutgers

Dominik Zechner, M.A., Vienna; M. Phil., Ph.D., New York

Ann Jurecic, B.A., Bryn Mawr College; M.A.T., Brown; Ph.D., Princeton

Mukti Mangharam, B.A., York (UK); M.Phil., Cambridge; Ph.D., Cornell

Louis Sass, B.A., Harvard; M.A., Ph.D., California (Berkeley)

Louisa Schein, B.A., Brown; M.A., Ph.D., California (Berkeley)

Meheli Sen, B.A., M.A., Jadavpur (India); Ph.D., Emory

Weijie Song, B.A., Xi'an Jiaotong (China); M.A., Ph.D., Peking (China); Ph.D., Columbia

Michelle Stephens, B.A., SUNY (Stony Brook); Ph.D., Yale

Andrea Baldi, B.A., Firenze; Ph.D., California (Los Angeles

Camilla Stevens, B.A., Tulane; M.A., New Mexico; Ph.D., Kansas

Wendy Swartz, B.A., California (San Diego); M.A., Ph.D., California (Los Angeles)

Comparative literature is an interdisciplinary program that studies global literary and cultural expressions as they shape and are shaped by science, economics, religion, politics, sexuality, and other historical forces. It attracts students with wide-ranging interests in literature, theory, cultural and media studies, and who wish to read literature in the original language as well as in translation. Students are urged to begin or continue the study of a language other than English, and to study abroad.

The program offers students the opportunity to design an individualized and interdisciplinary major and minor. Students generally begin with Literature across Borders (01:195:201), a course whose theme changes every year and whose weekly lectures are taught by different members of the program¿s core faculty. Students then choose 200- and 300-level courses in comparative literature and other programs that reflect their individual focus. Since students have different preparations and interests, no two pathways through the program are identical. Students might choose as their focus, for example, topics such as a national language and literature, the novel or film studied across cultures, cultural theories and philosophy, literature in relation to art and/or film, or two national literatures. Because of the individualized nature of the major, students are required to confer with the undergraduate director at least once each semester during the registration period.

Comparative literature core faculty members are accomplished scholars and devoted teachers. Many have won awards for their teaching and scholarship from Rutgers and around the world. The major and minor programs offer students the opportunity to work closely with these professors, who are from a wide range of departments, including African, Middle Eastern, and South Asian Languages and Literatures (AMESALL); Asian Languages and Cultures (ALC); English; French; German; Russian and East European languages and Literatures (REELL); Italian; Latino and Caribbean Studies; and Spanish and Portuguese. Core faculty members are available to mentor students and serve as advisers of honors theses.

Because of the intensive training in analytical thinking and writing, undergraduates who major or minor in comparative literature often go on to study literature or related fields in graduate school, attend law school, or find employment in a wide variety of professional fields such as publishing, business, and government service.

Comparative Literature 195 (SAS)

# Learning Goals

# Learning Goals

Students in comparative literature will demonstrate familiarity with a variety of world literatures, as well as with methods of studying literature and culture across national and linguistic boundaries. They will learn how to evaluate the nature, function, and value of literature from a global perspective; demonstrate critical reasoning and research skills; design and conduct research in an individual field of concentration (such as literary or critical theory, women's literature, postcolonial studies, film and media studies, etc.); and analyze a specific body of work and write clear and well-developed papers or design projects about a topic related to more than one literary and cultural tradition.

Comparative Literature 195 (SAS)

# Major Requirements

# Major Requirements

**Major in Comparative Literature: 34 credits**

All majors take the three core courses in the discipline of comparative literature. They organize the rest of their courses, taken in both comparative literature and in related fields, into a coherent, individualized program, in regular consultation with and subject to the approval of the undergraduate director.

*Core Courses (7 credits)*

01:195:201 Literature across Borders (3)

01:195:301 Introduction to Literary Theory (3)

01:195:394 Jr. Sem/Tpc Comp Lit (3)

*Foreign Literature Requirement (9 credits)*

Two courses at the 200 level or above in a national or regional literature (6)

One course on a literature from outside the European and Anglo-American literary traditions (3)

*Major Focus (18 credits)*

Six further courses at the 200 level or above in a foreign language, a foreign literature, film, or cultural studies, including two courses at the 300 level or above in comparative literature (18).

Grades of C or better must be earned in the above courses used to fulfill the requirements of the major.

**Advanced Studies in Comparative Literature: 45 credits**

Students wishing to achieve a wide knowledge of world literatures and cultural theories may choose this option. All students in the Advanced Studies in Comparative Literature option take five core courses in comparative literature. They organize the rest of their courses, taken in both comparative literature and related fields, into a coherent, individualized program, in regular consultation with and subject to the approval of the undergraduate director.

*Core Courses (15 credits)*

01:195:201 Literature across Borders (3)

01:195:203 Masterworks of Western Literature (3)

01:195:301 Introduction to Literary Theory (3)

01:195:307 Introduction to Postcolonial Literatures and Theories or one course on the 200 or 300 level in a non-European literature: examples are African, Caribbean, East Asian, Latin American, Middle Eastern, South Asian (3)

01:195:394 Sem/Tpc Comp Lit (3 )

*Foreign Languages and Literature Requirement (at least 15 credits)*

Three literature courses (9 credits) from a single national or regional literary tradition other than English or American. At least two of these must be taught in the original language.

Two courses (or at least 6 credits) in either language or literature taught in a language other than English.

*Major Focus (9 credits)*

Students select an area of concentration, such as period, region, theoretical approach, or theme (for example: gender/sexuality, colonialism/decoloniality, migration, translation, etc.) and choose a group of at least three courses (9 credits) in this area. One of these must be a comparative literature course at the 300 level or above. Two additional relevant courses may be chosen from other departments in the humanities or social sciences.

Grades of C or better must be earned in the above courses used to fulfill the requirements of the major.

*Senior Thesis (6 credits)*

Students write a final thesis related to the area of concentration and enroll in 01:195:495,496 Honors in Comparative Literature (3,3). Grades of B+ or better must be earned in the two Honors courses.

# Minor Requirements

# Minor Requirements

Minor Requirements

Minor Requirements: 18 credits

All minors take two core courses in the discipline of Comparative Literature: Literature Across Borders (201) and Introduction to Literary Theory (301). Please see below for more information about when these required courses are offered. If a course runs once per year, be sure to check the schedule of classes to see if it's running and/or reach out to the DUS for further information.

Minors in Comparative Literature are required to fill out and submit the above checklist every year by 1 November to the DUS to make sure they're on track. It is recommended you do so for the first time by at least fall of your junior year. If you have not done so by the beginning of your senior year, reach out for an advising appointment ASAP. Not meeting with the DUS to approve your checklist may mean that you will not be on track to graduate.

Please see below for more information about when the required courses for both the Major and Advanced Major are offered. If a course runs once per year, be sure to check the schedule of classes to see if it's running and/or reach out to the DUS for further information.

The minor consists of 18 credits of coursework in Comparative Literature:

Core courses (6 credits)

01:195:201 Literature across Borders (3) :: OFFERED ONCE PER YEAR, IN EITHER FALL OR SPRING

01:195:301 Introduction to Literary Theory (3) :: OFFERED ONLY IN THE FALL SEMESTER

Electives (12 credits)

Four other courses in Comparative Literature, chosen in consultation with and approved by the undergraduate director. One of these may be at the 100 level, and one must be at the 300 level or above. (12)

Grades of C or better must be earned in all courses used to full the requirements of the minor.

A minor in Comparative Literature may not count more than 3 credits towards both the CompLit minor and another minor or major.

Minor in Translation Studies:18 credits

Foundational Courses (6 credits)

01:195:303 Introduction to Translation Studies (3)

Senior Seminar in Translation Studies

Elective Courses (12 credits)

Four courses

Comparative Literature 195 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To graduate with Honors in Comparative Literature, students must complete a thesis, which will be evaluated by a director and a second reader. Students will receive 3 credits each semester for independent work on the thesis. A grade of B+ or better is required in the two Honors in Comparative Literature courses (01:195:495,496).

To qualify, at the end of their junior year majors must have a cumulative grade-point average of 3.0 or better, and a grade-point average of 3.5 or better in the major. They must have their topic approved as adequate for an honors thesis by their chosen thesis director and the undergraduate director. Such approval is usually required by the end of the spring semester of the junior year and in no case later than the end of the add/drop period of the first semester of the senior year.

Comparative Literature 195 (SAS)

# Courses

# Courses

**01:195:101** ***Introduction to World Literature (3)***
Study of outstanding works of fiction, plays, and poems from European, North and South American, African, Chinese, Japanese, Indian, and Middle-Eastern literature through a chosen theme. Focus on questions of culture, class, gender, colonialism, and on the role of translation.

**0:195:110** ***Introduction to Heritage Culture and Language Studies (3)***
Analysis and understanding of cognitive, social, and cultural aspects related to bilingual speakers of a minority language in a majority-language society. A hybrid online course.
***Credit not given for both this course and 01:940:110.***

**01:195:120** ***Global Science Fiction (3)***
Novels, short stories, and films from around the globe in the genre of science fiction. Works approached as experiments in the narrative imagination of world-making and -unmaking; and for the light they shed on the relation between science and fiction in different global contexts over the past two centuries. Attention also given to language, environment, nation, race, gender, and sexuality as aspects of fictional worlds.

**01:195:135** ***Short Fiction (3)***
Study of various genres of short fiction, in English translation, by some of the most important writers in world literature. Course themes focus on the city, the nation, migration and exile, colonialism, science fiction, the fantastic, magical realism, horror, mystery, among others.

**01:195:137** ***The Haunted (3)***
Examines what haunts us, both from within and without. Different approaches to understanding our own ghosts--as individuals and as a society--by turning to what haunts some of the key works of modern Western literature.

**01:195:140** ***Being Human (3)***
Definitions in literature and film of what it means to be human. Ancient conceptions of the ideal human being; early modern and modern definitions of the human in relation to ethnic others, animals, aliens, and machines.

**01:195:145** ***Heroes and Heroines (3)***
An introduction to the heroic dimension of human life as represented in literature.

**01:195:150** ***World Mythology (3)***
Story, structure, and meaning in myths of many cultures. Myth as a primary literary phenomenon, with some attention to anthropological and psychological perspectives.

**01:195:170** ***The Art of Comparison (1.5)***
An introduction to the arts and methodologies of comparison as practiced in the field of comparative literature, through topics that change each time the course is offered. Topics include love, envy, greed, etc. Development of skills in close reading and writing through an exposure to literary texts from a variety of cultures, as well as the capacity to reflect on the role that the topics play in students' own lives.

**01:195:201** ***Literature across Borders (3)***
Concept and practice of comparative literature across historical periods, cultures, and genres. Topics vary from year to year: war, metamorphosis, friendship, sex, being human, poison, the forbidden, translation and love, among others.

**01:195:203** ***Masterworks of Western Literature (3)***
Journey through Western literature from its beginnings to the 21st century. The epic, love poetry, drama, novels, and short novels. Classic Greek and Roman, medieval, Renaissance, modern French, German, English, and Russian literatures. European literary texts in their literary and sociopolitical contexts. All works read in translation.

**01:195:204** ***Masterworks of World Literature (3)***
Key works of literature from a variety of literary traditions, Western and non-Western, modern and ancient. Topics such as class, gender, politics, time, identity, and translation. All works read in translation.

**01:195:206** ***Banned Books (3)***
Global history of censorship with a focus on the political and cultural contexts of countries like the USA, Niger, Egypt and India. How ideas in great books have been suppressed through debates about sedition, blasphemy, obscenity, and sexuality and strategies that people used to undermine that suppression, such as book smuggling, underground markets, exile and translation.
***Credit not given for this course and 01:013:206.***

**01:195:216** ***Introduction to World Literatures in English (3)***
Survey of English language literatures, including Asian, African, and Caribbean, in a global context.
***Credit not given for both this course and 01:351:216.***

**01:195:220** ***Our World: Social Justice and the Environment (3)***
Study of the imagining of human/nonhuman relationships in recent social movements as represented in world literature, film, visual arts, and digital social networks. Interpretation of these representations within their cultural traditions, and in dialogue with local, regional, or planetary environmental changes and activism.

**01:195:221** ***Introduction to the Literatures of the Middle East (3)***
Literatures of the Middle East from their origins to the present.
***Credit not given for both this course and 01:013:221 or 01:685:221.***

**01:195:227** ***Tales of Horror (3)***
Examination of historical and political context, and psychoanalytical underpinnings, of horror tales in literature and film of the Western tradition from Brothers Grimm to Alfred Hitchcock. Focus on some of the most spellbinding creatures from this tradition: Frankenstein and Dracula, vampires and zombies, Doppelgängers, ghosts, artificial humans, and other figures that continue to haunt the cultural imagination.
***Credit not given for both this course and 01:470:227.***

**01:195:230** ***Modern Jewish Culture: Key Texts and Their Afterlives (3)***
Examines four key texts, written between 1894 and 1944, that have become fixtures not only of modern Jewish culture but also of world culture, primarily through adaptations and remediations in stage, film, broadcasting, music, and visual art.
***Credit not given for both this course and 01:563:230.***

**01:195:231** ***Masterpieces of Hispanic Literature in Translation (3)***
Reading and interpretation of outstanding Hispanic writers.
***Credit not given for both this course and 01:940:241. Prerequisite: 01:940:201, 202, 203, or 204 only for students who wish to count this course for the Spanish major or minor, and if all written work is done in Spanish.***

**01:195:232** ***Women Writers of South Asia (3)***
Survey of recent writings by women from a variety of cultural, linguistic, and regional areas of South Asia.
***Credit not given for both this course and 01:013:232 or 01:098:232.***

**01:195:233** ***Understanding the French Enlightenment (3)***
Critical examination through major philosophical and literary works of the history, concepts, and values of the French Enlightenment, with particular emphasis on their relevance in past and present debates about civil society, political institutions, nature, morality, artistic creation, scientific progress, religion, and changing notions of selfhood. Taught in English.
***Credit not given for both this course and 01:420:230.***

**01:195:235** ***Detective Stories (3)***
The detective story in its historical and philosophical context. The formal logic of the 19th- and early 20th-century detective story examined in respect to concepts such as identity, action, time, and social agency in works by American, Argentinian, British, French, and German authors. All non-English texts read in translation.

**01:195:237** ***Arabic Classical Literatures (3)***
Survey of a wide selection of Arabic literary texts in translation, dating from the sixth to the twelfth centuries, including poetry and prose in both classical and colloquial Arabic.
***Credit not given for both this course and 01:013:343. All works studied in translation.***

**01:195:240** ***Animals and Humans (3)***
Animals and humans in global literary and filmic texts. Animals as moral teachers; symbolic animals; animal narrators; humans turning into animals in metamorphosis stories; and ecofeminist versions of human-animal relations.

**01:195:241** ***Masterpieces of Modern Greek Literature (3)***
Reading and discussion of great works of modern Greek literature including short stories, poetry, the novel, and film.
***Taught in English translation. Credit not given for both this course and 01:489:241 or 01:489:340.***

**01:195:242** ***The Portuguese-Speaking World: A Literary Introduction for English Speakers (3)***
Introduction to literary texts from the Portuguese-speaking world (Portugal, Brazil, and Lusophone Africa).
***Credit not given for both this course and 01:810:242.***

**01:195:243** ***Introduction to the Literatures of South Asia (3)***
Literatures of South Asia from their origins to the present. All works studied in translation.
***Credit not given for both this course and 01:013:231.***

**01:195:244** ***Introduction to Myth (3)***
Myths of various cultures; their structures and functions in social and especially literary contexts.
***Credit not given for both this course and 01:351:244 or 01:358:244.***

**01:195:245** ***Introduction to Folklore (3)***
Major genres of folklore, including folktale, folk song, and legend, with attention to the methods of collecting and analyzing these materials.
***Credit not given for both this course and 01:351:245 or 01:358:245.***

**01:195:246** ***Fairy Tales Then and Now (3)***
Analysis of structure, meaning, and function of fairy tales and their enduring influence on literature and popular culture.
***Credit not given for both this course and 01:470:225.***

**01:195:247** ***PSY-FI: Literature and Psychoanalysis (3)***
Key psychoanalytical concepts explored through readings of literature, film, case studies, and literary theory.
***Credit not given for both this course and 01:470:247.***

**01:195:249** ***Modern Literatures of South Asia (3)***
Literary works from modern South Asia.
***Credit not given for both this course and 01:013:331. All works studied in translation.***

**01:195:250** ***Comparative Approaches to African Literatures (3)***
Reading and discussion of literature in translation from different geographic, linguistic, and cultural areas of Africa.
***Credit not given for both this course and 01:016:250.***

**01:195:251** ***Major French Writers in Translation (3)***
Landmarks of French literature from the Renaissance to the present. Plays, novels, and essays of such authors as Molière, Voltaire, Rousseau, Balzac, Flaubert, Sartre, and Camus.
***Credit not given for both this course and 01:420:241 or 01:420:242.***

**01:195:255** ***The City and Literature (3)***
Reading and discussion of different forms of representation of major cities in the United States, South America, Europe, and East Asia. Analysis of poetry, short stories, novels, film, and critical essays with emphasis on the similarities and differences between discourses about urban centers such as Paris, New York, London, Mexico City, São Paulo, Moscow, Tokyo, and Shanghai.

**01:195:257** ***The Postcolonial City (3)***
Study of literary and cultural representations of cities around the postcolonial world. Discussions regarding issues of community, violence, migration, displacement, homelessness, mass communication, and mass transportation.

**01:195:258** ***From Nietzsche to Superman (3)***
Examination of transformation of Nietzsche's Ubermensch ("overman") into the American Superman heroes of our contemporary culture. Analysis of impact of this motif on gender studies, animal studies, and contemporary media technologies, i.e. Hitler's racist Aryan superman and its dismantling in modern art; female versions of Superman such as Wonder Woman or the "material girl" in pop culture; figures of the "outlaw", the "idiot", and the cyborg.
***Credit not given for both this course and 01:470:254 or 01:470:258.***

**01:195:260** ***Introduction to Caribbean Literature (3)***
Reading and discussion of poetry, prose, and drama by major literary figures representative of different histories and cultures of the Caribbean and its diaspora.
***Credit not given for both this course and 01:595:270 or 01:940:270.***

**01:195:261** ***Introduction to Theater (3)***
Survey of various genres of theater across multiple cultures; theater's function in social and literary contexts.

**01:195:262** ***Life Writing in France (3)***
Critical interpretation of autobiographical texts, with particular attention to the distinction of fact and fiction, and theories of subjectivity, identity, and memory.
***Credit not given for both this course and 01:420:261.***

**01:195:267** ***Latino Literature (3)***
Latino experiences in the United States through literary voices drawn from the Mexican, Puerto Rican, Dominican, Central American, and Cuban diasporas and native cultures. Topics include: cultural identity, hybridity, mestizaje, border writing, transnationalism, transculturation, language appropriation, subversion and negotiation, and gender issues.
***Credit not given for both this course and 01:595:267.***

**01:195:268** ***Walking in the City (3)***
Representations of walking in modern European culture. Readings: Baudelaire, Calvino, Serao, Mansfield, Marinetti, Ortese, and Woolf. Screenings: Rossellini, De Sica, Sorrentino. Taught in English.
***Credit not given for both this course and 01:560:268.***

**01:195:269** ***Dominican Literature (3)***
Study of the development of Dominican literature from the Spanish colonial period to the present. Emphasis on major writers such as Columbus, Pané, Galván, Bosch, Alvarez, Danticat, Andújar, Rita Indiana, and Junot Díaz.
***Credit not given for both this course and 01:595:269 or 01:940:331,332. Reading knowledge of Spanish recommended.***

**01:195:270** *Past Today (3)*
Analysis of 21st-century conflicts through historical context, using literature, film, and the visual arts, music, architecture, and other forms of cultural production.

**01:195:271** *Resisting Petrocapitalism: Oceanians against Climate Collapse (3)*
Analysis of how literary works of the Pacific Islands¿ Indigenous activists across Oceania denounce the entanglement of capitalism, imperialism, and environmental crises and use their strategic position at the heart of the global fluxes of oil, goods, and capital transiting between Asia and North America to challenge petrocapitalism and the military industrial complex protecting it.Credit not given for both this course and 01:988:261.

**01:195:272** *Russia: Between Empire and Nation (3)*
Study of Russia's imperial culture, history, and politics from the 19th to the 21st century as a window onto geopolitical shifts in contemporary Russia's relations to the wider world.
*Credit not given for both this course and 01:510:277 or 01:860:272.*

**01:195:274** *Major French Plagiarists: Literature between Repetition and Originality (3)*
Critical examination of the history and practice of literary plagiarism, with particular emphasis on the pre-modern tradition of imitation and past and present debates about originality, creativity, plagiarism, and changing values of authorship.
*Taught in English. Credit not given for both this course and 01:420:272.*

**01:195:276** *Realism and Revolution (3)*
Introduction to 19th-century German literature and its response to and critical reflection of the French Revolution.
*Taught in English. Credit not given for both this course and 01:082:276 or 01:470:276.*

**01:195:277** *Radical Modernism and Anti-Art (3)*
Introduction to the major movements and protagonists of the early 20th-century European avant-garde--Expressionism, Futurism, Dada, Surrealism--and the impact of these movements on Pop Art and Punk Rock of the 1960s and 1970s. Includes examples from visual works (Kirchner, Kandinsky, Duchamp, Ernst), literature (Wedekind, Ball, Marinetti, Apollinaire), and cinema (Murnau, Richter, Buñuel, Warhol).
*Taught in English. Credit not given for both this course and 01:470:277 or 01:470:358.*

**01:195:280** *Textual Transformations (3)*
Introduction to a broad range of possible textual transformations such as literary translation, film adaptation, transcription, ekphrasis, and dramatization. Discussions regarding notions of originality and derivation and examination of the ways artists use form to domesticate, subvert, celebrate, or modernize other artists' works.
*Credit not given for this course and 01:195:303.*

**01:195:282** *Music, Culture, and Memory in the French-Speaking World (3)*
The place of music in French and Francophone culture, with particular attention to its role in historical events and in the way they are remembered.
*Credit not given for both this course and 01:420:282.*

**01:195:295** *Latino and Caribbean Cultural Studies (3)*
Comparative study of Latino and Caribbean cultures. Reviews key definitions of culture, historical and disciplinary evolution of the term, and key debates on cultural studies in the humanities.
*Credit not given for both this course and 01:595:295 or 01:050:295.*

**01:195:296** ***A Cultural History of Artificial Intelligence (3)***
A cultural-critical analysis of the notion of artificial intelligence, particularly as it relates to race, gender, and agency in multicultural and non-Western contexts. Analysis of the intellectual history within which our contemporary perceptions of artificial intelligence evolved via a survey of the history of computing and representations of artificial intelligence in fiction, cultural criticism, and film.

**01:195:301** ***Introduction to Literary Theory (3)***
An examination of theoretical concepts and contexts that constitute and frame contemporary views of literature. Critical analysis of formalist, psychoanalytic, structuralist, poststructuralist, Marxist, and feminist approaches to theory and literature. Structured to familiarize students with recent debates in critical and cultural theory.

**01:195:302** ***Writing in the Discipline: Literary and Cultural Studies (3)***
Advanced writing course for students of literature and humanities. Introduction to research methods, library resources, and scholarly writing in general. Assignments include writing abstracts, book reviews, research papers, and preparation for longer writing projects such as honors theses and sample writings for admission to graduate school.
***Prerequisite: One second-level writing course or permission of the undergraduate director.***

**01:195:303** ***Introduction to Translation Studies (3)***
Introduction to the main themes and issues in contemporary Translation Studies.
***Taught in English. Credit not given for this course and 01:013:304 or 01:195:280.***

**01:195:304** ***Fiction and Ideology (3)***
Fictional narratives as statements about social order. Texts by major thinkers such as Marx, Lukács, Goldmann, Benjamin, and Williams.

**01:195:305** ***Readings in Latin American Literature and Theory (3)***
Analysis of Latin American literature as theory and criticism. Close readings of texts in Anglo-American and French criticism alongside Latin American literary and cultural production to compare the relationship and articulation of these different theoretical modes.

**01:195:306** ***Literature and Cultural Conquest (3)***
Dissemination and reception of hegemonic literatures: the function of travel literature; the transformation and appropriation of popular cultures.
***Credit not given for both this course and 01:353:326 or 01:359:345. 01:353:326 may be counted for major core requirement with permission of undergraduate director.***

**01:195:307** ***Introduction to Postcolonial Literatures and Theories (3)***
Study of novels, poetry, essays, and films from regions of the world deemed postcolonial, which may include Africa, Latin America, South and Southeast Asia, and the Caribbean. Discussion of major issues in postcolonial theory and criticism.
***Credit not given for both this course and 01:013:307.***

**01:195:308** ***Gender, Race, and Textual Imagination (3)***
Literature as the privileged representation of the other. The connection between the form(s) of creative writing and the evolution of the notion of sexual and/or racial differences.

**01:195:309** ***Major Literary Trends (3)***
Survey of major literary periods or movements such as classical, medieval, Renaissance, romanticism, realism, and naturalism.

**01:195:310** ***Literary Institutions (3)***
Literature as a socially determined phenomenon. The historical evolution of the status of the writer, the work, the critic, and the vicissitudes of the dissemination of literary writing in various societies.

**01:195:311** ***Dostoevsky (3)***
Major works in historical, intellectual, and aesthetic contexts. *The Brothers Karamazov*, *Crime and Punishment*, *Notes from Underground*, and short works. All readings and discussion in English.
***Credit not given for both this course and 01:860:330.***

**01:195:312** ***Russian and East European Science Fiction (3)***
Exploration of the 19th-21st-century tradition of Russian and East European science fiction in literature and film. Discussions include the problem of utopia, new technologies and how they transform our understanding of the human, alien encounter narratives, and more. No prerequisites. Course taught in English.
***Credit not given for this course and 01:860:326.***

**01:195:314** ***German and Comparative Literature (3)***
Examination of the literary and artistic traditions of German-speaking Europe as they relate to the social, technological, religious, political and linguistic histories of both these regions, and those of other cultures with which these traditions have, historically, been in dialogue.
***Credit not given for this course and 01:470:304.***

**01:195:315** ***Dante and Medieval Culture (3)***
Dante's work in historical perspective: theological antecedents, memory of the classical writers, and new profane literary experience.
***Credit not given for both this course and 01:560:315.***

**01:195:316** ***Politics, Literature, and the Arts (3)***
Discussion and analysis of political elements in selected aesthetic works. Themes vary according to instructor.
***Credit not given for both this course and 01:790:316.***

**01:195:318** ***Postmodern Approaches to Sacred Literature (3)***
Postmodern literary analysis of religious texts drawn from Jewish, Christian, and Hindi traditions.
***Credit not given for both this course and 01:840:362.***

**01:195:319** ***Unraveling Race in Latino and Latin American Studies (3)***
Study of the history and cultural representation of race and ethnicity in Latin American and Latino Studies from the colonial period to the present. Emphasis on major writers working with race, miscegenation, and radicalization.
***Credit not given for both this course and 01:595:319.***

**01:195:320** ***World Cinema I (3)***Developments in French, Italian, British, Russian, and other national cinemas from 1896 to World War II; also examines cross-influences between foreign and American cinema.
***Credit not given for both this course and 01:354:320 or 01:175:320.***

**01:195:321** ***World Cinema II (3)***
Major developments in global filmmaking from the 1950s to the present, with an emphasis on specific national and transnational cultures and their industrial and artistic practices.
***Credit not given for both this course and 01:354:321 or 01:175:321.***

**01:195:324** ***Twentieth-Century Literature in a Global Context (3)***
Twentieth-century writing in English other than British and American.
***Credit not given for both this course and 01:350:378 or 01:358:361.***

**01:195:326** ***Sexuality and Literary Studies (3)***
Survey of how sexual identities (gay, lesbian, transgender, queer, and others) relate to narrative and cultural theory.
***Credit not given for both this course and 01:351:315.Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:195:327** ***Women's Traditions in Literature (3)***
Focus on the social context of a feminine literary tradition and the relationship between gender and genre.
***Prerequisite: One course in women writers or permission of instructor.***

**01:195:329** ***Japanese Selves, Western Others (3)***
The Japanese gaze on European and American concepts, people, and objects in fiction from the late 19th century to the present. Japanese identity defined through the encounter with the Western Other.

**01:195:330** ***Literature and Culture of Brazil (3)***
Reading and discussion of selected works of fiction and nonfiction with emphasis on their place in the development of Brazilian literature and their relationship to Brazilian culture.
***Credit not given for both this course and 01:810:330.***

**01:195:331** ***The Novel, East and West (3)***
The novel of the last one hundred years as a cross-cultural form. Comparison of novels from America, Europe, Asia, India, and Africa.

**01:195:332** ***The Samurai Tradition in Japanese Literature and Film (3)***
The samurai warrior as a focus of cultural and political expression in Japanese literature and cinema. Supplementary readings on samurai culture and thought.
***Credit not given for both this course and 01:565:320.***

**01:195:333** ***Modern Writers and East Asia (3)***
Influence of Asian literature and philosophy on the development of Western poetry, drama, and fiction of the 20th century. Works include poems of Pound, Brecht, and Gary Snyder; plays of Yeats and Brecht; novels of Forster, Conrad, and Hesse.

**01:195:336** ***Literatures of Migration, Immigration, and Diaspora (3)***
Writings that foregrounds representations of place, community, and identity in relation to national and international movement and displacement.
***Credit not given for both this course and 01:351:366 or 01:358:384.***

**01:195:337** ***Literature and Memory in the Arab World (3)***
Explores the interconnections between memory and literature in the Arab world through close readings of memoirs, novels, poems, short stories, films, and graphic art.
***Credit not given for both this course and 01:013:346 or 01:685:347.***

**01:195:338** ***Caribbean Pluralities and Indo-Caribbean Literature (3)***
A study of some of the major canonical works of the Anglophone Caribbean and Indo-Caribbean writers.
***Credit not given for both this course and 01:013:335 and 01:595:335.***

**01:195:340** ***Renaissance and Baroque (3)***
Intellectual currents and representative works, including epic, lyric, prose fiction, and drama of the European Renaissance. Readings from Marlowe, Rabelais, Montaigne, Erasmus, More, and others.

**01:195:341** ***European Neoclassicism (3)***
European literature in the 17th and early 18th centuries and its connections with political, philosophical, and scientific thought of the time. Authors include: Galileo, Descartes, Corneille, Molière, Milton, Dryden, Pope, and Grimmelshausen.

**01:195:342** ***The Romantic Movement (3)***
Intellectual currents and representative works, including lyric, fiction, and drama of the European romantic movement. Major romantic texts of France, Germany, and Russia.

**01:195:345** ***From Dostoevsky to The Wire: Serial Storytelling across Media (3)***
Investigation of serial narrative as a modern mode of storytelling, from the emergence of the serial novel in 19th-century Europe and Russia through 21st-century American serial television and podcasts. Exploration of the enduring power of this narrative form, in multiple media, to interweave fiction with the course of current events and the rhythms of everyday life. All readings and discussions in English.
***Credit not given for both this course and 01:860:345 or 01:359:347.***

**01:195:346** ***Classical Backgrounds of Literature (3)***
Influence on literature of classical Greek and Roman epic, tragedy, comedy, and other literary forms.
***Credit not given for both this course and 01:351:317 or 01:358:302.***

**01:195:347** ***The Life and Works of Odysseus Elytis (3)***
Examination of the works of Odysseus Elytis; the writers and artists who influenced his work.
***Credit not given for both this course and 01:489:347.***

**01:195:348** ***Stories of Russian Life: Memory, Invention, Experience (3)***
Examination of how Russian writers have imagined and represented the self in various kinds of life narratives (autobiography, diary, memoir, and semifiction). Memory and invention, history and personality, genre and technique, from the medieval era to the present, with emphasis on the 20th century.
***Taught in English. Credit not given for both this course and 01:860:348.***

**01:195:349** ***The Bible and Western Literature (3)***
Influence of the King James and other versions of the Bible on literature in English.
***Credit not given for both this course and 01:351:319 or 01:358:204.***

**01:195:350** ***Theory of Narrative (3)***
Logic of narrative and its implications in modern culture. Theoretical texts by Jakobson, Foucault, Genette, and Propp; modern fiction by Poe, Borges, Robbe-Grillet; newspaper articles, and advertisements.
***Prerequisite: One course in literature or permission of instructor.***

**01:195:352** ***The European Novel (3)***
Comparative study of the emergence of forms, themes, and techniques of the novel from the Renaissance to the 20th century.

**01:195:354** ***The Nineteenth-Century Novel (3)***
Major works of fiction in their historical and social context. Authors from Europe, the Americas, and the non-Western world.

**01:195:356** ***Modern Fiction (3)***
Major works of fiction from 1900 to 1945 in their historical and political context. Works by authors such as Lawrence, Gide, Woolf, Mann, Malraux, Kafka, Proust, Sõseki, and Lu Xun.

**01:195:357** ***Contemporary Novel (3)***
Major novels written since 1945 by authors from Europe, the Americas, and the non-Western world.

**01:195:358** ***Odysseus in Literature, Drama & Film (3)***
Evolving images of Odysseus from ancient literature through medieval poetry and modern novels, poetry, plays, and films. Significance of Odysseus as an enduring literary icon.
***Credit not given for both this course and 01:190:358 or 01:489:358. Taught in English.***

**01:195:359** ***Literature of the Fantastic (3)***
Short stories of the 19th and 20th centuries, with some consideration of longer forms and parallel literary developments in ancient and Eastern cultures. Structuralist and psychological approaches to genre.

**01:195:360** ***Autobiography (3)***
Major works with special focus on theory and poetics.
***Credit not given for both this course and 01:351:341 or 01:358:250.***

**01:195:361** ***Brazil and the United States: Comparative Approaches (3)***
Comparative and interdisciplinary study of Brazilian literature and culture as it relates to contemporary issues of race relations, diversity, cultural dependency, and globalization.
***Course taught in English. Credit not given for both this course and 01:810:361.***

**01:195:362** ***Contemporary Caribbean Women Writers (3)***
Reading and discussion of recent writings by women from the Anglophone, Francophone, and Spanish-speaking Caribbean.

**01:195:363** ***Women Writers of Africa (3)***
Survey of recent writings by women from a variety of cultural, linguistic, and regional areas of Africa.
***Credit not given for both this course and 01:013:311 or 01:016:363.***

**01:195:364** *Big Bang: The Literature of Chaos and Order (3)*
Examination of literary and philosophical works from the Renaissance to the present, aimed at understanding how dramatic upheavals in the physical universe have been conceived as analogies for crisis and revolution in the realms of history, politics, psychology, science, gender, and the arts.
*Credit not given for both this course and 01:470:364.*

**01:195:365** *Modern Arabic Literature (3)*
Survey of representative works of modern Arabic literature in translation, including poetry, the novel, the short story, and plays.
*Credit not given for both this course and 01:013:342.*

**01:195:370** *Germany Confronts the Holocaust (3)*
Analysis of the shifting role of the Holocaust in postwar German public life, including art, literature, museums, memorials, film, television, and political discourse. Some attention given to Austria and Switzerland; contrasts will be drawn to place of Holocaust in postwar and contemporary America.
*Credit not given for both this course and 01:470:370 or 01:563:370.*

**01:195:371** *Holocaust Media (3)*
Examines the wide array of uses of media to represent the Holocaust, from World War II to the present. Examples range from wartime radio broadcasts and newsreels to documentaries, television dramas, videotaping of Holocaust testimonies, art, photography, as well as the use of media in museum displays and tourist practices.
*Credit not given for both this course and 01:563:366.*

**01:195:372** *Holocaust Literature in Translation (3)*
Interpretation of works dealing with the Holocaust by leading Hebrew, Yiddish, and European writers. Appropriate films used.
*Credit not given for both this course and 01:563:365.*

**01:195:373** *Justice and Violence (3)*
Justice, violence, and the law are entangled in complex ways. While we may think that following the law will always ensure a just outcome, justice inevitably exceeds the boundaries of legal stipulations. In fact, it is quite uncertain whether and how it is possible to make a just decision, to act or speak justly. While the law is never fully able to represent justice, it is also fundamentally reliant on violence. But how is legal violence different from the unrestrained violence of lawlessness?

Taught in English. Credit not given for both this course and 01:470:309 or 01:904:309.

**01:195:374** *Marx, Nietzsche, Freud (3)*
Exploration of the work of three German writers who revolutionized modern philosophy, theology, psychology, aesthetics, social and political science, gender studies, historiography, literature, and the arts.
*Credit not given for both this course and 01:470:371 or 01:730:344.*

**01:195:375** *The Devil in the Text (3)*
An investigation of the devil's image in literature across cultures and centuries.

**01:195:377** ***Topics in World Cinema (3)***
Study of a particular region, time period, movement, or theme in world cinema. Specific topic announced at preregistration.
***Credit not given for both this course and 01:175:377. May be taken more than once, if content is different.***

**01:195:380** ***German-Jewish Literature and Culture from the Enlightenment to the Present (3)***
Survey of German-Jewish culture, 18th century to the present. Literature in political-historical context, with some attention to music, philosophy, and film.
***Credit not given for both this course and 01:470:380.***

**01:195:381** ***Topics in Comparative Cultural Studies (1.5)***
Seven-week course. Variable content. Studies in particular ideas, themes, forms, and historic units in literature and other fields in the humanities. Specific titles available at registration.

**01:195:382** ***Kafka and World Literature (3)***
Introduction to Kafka's work and its impact on world literature. Topics include: literary modernism and European modernity; Jewish languages, culture, identity, and music in the early 20th century and beyond; minor and postcolonial literature; rethinking the relationship among humans, animals, hybrids, and monsters; and new directions in art, literature, film, and music.
***Taught in English. Credit not given for both this course and 01:470:354 or 01:563:355.***

**01:195:383** ***Nikos Kazantzakis (3)***
Works of Nikos Kazantzakis (1885-1957) and the Eastern and Western ideas that influenced him: Homer, Henri Bergson, Nietzsche, Freud, and Buddhist philosophy.
***Pre- or corequisite: 01:489:241 or permission of instructor. Credit not given for both this course and 01:489:350 or 01:489:383.***

**01:195:384** ***Poetry (3)***
Poetry from the ancient Greeks to the 21st century, including Western and Asian poetry

**01:195:385** ***Modern Poetry (3)***
Comparative survey of poetry in languages other than English from 1850 to the present. Poets include Baudelaire, Mallarmé, Rimbaud, Rilke, Brecht, Neruda, Vallejo, Mandelstam, Akhmatova, Pessoa, Apollinaire, and Artaud.

**01:195:386** ***Twentieth-Century Greek Poetry (3)***
Modern Greek poetry from 1900 to 2000.
***Credit not given for both this course and 01:489:386.***

**01:195:387** ***Hybrid Western Modernity in Literature and the Arts (3)***
The formation of European modernity in literature and the arts from the 1880s-1930 under the impact of Japanese and other non-Western aesthetics.

**01:195:388** ***The Cultures of the Middle Ages (3)***
Detailed introduction to a particular aspect of the rich cultural diversity of the European Middle Ages. Topics vary.
***Credit not given for both this course and 01:350:388 or 01:667:388 or 01:358:308.***

**01:195:389** ***Love and Power in the Italian Renaissance (3)***
Interdisciplinary investigation of early modern Italian culture, seen through the perspective of power structures.
***Credit not given for both this course and 01:560:358.***

**01:195:390** ***Comedy (3)***
Study of the major comic traditions, especially the Menandrian (Menander, Plautus, Terence, Molière) and its modern descendant, the comedy of social criticism (Beaumarchais, Gogol, Chekhov, Shaw).

**01:195:391** ***Tragedy (3)***
Study of the literature and theory of tragedy from the Greeks to the 20th century.
***Credit not given for both this course and 01:351:326 or 01:358:248.***

**01:195:392** ***The Realistic Theater (3)***
History of the realistic presentation of theatrical spectacles in Europe from the 18th to the 20th century. Equal emphasis on staging and playwriting. Includes Ibsen, Chekhov, Shaw, and Becque.

**01:195:393** ***Israeli Film (3)***
Explores major social, cultural, and political issues central to contemporary Israeli society and its development, and their representation in Israeli cinema.
***Credit not given for both this course and 01:563:393.***

**01:195:395,396,397,398** ***Issues in Comparative Literature (3,3,3,3)***
Separate sections focusing on comparative, interdisciplinary topics. Specific titles announced at the time of registration.
***Prerequisite: Permission of instructor. May be taken more than once if content is different.***

**01:195:399** ***Service Learning Internship (1)***
One-credit community service placement in comparative literature.
***Must be taken in conjunction with a designated CESEP (Civic Engagement and Service Education Partnerships) course offered in comparative literature.***

**1:195:419** ***History of Criticism (3)***
History of criticism from Plato and Aristotle to the 20th century.

**01:195:420** ***History of Criticism (3)***
Major criticism of the 20th century.

**01:195:430** ***Gender, Nation, and Literature in South Asia (3)***
Course focuses on how representations of women have shaped ideas of modern Indian citizenship and belonging in colonial and postcolonial periods.
***Credit not given for both this course and 01:013:430 or 01:988:431.***

**01:195:440** ***Seminar: Topics in Genre (3)***
Intensive study, in a discussion-oriented format, of a particular genre (e.g., pastoral, epic, comedy, lyric) or relationship among genres. Topics vary.
***Credit not given for both this course and 01:351:440.***

**01:195:471** ***Yukio Mishima: His Fictions and Global Literary Legacy (3)***
Explores the many facets, fictions, and global literary legacy of one of Japan¿s most formidable 20th-century writers, Yukio Mishima (1925-1970).
***Taught in English. Credit not given for both this course and 01:565:471.***

**01:195:475** ***The Tale of Genji as World Literature (3)***
The *Tale of Genji* in the context of world literature as court romance, psychological novel, and feminist text. Extensive readings from critical literature in English and discussion of issues in translation.
***Credit not given for both this course and 01:565:475.***

**01:195:477** ***Advanced Topics in World Cinema (3)***
Intensive study of a particular issue in world cinema, with special attention paid to theoretical approaches. Specific topic announced at preregistration.
***Prerequisite: permission of instructor. May be taken more than once, if content is different. Credit not given for both this course and 01:175:477.***

**01:195:480** ***Special Topics in Comparative Literature (3)***
Special studies in particular ideas, themes, forms, and historic units in literature. Content varies according to instructor.
***Prerequisite: permission of instructor.***

**01:195:484** ***Russia after Stalin: Literature, History, Theory (3)***
Recent past of Russian culture and politics. How the Stalinist past influenced late Soviet Russian culture, contributed to the collapse of the USSR, and shaped post-Soviet Russia through examination of powerful fictional texts and films that defined the post-Soviet era, from 1950s onward, as well as nonfiction and theoretical texts on Stalinism and its aftermath.
***Taught in English. Credit not given for both this course and 01:510:484 or 01:860:484.***

**01:195:489** ***Tolstoy's War and Peace (3)***
Detailed study of Leo Tolstoy's monumental novel *War and Peace* (1869) in its historical, cultural, and critical context. Readings and discussion in English.
***Credit not given for both this course and 01:860:289 or 01:860:489.***

**01:195:493,494** ***Independent Study (BA,BA)***
Independent reading under supervision of a member of the department.
***Prerequisites: permission of instructor and undergraduate director.***

**01:195:495,496** ***Honors in Comparative Literature (3,3)***
Independent research on the honors thesis.
***Prerequisite: permission of the department and undergraduate director.***

**01:195:497** ***Capstone Seminar Workshop (1)***
Assessment of the undergraduate experience as a major in comparative literature. Debate around the present state of the discipline. Series of workshops intended to explore professional and academic careers, including preparation for graduate school and grant writing.
***Open to comparative literature seniors only.***

# Computer Science 198 (SAS)

## COMPUTER SCIENCE 198

Department of Computer Science, School of Arts and Sciences

**Website:** Here

**Chair:** Ulrich Kremmer

**Associate Chair:** Richard Martin

**Director of Undergraduate Program:** Santosh Nagarakatte

**Distinguished Professors:**

Dimitris N. Metaxas, Board of Governors Professor of Computer Science ; M.Sc., Maryland; Ph.D., Toronto

Mario Szegedy, M.S., Eötvös Lóránd (Hungary); Ph.D., Chicago

**Professors:**

Ahmed Elgammal, M.Sc., Ph.D., Maryland

Jie Gao, B.A. China, PH.D., Stanford

Tomasz Imielinski, M.S., Gdansk Politechnica (Poland); Ph.D., Polish Academy of Sciences

Ulrich Kremer, M.S., Ph.D., Rice

Badri Nath, Ph.D., Massachusetts

Thu D. Nguyen, B.S., California (Berkeley); M.S., Massachusetts Institute of Technology; Ph.D., Washington

Vladimir Pavlovic, M.S., Illinois (Chicago); Ph.D., Illinois (Urbana-Champaign)

David Pennock, B.S., M.S. Duke, Ph.D. University of Michigan

Matthew Stone, Sc.B., Brown; Ph.D., Pennsylvania

Liring Xia, B.A.(China), M.A., Ph.D., Duke

Zhang Zheng B.S., China; M.S., Ph.D., William & Mary

**Associate Professors:**

Abdeslam Boularas, B.S., Ecole nationale Superieure d'Informatique (Algeria);M.S., Paris Sud; Ph.D., Laval (Canada)

Mubbasir Kapadia, B.Eng., Sanghvi (India); Ph.D., California (Los Angeles)

Amélie Marian, B.S., M.S., Université de Paris-Dauphine; Ph.D., Columbia

Richard P. Martin, B.A., Rutgers; M.S., Ph.D., California (Berkeley)

Konstantinos Michmizos, B.S., Patras (Greece); M.S., McGill (Canada); Ph.D., National Technical University of Athens (Greece)

Jingjin Yu, B.S.; Ph.D., University of Illinois

Yongfeng Zhang, B.S., Peking; B.E., Ph.D., Tsingha (China)

Zhang Zheng B.S., China; M.S., Ph.D., William & Mary

**Assistant Professors:**

Arpita Biswas, B.T.,IEM(India), M.E., Ph.D., India Institute of Science

Dong Deng, B.S., Beihang; Ph.D., Tsinghua University

Xiong Fan, M.S., Chinese Academy of Science; Ph.D.,Cornell

Sumegha Garg, BT, India Institute(Delhi), Ph.D., Princeton

Yipeng Huang, B,S., M.S.,Ph.D., Columbia

Sudarsun Kannan, B.E., Anna (India); M.S., Ph.D., Georgia Tech

Minsung Kim, B.E., Korea University, M.A., Ph.D., Princeton

Roie Levin, B.S., Brown, Ph.D., Carnegie Mellon

Sharon Levy, B.S., M.S., Ph.D., UC Santa Barbera

Srinivas Narayana, B.Tech IIT, Madras (India); M.A., Ph.D., Princeton

Minesh Patel, B.S., UT Austin, Ph.D., Carnegie Mellon, Ph.D., ETH Zurich

Karl Stratos, B.S., University of Rochester; Ph.D., Columbia

Zihan Tan, B.S., Tsinghua, Ph.D., U of Chicago

Ruixiang Tang, B.S., Tsinghua, Ph.D., Rice

Hao Wang, B.S., Shanghai Jiao Tong University; Ph.D.

Kangning Wang, B.Eng.,Tsinghua, Ph.D., Duke

Xintong Wang, B.S., Washington, Ph.D., U of Michigan

Peng Zhang, B.S., Zhejiang; M.S., Purdue; Ph.D., Georgia Tech

Qiong Zhang, B.S., National University of Singapore; Ph.D., Carnegie Mellon

He Zhu, M.S., Tsinghua University; Ph.D., Purdue

**Teaching Professors:**

Frances Trees, M.A., Montclair; Ph.D., Pace

Sesh Venugopal, M.S., Ph.D., Rutgers

**Associate Professor of Practice:**

James Abello Monedero, M.S., California (Santa Barbara); Ph.D., California (San Diego)

**Associate Teaching Professors ;**

Ana Paula Centeno, B.S.,UCPel; M.S. UFRGS and Stony Brook; Ph.D.,, Rutgers

Lily Chang , M.S., NJIT; Ph.D.,Florida International

Antonio Miranda Gacia, B.S., Universidad Nacional Autónoma de México; Ph.D., Texas A&M

**Assistant Teaching Professors:**

Charles Wesley Cowan, Ph.D., Rutgers

Abraham Gale, B.A., Yeshiva University, Ph.D., Rutgers (NB)

Surya Teja Gavva, Ph.D., Rutgers (NB)

Samaneh Gholizadeh Hamidi, B.S.,Islamic Azad; M.S., Khayyam; Ph.D., University of Malaya

David Menendez, Ph.D., Rutgers

**Faculty Emeriti:**

Eric Allender

Alex Borgida

Martin Farach-Colton

Michael Fredman

Apostolos Gerasoulis

L. Thorne McCarty

Naftaly Minsky

Gerard Richter

Barbara Ryder

Chitoor Srinivasan

William Steiger

Louis Steinberg

Endre Szemeredi

Robert Vichnevatsky

Sholim Weiss

Students should check the Department of Computer Science website regularly, especially before selecting each semester¿s courses. Announcements of particular importance are highlighted on the main webpage.

Courses in computer science introduce students to a broad range of formal and applied material, as well as new ways of thinking. Mastery of material is important for moving on toward deeper ideas. Please note that courses for which a student has received a grade of D cannot be used to satisfy prerequisite requirements. Students who are having difficulty earning grades of C or better are strongly encouraged to see a computer science academic adviser.

Computer Science 198 (SAS)

# Learning Goals

# Learning Goals

Majors will:

1. be prepared to contribute to a rapidly changing field by acquiring a thorough grounding in the core principles and foundations of computer science (e.g., techniques of program design, creation, and testing; key aspects of computer hardware; algorithmic principles);

2. acquire a deeper understanding on (elective) topics of more specialized interest, and be able to critically review, assess, and communicate current developments in the field; and

3. be prepared for the next step in their careers, for example, by having done a research project (for those headed to graduate school), a programming project (for those going into the software industry), or some form of business plan (for those going into start-ups).

Computer Science 198 (SAS)

# Entry Requirements for the Major

# Entry Requirements for the Major

Students wishing to declare a major in computer science must achieve a grade of C or better in 01:198:111, 112, and 205, and 01:640:151-152. Transfer students are required to take at least three courses in the Rutgers University-New Brunswick Department of Computer Science before being accepted to the major.

Computer Science 198 (SAS)

# Major Requirements

# Major Requirements

The basic major, leading to a bachelor of arts (B.A.) degree, consists of:

1) six required courses in computer science, 01:198:111, 112, 205, 206, 211, and 344;

2) three courses in mathematics, 01:640:151-152 and 01:640:250; and

3) five electives from a designated list of courses in computer science and related disciplines (e.g., electrical engineering, mathematics).

For details, see a computer science adviser or the departmental website. At most, two of the five electives may be taken outside the Department of Computer Science; at least two must be computer science courses at the 300 level or above.

To receive a bachelor of science (B.S.) degree, students must satisfy requirements 1 and 2 (above) for the bachelor of arts degree, and, in addition, complete seven courses from category 3, no more than two of these outside the Department of Computer Science; plus four physics courses: 01:750:203, 204, 205, and 206 (or 01:750:123, 124, 227, and 229 or 01:750:193 and 194 or 01:750:271, 272, 275, and 276 or 01:750:201 and 202 or 01:750:193, 194); or chemistry 01:160:159, 160, and 171 (or 01:160:161, 162, and 171 or 01:160:163, 164, and 171).

The B.A. option requires 51-55 credits (depending on 3-credit or 4-credit elective options); the B.S. option requires 67-72 credits. No more than one grade of D can be accepted in the courses required for the major.

Declared computer science majors (198) will not receive credit (major or degree) for subsequent enrollment in computer science 105, 107,110, 142, 170, or 405.

A minimum of seven courses must be taken in the Rutgers University-New Brunswick Department of Computer Science.

Computer Science 198 (SAS)

# Minor Requirements

# Minor Requirements

The minor consists of six computer science courses, at least two of which are at the 300 or 400 level, chosen in consultation with a departmental adviser. Computer science courses 01:198:105, 107, 110, 170, or 405 cannot be credited toward a minor in computer science. Only courses that count toward the major may be counted toward the minor. No more than one D will be accepted in courses taken toward the minor. A minimum of five courses must be taken in the Rutgers University-New Brunswick Department of Computer Science.

Computer Science 198 (SAS)

# Departmental Honors Program

# Departmental Honors Program

The Department of Computer Science's honors program consists of an honors track and honors graduation requirements.

**Honors Track**
The department offers a special honors track to qualified students. Students in the honors track will have their progress reviewed by the honors committee and are expected to earn grades of B or better in their advanced computer science courses (300 level and above). Students who successfully complete the honors track with a grade-point average (GPA) in their computer sciences courses of at least 3.6 will automatically qualify for graduation with honors in computer science. The program offers a capstone option where the student will formulate a proposed course plan to meet honors graduation requirements, subject to the approval of the computer science honors committee.

**Honors Graduation Requirements**
The honors graduation requirements are:

- two units of honors credit (These are either honors sections at the 300 or 400 level in computer science, a computer science capstone project, or another program approved by the honors committee and a sponsoring faculty member. Alternatives include graduate courses in computer science or advanced honors-level courses in a related discipline such as mathematics.)
- a GPA in computer science courses of at least 3.6

Computer Science 198 (SAS)

# Courses

# Courses

**01:198:103** ***Introduction to Computer Infrastructure (1)***
Provides students with no computer experience other than basic word processing and spreadsheets the computer skills needed for the introductory computer science courses including effectively use the Rutgers Linux computing environment to iteratively design, build, and debug programming assignments.
***Pass/No Credit***

**01:198:105** ***Great Insights in Computer Science (3)***
Fundamental concepts of computer science for nonscience majors. Influential ideas that have shaped the discipline. Example problems drawn from areas such as artificial intelligence (robotics), bioinformatics (DNA analysis), computer graphics (3-D visualization), networking (high-speed communication), and security (cryptography).
***Prerequisite: 01:640:026 or higher, or placement. Not for credit toward the computer science major or minor.***

**01:198:107** *Computing for Math and the Sciences (3)*
Introduction to computers and programming for noncomputer science majors in math and the sciences. Introduces key ideas in computer science, including programming (MATLAB) and symbolic algebra (MAPLE).
*Prerequisite: CALC1 (01:640:135 or 151 or 153 or 191). This course is for math and physical science majors. Not for credit toward the computer science major or minor.*

**01:198:110** *Principles to Computer Science*
General survey about what computers are and how they are used, including an introduction to computer programming and contemporary application packages.
*Lec. 2 hrs., rec. 1 hr. Students planning further study in computer science should take 01:198:111. Credit not given for both this course and 01:198:170. Not open to students with a prebusiness major.*

**01:198:111** *Introduction to Computer Science (4)*
Intensive introduction to computer science. Problem solving through decomposition. Writing, debugging, and analyzing programs in Java. Algorithms for sorting and searching. Introduction to data structures, recursion.
*Prerequisite: 01:640:115 or placement in CALC1. For students in science, mathematics, and engineering. Credit not given for both this course and 14:332:252.*

**01:198:112** *Data Structures (4)*
Queues, stacks, trees, lists, and recursion; sorting and searching; hashing; complexity of algorithms; graph representations and algorithms.
*Prerequisites: 01:198:111. Credit not given for both this course and 14:332:351.*

**01:198:142** *Data 101 (4)*
Topics in data literacy for nonmajors in computer science or statistics.
*Prerequisite: Any course equal to or greater than 01:640:025 or placement into Intermediate Algebra or higher. Credit not given for both this course and 01:198:143 or 01:960:142.*

**01:198:143** *Data 101 (3)*
Topics in data literacy for students not majoring in Computer Science or Statistics. Hybrid course: meets in the classroom and online.

*Prerequisite: Any course equal to or greater than 01:640:025 or placement into Intermediate Algebra or higher. Credit not given for both this course and 01:198:142 or 01:960:142.*

**01:198:170** *Computer Applications for Business (3)*
Introduction to the fundamentals of information technology, with an emphasis on business applications. Examination of computer hardware and software, networking and technology concepts, and hands-on experience with electronic spreadsheets, webpage design, and programming applications for problem solving using JavaScript. No prior experience in using a computer is needed--this course is intended for beginners
Lec. 2 hrs., rec. 1 hr. This course is for students seeking admission to Rutgers Business School: Undergraduate-New Brunswick. Limited to prebusiness and business majors. Credit not given for both this course and 01:198:110. Not open to students with a declared major in computer science.
*Lec. 2 hrs., rec. 1 hr. This course is for students seeking admission to Rutgers Business School: Undergraduate-New Brunswick. Limited to prebusiness and business majors. Credit not given for both this course and 01:198:110. Not open to students with a declared major in computer science.*

**01:198:195,196** *Honors Seminar in Computer Science (1,1)*
Discussion of selected topics in computer science.
***Prerequisite: Permission of department required. Corequisite: Any course offered by the Department of Computer Science at Rutgers.***

**01:198:205** *Introduction to Discrete Structures I (4)*
Sets, propositional and predicate logic, logic design, relations and their properties, and definitions and proofs by induction with applications to the analysis of loops of programs.
***Prerequisites: 01:198:111 or 14:332:252. Credit not given for both this course and 14:332:312.***

**01:198:206** *Introduction to Discrete Structures II (4)*
Counting (binomial coefficients, combinations), methods of finding and solving recurrence relations, discrete probability, regular expressions and finite automata, basic graph theory.
***Prerequisites: 01:198:205 or 14:332:312; 01:640:152. Credit not given for both this course and 01:640:477 or 14:332:226.***

**01:198:210** *Data Management for Data Science (4)*
Provides knowledge and skills needed to acquire and curate real word data, to explore the data to discover patterns and distributions, and to manage large datasets with databases.
***Prerequisites: 01:198:142, 01:960:142, or 01:198:111.***

**01:198:211** *Computer Architecture (4)*
Levels of organization in digital computer systems; assembly language programming techniques; comparative machine architectures; assemblers, loaders, and operating systems. Programming assignments in assembly language.
***Prerequisite: 01:198:112, with a grade of C or better. Credit not given for both this course and 14:332:331.***

**01:198:213** *Software Methodology (4)*
Principles, techniques, tools, and methods used to build modern software applications. Object-oriented design and implementation, graphical user interfaces, portability to the mobile platform, and collaborative work.
***Prerequisite: 01:198:112.***

**01:198:214** *Systems Programming (4)*
C-level programming and its accompanying paradigm; mapping of high-level language programs to underlying computing architecture; tools for effective scaling; automation using scripts.
***Prerequisite: 01:198:112. Corequisite: 01:198:211.***

**01:198:310** *Data Science Capstone Project (1)*
This is a 1-credit capstone course for the Data Science Certificate Program. Students must already have completed the three core courses in the Certificate program, and must have either completed or be concurrently enrolled in a domain course for the Certificate in order to register for this course. The course is meant to be a largely independent empirical project which makes concrete use of all aspects of data science explored in the core and possibly in domain course, from identifying a data source, cleaning and organizing the data, conducting appropriate statistical analysis, to interpreting and reporting the results of the study in a standard scholarly form. Finding an appropriate project and data source with suitable characteristics for a data science-oriented study is an important component of the course.

Students must complete ALL prerequisites before registering for Capstone 310. It cannot be taken simultaneously with any of the three prerequisite courses.
*Prerequisites: 01:198:142 OR 01:960:142 AND 01:960:291 OR 01:960:212 OR 01:960:384 OR 33:136:385 AND 01:198:210 OR 01:960:295 OR 04:547:221*

**01:198:314** *Principles of Programming Languages (4)*
Syntax: formal languages, parsing. Design: modeling relations, modules, information hiding, abstraction. Compiler versus interpreter; names; binding; memory; pointers; types. Functional, imperative, object oriented, and logic programming; concurrency.
*Prerequisites: [(01:198:205 and 01:198:211) and (01:640:152) or 01:640:192)] or [(01:198:205 and 14:332:331 and 01:640:152)] or [(14:332:312 and 14:332:331) and (01:640:152 or 01:640:192)] or [(14:332:312 and 01:198:211 and 01:640:152)].*

**01:198:323** *Numerical Analysis and Computing (4)*
Approximation, interpolation, numerical differentiation, integration; numerical solution of nonlinear equations, linear algebraic systems, and ordinary differential equations.
*Prerequisites: 01:640:152 and 250, both with grades of C or better. Credit not given for both this course and 01:640:373.*

**01:198:324** *Numerical Methods (4)*
Computational methods for linear algebraic systems, eigenvalues and eigenvectors, approximation of functions, splines; numerical solution of initial and boundary value problems for differential equations.
*Prerequisite: 01:198:323 or 01:640:373, with a grade of C or better. Credit not given for both this course and 01:640:374.*

**01:198:334** *Introduction to Imaging and Multimedia (4)*
Introduction to digital image processing, computer vision, and multimedia computing; image, video, and audio formation and processing; the basics of multimedia lossless and lossy compression.
*Prerequisites: 01:198:112 or 14:332:351; 01:198:206 or 14:332:226 or 01:640:477; 01:640:250.*

**01:198:336** *Principles of Information and Data Management (4)*
Describing and querying various forms of information such as structured data in relational databases, unstructured text (IR), semistructured data (XML, Web), and deductive knowledge. Conceptual modeling and schema design. Basics of database management systems services (transactions, reliability, security, and optimization). Advanced topics: finding patterns in data, information mapping, and integration.
*Prerequisites: (01:198:205 and 01:198:112 and (01:640:152 or 01:640:192) or (01:198:205 and 14:332:351 and (01:640:152 or 01:640:192) or (14:332:312 and 01:640:152 and (01:198:112 or 14:332:351). Linear Algebra is recommended.*

**01:198:344** *Design and Analysis of Computer Algorithms (4)*
Study of algorithms. Techniques for efficiency improvement. Analysis of complexity and validity for sorting (internal, external), shortest path, spanning tree, connected and biconnected components, and string matching. Introduction to NP-completeness.
*Prerequisites: 01:198:112 and 206.*

**01:198:345** *Algorithms in Society (4)*
This class introduces students to various types of algorithms used for real-world decisions in a wide range of applications: public policy, health, e-commerce, and justice.
*Prerequisite: 01:198:112 or 01:198:210.*

**01:198:352** *Internet Technology (4)*
TCP/IP protocols, media access protocols, socket programming in C/UNIX, multicasting, wireless and mobile communication, multimedia over the internet, ATM, switching theory, and network architectures.
***Prerequisites: 01:198:211 or 14:332:331; 01:198:206 or 01:640:477 or 14:332:226.***

**01:198:405** *Seminar in Computers and Society (3)*
Study and discussion of the impact of computers on man and society. For all students interested in exploring the social consequences of computer developments.
***Prerequisites: At least one computer science course and one course in sociology, political science, anthropology, or philosophy; senior standing. May not be used for major credit.***

**01:198:411** *Computer Architecture II (4)*
Characteristics of a modern computer. Topics to be covered include pipelining, instruction level parallelism, VLIW and speculative dynamic super scalar architectures, computer arithmetic, assessing performance, memory hierarchy, input-output, and multiprocessors.
***Prerequisite: 01:198:205 and either 01:198:211 or 14:332:331, all with grades of C or better.***

**01:198:415** *Compilers (4)*
Study of compilers and interpreters. Parsing, lexical analysis, semantic analysis, code generation, and optimization.
***Prerequisites: 01:198:211 or 14:332:331; 01:198:314, all with grades of C or better.***

**01:198:416** *Operating Systems Design (4)*
Computer organization, process and thread management, synchronization, scheduling, memory management, virtual memory, I/O management, file systems, and case studies.
***Prerequisites: 01:198:211 and 01:198:214 or (14:332:331 and 351).***

**01:198:417** *Distributed Systems: Concepts and Design (4)*
Introduction to the concepts and design principles used in distributed computer systems. Communication methods, concepts, and strategies used in distributed services such as file systems, distributed shared memory, and distributed operating systems.
***Prerequisite: 01:198:416, with a grade of C or better.***

**01:198:419** *Computer Security (4)*
Introduction to computer security. Topics include applied cryptography, authentication, authorization and basic security principles, as well as recent topics such as web security and virtual machine-based security.
***Prerequisites: [01:198:205 and 01:198:416 and (01:640:152 or 01:640:192)] or [(01:198:205 and 14:332:352 and (01:640:152 or 01:640:192)] or [(14:332:312 and 01:640:152 and (01:198:416 or 01:198:352)].***

**01:198:425** *Brain-Inspired Computing (4)*
Overview of the fundamental concepts and current trends in neuro-mimetic and neuro-inspired computing with a focus on designing neuromorphic networks for vision and movement.
***Prerequisite: 01:198:206 and (01:640:136 or 01:640:152.)***

**01:198:428** *Introduction to Computer Graphics (4)*
Displays, colors, perception, images, sampling, image processing, geometric transformations, viewing and visibility, modeling hierarchies, curve and surface design, animation, lighting, rendering, rasterization, shading, and ray tracing.
*Prerequisites: CALC2 and 01:640:250; 01:198:112 or 14:332:351. Credit not given for both this course and 14:332:474.*

**01:198:431** *Software Engineering (4)*
Problems and techniques involved in the specification, design, and implementation of large-scale software systems, studied in conjunction with actual group construction of such a system.
*Prerequisites: 01:198:213 and one of 01:198:314, 336, 352, or 416. Credit not given for both this course and 14:332:452.*

**01:198:437** *Database Systems Implementation (4)*
Focuses on the implementation of database management systems (DBMS). Provides students the tools to understand the internals of a DBMS: transaction management, query processing and query optimization, implementation of systems handling text data, and management issues in a web context.
*Prerequisites: 01:198:214 and 336.*

**01:198:439** *Introduction to Data Science (4)*
Focuses on algorithms and tools for solving data-science problems, including preparation, characterization and presentation, analysis, and applications.
*Prerequisites: (01:198:205 or 14:332:202 or 14:332:312) and (01:640:152 or 01:640:192).*

**01:198:440** *Introduction to Artificial Intelligence (4)*
Broad introduction to artificial intelligence, including search, knowledge representation, natural language understanding, and computer vision.
*Prerequisites: (01:198:205 or 14:332:202 or 14:332:312) and (01:640:152 or 01:640:192).*

**01:198:442** *Topics in Computer Science (3-4)*
Advanced topics in computer science. Topics vary from year to year according to the interests of students and faculty.

**01:198:445** *Topics in Computer Science (3)*
Advanced topics in computer science. Topics vary from year to year according to the interests of students and faculty.
*Prerequisites: (01:198:111 or 01:198:142). Restricted to Computer Science majors.*

**01:198:446** *Topics in Computer Science (3)*
Advanced topics in computer science. Topics vary from year to year according to the interests of students and faculty.

**01:198:452** *Formal Languages and Automata (3)*
Finite automata and regular languages; context free languages, pushdown automata, and parsing; language hierarchies; Turing machines; decidability and complexity of languages. Applications emphasized throughout.
*Prerequisite: 01:198:344 with a grade of C or better.*

**01:198:460** ***Introduction to Computational Robotics (4)***
General introduction to robotics from a computational perspective with a focus on mobile robots. Provides hands-on experience through projects on various robotic platforms including exposure to industry standard software.
***Prerequisite: 01:198:206 or instructor's permission.***

**01:198:461** ***Machine Learning (4)***
Principles Systematic introduction to machine learning, covering theoretical as well as practical aspects of the use of statistical methods. Topics include linear models for classification and regression, support vector machines, regularization and model selection, and introduction to deep learning. Application examples are taken from areas like computer vision, natural language processing, information retrieval and others.
***Prerequisites: 01:198:112, 0:198:206, 01:640:250.***

**01:198:462** ***Introduction to Deep Learning (4)***
Introduction to deep learning. Includes theories, principles, and practices of traditional neural networks and modern deep learning. The topics include fundamentals of Machine Learning, neural networks, modern deep learning, and applications and advanced topics.
***Prerequisites: 01:198:112, 0:198:206, 01:640:250.***

**01:198:463** ***Design and Analysis of Randomized Algorithms (4)***
This course offers an introduction into the tools and techniques of randomized algorithms, at a level accessible to advanced undergraduates.

***Prerequisite: 01:198:344***

**01:198:493,494** ***Independent Study in Computer Science (BA,BA)***

**01:198:495-496** ***Computer Science Honors Capstone Program (3,3)***
Fall and spring semester of year long capstone program for Computer Science undergraduate honors students.

# Criminal Justice 202 (SAS)

## CRIMINAL JUSTICE 202

School of Arts and Sciences

**Website:** Here

**Program Director:** Paul Hirschfield

**Undergraduate Director:** Sinan Celiksu

**Professors:**

Lisa L. Miller, Political Science; B.A., Virginia; M.A., Ph.D., Washington

Alec D. Walen, Law and Philosophy; B.A., Maryland; M.A., Ph.D., Pittsburgh; J.D., Harvard

Michael Welch, Criminal Justice; B.A., Benedictine College; M.A., Missouri (Kansas City); M.S., Illinois State; Ph.D., North Texas

**Associate Professor:**

Noura S. Erakat, Africana Studies; B.A., J.D., California (Berkeley); LL.M., Georgetown; LL.M., Temple

Paul Hirschfield, Sociology; B.A., Kalamazoo College; M.A., Ph.D., Northwestern

K. Sebastian Leon, Latino and Caribbean Studies; B.S., Florida State; M.A., George Washington; Ph.D., American

Calvin Lai, Psychology, Sociology; B.A Rutgers; M.A., Ph.D., U of Virginia, Charlottesville

**Assistant Professors:**

Ricardo Martinez-Schuldt, Sociology; B.A., St. Cloud State; M.A., Ph.D., U. of North Carolina

Kevin Dahaghi, Sociology; B.A. Rutgers; M.A., Ph.D., U. of Texas at Austin.

**Assistant Teaching Professors:**

Mark Desire, Criminal Justice; B.A., Rutgers; M.S., Allegheny; J.D., New York Law School

Sinan Celiksu, Anthropology; B.A., Police Academy, Turkey; M.A., Uludag University; M.A., M.Phil.,Ph.D., Columbia

**Instructor:**

Christopher Chuckwuedo, Criminal Justice, B.A, U. of Texas San Antonio; M.A. U of Louisville, Ph.D. Rutgers

Criminal Justice 202 (SAS)

# Learning Goals

# Learning Goals

The program in criminal justice is a comprehensive, interdisciplinary program that blends a strong liberal arts educational experience with preprofessional instruction in the field of criminal justice. Majors will be able to demonstrate skills in effective written and oral communication, critical analysis of data and ideas, and computer literacy; knowledge of the major theories, methodologies, and research topics and strategies in the field of criminal justice; a historical and contemporary understanding of the social, cultural, and legal factors that influence the criminal justice field in the United States and around the world; an understanding of the ethical and moral issues that permeate the criminal justice field; awareness of local, national, and international perspectives of criminal justice; and an understanding of the role of human behavior and social order on issues of criminal justice. Majors will be prepared for postbaccalaureate graduate or professional studies in criminal justice, sociology, public policy, social work, and law or employment in a variety of legal, policy making, and law enforcement occupations.

Criminal Justice 202 (SAS)

# Major Requirements

# Major Requirements

The major in criminal justice requires a total of 36 credits distributed as follows:

01:202:201 Introduction to Criminal Justice (3)

01:202:202 Police (3)

01:202:203 Prison and Prisoners (3)

01:202:204 Crime and Public Policy (3) or
01:202:205 Criminal Procedure (3) or
01:790:106 Law and Politics (3)

01:202:307 Criminal Justice Research Methods (3) or
01:830:200 Quantitative Methods in Psychology (4) or
01:920:311 Introduction to Social Research (4) or
01:920:312 Introduction to Statistics in Sociology (4) or
01:960:285 Introductory Statistics for Business (3)

01:920:222 Criminology (3)

Nine credits in courses offered by School of Arts and Sciences departments relevant to the themes of crime, justice, and law and drawn from the approved list of thematic courses. These courses must be chosen from at least two of the following three thematic areas:

- human behavior, deviance, and crime
- social control institutions
- law and ethics

Majors must take at least three electives, chosen from any of the criminal justice course offerings (courses with a 202 subject code) at the 300 and 400 level, at least one of which is at the 400 level.

Only courses completed with a grade of C or better may be counted toward the major. At least one 3-credit criminal justice course (01:202) must be at the 400 level. Only 3 credits from 01:202:406, 407, 408 (internships) may count toward the major. Students can take only 3 credits of internship per semester with a limit of 6 credits overall. No more than 6 credits of 01:202:495 Independent Study may count toward the major; no more than 3 credits may be taken in a single semester. Courses listed above with subject codes other than 202 may also have prerequisites; such requirements are described under the departments offering these courses.

# Honors

# Honors

*Thesis Option*

Students who have completed 15 credits toward the major, have senior standing, a 3.4 grade-point average (GPA) in the major, and a 3.0 GPA overall are eligible to elect the honors thesis option. These independent research projects, carried out in the senior year under the supervision of program faculty, carry 6 credits. The honors program for criminal justice majors may be undertaken in conjunction with a School of Arts and Sciences honors thesis.

*Departmental Honors*

Honors--Students in the major who earn a 3.6 GPA in departmental coursework (01:202 courses, required research methods course, and thematic courses) will graduate with honors.

High Honors--Students in the major who earn a 3.8 GPA in departmental coursework (01:202 courses, required research methods course, and thematic courses) will graduate with high honors.

Highest Honors--Students in the major who earn a 4.0 GPA in departmental coursework (01:202 courses, required research methods course, and thematic courses) will graduate with highest honors.

Criminal Justice 202 (SAS)

# Approved Thematic Courses

# Approved Thematic Courses

**Theme: Human Behavior, Deviance, and Crime**

01:050:306 American Detective in Fiction and Film

01:050:324 Wayward Americans (3)

01:830:320 Forensic Psychology (3)

01:830:375 Stereotyping and Prejudice (3)

01:920:304 Sociology of Deviant Behavior (3)

01:920:306 Race Relations (3)

01:920:307 Mental Illness (NB) (3)

01:920:361 Sociology of Drug Use (3)

01:920:410 Sociology of Alcohol Problems (3)

**Theme: Social Control Institutions**

01:014:353 Black Community Law and Social Change (3)

01:070:360 Law, Justice, Rights (3)

01:220:331 Economics of Crime (3)

01:220:395 Law and Economics (3)

01:512:404 American Constitutional History from 1865 (3)

01:595:370 Law and the Latino Community (3)

01:790:340 Law and Society (3)

01:790:341 Public Administration: American Bureaucracy (3)

01:790:343 Counterterrorism & Democracy (3)

01:790:404 Politics of Criminal Justice (3)

01:920:349 Law and Society (3)

11:370:414 Forensic Entomology (3)

**Theme: Law and Ethics**

01:730:342 Social and Political Philosophy through History (3)

01:730:345 Philosophy and the Law (3)

01:730:358 Philosophy of Law (3)

01:790:373 Legal Philosophy, Rights, and Justice (3)

01:790:401 American Constitutional Law (3)

01:790:406 Civil Liberties and Civil Rights (3)

01:988:307 Women and the Law (3)

Criminal Justice 202 (SAS)

# Courses

# Courses

**01:202:201** ***Introduction to Criminal Justice (3)***

Societal responses to people and organizations that violate criminal codes; police, courts, juries, prosecutors, defense and correctional agencies, and the standards and methods used to respond to crime and criminal offenders; social forces that affect the evolution of criminal laws.

**01:202:202** *Police (3)*
The function of police in contemporary society; the problems arising between citizens and police from the enforcement and nonenforcement of laws, from social changes, and from individual and group police attitudes and practices.
***Pre- or corequisite: 01:202:201.***

**01:202:203** *Prison and Prisoners (3)*
Origins and methods of revenge, coercive custody, confinement, punishment, rehabilitation, restitution, deterrence, and prisoner education programs are examined. Includes emphasis on current controversies related to jail and prison overcrowding, treatment of violent juveniles and chemically dependent offenders, and AIDS risk assessment of juvenile and adult offenders.
***Pre- or corequisite: 01:202:201.***

**01:202:204** *Crime and Public Policy (3)*
Introduction to the process by which criminal law and criminal justice policies are crafted and implemented in the American political process. Basic concepts of public policymaking across local, state, and national governments; unique challenges of developing effective crime control policies.
***Pre- or corequisite: 01:202:201.***

**01:202:205** *Criminal Procedure (3)*
Description and discussion of what is commonly characterized as the "criminal justice process and public policy consideration" through which the substantive criminal law is enforced.
***Prerequisite: 01:202:201.***

**01:202:210** *Introduction to Security (3)*
Principles and methods for screening people; monitoring environments; effective use and care of preventive techniques; preventive response and control; response procedures; legal aspects of security; individual and collective behavior; and developing problems in security such as terrorism and organized vandalism.
***Pre- or corequisite: 01:202:201.***

**01:202:302** *Police Organization and Administration (3)*
The effect of organizational structure and administrative procedure on police function; the processes of police recruitment, career advancement, and leadership.
***Prerequisite: 01:202:201.***

**01:202:303** *Correctional Systems (3)*
The major types of community-based correctional alternatives ranging from probation, shock incarceration, parole, work-release, overnight and weekend incarceration, and halfway houses to community-based centers; discussion of correctional laws, personnel development, correctional management, controversies, political pressures, and emerging trends in organization and goals.
***Prerequisite: 01:202:201.***

**01:202:305-306** *Scientific Applications in Justice (3,3)*
Contributions of physical science to crime prevention, detection, and prosecution; significant forensic aspects of chemistry, biology, geology, and physics as applied to prevention planning, contraband control, preserving evidence, ballistics, optics, sound, and sampling natural materials.
***Prerequisite: 01:202:201.***

**01:202:307** ***Criminal Justice Research Methods (3)***
Underlying research concepts, methodologies, and techniques appropriate for application in the main behavioral environments of justice; application of course content to justice agencies, policies, and programs.
***Prerequisites: 01:202:201; 01:640:112 or 115, or Calculus I; or placement.***

**01:202:308** ***Advanced Criminal Justice Research Methods (3)***
Advanced research concepts, methodologies, and techniques appropriate for application in the main behavioral environments of justice; application of course content to justice agencies, policies, and programs.
***Prerequisites: 01:202:201 and 307.***

**01:202:309** ***Criminal Law: Theory and Practice (3)***
Study of the substantive criminal laws and judicial opinions, with emphasis on the New Jersey Code of Criminal Justice to enhance insights into an understanding of the potentialities and limitations on the law as an instrument of social control.
***Prerequisite: 01:202:201.***

**01:202:310** ***Victimology and Domestic Violence (3)***
Definitions and scope of violent crime in society. Includes a review of the issues, prevalence, myths, policies, programs, and services aimed at victims of violent crimes. The expanding role of the courts, police, battered women shelters, victim/witness assistance programs, crisis intervention units, and legislation highlighted.
***Prerequisite: 01:202:201.***

**01:202:311** ***Political Terrorism (3)***
Analysis of diverse organizations using terror, starvation, torture, and murder for political objectives.
***Prerequisite: 01:202:201.***

**01:202:312** ***Crimes against Humanity (3)***
Applies the concept of "crimes against humanity," as developed at the Nuremberg trials, to an analysis of similar events.
***Prerequisite: 01:202:201.***

**01:202:315** ***Race, International Law and Empire (3)***
Critical examination of the role of international law establishing racial regimes in a global order using TWAIL (Third World Approaches to International Law). Topics may include laws of armed conflict, international criminal law, sovereignty, self-determination, and human rights using an interdisciplinary approach combining law, history, anthropology, geography, and political science.
***Credit not given for both this course and 01:014:305.***

**01:202:322** ***Juvenile Justice (3)***
Examination of the recent political history of American juvenile justice; the policies, trends, and programs in juvenile justice during the past two decades. Focus on historical developments, the full range of contemporary alternatives for counseling and treatment, legal issues and functions of juvenile justice agencies, an exploration of future directions, and a reform agenda for the next two decades.
***Prerequisite: 01:202:201.***

**01:202:327** ***Sex, Crime, and Justice (3)***
Survey of changing social values about sex, changing criminal codes about sex crimes, changing law enforcement policies and procedures in prosecuting sex offenders, and emerging legal doctrines about privacy and sexual rights.
***Prerequisite: 01:202:201.***

**01:202:351-352** ***Forensic Science (4,4)***
Lecture and laboratory training in scientific methods and techniques applied to criminal investigation. Suitable for natural science majors and criminal justice majors interested in forensic science.
***Prerequisites: 01:119:115-116, 01:160:161-162, 01:202:201, 01:202:205; and 01:640:112 or 01:640:115 or Calculus I; or placement.***

**01:202:360** ***Ideas in Justice (3)***
Twentieth-century contributions to the development and application of penology, criminology, and criminal and social justice; study of the main ideas and key events that influenced the ideas and ideals evident in our social institutions.
***Prerequisite: 01:202:201 or 01:920:222.***

**01:202:370** ***Crisis Intervention in Criminal Justice Settings (3)***
Focuses on the conceptual framework for crisis intervention practice including crisis theory, crisis concepts, crisis intervention models and strategies, and guidelines for evaluating program outcomes.
***Prerequisites: 01:202:201, and 01:830:340 or 01:920:210. Credit not given for both this course and 01:202:422.***

**01:202:388,389** ***Criminal Justice Seminar (3,3)***
Examination of some central issues in contemporary criminal justice. Topics vary from semester to semester.
***Prerequisite: 01:202:201.***

**01:202:406,407,408** ***Internship in Criminal Justice (3,3,3)***
The internships are 120 hours in a local criminal/administration of justice agency. Involves an intensive learning experience under professional agency supervision, as well as periodic symposia and study sessions, research, semester papers, and oral presentations.
***Prerequisites: 01:202:201, 3 credits in criminal justice, senior standing, and permission of instructor.***

**01:202:425** ***Race, Crime, and Justice (3)***
Explores the economic, political, and sociological relationships between the criminal justice system and racial minorities in the United States.
***Prerequisites: 01:202:201, 01:920:222 and 307 or other research methods course satisfying the criminal justice major requirement.***

**01:202:488,489** ***Advanced Criminal Justice Seminar (3,3)***
Examination of some central issues in contemporary criminal justice. Topics vary from semester to semester.
***Prerequisite: 01:202:201.***

**01:202:495** ***Independent Study (1-3)***
Independent study under the direction of a member of the faculty.
***Prerequisites: 01:202:201 and permission of instructor and program.***

**01:202:496-497** ***Special Topics (3,3)***
Focuses on critical issues in criminal justice. May encompass topics related to law, law enforcement, the courts, corrections, etc. Specific issues are determined by the instructor.
***Prerequisite: 01:202:201.***

**01:202:498,499** ***Honors Thesis in Criminal Justice (3,3)***
Individual research projects to be written as an honors thesis.
***Prerequisites: Permission of program. For majors only. Students must have completed 15 credits toward the major, have senior standing, a 3.4 GPA in the major, and a 3.0 GPA overall.***

# Criminology 204 (SAS)

## CRIMINOLOGY 204

School of Arts and Sciences

**Website:** Here

**Program Director:** Jeffrey Dowd

**Program Faculty:**

Keiko Brynildsen, Psychology; Ph.D., California (Riverside) (CV with credentials not found)

Sarah Carton, Psychology; Ph.D. New York University

Sinan Celiksu, Criminal Justice; Ph.D., Columbia University

Christopher Chuckwuedo, Criminal Justice, B.A, U. of Texas San Antonio; M.A. U of Louisville, Ph.D. Rutgers

Kevin Dahaghi, Sociology; Ph.D., M.A., Univerity of Texas at Austin, B.A., Rutgers University

Mark Desire, Criminal Justice; J.D., New York Law School, M.S. Allegheny, B.A. Rutgers University

Noura Erakat, Criminal Justice; J.D., B.A. University of California at Berkeley, LLM, Georgetown University & Temple University

Theresa Herman, B.A Saint Vincent University; MA., New York University; PsyD California Southern University

Paul Hirschfield, Sociology; Ph.D., Northwestern

Larry Jacobs, Psychology; Ed.S., M.S., University of Albany

Calvin Lai, Psychology; Ph.D., University of Virginia

Sebastian Leon, Latino and Caribbean Studies; Ph.D., American University, M.A., George Washington University. B.S., Florida State University

Ricardo Martinez-Schuldt, Sociology; Ph.D., M.A., University of North Carolina at Chapel Hill, B.A. St. Cloud State University

Lisa L. Miller, Political Science; Ph.D., Washington

Lyra Stein, Psychology; , B.A., Rutgers; M.S., Einstein College of Medicine, Ph.D., Rutgers

Sheryl Van Horne, Criminal Justice; B.S. The College of New Jersey, M.A., Ph.D. Rutgers

Alec D. Walen, Philosophy and Law; J.D., Harvard University; Ph.D., University of Pittsburgh

Michael Welch, Criminal Justice; Ph.D., University of North Texas, M.S. Illinois State University, M.A. University of Missouri-Kansas City, B.A. Benedictine College

Criminology 204 (SAS)

# Learning Goals

# Learning Goals

1. Students will understand the criminological perspective, a distinctly interdisciplinary approach to the criminal justice system.

2. Students will understand how key questions in the criminal justice system can be better analyzed using both sociological and psychological concepts.

3. Students will develop the skills necessary to read and evaluate criminological research in an intelligent and critical manner.

4. Students will understand the role of theory and methods in criminological research.

Criminology 204 (SAS)

# Minor Program

# Minor Program

The interdisciplinary minor in criminology consists of eight courses (24 credits).

*Six courses are required:*
01:202:201 Introduction to Criminal Justice (3)
01:830:101 Introduction to Psychology (3)
01:830:340 Psychopathology (3)
01:920:101 Introduction to Sociology (3)
01:920:222 Criminology (3)
01:920:306 Race Relations (3)

*One Sociology elective course must be taken from the following:*
01:920:304 Sociology of Deviant Behavior (3)
01:920:307 Mental Illness (3)
01:920:349 Law and Society (3)

One additional 3-credit elective course offered by the criminal justice program (01:202) must be taken.

All courses must be passed with a grade of C or better to earn credit toward the minor.

The criminology minor is not available to criminal justice majors.

If a student is a criminal justice major and a sociology minor, 01:920:222 may not count toward their sociology minor due to overlap.

# Dance 203 (MGSA)

## DANCE 203

Department of Dance, Mason Gross School of the Arts

**Website:** Here

See the Mason Gross School of the Arts section for faculty listing and bachelor of fine arts (B.F.A.) degree program information.

The bachelor of arts (B.A.) major program in dance combines a broad experience in the liberal arts with a specialization in the area of dance. It prepares students to advance beyond the bachelor's degree in performance, teaching, dance criticism, or history. Audition required.

The Department of Dance is an accredited institutional member of the National Association of Schools of Dance.



## Major Requirements: B.A. Program

## Major Requirements: B.A. Program

Audition required.

Dance majors in the bachelor of arts (B.A.) program are required to complete a total of 41 credits of courses listed in this chapter under 07:203 and 07:206. It is recommended that dance majors elect additional courses in the major after a consultation with an academic advisor for dance.

All B.A. majors are required to perform in at least one public performance sponsored by the Department of Dance.

Dance 203 (MGSA)

# Minor Requirements

# Minor Requirements

Audition required.

The minor in dance requires a total of 20 credits. It includes the following sequence in modern dance studio courses (07:203:123, 124, 225, 226); 07:203:149 Ballet 1; 07:206:142 Dance Improvisation 1; 07:203:329 Dance Composition; 07:206:161 Production Study (1 credit). In addition, dance minors elect any two of the following courses: 07:203:101 Dance Appreciation or 07:203:131 Dance Appreciation Online; 07:203:150 Ballet 2; 07:206:441 Dance History World Survey; 07:206:442 Dance History 1900 to Present.

Dance 203 (MGSA)

# Courses (203)

# Courses (203)

## Dance 203

**07:203:101** *Dance Appreciation (3)*
Dance Appreciation is an introduction to dance as an art form, wherein students study the historical, cultural, social, and performative contexts of diverse dance forms. Students engage with aesthetic, theoretical, and scholarly discourses aimed at illuminating how dance functions as a form of communication and personal, aesthetic expression. In addition, students explore the ways in which dance both reflects and comments upon contemporary society. Students develop fundamental dance literacy through critical analysis of dance in live and recorded formats; identify aesthetic concepts and ideas through written and visual media; demonstrate comprehension in their utilization of dance vocabulary and terminology; discuss influential choreographers and genres of dance; and articulate critical conclusions about the reciprocal relationship between dance, the arts, and societal concerns.
***Please note: Students may not receive credit for both 07:203:101 and 07:203:131.***

**07:203:110** *Street and Club Dances (2)*
The study of fusion dance evolving from traditional and contemporary African and African diasporic dance forms, including contemporary social dances. Students will be introduced to these dance forms through studio practice, video, masterclasses, and performance.
***Open to BA majors, minors, and non-dance majors.***

**07:203:115** *Introduction to Dance Studies (3)*
Introduction to the domain of dance practice and theoretical frameworks, within a humanities context that acknowledges the intersection of multiple intelligences. Students observe and describe dance as a performing art and as cultural intervention. Guest artists provide performance demonstrations on a variety of topics including race/ethnicity, gender/sexuality, disability studies, screendance technology, and sound/lighting/costume design, among others. Descriptive and analytic writing required.
***Open only to dance majors.***

**07:203:123** *Modern Dance 1 (2)*
Introduction to the fundamentals of movement skills and body awareness in modern dance technique, improvisation, and composition.

**07:203:124** *Modern Dance 2 (2)*
Continued development of movement skills, improvisation, and composition in modern dance.
***Prerequisite: 07:203:123 or permission of instructor.***

**07:203:131** *Dance Appreciation (3)*
Dance Appreciation Online is an introduction to dance as an art form, wherein students study the historical, cultural, social, and performative contexts of diverse dance forms. Students engage with aesthetic, theoretical, and scholarly discourses aimed at illuminating how dance functions as a form of communication and personal, aesthetic expression. In addition, students explore the ways in which dance both reflects and comments upon contemporary society. Students develop fundamental dance literacy through critical analysis of dance in live and recorded formats; identify aesthetic concepts and ideas through written and visual media; demonstrate comprehension in their utilization of dance vocabulary and terminology; discuss influential choreographers and genres of dance; and articulate critical conclusions about the reciprocal relationship between dance, the arts, and societal concerns.
***Please note: Students may not receive credit for both 07:203:101 and 07:203:131.***

**07:203:132** *History of Broadway Dance Online (3)*
Explores the evolution of dance in musical theater and on Broadway. Course topics will include a historical survey of dance on Broadway; an examination of the reciprocal relationship of Broadway dance to economic and cultural change; and a close look at the power structure and organization of Broadway musicals. The evolution of Broadway dance steps and styles and the contribution of notable dancers will be examined.

**07:203:134** *Dance in Israel: Body, Ideology, and Culture (3)*
Survey of Israel's concert dance history, from roots in imported styles in the pre- and immediate post-state decades to the blossoming of a homegrown Israeli contemporary dance within the last few decades. Topics include aesthetic influences, significant artists, and recent innovations, with discussions about technical, stylistic, and thematic concerns. Throughout the course, dance is situated within a larger historical, sociopolitical context, and connections to politics, nationalism, religion, ethnicity, and culture are considered.

**07:203:135** *Dance Forms in Africa (3)*
Explores dance forms from different cultures in different blocks on the African continent. Through readings, viewings, and engagement with movement, students use skills of observation, movement learning, and contextual and comparative analysis, focusing on the social, cultural, religious, and political significance of African dance forms. Types and functions of traditional African dances, contexts of performance, and their unique characteristics will also be explored.

**07:203:136** *Dance in India (3)*
Covers a wide range of forms practiced in India in the 20th and 21st century, including folk dances, classical dance styles, contemporary choreography, and film dances, among others. Also looks beyond India, into the diaspora and global contexts in which Indian dance forms are practiced. Methods include analysis of readings, video documentaries, dance films, and interviews, as well as concept mapping. Practical engagement with movement material and aesthetic principles included.

**07:203:149** *Ballet 1 (2)*
Introduction to ballet as an art form with an emphasis on traditional steps.

**07:203:150** *Ballet 2 (2)*
Practice in the development of ballet technical skill, body alignment, and concepts of ballet aesthetics.
***Prerequisite: 07:203:149 or permission of instructor.***

**07:203:155** *Introduction to Jazz Dance (2)*
Familiarizes nondance majors to technical and performance aspects of jazz dance. The course introduces students to a variety of jazz styles to provide a broad foundation from which to select future training opportunities.
***Open to BA majors, minors, and non-dance majors.***

**07:203:160** *Pilates Mat (1)*
Covers the 34 Pilates mat exercises as developed by Joseph and Clara Pilates. Variations and modifications for each of these exercises will also be taught in an effort to not only further explore the possibilities that the method offers, but to prevent injury and suit the needs of each student. Use of foam roller and magic circle props will be integrated into this practice.
***Open to dance majors, minors, and non-majors.***

**07:203:170** *Yoga for Wellness (2)*
In this course, students will learn the historical beginnings of yoga, gaining a broad understanding of the cultural significance of this practice. Basic Sanskrit, Hindu mythology, and the culture of India will also be discussed.
***Open to dance majors, minors, and non-majors.***

**07:203:329** *Dance Composition (2)*
Development of fundamental skills in choreography.
***Pre- or corequisite: 07:203:142. Open only to B.A. dance majors and dance minors.***

**07:203:350** *Performing Climate Change (3)*
This course provides a conceptual framework and creative practicum for students who wish to engage with climate change through the performing arts. The course is open to students of all disciplines. The prerequisites are an interest in climate change and a willingness to active the creative imagination.

**07:203:363** *B.A. and Minor Modern Dance Repertory (2)*
Study and performance of original or repertory works, both historical and contemporary, by guest or resident choreographers.
***Open only to B.A. dance majors and dance minors.***



# Courses (206)

# Courses (206)

**07:206:100** *Dance Assembly (N.5)*
Grade based on attendance. Required of all B.F.A dance majors for eight semesters of enrollment as a declared major.

**07:206:126** ***Rhythm for Dancers (2)***
Analysis of rhythmic structure relative to movement. Sight-reading note values, movement dictation, and composition.
***Prerequisites: 07:203:123 and 124. Open to dance majors only.***

**07:206:130** ***African Diasporic Movement Practices 1 (1.5)***
African Diasporic Movement Practices brings forward for dancers the origins of Black African Diasporic derived dance forms and fusions and their value in dance training. Forms and fusions of forms will be identified and contextualized culturally and historically in order to provide students with skills essential to embody and physically master the movement practice. The dance form's social and cultural roots will be studied as essential to movement practice. Studio work, readings, and self-reflections will help students to understand the physical, intentional, and expressive values by which a dancer is understood to be proficient in the form.
***Open only to B.F.A. dance majors.***

**07:206:131** ***Classical/Traditional Movement Practices 1 (1.5)***
Dance forms centered in codified movement vocabularies emerging from global, temporal, and cultural contexts. Example forms include: Classical Ballet, Kathak, Chinese classical dance, and forms based on or derived from Cunningham, Fosse, Cole, Graham, Horton, Limon, Luigi, and Taylor Techniques.
***Open only to B.F.A. dance majors.***

**07:206:132** ***Contemporary Fusion Movement Practices 1 (1.5)***
Studio course in which students engage both physically and theoretically with contemporary movement practices that draw from at least two forms of dance. The course situates the individual forms and fused practice within historical, social, and cultural lenses to provide an understanding of lineage, to accurately represent the values of the practice, and to help students recognize their individual relationship to the practice.
***Only open to B.F.A. dance majors.***

**07:206:133** ***Somatic Movement Practices 1 (1.5)***
Movement practices that emphasize wellness, functional efficiency, and injury prevention through embodied experience and integration of body/mind/spirit. Example practices include: Alexander Technique, Bartenieff Fundamentals, Feldenkrais Method, Franklin Method, Functional Movement Training, Klein Technique, Pilates, and Yoga.
***Open only to B.F.A. majors.***

**07:206:142** ***Dance Improvisation 1 (2)***
Introductory experience in dance improvisation including the use of kinetics, movement design, and spatial sensing as potential sources of movement and partner interaction.
***Open only to dance majors and minors.***

**07:206:145** ***Performance Skills 1 (2)***
Development of performance skills for first-year B.F.A. dance majors. Students are engaged in an extensive rehearsal process with a guest or faculty choreographer in order to introduce them to generative improvisational and compositional strategies for the creation of original works of choreography.
***Open only to B.F.A. majors.***

**07:206:146** *African Diasporic Movement Practices 2 (1.5)*
African Diasporic Movement Practices brings forward for dancers the origins of Black African Diasporic derived dance forms and fusions and their value in dance training. Forms and fusions of forms will be identified and contextualized culturally and historically in order to provide students with skills essential to embody and physically master the movement practice. The dance form's social and cultural roots will be studied as essential to the movement practice. Studio work, readings and self-reflections will help students to understand the physical, intentional and expressive values by which a dancer is understood to be proficient in the form.
*Open only to B.F.A. dance majors.*

**07:206:147** *Classical/Traditional Movement Practices 2 (1.5)*
Through engaging in a new Classical/Traditional form, Movement Practices 2 inwardly builds, outwardly expands, and develops variation in learning from Somatic Movement Practices 1. Students continue to find connections among the five course goals and learning outcomes listed below. Students will add to their movement vocabulary and also continue to unearth personal voice through a non-hierarchical nexus of learning.
*Open only to B.F.A. dance majors.*

**07:206:148** *Contemporary Fusion Movement Practices 2 (1.5)*
Through engaging in a new Contemporary Fusion form, Movement Practices 2 inwardly builds, outwardly expands, and develops variation in learning from Contemporary Fusion Movement Practices 1. Students continue to find connections among the five course goals and learning outcomes listed below. Students will add to their movement vocabulary and continue to unearth personal voice through a non-hierarchical nexus of learning. Students will investigate another Contemporary Fusion form that draws from at least two forms of dance. This is a studio course in which students engage both physically and theoretically with such contemporary movement practices.
*Open only to B.F.A. dance majors.*

**07:206:149** *Somatic Movement Practices 2 (1.5)*
Somatic Movement Practices 2 focuses on theoretical and embodied understanding of selected somatic practice(s) with a special focus on application to dance training and performance. Students will examine somatic theories and principles and how they manifest in somatic practices that emphasize internal physical perception and experience.
*Open only to B.F.A. dance majors.*

**07:206:154** *Pointe Class (1)*
Class includes participation in a ballet barre and center work. The focus will be on the practice and principles of the classical ballet vocabulary with an emphasis on strengthening foundational skills in pointe technique. Advice will be given on how students can best prepare and maintain their pointe shoes.
*Open to dance majors only. B.A. dance majors and dance minors with permission of instructor only.*

**07:206:155** *Ballet Jumps and Turns (1)*
Class includes participation in a ballet barre and center work. The focus will be on the practice and principles of classical ballet jumps and turns.
*Open to B.F.A. dance majors only. B.A. dance majors and dance minors with permission of department only.*

**07:206:161** *Production Study (1-2)*
Crew assignments and production support for department dance performances.
*Dance majors and dance minors to complete 1 credit; B.F.A. dance majors to complete 2 credits.*

**07:206:235** *Choreography 1 (2)*
Introduction to the choreographic process. Solo forms and group choreography.
*07:206:243 or permission of the instructor. Open only to B.F.A. dance majors.*

**07:206:237** *Dance Production (3)*
Theoretical and practical applications of computer, lighting, audio, and technical theater skills necessary to produce, promote, and direct dance productions. Students develop computer skills in graphic design and sound design/ editing as well as computer lighting consoles and theatrical lighting equipment in two professional theaters. Students study lighting design and stage management for dance in theory and practical application around a department production.

**07:206:243** *Dance Improvisation 2 (2)*
Exploration of dance improvisation as the source of movement for choreography.
*07:206:142 or permission of the instructor. Open only to B.F.A. dance majors.*

**07:206:245** *Performance Skills 2 (2)*
Continued development of performance skills for second-year B.F.A. dance majors. Students are challenged to further refine their technical skills and advance their performance abilities through a collaborative, creative process with a guest or faculty choreographer.
*07:206:145 or permission of the instructor. Open only to B.F.A. majors.*

**07:206:260** *African Diasporic Movement Practices 3 (1.5)*
African Diasporic Movement Practices 3 inwardly builds, outwardly expands, and develops variation in learning from Movement Practices 2. Students will elevate connections among the five course goals and learning outcomes and incorporate an additional goal towards communication of their individual identities, perspectives and artistry. Students apply skills, approaches to movement, and contexts learned in Movement Practices 1 and 2 to train in a new African Diasporic-derived form as an informed dancer in the movement practice. Students will add to their movement vocabulary and artistic strategies as they navigate the use of their year one Movement Practices training to illuminate embodied communication and strengthen performance in the form. Leadership skills will also be developed.
*Open only to B.F.A. dance majors.*

**07:206:261** *Classical/Traditional Movement Practices 3 (1.5)*
Students apply skills, approaches to movement, and contexts learned in Movement Practices 1 and 2 to train in a new Classical/Traditional form as an informed dancer in the movement practice. Students will add to their movement vocabulary and artistic strategies as they navigate the use of their year one Movement Practices training to illuminate embodied communication and strengthen performance in the form. Leadership skills will also be developed. Students will deeply investigate this codified, Classical/Traditional form and its value in their dance training. Forms and fusions of forms will be identified and contextualized culturally and historically in order to provide students with skills essential to embody and physically master the movement practice. The form's traditions, modes of study, movement vocabularies, and prescriptive grammars will also be studied and expressed
*Open only to B.F.A. dance majors*

**07:206:262** *Contemporary Fusion Movement Practices 3 (1.5)*
Through engaging in a new Contemporary Fusion form, Movement Practices 3 advances the artistic and kinesthetic investment of inwardly building, outwardly expanding, and developing variation in learning from Contemporary Fusion Movement Practices 1 and 2. Students will investigate a Contemporary Fusion form that draws from at

least two forms of dance. This is a studio course in which students engage both physically and theoretically with contemporary movement practices. The course situates the individual forms and fused practice within historical, social, and cultural lenses to provide an understanding of lineage, to accurately represent the values of the practice, and to help students recognize their individual relationship to the practice. The course emphasizes the progression from internal investigation to external expression.
***Open only to B.F.A. dance majors.***

**07:206:263** ***Somatic Movement Practices 3 (1.5)***
Somatic Movement Practices 3 continues to focus on theoretical and embodied understanding of selected somatic practice(s) with a special focus on application to dance training and performance. Students will examine somatic theories and principles and how they manifest in somatic practices that emphasize internal physical perception and experience. Distinctive forms enable students to better understand how they can promote wellness and self-knowledge, and prevent injury through continued and varied experiences with and reflective thinking about somatic practices.
***Open only to B.F.A. dance majors.***

**07:206:264** ***African Diasporic Movement Practices 4 (1.5)***
Through engagement in a new form, African Diasporic Movement Practices 4 continues to advance the artistic and kinesthetic investment in inwardly building, outwardly expanding, and developing variations in learning from African Diasporic Movement Practices 1, 2 and 3. Students elevate increasingly sophisticated connections among the six course goals and learning outcomes listed below and apply skills, approaches to movement, and contexts learned in Movement Practices 1 and 2 to train in a new African Diasporic-derived form as an informed dancer in the movement practice.
***Open only to B.F.A. dance majors.***

**07:206:265** ***Classical/Traditional Movement Practices 4 (1.5)***
Continued study and training in dance forms centered in codified movement vocabularies, emerging from global temporal and cultural contexts. Example forms include: Classical Ballet, Bharatanatyam, Chinese classical dance, and forms based on or derived from Cunningham, Fosse, Cole, Graham, Hawkins, Horton, Limon, Luigi, and Taylor Techniques.
***Open only to B.F.A. dance majors.***

**07:206:266** ***Contemporary Fusion Movement Practices 4 (1.5)***
Through engagement in a new Contemporary Fusion form, Movement Practices 4 continues to advance the artistic and kinesthetic investment of inwardly building,¿outwardly expanding, and developing variation in learning from Contemporary Fusion Movement Practices 1, 2 and 3. Students investigate this additional Contemporary Fusion form that draws from at least two forms of dance. This is a studio course in which students engage both physically and theoretically with contemporary movement practices. The course situates the individual forms and fused practice within historical, social, and cultural lenses to provide an understanding of lineage, to accurately represent the values of the practice, and to help students recognize their individual relationship to the practice. The course emphasizes the progression from internal investigation to external expression.
***Open only to B.F.A. dance majors.***

**07:206:267** ***Somatic Movement Practices 4 (1.5)***
Somatic Movement Practices 4 continues to focus on theoretical and embodied understanding of selected somatic practice(s) with a special focus on application to dance training and performance. Students will examine somatic

theories and principles and how they manifest in somatic practices that emphasize internal physical perception and experience. Distinctive forms enable students to better understand how they can promote wellness and self-knowledge, and prevent injury through continued and varied experiences with and reflective thinking about somatic practices.
*Open to only B.F.A. dance majors.*

**07:206:274** *Jazz Dance (2)*
Various styles and techniques in the idiom of jazz dance.
*May be repeated for credit. Open only to dance majors and minors.*

**07:206:277** *Latino and Hispanic Dance Forms (2)*
Studio course includes technique and performance of selected dance forms within their historical and cultural contexts. Dance forms may include indigenous, diasporic, and hybrid dances from the Caribbean, Mexico, and South America; classical Spanish and Flamenco dance; and Filipino dances derived from Spanish influence.
*May be repeated for credit if a new culture.*

**07:206:312** *Advanced Ballet (2)*
Studio-based course with barre and center format. We will call upon our curiosities and sense of play to examine and embody classical ballet vocabulary through the applications of somatic practices, repertory, and improvisation techniques. Class material will increase with complexity of vocabulary, tempos, and spatial pathways over the course of the semester. Journaling and class discussions will include, but are not limited to: the role of ballet a Eurocentric form in the 21st century, the potential for ballet class to be an individual and/or collective practice, and applications of tools/approaches learned in this class to other dance forms.
*Classical/Traditional Movement Practices 2 or Ballet 2*

**07:206:319** *Sound and Movement (3)*
Analysis of the relationships of music and dance in content, form, and structure.
*B.A. dance majors complete 07:203:126 prior to enrollment.*

# Data Science 219 (SAS)

## DATA SCIENCE 219

**Data Science Undergraduate Program**

**Website**: Here

**Data Science Undergraduate Program Directors:** Steven Buyske and Tomasz Imielinski

**Administrative Director, Data Science Undergraduate Program:** Sangya S. Varma

**Board of Governors Professor:**

**SAS Computer Science**

Casimir Kulikowski, B.E., M.S., Ph.D. University of Hawaii

**Distinguished Professors:**

**SAS Statistics**

Minge Xie, B.S., University of Science and Technology of China; M.S., Ph.D., Illinois (Urbana-Champaign)

**Professors:**

**SAS Computer Science**

Ahmed Elgammal, B.S., M.S., Ph.D., University of Maryland, College Park

Jie Gao B.S., Ph.D., Stanford University

Tomasz Imielinski, B.E., M.E., Ph.D., Polish Academy of Sciences

Vladimir Pavlovic, Dip., M.S., Ph.D., University of Illinois at Urbana-Champaign

Matthew Stone, Sc.B., Ph.D., University of Pennsylvania

**SAS Statistics**

Javier Cabrera, B.A., Madrid; M.A., Ph.D., Princeton

Harry Crane, B.S., Pennsylvania; Ph.D., Chicago

Tirthankar Dasgupta, B.S., Calcutta; M.S., Indian Statistical Institute; Ph.D., Georgia Institute of Technology

Ying Hung, B.A., National Taiwan (Taiwan); M.S., National Tsing Hua (Taiwan); Ph.D., Georgia Institute of Technology

Sijian Wang, B.S., Tsinghua (China); M.S., Ph.D., Michigan

Han Xiao, B.S., Peking; M.S., National (Singapore); Ph.D., Chicago

**Associate Professors:**

**SAS Computer Science**

Amélie Marian, B.Sc., M.Sc., Ph.D., Columbia University

Konstantinos P. Michmizos, Dip., M.S., Ph.D., National Technical University of Athens

Jingjin Yu, B.S.,M.S., Ph.D., University of Illinois Urbana-Champaign

Yongfeng Zhang, B.E., B.S., Ph.D., Tsinghua University

**SAS Statistics**

Pierre Bellec, Dipl. d'Ingénieur, Ecole Polytechnique; Part III (MASt), Cambridge (UK); Ph.D., ENSAE Paris Tech

Steven Buyske, B.A., Haverford College; Sc.M., Ph.D., Brown; Ph.D., Rutgers

Roubin Gong, B.Sc., Toronto; A.M, Harvard; Ph.D., Harvard

Zijian Guo, B.S., Chinese University of Hong Kong; Ph.D., Pennsylvania

Linjun Zhang, PhD., The Wharton School, University of Pennsylvania

**SC&I Communication**

Katherine Ognyanova, B.Sc., Bulgaria, M.A., Bulgaria, M.A. University of Southern California, Ph.D., Annenberg School of Communication.

**SC&I Library and Information Science**

Vivek Singh, B.E., Singapore, Master of Computing, Singapore, Ph.D., University of California, Irvine.

**SC&I Journalism and Media Studies**

Caitlin Petre, B.A., Wesleyan University, M.A., New York University, Ph.D., New York University.

**Assistant Professors:**

**SAS Computer Science**

Hao Wang, B.Sc., Ph.D., Hong Kong University of Science and Technology

**SAS Statistics**

Matteo Bonvini, PhD., Carnegie Mellon University

Yaqing Chen, B.S., Peking; Ph.D., California (Davis)

Koulik Khamaru, B.S., M.S., Indian Statistical Institute; Ph.D., California (Berkeley)

Gemma Moran, PhD., University of Pennsylvania

Nicole Pashley, B.S., Queen¿s (Kingston); M.A., Ph.D., Harvard

Guanyang Wang, B.S, Science and Technology (China); Ph.D., Stanford

Min Xu, B.S., California (Berkeley); Ph.D., Carnegie Mellon

**SC&I Library and Information Science**

Britt Paris, M.A. The New School, Ph.D., University of California (Los Angeles)

Shagun Jhaver, B.Tech., IIT, Bombay, M.S., University of Texas, Dallas, Ph.D., Georgia Institute of Technology

**Teaching Faculty:**

**SAS Computer Science**

James Abello, M.S., Ph.D., University of California, San Diego

Ana Paula Centeno, B.S., M.S., Ph.D., Rutgers University

Charles Cowan, B.A., Ph.D., Rutgers University

Ananda D. Gunawardena, B.Sc., M.S., Ph.D., Ohio University

Samaneh Hamidi., B.S., M.S., Ph.D., University of Malaya

Antonio Miranda Garcia, B.S., Ph.D., Texas A&M University

Sesh Venugopal, B.Tech., Ph.D., Rutgers University

**SAS Statistics**

Michael LuValle, B.A., Pomona; Ph. D., Univ CA Davis

Ravi Remaswamy, B.S., Indian Statistical Institute; Ph.D., Univ Rochester

Suryakala Srinivasan, B.S., Sarada College Salem; M. PhiL,, Loyola College Chennai

Zhanyun Zhao, B.S., Nankai; Ph. D., University of Pennsylvania

**Assistant Teaching Professors:**

SC&I Library and Information Science

Brendan Mahoney

Kaushal Trivedi

# Learning Goals

# LEARNING GOALS

Students will be able to:

- Transform and map data (otherwise called data wrangling) from one "raw" data format into another format for further analysis, querying, learning, and prediction.
- Acquire data management skills such as database design and database querying. They will be able to create and maintain databases to facilitate querying and the incorporation of new data.
- Execute data analyses with professional statistical and machine learning software such as R and python.
- Visualize (plot) data relationships in meaningful ways, such as scatter plots, bar charts, box plots, and histograms, to communicate salient features of datasets. They will be able to adapt visualizations to the intended audience ranging from novice to expert.
- Understand the conceptual basis of those analyses used in data science and how those analysis methods aid in finding and articulating salient features of the data.
- Apply data science concepts and analysis methods to solve real-world problems by extending concepts and methods to novel contexts.
- Support an argument or stance with data, as well as critique findings and conclusions that are not justified by the data. They will be able to use data analysis methods to distinguish between and/or compare arguments and stances and discern between arguments strongly supported by the data versus those that misinterpret, distort, and/or misrepresent the data analysis to suit the argument, such as selectively emphasizing a subset of data while neglecting other conflicting data.
- Analyze the ethical, legal, and social implications of data collection, data processing, and algorithm development.

Data Science 219 (SAS)

# Major Requirements

# Major Requirements

**Entry Requirements for the Major**
Students wishing to declare a major in Data Science must have successfully completed three courses: Data Literacy/ Data101, Statistical Inference (or one of its equivalents), and one of the Data Management courses with a grade of C or better.

**Major Requirements**

Required Courses for All Major Options

01:198:142/01:960:142 Data 101: Data Literacy

01:960:291 Statistical Inference for Data Science or one of the following equivalents:

01:960:212 Statistics II

01:960:384 Intermediate Statistical Analysis

33:136:385 Statistical Methods in Business

One of the following Data Management courses:

01:198:210 Data Management for Data Science

01:960:295 Data Management and Wrangling with R

04:547:221 Fundamentals of Data Curation and Management

01:640:250 Introductory Linear Algebra

04:189:220 Data in Context

**B.A. in Data Science-Statistics Track NB219TJ (must do a Minor, except a Minor in Statistics):**

01:640:136 Calculus II or 01:640:/152 Calculus II

01:198:111 Intro Comp Science

01:198:112 Data Structures

01:960:463 Regression Methods

01:960:486 Applied Statistical Learning

One of the following:

01:960:365 Bayesian Data Analysis

01:960:467 Applied Multivariate Analysis

01:960:490 Intro to Experimental Design

**B.A. in Data Science-Societal Impact Track NB219IJ (must do a Minor):**

01:640:135 Calculus I or 01:640:151 Calculus I

01:960:463 Regression Methods

01:960:486 Applied Statistical Learning

04:189:103 IT and Informatics

04:547:201 Information Technology Fundamentals

04:547:321 Information Visualization

One of the following:

01:960:365 Bayesian Data Analysis

01:960:467 Applied Multivariate Analysis

01:960:490 Intro to Experimental Design

**B.S. in Data Science-Computer Science Track NB219SJ:**

01:640:152 Calculus II

01:640:251 Multivariable Calculus

01:198:111 Introduction to Computer Science

01:198:112 Data Structures

01:198:205 Intro to Discrete Structures I

01:198:206 Intro to Discrete Structures II

01:198:336 Principles of Information and Data Management

01:198:439 Introduction to Data Science

01:198:461 Machine Learning Principles or, 01:198:462 Introduction to Deep Learning

01:960:463 Regression Methods

01:960:486 Applied Statistical Learning

04:547:321 Information Visualization

**B.S. in Data Science-Economics Track NB219EJ:**

01:640:136 Calculus II or /01:640:152 Calculus II

04:547:321 Information Visualization

01:220:102 Intro to Microeconomics

01:220:103 Intro to Macroeconomics

01:220:320 Intermediate Microeconomics Analysis

01:220:321 Intermediate Macroeconomic Analysis

01:220:322 Econometrics

01:220:421 Economic Forecasting and Big Data

01:220:422 Advanced Econometrics for Microeconomic Data or 01:220:423 Advanced Time Series and Financial Econometrics

01:220:424 Advanced Analytics for Economics

**B.S. in Data Science-Chemical Data Science Track NB219CJ:**

01:640:152 Calculus II

01:198:111 Introduction to Computer Science

One of the following:

01:160:161 General Chemistry

01:160:159 General Chemistry for Engineers

01:160:163 Honors General Chemistry

01:160:165 Extended General Chemistry

One of the following:

01:160:162 General Chemistry

01:160:160 General Chemistry for Engineers

01:160:164 Honors General Chemistry

01:160:166 Extended General Chemistry

01:160:171 Introduction to Experimentation

One of the following:

01:160:307 Organic Chemistry

01:160:315 Honors Organic Chemistry

One of the following:

01:160:308 Organic Chemistry

01:160:316 - Honors Organic Chemistry

Nine credits from the following:

01:160:251 Analytical Chemistry (3)

01:160:309 Organic Chemistry Laboratory (2.5)

01:160:348 Instrumental Analysis (3)

01:160:351 Inorganic Chemistry (3)

01:160:352 Inorganic Chemistry IIA (7-week course) (1.5)

01:160:353 Inorganic Chemistry IIB (7-week course) (1.5)

Either 01:160:327 Physical Chemistry (4) OR 01:160:341 Physical Chemistry: Biochemical Systems (3) **

Either 01:160:328 Physical Chemistry (4) OR 01:160:342 Physical Chemistry: Biochemical Systems (3) OR 01:160:438 Introduction to Computational Chemistry (3)**

Either 01:694:407 Molecular Biology and Biochemistry (3) OR 11:115:403 General Biochemistry I (4) **

** Students cannot select both courses to fulfill the 9 credits; they are only allowed to choose one.

One of the following:

01:960:365 Introduction to Bayesian Data Analysis

01:960:463 Regression Methods

One of the following:

01:198:310 Data Science Capstone Project

01:160: TBD Chemical Data Science and Machine Learning Applications (under development)

Data Science 219 (SAS)

# Minor Requirements

# MINOR REQUIREMENTS

To declare the Data Science minor, students must successfully complete the Data Literacy course, Data 101 (198:142/960:142), with a grade of C or better.

**Required Core Courses**

The following courses are required for all Data Science minors:

01:198:142/01:960:142 Data 101: Data Literacy

01:960:291 Statistical Inference for Data Science or one of the following equivalents:

01:960:212 Statistics II

01:960:384 Intermediate Statistical Analysis

33:136:385 Statistical Methods in Business

One of the following Data Management courses:

01:198:210 Data Management for Data Science

01:960:295 Data Management and Wrangling with R

04:547:221 Fundamentals of Data Curation and Management

One of the following domain courses:

01:198:439 Introduction to Data Science

01:220:322 Econometrics

01:359:207 Data and Culture

01:447:303 Computational Genetics of Big Data

01:450:320 Spatial Data Analysis

01:450:321 Geographic Information Systems

01:450:330 Geographical Research Method

01:750:345 Computational Astrophysics

01:790:391 Data Science for Political Science

01:920:360 Computational Social Science

01:960:365 Introduction to Bayesian Data Analysis

01:960:463 Regression Methods

01:960:486 Applied Statistical Learning

04:189:220 Data in Context

04:547:321 Information Visualization

11:126:486. Functional Genomics for Research

14:332:443 Machine Learning for Engineers

One of the following Capstone Course:

Data Science Capstone Project (01:198:310) - default, or

Data Science and Econometrics (01:220:323)

**Minor in Data Science-Computer Science Track:**

This track targets students with existing programming experience. It requires courses in statistics, data-centric programming, data management, and data analysis. Note that the courses 01:198:461 and 01:198:462 have prerequisites that include courses in addition to those required for the minor.

- 01:960:463 Regression Methods
- One of the following Machine Learning courses:

01:198:461 Machine Learning Principles

01:198:462 Introduction to Deep Learning

**Minor in Data Science-Statistics Track:**

This track targets students with a quantitative background but perhaps little programming experience. It can be pursued without any additional prerequisite courses beyond those in requirements I, II, and III.

- 01:960:486 Applied Statistical Learning
- One of the following:

04:547:321 Information Visualization

04:189:220 Data in context

01:960:463 Regression Methods

**Minor in Data Science-Economics Track:**

This track is intended mainly for Economics majors or Quantitative Economics minors. In any case, completion of the intermediate economics core courses (01:220:320, 321, and 322) is required, as these courses are prerequisites to Advanced Analytics for Economics, 01:220:424. Calculus II (01:640:152) is a prerequisite.

- 01:220:424 Machine Learning for Economics
- One of the following:

04:547:321 Information Visualization

04:189:220 Data in Context

**Minor in Data Science-Societal Impact Track:**

This track will allow students to develop skills in human-centered aspects of data science.

- 04:547:321 Information Visualization
- 04:189:220 Data in Context

Data Science 219 (SAS)

# Undergraduate Certificate in Data Science

# Undergraduate Certificate in Data Science

**Undergraduate Certificate in Data Science:**
The goals of the Data Science Certificate program are achieved by completing three foundational courses followed by an advanced domain-specific course and a mini-capstone course.

Students must take 4 courses (14 to 16 credits) which include a 1-credit mini-capstone for skills demonstration for the successful completion of the Certificate in Data Science.

Students must maintain a G.P.A. of 2.0 in the courses applied to the certificate. No courses with a grade of D can be counted toward the certificate.

**Data Science Undergraduate Certificate Requirements:**

01:198:142/01:960:142 Data 101: Data Literacy

01:960:291 Statistical Inference for Data Science or one of the following equivalents:

01:960:212 Statistics II

01:960:384 Intermediate Statistical Analysis

33:136:385 Statistical Methods in Business

One of the following Data Management courses:

01:198:210 Data Management for Data Science

01:960:295 Data Management and Wrangling with R

04:547:221 Fundamentals of Data Curation and Management

One of the following domain courses:

01:198:439 - Introduction to Data Science

01:220:322 Econometrics

01:359:207 Data and Culture

01:447:303 Computational Genetics of Big Data

01:450:320 Spatial Data Analysis

01:450:321 Geographic Information Systems

01:450:330 Geographical Research Method

01:750:345 Computational Astrophysics

01:790:391 Data Science for Political Science

01:920:360 Computational Social Science

01:960:365 Introduction to Bayesian Data Analysis

01:960:463 Regression Methods

01:960:486 Applied Statistical Learning

04:189:220 Data in Context

04:547:321 Information Visualization

11:126:486. Functional Genomics for Research

14:332:443 Machine Learning for Engineers

One of the following Capstone Courses:

01:198:310 Data Science Capstone Project

01:220:323 Data Science and Econometrics

# Medicine and Dentistry (SAS)

## MEDICINE AND DENTISTRY

The Association of American Medical Colleges, the American Association of Colleges of Osteopathic Medicine, and the American Dental Association have set the following entrance requirements for their member medical and dental schools:

| Subject | Credits |
|---|---|
| Biology | 8 |
| Chemistry: General Inorganic | 8 |
| Chemistry: Organic | 8 |
| English | 6 |
| Humanities | 6 |
| Physics | 8 |
| Biochemistry | 3/4* |
| Psychology | 3* |
| Sociology | 3* |
| Statistics | 3* |

*These courses are recommended for the Medical College Admissions Test (MCAT) as of 2015.

All four science areas should include a laboratory. In addition, some medical and dental schools may require knowledge of a foreign language, a year of college mathematics, and additional work in the sciences. There is, however, no prescribed premedical major. Applicants to medical and dental schools should have excellent records, especially in the sciences, as well as experience in a health care field. Also, all schools recognize the importance of well-developed communication skills and a strong background in the humanities and the social sciences.

Before sitting for either the MCAT or Dental College Admissions Test (DAT), it is recommended that students take coursework in psychology, sociology, statistics, and other biomedical sciences such as biochemistry, genetics, physiology, and/or cell biology. Students should contact the Rutgers Health Professions Office (848-445-5667) for more information.

(See also Health Professions Office in the School of Arts and Sciences chapter of this catalog.)

# Ecology, Evolution, and Natural Resources 216 (SEBS)

## ECOLOGY, EVOLUTION, AND NATURAL RESOURCES 216

(Formerly 704)

**Degree:** B.S.

**Director:** Kimberly N. Russell; 124 ENR Building, 848-932-9383, (Kimberly.russell@rutgers.edu)

**Program Webpage:** Here

**Department of Ecology, Evolution, and Natural Resources Webpage:** Here

The ecology, evolution, and natural resources curriculum provides an understanding of how natural living systems function and evolve, and how they can be managed to conserve biodiversity while providing benefits to people. Students may pursue coursework that prepares them for traditional careers in resource management or they may take a broader array of courses that meets interests related to the conservation of natural resources and the ecology and evolution of natural systems. Graduates may pursue further study at the graduate level or find career opportunities in academia and in public or private organizations involved in the management of natural resources. The major provides a broad general understanding of the functioning, significance, and conservation of living systems. In addition to the general major curriculum, we offer two specialized disciplinary tracks with a more focused sequence of courses in 1) Natural Resources and Ecosystem Management, or 2) Urban Forestry. The flexibility of this major is intended to meet a variety of student interests and needs. Students are encouraged to organize curricular and elective courses to fulfill simultaneously the requirements of a minor or certificate program. Particularly appropriate are the Minor in Sustainability; the Certificate in Environmental Geomatics; and the Certificate in Evolutionary Medicine.

Ecology, Evolution, and Natural Resources 216 (SEBS)

# Learning Goals

# Learning Goals

Goal 1: Explain basic population, community ecology, and ecosystem-level concepts.

Goal 2: Describe the evolutionary origins, processes, and patterns over geologic time.

Goal 3: Create a natural resource management plan demonstrating an understanding of societal values and interests.

Goal 4: Effectively utilize software, hardware, field, and laboratory techniques commonly used in the study of ecology, evolution, and natural resource management.

Goal 5: Use quantitative methods to analyze and understand ecological systems, including interpretation of numeric and graphical data.

Goal 6: Communicate effectively orally and through written text and graphics.

Goal 7: Evaluate ecology, evolution, and natural resource management concepts in a global context.

*Natural Resources and Ecosystem Management Track Specific Learning Goals:*

Goal 3a: Utilize common forestry inventory methods and apply a fundamental knowledge of silviculture and ecology to create a forestry management plan that fosters the long-term capacity of the land and demonstrates an understanding of societal values and interests.

Goal 8: Evaluate conflicts and dilemmas through a lens of professional ethics.

Goal 9: Describe natural resource relevant laws and policies in New Jersey and at the national level.

*Urban Forestry Track Specific Learning Goals:*

Goal 3b: Utilize common urban forestry analysis tools to create a community forestry management plan demonstrating an understanding of societal values and interests as well as the long-term capacity of the urban forest.

Goal 10: Apply a fundamental knowledge of tree biology and professional ethics to tree care management and practice.

Goal 11: Describe urban forestry relevant laws and policies in New Jersey and at the national level.

The department has publicly posted mission statement and curricular learning goals on its website.

Ecology, Evolution, and Natural Resources 216 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

**EENR General Track**

*Biology: Required*
01:119:115 Gen Bio I
01:119:116 Gen Bio 2
01:119:117 Bio Res. Lab

*Chemistry & Physics - Choice of: 1 Year of Chemistry (with lab) OR 1 Year of Physics (with lab) OR 1 Semester of Each (with labs)*
01:160:161 Gen Chem 1
01:160:162 Gen Chem 2
01:160:171 Intro to Exp.
01:750:203 Gen Physics 1
01:750:204 Gen Physics 2
01:750:205 Gen Physics 1 Lab

01:750:206 Gen Physics 2 Lab
01:750:193 Phys for the Sci. 1
01:750:194 Phys for the Sci. 2

*Experienced Based Education: Required (3 cr)*
11:216:440 Pract Exp in EENR
11:216:484 Res. Probl in EENR
11:216:376 Pract Fish.
11:216:377 Pract Forestry
11:554:488 GHCook
11:902:300 SEBS Internship I
11:902:301 SEBS Internship II
01:556:221/2 or 301/302 Aresty

*Math - Choice of 1*
01:640:135 Calculus 1 for Life/SS
01:640:151 Calculus 1 for Math/Phy

*Core Courses: Required*
11:216:104 Topics in EENR
11:216:217 Principles of Natural Resource Management
11:216:351 Principles of Ecology
11:216:352 Principles of Ecology lab
11:216:369 Analytical Methods (SEBS Core QQ)
11:216:431 FEEM
11:216:499 Capstone in EENR

*Evolution Core: Choice of 1*
11:216:486 Principles of Evolution
11:216:251 Fundamentals of Evolution
*Required*
11:216:252 Fundamentals of Evol. Lab

*Ecology Electives: Choice of 2*
11:216:272 Dendrology
11:216:317 Conservation Ecology (SEBS Core CCO/WCd)
11:216:332 Plant Ecology
11:216:360 Anim Phys. Ecol
11:216:450 Landscape Ecology
11:216:451 Global Change Ecology
11:216:487 Urban Ecology
11:216:296 Honors Seminar
11:216:435 Freshwater and Wetland Ecosystems

*Evolution Electives: Choice of 2*
11:216:240 Behavioral Biology
11:216:269 Evol of Animal Behavior

11:216:296 Honors Seminar
11:216:323 Ornithology
11:216:324 Invertebrate Zoology
11:216:325 Vertebrate Zoology
11:216:405 Evolution of Infec. Dis.
11:216:441 Animal Behavior
11:216:411 & 412 Plant Diversity & Evol

*Natural Resources/Techniques Electives: Choice of 2*
11:216:314 Forest Measurements
11:216:274 Field Techniques
11:216:371 Introduction to Remote Sensing
11:216:464 Wildlife Ecology & Cons
11:216:471 Silviculture
11:216:477 Forest Management Applications
11:573:232 & 233 Fund. of Geom. & lab
11:216:403 Urban Forestry
11:573:362 Intem. Envi. Geom.
11:573:462 Advan. Envi. Geom.
11:216:210 Nature Journaling
11:216:315 Conservation Techniques
11:216:320 Controversies in Sustainability
11:216:365 Arboriculture
11:216:474 Adv. Remote Sensing
11:216:475 Winter Field Ecology

*Additional Courses: Choice of 4*
*Any 216 or 573 course listed above and/or:*
11:216:101 Intro to Ecol & Evol (SEBS Core NS)
11:216:110 Evol Disease and Med (SEBS Core NS)
11:216:115 Evol Sex & Gender (SEBS Core NS/CCO)
11:216:199 Trees in the Environment (SEBS Core NS) Fall Only
*Non-216 (approval possible for 200+ level courses)*
11:067:300 Integrative Physiology
11:067:328 Animal Genetics
11:067:404 Animal Diseases
11:115:301 Introductory Biochemistry
11:115:423 Fundamentals of Genomics
11:370:300 Insects & The Environment
11:370:320 Insect Ecology and Evolution
11:370:308 Apiculture
11:370:355 Applied Acarology
11:370:380 Insect Biotechnology
11:370:381 Insect Biology
11:370:402 Aquatic Entomology

11:370:403 Insect Structure and Function
11:370:404 Insect Structure and Function II
11:370:406 Medical and Veterinary Entomology
11:370:409 Insect Classification
11:370:430 Urban Entomology
11:573:231 Fundamentals of Environmental Planning
11:573:322 Land Measurement and Mapping
11:573:371 Air-Photo Interpretation
11:373:362 Natural Resource Economics
11:373:363 Environmental Economics
11:374:313 U.S. Environmental Policy
11:374:314 Natural Resource Policy
11:374:325 Environmental Communication
11:375:346 Introduction to Atmospheric Chemistry
11:375:360 Soils and Water
11:375:407 Environmental Toxicology
11:375:411 Environmental Microbiology
11:375:421 Air Pollution
11:375:444 Water Chemistry
11:375:450 Terrestrial Carbon Cycle
11:375:453 Soil Ecology
11:628:309 Fishery Science
11:628:320 Dynamics of Marine Ecosystems
11:628:342 Marine Conservation
11:670:201 Elements of Meteorology
11:670:202 Elements of Climatology
11:680:491 Microbial Ecology and Diversity
11:776:210 Principles of Botany
11:776:242 Plant Science
11:776:305 Plant Genetics
11:776:306 Weed Science and Management
11:776:382 Plant Physiology
11:776:400 Fungi in the Environment
01:460:101 Introductory Geology
01:460:303 Paleontology
01:070:212 Life of Primates
01:070:348 Primate Behavioral Ecology
01:070:402 Primate Conservation
01:070:409 Primate Nutritional Ecology
01:160:209 Elementary Organic Chemistry
01:160:307 Organic Chemistry
01:160:308 Organic Chemistry
01:447:380 Genetics
01:640:136 Calculus II for the Life and Social Sciences
01:640:138 Calculus II for the Biological Sciences

**EENR Urban Forestry Track**

*Biology: Required*
01:119:115 Gen Bio I
01:119:116 Gen Bio 2
01:119:117 Bio Res. Lab

*Chemistry: Required*
01:160:161 Gen Chem 1
01:160:171 Intro to Exp.

*Physics: Choice of 1*
01:750:203 Gen Physics 1 & 01:750:205 Gen Physics 1 Lab
01:750:193 Phys for the Sci. 1

*Experienced Based Education: Choice (3 cr)*
11:216:440 Pract Exp in EENR
11:216:484 Res. Probl in EENR
11:216:377 Pract Forestry
11:554:488 GHCook
11:902:300 SEBS Internship I
11:902:301 SEBS Internship II

*Math: Choice of 1*
01:640:135 Calculus 1 for Life/SS
01:640:151 Calculus 1 for Math/Phy

*Core Courses: Required*
11:216:104 Topics in EENR
11:216:217 Principles of Natural Resource Management
11:216:351 Principles of Ecology
11:216:352 Principles of Ecology lab
11:216:369 Analytical Methods (SEBS Core QQ)
11:216:431 FEEM
11:216:499 Capstone in EENR

*Ecology: Required*
11:216:272 Dendrology
11:216:487 Urban Ecology

*Evolution: Required*
11:216:411 & 412 Plant Diversity & Evol

*Natural Resources/Techniques: Required*
11:216:371 Introduction to Remote Sensing
11:216:471 Silviculture

11:573:232 & 233 Fund. of Geom. & lab
11:216:403 Urban Forestry
11:216:365 Arboriculture

*Additional Courses: Required*
11:373:101 Economics, People, and the Environment (SEBS Core CCO/ECN/SCL)
11:573:202 Environmental Issues in US (SEBS Core CCO/WCd)
11:776:302 General Plant Pathology
11:374:250 Environmental Justice (SEBS Core CCD)
*Additional Courses: Choice of 2*
11:370:350 Agricultural Entomology and Pest Management
11:373:362 Natural Resource Economics (SEBS Core GVT/SCL)
11:375:360 Soils and Water
11:573:231 Fundamentals of Environmental Planning
11:776:202 Applied Physiology of Horticultural Crops
11:776:404 Soil Management for Sport and Landscapes
11:550:230 Environmental Design Analysis
11:216:199 Trees in the Environment
11:573:413 Open Space Planning

**EENR: Natural Resources and Ecosystem Management Track**

*Biology: Required*
01:119:115 Gen Bio I
01:119:116 Gen Bio 2
01:119:117 Bio Res. Lab

*Chemistry: Required*
01:160:161 Gen Chem 1
01:160:171 Intro to Exp.

*Physics: Choice of 1*
01:750:203 Gen Physics 1 & 01:750:205 Gen Physics 1 Lab
01:750:193 Phys for the Sci. 1

*Experienced Based Education: Choice (3 cr)*
11:216:440 Pract Exp in EENR
11:216:484 Res. Probl in EENR
11:216:377 Pract Forestry
11:554:488 GHCook
11:902:300 SEBS Internship I
11:902:301 SEBS Internship II

*Math: Choice of 1*
01:640:135 Calculus 1 for Life/SS
01:640:151 Calculus 1 for Math/Phy

*Core Courses: Required*
11:216:104 Topics in EENR
11:216:217 Principles of Natural Resource Management
11:216:351 Principles of Ecology
11:216:352 Principles of Ecology lab
11:216:369 Analytical Methods (SEBS Core QQ)
11:216:431 FEEM
11:216:499 Capstone in EENR

*Ecology: Required*
11:216:272 Dendrology
*Ecology: Choice of 1*
11:216:317 Conservation Ecology
11:216:332 Plant Ecology
11:216:360 Animal Physiological Ecology
11:216:450 Landscape Ecology
11:216:451 Climate Change Ecology
11:216:487 Urban Ecology
11:216:296 Honors Seminar

*Evolution: Required*
11:216:411 & 412 Plant Diversity & Evol

*Natural Resources/Techniques (Required)*
11:216:371 Introduction to Remote Sensing
11:216:471 Silviculture
11:573:232 & 233 Fund. of Geom. & lab
11:216:314 Forest Measurements
11:216:274 Field Techniques
11:216:464 Wildlife Ecology & Conservation
11:216:477 Forest Management Applications

*Additional Courses: Required*
11:373:101 Economics, People, and the Environment (SEBS Core CCO/ECN/SCL)
11:573:202 Environmental Issues in US (SEBS Core CCO/WCd)
11:776:302 General Plant Pathology
11:374:250 Environmental Justice (SEBS Core CCD)
*Additional Courses: Choice of 2*
11:370:350 Agricultural Entomology and Pest Management
11:373:362 Natural Resource Economics (SEBS Core GVT/SCL)
11:375:360 Soils and Water
11:573:231 Fundamentals of Environmental Planning
11:776:202 Applied Physiology of Horticultural Crops
11:776:404 Soil Management for Sport and Landscapes

11:374:201 Research Methods in Human Ecology
11:216:199 Trees in the Environment
11:375:453 Soil Ecology

# Economics 220 (SAS)

## ECONOMICS 220

Department of Economics, School of Arts and Sciences

**Website:** Here

**Chair:** John Landon-Lane

**Undergraduate Program Director:** Colin Campbell

**Distinguished Professors:**

Michael D. Bordo, B.A., McGill (Canada); M.S., London School of Economics; Ph.D., Chicago

Roberto Chang, B.S.S., Universidad Catolica Del Peru; Ph.D., Pennsylvania

Hugh T. Rockoff, A.B., Earlham; M.A., Ph.D., Chicago

John Tomas Sjöström, B.A., Stockholm; Ph.D., Rochester

Norman R. Swanson, B.A., Waterloo (Canada); M.A., Ph.D., California (San Diego)

**Professors:**

Oriol Carbonell-Nicolau, B.A., M.A., Pompeu Fabra (Spain); Ph.D., New York

Ira N. Gang, B.A., Johns Hopkins; M.A., Ph.D., Cornell

Joseph P. Hughes, A.B., Davidson; Ph.D., North Carolina

Jennifer Hunt, S.B., Massachusetts Institute of Technology; Ph.D., Harvard

Todd Keister, B.S., Duke; Ph.D., Cornell

Mark R. Killingsworth, A.B., Michigan; B.Phil., Ph.D., Oxford

Roger W. Klein, A.B., California (Berkeley); Ph.D., Yale

John S. Landon-Lane, B.Sc. (Hons), M.Comm., Canterbury (New Zealand); M.A., Ph.D., Minnesota

Yuan Liao, B.A., Tsinghua (China); Ph.D., Northwestern

Richard P. McLean, B.S., Pennsylvania State; M.A., M.S., Ph.D., Stony Brook

Bruce Mizrach, A.B., M.A., Tufts; Ph.D., Pennsylvania

Carolyn Moehling, B.A., Michigan State; Ph.D., Northwestern

Anne Morrison Piehl, A.B., Harvard; Ph.D., Princeton

Thomas J. Prusa, B.A., Georgetown; M.A., Ph.D., Stanford

Hilary Sigman, B.A., Yale; M.Phil., Cambridge; Ph.D., Massachusetts Institute of Technology

Barry Sopher, B.A., M.A., Ph.D., Iowa

**Associate Professors:**

Colin Campbell, A.B., Columbia; Ph.D., Northwestern

Martin Saavedra, B.A., B.S., Catholic University of America; M.A., Ph.D., Pittsburgh

Bingxiao Wu, B.A., Tsingua (China); Ph.D., Northwestern

Xiye Yang, B.A., Peking; Ph.D., Amsterdam

**Assistant Professors:**

Jacob Bastian, B.A., Azusa Pacific; M.A., New York; Ph.D., Michigan

Hector Blanco, B.A, Pompeu Fabra (Spain); M.S., Barcelona (Spain); Ph.D., Massachusetts Institute of Technology

Zhifeng Cai, B.A., Hong Kong; Ph.D., Minnesota

Carlos Esquivel, B.A., ITAM; Ph.D., Minnesota

Rosemary Kaiser, B.S., Ball State; M.S., Ph.D., Wisconsin-Madison

Andrew Mackenzie, B.S., Union College; M.A., Ph.D., Rochester

Daniel Maggio, B.A., New York at Geneseo; M.A., Boston; Ph.D. Cornell

Kenwin Maung, B.A., Waseda (Japan); M.A., Ph.D., Rochester

Ruonan Xu, B.A., Fudan; Ph.D., Michigan

**Associate Teaching Professor:**

Daijiro Okada, B.A., M.A., Tohoku (Japan); Ph.D., Stony Brook

**Assistant Teaching Professor:**

Alex Hohmann, B.S., M.S., Drexel; M.A., Rutgers

**Teaching Instructors:**

Michael Elgawly, B.A., M.B.A., Rutgers

Raymond Stone, B.A., New York; M.A., Ph.D., Rutgers

Economics is the study of individual and collective decision-making given the limited availability of material resources. The economics curriculum is designed to contribute to a liberal arts education by increasing a student's understanding of the economic problems that confront individuals and societies and to prepare students for graduate work in a variety of fields. Majors are expected to develop skills that permit critical analysis of important economic problems and are exposed to a wide variety of economic policy issues.

The curriculum stresses such skills as gathering and interpreting information, predicting the consequences of specific decisions, evaluating alternative choices, and managing public and private enterprises. Computer applications are a major component of instruction. The economics major provides a sound basis for a variety of professional careers, including graduate study in economics, business, management science, law, and public policy. A successful major also is well prepared for employment opportunities that demand strong analytical skills. Students who anticipate business careers may find courses in financial economics and international economics particularly beneficial.

Economics 220 (SAS)

# Learning Goals for Economics Majors

# Learning Goals for Economics Majors

1. *Economic Literacy*--Students who complete the major in economics should understand and be able to articulate, both orally and in writing, the core economic principles, concepts, and theories that form the foundation for modern economic analysis and economic research.
2. *Economic Numeracy*--Students who complete the economics major should be familiar with the tools, techniques, and methods of empirical economics. They should be able to analyze data using computer applications and should be familiar with regression methods and other statistical techniques. They should be able to read and assess general interest articles on economic topics. In addition, they should be able to understand and evaluate key findings in published economic research from a wide range of sources including academic economists, public policy think tanks, and government agencies.
3. *Economic Citizenship*--Upon completion of the major, students should be able to apply their understanding of core concepts and quantitative tools to analyze and research real-world problems and evaluate alternative economic policy proposals on microeconomic and macroeconomic issues.
4. *Economic Scholarship*--Qualified majors should have an opportunity through such avenues as advanced coursework, faculty interactions, national and local competitions, and honors courses and programs to utilize up-to-date methodological tools and become fully engaged in economic research and issues on the frontiers of economics.

Economics 220 (SAS)

# Major Requirements

# Major Requirements

The foundation of the curriculum in economics consists of 01:220:102,103, 320, 321, and 322. It also requires one semester of statistics (01:960:211 or preferably 285) with a grade of C or better.  If possible, 01:960:285 should be

taken in the semester immediately prior to the one in which the student expects to take econometrics (01:220:322). One semester of calculus (01:640:135 or equivalent) with a grade of C or better also is required. Second semesters of both calculus and statistics are strongly recommended. The seven required courses (five in economics, one in statistics, and one in mathematics) plus seven electives within economics (which may, under certain circumstances, include a limited number of courses from related disciplines) constitute the major. Engineering students who take 01:220:200 Economic Principles and Problems will use this in place of 01:220:102 and 103, and will need to take eight electives instead of seven. Credit is not given for 01:220:200 and for 01:220:102 or 103.

Students can count no more than three courses that have no prerequisites, or whose prerequisites are only 01:220:102 and 103 (or only 200), toward the seven required electives needed to complete the economics major. (These courses are often referred to as "lower-level" electives.) Typically, most transfer courses that count as economics electives fall into this category. An economics major who has taken 200 in lieu of 102 and 103 may take a maximum of four electives that have no prerequisites or only 102 and 103 as prerequisites.

For both students who begin at Rutgers as first-year students and for transfer students, a maximum of three economics courses taken outside the Department of Economics at Rutgers University-New Brunswick may be applied toward the major. Transfer students who wish to apply transfer courses toward the major must obtain approval from the undergraduate adviser. Enrolled economics majors who wish to take an economics course outside of Rutgers-New Brunswick must have prior approval from the undergraduate adviser. Equivalencies are not awarded to transfer courses that do not have comparable calculus prerequisites. Students should consult the economics department for further information on courses offered by the Department of Agricultural, Food, and Resource Economics (major in environmental and business economics) at the School of Environmental and Biological Sciences and by other departments in the School of Arts and Sciences.

Economics majors can receive credit for two accounting courses offered by the Rutgers Business School: Undergraduate-New Brunswick program. Students may take 33:010:272 and 275. These courses will count toward the required seven electives and are considered courses outside the Rutgers-New Brunswick Department of Economics. Accounting courses are considered lower-level electives.

The Department of Economics allows economics majors to receive 1 credit for an approved internship. See here for more information or contact the undergraduate director.

**To declare a major in economics,** a student must have a grade of C or better in both 01:220:102 Introduction to Microeconomics and 01:220:103 Introduction to Macroeconomics. The student must also have completed the required calculus course with a grade of C or better.

**To satisfactorily complete the major,** students must have a minimum cumulative grade-point average of 2.0 in the major. A grade of C or better is required in 102,103, 320, 321, 322, the required statistics course, and the required calculus course. Only one elective course with a grade of D can count toward the major.

Students who major in economics (220) may not minor in environmental and business economics (373).

All courses taken outside Rutgers-New Brunswick need to be preapproved.

# Minor in Economics Requirements

# Minor in Economics Requirements

The traditional Minor in Economics introduces students to both microeconomics and macroeconomics, allows students to explore a variety of economic institutions and economic policies that characterize the modern economy, and provides training in basic data analysis.

This minor requires a total of 18 credits in economics.

Specific requirements for the traditional Minor in Economics:

Introduction to Microeconomics (01:220:102) and Introduction to Macroeconomics (01:220:103), both with a grade of C or better.

Economic Data Analytics: Introduction to Data Management, Statistics and Regression Analysis (01:220:212) with a grade of C or better.

Three electives or core economics courses (i.e., 300-level economics courses). One grade of D is allowed for this minor. The following 300 level courses are the most usual choices for electives by students completing the minor:

01:220:300 International Economics (3)

01:220:301 Money, Banking and the Financial System (3)

01:220:305 American Economic History (3)

01:220:307 Economics of Globalization: A Historical Perspective (3)

01:220:331 Economics of Crime (3)

01:220:334 Energy Economics (3)

01:220:389 Public Policies toward Business (3)

01:220:395 Law and Economics (3)

"The intermediate core courses (01:220:320, 321 and 322) or any 400-level elective course in economics, may also be used, though additional prerequisites are required for these courses."

Engineering students may use 14:540:343, Engineering Economics, as an elective course for this minor.

Note that accounting courses cannot be used towards either minor. Only two courses outside of the Economics Department in Rutgers-New Brunswick will be accepted towards either minor.

# Minor Quantitative Economics Requirements

# Minor Quantitative Economics Requirements

The new Minor in Quantitative Economics permits quantitatively well-prepared students to do the core of the Economics major, and gives them access to the Certificate Programs in Economics, with fewer required electives than the full Major in Economics.

This minor requires a total of 18 credits in economics.

Specific requirements for the Minor in Quantitative Economics:

Introduction to Microeconomics (01:220:102) and Introduction to Macroeconomics (01:220:103), both with a grade of C or better.

Intermediate Microeconomic Analysis (01:220:320) and Intermediate Macroeconomic Analysis (01:220:321), both with a grade of C or better. These courses have the introductory courses and Calculus I (01:640:135 or 151), all with a grade of C or better, as prerequisites.

Econometrics (01:220:322), with a grade of C or better. This course has the introductory courses, Calculus I, and Statistics (01:960:285 or 01:960:211), all with a grade of C or better, as prerequisites. Mathematical Theory of Probability (01:640:477) or Mathematical Theory of Statistics (01:640:481) may substitute for the Statistics prerequisite.

One upper level (i.e., 400-level) elective in economics from the following list:

01:220:410 Advanced Macroeconomic Theory (3)

01:220:423 Advanced Time Series and Financial Econometrics (3)

01:220:424 Machine Learning for Economics (3)

01:220:480 Behavioral and Experimental Economics (3)

01:220:481 Economics of Uncertainty (3)

01:220:482 Game Theory and Economics (3)

01:220:483 Markets, Games and Information (3)

01:220:485 Advanced Microeconomic Theory (3)

01:220:488 Networks and Complexity in Economics (3)

01:220:489 Advanced Topics in Economic Theory (3)

All of these 400 level courses have an additional prerequisite of Calculus II (01:640:136 or 152) with a grade of C or better. One grade of D is allowed for this minor.

Students completing this minor may, opt to pursue the Certificate Programs in Economics, including the Certificate in Economic Theory, the Certificate in Computational Economics and Data Analytics, the Certificate in Financial Economics, the Certificate in Global Economics, or the Certificate in Public Policy Economics. Details on the Certificates are elsewhere on the Economics web page.

Note that accounting courses cannot be used towards either minor. Only two courses outside of the Economics Department in Rutgers-New Brunswick will be accepted towards either minor.

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# Minor in Philosophy, Politics, and Economics

# Minor in Philosophy, Politics, and Economics

**Minor in Philosophy, Politics, and Economics (PPE)**

The minor in philosophy, politics, and economics (hereafter shortened to PPE) is designed to engage students with the practical problems of organizing and running human society. The minor stands at the confluence of three major fields of study--philosophy, political science, and economics--and combines elements of these into a coherent framework in which to address questions about the nature of citizenship and the role individuals can and must play in making critical decisions facing society.

Students pursuing the PPE minor are expected to develop the ability to read and listen critically, to reason analytically concerning questions of public policy (especially economic policy), to engage in thoughtful moral judgment, and to write and speak clearly. The minor combines the best of the three participating fields: confronting the ethical issues of philosophy, the policy questions of political science, and the quantitative analytical problems of economics.

Generally, students taking the PPE minor will be majoring in one of the three included disciplines: philosophy, political science, or economics, and the courses that can be used toward the PPE minor taken in the student's major department may be used for both the major and the PPE minor. In other words, while the minor requires 9 courses (27 credits), students majoring in philosophy, political science, or economics will only need to take 6 courses (18 credits) outside the major.

***Main contacts for PPE:*** Alec Walen (Philosophy), Barry Sopher (Economics), and Christy Cahill (Political Science).

**Learning Goals**

At the end of this program students will be able to:

- Identify key factors in evaluating the morality of individual behavior and the legitimacy of regulations about that behavior.
- Explain the process through which the public regulation of individuals and groups occurs.
- Evaluate the economic ability of institutions to provide for the common welfare.
- Critique boundaries between private market forces and their just and efficient public regulation.

**Minor Requirements**

The minor requires students to take 3 courses (9 credits) in each of three fields of study. The course offerings in each field are structured to give students a solid grounding in each field, as well as a taste of what more advanced work in the field involves.

Students are permitted to bring in only three credits for each field from outside of Rutgers University-New Brunswick. In other words, at least two of the three classes for each field must be taken at Rutgers University-New Brunswick; only one course in each field can come from transfer credit, AP credit, study abroad, or other Rutgers campuses. Courses that are cross listed may be used to satisfy only one requirement.

All courses must be completed with a grade of C or better in order to be used for the minor.

Below are the requirements for each field, which must be completed whether the student majors in the field or pursues them as other parts of the minor.

**Requirements for the Philosophy Component of the PPE Minor (3 courses, 9 credits)**

Total of three philosophy courses, no more than one at the 100 level, and two from the following list, at least one of which must be at a 300 level or higher (other courses on a case-by-case basis):

01:730:105/106 Current Moral and Social Issues

01:730:107 Introduction Ethics

01:730:249 Bioethics

01:730:250 Environmental Ethics

01:730:251 Ethics and Business

01:730:255 Introduction to Social and Political Philosophy

01:730:330 Ethics of War and Conflict

01:730:341 Ethics through History

01:730:342 Social and Political Philosophy through History

01:730:343 Marx and Marxism

01:730:345 Philosophy and the Law

01:730:347 Philosophical Issues in Feminism

01:730:358 Philosophy of Law

01:730:371 Philosophies of Death and Dying

01:730:441 Ethical Theory

01:730:442 Moral Responsibility

01:730:445 Topics in Social and Political Philosophy

01:730:450 Topics in Moral Philosophy

01:730:459 Advanced Seminar in Ethics

01:730:470 Ethics and Practical Reason

**Requirements for the Political Science Component of the PPE Minor (3 courses, 9 credits)**

*1 course in political theory, from the following list:*

01:790:101 Nature of Politics

01:790:365 Gender and Political Theory

01:790:371 Western Tradition: Plato to Machiavelli

01:790:372 Western Tradition: Hobbes to Mill

01:790:373 Legal Philosophy, Rights, and Justice

01:790:374 Democratic Political Philosophy

01:790:375 American Political Thought to 1865

01:790:376 American Political Thought from 1865

01:790:472 Religion and Politics

01:790:473 Critics of Modernity

01:790:477 Critical Theory and Society

*2 courses in policy or group relations, from the following list:*

01:790:305 Public Policy Formation

01:790:318 Comparative Public Policy

01:790:319 Issues of American Foreign Policy

01:790:320 Political and Social Policy: Lessons from Europe

01:790:322 Strategy in International Relations

01:790:323 Defense Policy

01:790:330 Interest Groups

01:790:333 Race, Ethnicity, and Politics

01:790:334 Politics of Black America

01:790:335 Women and American Politics

01:790:338 Government and Business

01:790:350 Environmental Politics-U.S. and International

01:790:355 Women and Public Policy

01:790:358 Globalization, Democracy, and Contemporary Capitalism

01:790:360 Gender and Politics and Global Perspective

01:790:363 Conflict Resolution in World Politics

01:790:364 Global Order

01:790:386 Political Change in China

01:790:401 American Constitutional Law I

01:790:404 Politics of Criminal Justice

**Requirements for the Economics Component of the PPE Minor (3 courses, 9 credits)**

Both of these introductory courses:

01:220:102 Introduction to Microeconomics

01:220:103 Introduction to Macroeconomics

*One course from the following list:*

01:220:327 History of Economic Thought

01:220:331 Economics of Crime

01:220:390 Choice and Strategy in Politics (Prerequisite: 01:220:102)

01:220:402 Labor Economics (Prerequisites: 01:220:320 and 01:220:322)

01:220:417 Health Economics (Prerequisites: 01:220:320 and 01:220:322)

01:220:432 Environmental Economics (Prerequisites: 01:220:320 and 01:220:322)

01:220:460 Public Economics (Prerequisites: 01:220:320 and 01:220:322)

01:220:463 Economics of Taxation (Prerequisites: 01:220:320 and 01:220:322)

01:220:482 Game Theory and Economics

**Certificate Programs in Economics that are open to students that complete the Quantitative Economics Minor**

- Certificate in Economic Theory
- Certificate in Computational Economics and Data Analytics
- Certificate in Financial Economics

- Certificate in Global Economics
- Certificate in Public Policy Economics

See the economics certificate programs page for more details.

Economics 220 (SAS)

# Honors Research in Economics

# Honors Research in Economics

Majors who apply for departmental honors research usually have cumulative grade-point averages that generously exceed the minimum required 3.0 overall and 3.4 in economics.

Honors research consists of two tracks that differ in the way students identify and develop a topic. Either track can be launched as soon as the applicant has completed the prerequisites--typically in the senior year, but sometimes earlier.

*Independent Launch*

The student using the independent launch chooses a thesis topic in consultation with his or her faculty supervisor and with the approval of the department. Topics vary widely. The student must submit an application, which describes the topic, provides a preliminary review of some of the relevant literature, and identifies the data to be used in the econometric analysis. Both the faculty supervisor and the undergraduate director must approve the application. The independent launch is the most common approach to doing honors research.

The first (fall) semester of the Honors Research Seminar (01:220:493) is used to refine the topic by extending the literature review, by developing a theoretical and an empirical model for the investigation, and by launching preliminary econometric work on the data. Students enrolled in 493 must have completed or be enrolled in Advanced Econometrics (01:220:401).

In the second (spring) semester, 01:220:494, the student completes the investigation and submits the final draft of the thesis.

*Course-Based Launch*

The course-based launch uses a research-oriented elective course to develop and refine the topic in contrast to the independent launch, which uses 01:220:493. Research-oriented courses assign scholarly papers and econometric analysis of data. For an updated list of research-oriented courses, contact the department.

Having enrolled in one of these courses, the student identifies a topic, writes a literature review both from papers assigned in the course and from additional readings, and carries out some preliminary analysis of data (perhaps extending work done in the course). This work constitutes an application to 01:220:494, in which the student would complete the thesis. The student would need to enroll in Advanced Time Series and Financial Econometrics (01:220:400) or Advanced Cross-sectional and Panel Econometrics (01:220:401) along with the other honors research students.

Note that the research-oriented elective course launches the honors research and substitutes for the first semester of work, 01:220:493, in the independent launch.

*Honors and Awards*

The completed thesis can be submitted to the Awards and Honors Committee of the Economics Faculty, which will evaluate the thesis and, if appropriate, assign it one of three designations: honors, high honors, or highest honors. The committee also awards the Simon Prize for the best honors thesis, which may be shared by more than one thesis.

Economics 220 (SAS)

# Certificate Programs

# Certificate Programs

**GENERAL INFORMATION ON CERTIFICATES IN ECONOMICS**

The Department of Economics has five certificate programs for declared Economics majors. The certificates are in Financial Economics, Global Economics, Public Policy Economics, Economic Theory and Computational Data Analytics. These certificates are meant to provide economics majors with an incentive to plan and organize their thinking along several specific career paths that an economics degree is a good launching pad for, to the extent that this appeals to them. There are specific grade requirements, including a minimum overall g.p.a. of 3.0 to receive the certificate, and a minimum B grade for all courses taken to satisfy the certificate requirements.

The certificates are uniform in requiring four courses from a select list of mainly upper-level economics electives, including a core course for the certificate, which may be a specific course or one course from a short list of courses. In the latter situation, other courses in the core list may also be used to satisfy the overall course requirement for the certificate. Note that the Certificate in Economic Theory has some additional course requirements outside of economics. Click the tab for the Economic Theory Certificate for details. Certificates are noted on the student's transcript at graduation and may be listed on a c.v. or resume as an additional credential.

The Department of Economics no longer offers the Certificate in Quantitative Economics (CQE), which was a more credit-intensive certificate. However, the combination of the Certificate in Economic Theory and the Certificate in Computational Data Analytics is approximately equivalent to the old CQE.

Finally, note that the certificates are also available to students who are completing the Minor in Quantitative Economics, as the prerequisite courses in economics necessary to complete any of the certificates will satisfy the requirements for the Minor in Quantitative Economics.

**Certificate in Financial Economics:**

This concentration provides students with a deep background in the institutions, theory, quantitative practice, and history of the important field of financial economics. Students completing this certificate are well prepared for a career in Wall Street or for graduate study in economics, quantitative finance or financial engineering. Besides the normal core courses for the economics major, students take four of the following courses as part of the seven

electives required for the major. One of these is a required core course. There are specific grade requirements, including a minimum overall g.p.a. of 3.0 to receive the certificate, and a minimum B grade for all courses taken to satisfy the certificate requirements. In addition, students completing the Certificate in May 2021 or later must take either 01:220:423, 436, or 481 as one of their electives to complete the certificate.

*Core:*
220:413 Financial Economics
*Electives (three courses):*
220:421 Economic Forecasting and Big Data
220:423 Advanced Time Series and Financial Econometrics
220:436 International Finance and Macroeconomics
220:481 Economics of Uncertainty
220:495 Markets and Finance

**Certificate in Global Economics:**

This concentration is for students with an interest in global economic issues, including the international business cycle, long-term economic growth, balance of payments issues, integration of international markets and economic development. This certificate is a good preparation for employment in the Federal Reserve System or other central banks and in international organizations such as the IMF, the World Bank and the UN, and for graduate study in international relations, public policy or economics. Besides the normal core courses for the economics major, students take four courses, including one core course, as part of the seven electives required for the major. There are specific grade requirements, including a minimum overall g.p.a. of 3.0 to receive the certificate, and a minimum B grade for all courses taken to satisfy the certificate requirements.

*Core: One of the following courses:*
220:300 International Economics
220:435 International Trade
220:436 International Finance and Macroeconomics

*Electives:* Three of the following courses, with the option of including an additional course from the core list above. Note that only two of the three core courses may be used for credit toward the economics major, and this general rule applies to the certificate as well.

220:410 Advanced Macroeconomic Theory
220:411 Global Financial Crises
220:423 Advanced Times Series and Financial Econometrics
220:439 Economic Development
220:477 Economics of Population

**Certificate in Public Policy Economics:** The Certificate in Public Policy Economics is intended for students with an interest in working on fundamental policy issues related to labor, health, taxation, the environment, economic equality, gender, and other microeconomic issues. Employment in state and federal government agencies, in non-profit or non-governmental policy organizations, or graduate study in economics or public policy, are likely career paths. Besides the normal core courses for the economics major, students take four of the electives listed below as

part of the seven electives required for the major. One of these is a required core course. There are specific grade requirements, including a minimum overall g.p.a. of 3.0 to receive the certificate, and a minimum B grade for all courses taken to satisfy the certificate requirements.

*Core: One of the following courses:*
220:402 Labor Economics
220:433 Health Economics
220:460 Public Economics

*Electives:* Three of the following courses, with the option of including additional courses from the core list above.
220:331 Economics of Crime
220:422 Advanced Econometrics for Microeconomic Data
220:431 Urban Economics
220:432 Environmental Economics
220:438 Education Economics
220:463 Economics of Taxation

**Certificate in Economic Theory:** The certificate in economic theory is appropriate for students with a strong mathematical preparation who wish to deepen their understanding of microeconomic theory. This track is particularly recommended for students who would like to be better prepared for graduate study in economics. Students are advised to fulfill the major Calculus I requirement with 01:640:151 rather than 01:640:135. Besides the normal core requirements, students take Calculus II (640:152), Linear Algebra (640:250), and the sequence of Mathematical Theory of Probability (640:477) and Mathematical Theory of Statistics (640:481), or the sequence of Theory of Probability (960:381) and Theory of Statistics (960:382). The 477/481 math sequence or the 381/382 statistics sequence can substitute for 960:285 in the major core. For the seven electives for the major, students must take at least four courses, including one core course. With instructor approval, appropriate courses in the economics Ph.D. program may be used as electives as well. Students who aspire to enroll in a Ph.D. program in economics are encouraged, though not required for the certificate, to take additional mathematics courses, including Multivariable Calculus (640:251), Elementary Differential Equations (640:252), and Real Analysis (640:300 and 640:311). There are specific grade requirements, including a minimum overall GPA of 3.0 to receive the certificate, and a minimum B grade for all courses taken to satisfy the certificate requirements.

*Core: One course from the following:*
220:481 Economics of Uncertainty
220:482 Game Theory and Economics

*Electives:* Three courses from the following, with the option of including an additional course from the core list above:
220:441 Industrial Organization
220:480 Behavioral and Experimental Economics
220:483 Markets, Games, and Information
220:485 Advanced Microeconomic Theory

**Certificate In Computational Economics and Data Analytics:**

This concentration provides students with a deep background in advanced tools for analysis of economic data, including traditional regression methods commonly used in economics, as well as more computationally intensive methods, such as machine learning.¿ Students completing this certificate will be well-prepared for positions in a wide range of business and government organizations where high through-put analysis of incoming data is valued.¿ The certificate is also an excellent preparation for graduate study in economics or decision sciences, particularly for areas where computational modeling of economic decision making and analysis of data from decision making is the focus.¿Students planning to pursue this certificate should have a strong aptitude and interest in econometrics and are recommended to complete econometrics (01:220:322) and calculus II (01:640:136 or 152) as early as possible.¿ As for all the certificate programs in economics, a total of four courses, each with a grade of B or better, are required, as well as an overall g.p.a. of at least 3.0.¿

*Required*
220:420 Computational Methods for Research in Economics
*Data Methods electives (at least three from this list):*
220:421 Economic Forecasting and Big Data
220:422 Advanced Econometrics for Microeconomic Data
220:423 Advanced Time Series and Financial Economics
220:424 Advanced Analytics for Economics

Economics 220 (SAS)

# Courses

# Courses

**01:220:102** ***Introduction to Microeconomics (3)***
The market system and alternative mechanisms for determining prices and allocating resources. Economic analysis of monopoly, cartels, wage and price controls, pollution, and other contemporary problems.
***Prerequisite: 01:640:111, or 115, or calculus placement. Credit not given for both this course and 11:373:121.***

**01:220:103** ***Introduction to Macroeconomics (3)***
Determinants of aggregate employment and national income; evaluation of government policies to alleviate inflation and unemployment. Money, banking, and monetary policy. International trade and finance, and the prospects for world economic development.
***Prerequisite: 01:640:111, or 115, or calculus placement. Credit not given for both this course and 11:373:122.***

**01:220:110** ***Personal Finance and Financial Decision-Making (3)***
Economics and financial literacy; basic tools of financial planning; simple and compound interest; investment and retirement planning; insurance, futures, and options.
***Prerequisite: 01:640:025. Credit not given for both this course 11:373:353 and 37:575:250. Course cannot be used for major or minor credit.***

**01:220:200** *Economic Principles and Problems (3)*
Economic principles and their application to current problems.
*Prerequisite: 01:640:111, or 115, or calculus placement. Open only to engineering students. Credit not given for both this course and 01:220:102 and 103. 01:220:200 may be used in place of 01:220:102 and 103 to satisfy the prerequisite for more advanced courses.*

**01:220:212** *Economic Data Analytics: Introduction to Data Management, Statistics, and Regression Methods for Decision-Making (3)*
Introduction to data collection, visualization, analysis, and presentation; introduction to basic linear regression methods, hypothesis testing, and interpretation of estimates; use of Microsoft Excel and Regressit, an Excel add-in, throughout.
*This course is equivalent to the 210-211 sequence. Prerequisite: 01:640:026 or placement into higher. May be used for economics minor credit only. Credit not given for both this course and 01:220:210 or 01:220:211.*

**01:220:300** *International Economics (3)*
Pure or "real" aspects of international trade, including the basic comparative advantage model, commercial policy (tariffs, quotas, etc.), economic integration, and the role of international trade in economic development. Monetary aspects of international trade, including international capital movements, foreign exchange market, concept and measurement of balance of payments, alternative means of correcting disequilibrium in the balance of payments, and international monetary arrangements.
*Prerequisites: 01:220:102, 103. Major credit may be earned for only two of the three courses: 01:220:300, 335, 336.*

**01:220:301** *Money, Banking, and the Financial System (3)*
Economic significance of money; structure, history, and present state of the American monetary system; credit, banking, and Federal Reserve; instruments of credit control; Federal Reserve and treasury policies; monetary reform, monetary theory and policy. Lower-level elective.
*Prerequisites: 01:220:102, 103.*

**01:220:303** *Labor Institutions and Markets (3)*
Private and public employee unions, industrial relations, and collective bargaining. Public regulation of labor markets including industrial safety and wage levels. Lower-level elective.
*Prerequisites: 01:220:102, 103, or 200.*

**01:220:305** *American Economic History (3)*
Long-term trends in economic growth and institutions from the colonial period to World War II. Development of transportation and industry. Effects of technological change and immigration.
*Prerequisites: 01:220:102, 103, or 200.*

**01:220:307** *Economics of Globalization: A Historical Perspective (3)*
Examination of the evolution of globalization from the 1800s to the present; assessment of the benefits of financial and trade integration relative to the costs associated with integration such as the consequences of financial crises. Lower-level elective.
*Prerequisite: 01:220:102 and 01:220:103.*

**01:220:311** *Methods of Cost-Benefit Analysis (3)*
Introduction to theoretical and applied welfare economics. Theories of social welfare; the normative basis for, and practical techniques of, cost-benefit analysis. Selected applications.
*Prerequisites: 01:220:102 and 103.*

**01:220:320** *Intermediate Microeconomic Analysis (3)*
Households and firms as maximizing agents; implications for demand and supply of goods and productive services in competitive and monopolistic markets; general equilibrium; welfare economics.
*Prerequisites: 01:220:102, grade of C or better; 01:640:135 or 151, grade of C or better. Credit not given for both 01:220:320 and 203.*

**01:220:321** *Intermediate Macroeconomic Analysis (3)*
Modern and classical theories of income determination, stabilization, and economic growth; emphasis on unemployment and inflation.
*Prerequisites: 01:220:102, 103, grade of C or better; 01:640:135 or 151, grade of C or better. Credit not given for both 01:220:321 and 204.*

**01:220:322** *Econometrics (3)*
Introduction to the application of statistical methods for the estimation, testing, and prediction of economic relationships. Emphasizes ordinary least squares regression and problems in its application. Extensive use of microcomputers. Special topics may include limited dependent variable models, simultaneous equation methods, and time-series methods.
*Prerequisites: 01:220:102, 103, grade of C or better; 01:960:211 or 285 or equivalent, grade of C or better; 01:640:135 or 151, grade of C or better.*

**01:220:323** *Data Science and Econometrics (1)*
Empirical capstone project for Data Science Certificate Program. Includes proposing an economic research project and conducting a data-based project including identifying a data source, cleaning and organizing the data, conducting appropriate statistical analysis, and interpreting and reporting the results of the study in a standard scholarly form. Requires finding an appropriate project and data source with suitable characteristics for a data science-oriented study.
*Prerequisites: (01:198:142 or 01:960:142) and 01:960:291 and (01:198:210 or 01:960:295 or 04:547:221) and 01:220:322.*

**01:220:327** *History of Economic Thought (3)*
Historical examination of the major concepts of economic theory. Covers all major traditions within economic thought, with special emphasis on the school of classical political economy. Lower-level elective.
*Prerequisites: 01:220:102, 103, or 200, or permission of instructor.*

**01:220:331** *Economics of Crime (3)*
Economic analysis of crime and the criminal justice system, criminal behavior, law enforcement, crime prevention, sentencing, capital punishment, organized crime, and the war on drugs. Lower-level elective.
*Prerequisites: 01:220:102, 103, or 200.*

**01:220:334** *Energy Economics (3)*
Economic analysis of energy problems. Critical examination of government energy policies. Lower-level elective.
*Prerequisites: 01:220:102, 103.*

**01:220:362** *Comparative Economic Systems (3)*
Comparative analysis of differing economic systems with emphasis on plan/market comparisons and the nature of transitions in formerly planned economies. Lower-level elective.
*Prerequisites: 01:220:102, 103, or 200.*

**01:220:389** *Public Policies toward Business (3)*
Analysis of major policies affecting competition. Topics include antitrust, traditional public-utility regulation, and newer regulatory alternatives. Lower-level elective.
*Prerequisites: 01:220:102, 103, or 200.*

**01:220:390** *Choice and Strategy in Politics (3)*
Rational-choice approaches to understanding political behavior and institutions. Spatial models of direct and representative democracy; strategic behavior of political actors; ideal voting systems; selected applications in U.S. and other political systems.
*Credit not given for both this course and 01:790:390. Prerequisites: 01:220:102, 103.*

**01:220:395** *Law and Economics (3)*
Economic rationale and consequences of legal rules. Contracts, compensation, property rights, liability rules, crime, safety, monopoly, discrimination, health care, pollution, and public interest law. Lower-level elective.
*Prerequisites: 01:220:102, 103, or 200.*

**01:220:396** *Corporations, Bankruptcies, and Takeovers (3)*
Origin and nature of corporations; corporate bankruptcy, including liquidation and reorganization; mergers and acquisitions; takeover disputes. Lower-level elective.
*Prerequisites: 01:220:102, 103, or 200. Credit not given for both this course and 01:220:309.*

**01:220:397** *Internship in Economics (1)*
Supervised internship in economics-related position. Approval of the director of undergraduate studies and semester paper required.
*Prerequisites: 01:220:102, 103, or 200. Each student is limited to one internship in economics. Students are responsible for finding internships. Majors only. Graded Pass/No Credit.*

**01:220:398,399** *Independent Study in Economics (3,3)*
Independent research supervised by a faculty member.
*Prerequisites: 01:220:102, 103. By permission of instructor and department. Maximum of two independent study courses in economics allowed.*

**01:220:402** *Labor Economics (3)*
The firm's labor demand, the household's labor supply, and wage determination in competitive and noncompetitive markets. Economics of unions. Human capital, occupational choice, wage structure, and unemployment. Upper-level elective.
*Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:302.*

**01:220:403** *Special Topics in Labor Markets (3)*
Analysis of topics such as hours of work, fertility and population, mobility, job search, and unemployment. Investment in human capital, wage and retirement policies, and occupational training. Upper-level elective.
*Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:304.*

**01:220:410** *Advanced Macroeconomic Theory (3)*
Use of models of household and firm behavior and equilibrium analysis to study macroeconomic issues. Competing theories of aggregate fluctuations, including real business cycle theory and the New Keynesian model. Effects of fiscal and monetary policy on the economy in the short and long run. Upper-level elective.
***Prerequisites: 01:220:320, 01:220:321, 01:220:322, 01:640:136, or 01:640:152. Credit not given for both this course and 16:220:586.***

**01:220:411** *Global Financial Crises (3)*
Financial crises from a historical perspective; survey of the history of banking, currency, and debt crises across the world for the past century and a half; in-depth discussion of the 2008 crisis in the United States and the Euro-zone crisis of 2010-2013. Seminar. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322.***

**01:220:412** *Monetary Theory and Policy (3)*
Role of money and the monetary system in determining income, employment, and price level; techniques of monetary policy; relation of monetary and fiscal policy; international policies. Upper-level elective.
***Prerequisites: 01:220:321 and 322.***

**01:220:413** *Financial Economics (3)*
Analysis of financial decision-making; market structure; asset valuation; return on assets; determinants of relative yields. Upper-level elective.
***Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:393.***

**01:220:414** *Economics of Capital Markets (3)*
Capital markets uncertainty; capital budgeting; theories of stock and bond market activity. Innovations in financial instruments. Upper-level elective.
***Prerequisites: 01:220:321, 322, and either 393 or 413. Credit not given for both this course and 01:220:394.***

**01:220:415** *Portfolio Theory (3)*
Selection of a financial portfolio under conditions of uncertainty. Treatment of risk. Case histories of investment fund performance. Upper-level elective.
***Prerequisite: 01:220:393 or 413.***

**01:220:420** *Computational Methods for Research in Economics (3)*
Computational tools and custom-designed data collection methods for economic research; self-contained primer in building computational tools; use of computational tools in adapting tightly specified and general theoretical models to more complex and realistic settings; primer in research design, with emphasis on efficient collection of data to test theory. Upper-level elective.
***Prerequisites: 01:220:320, 321, 322; 01:640:136 or 152.***

**01:220:421** *Economic Forecasting and Big Data (3)*
Application of forecasting methods to data sets with large numbers of observations and variables. Introduction to Big Data methods for economics and finance. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322.***

**01:220:422** *Advanced Econometric for Microeconometric Data (3)*
Advanced topics in microeconomic applications of econometrics. May include fixed effects, panel data, instrumental variables and simultaneous equation methods, limited dependent variable models, duration models, regression discontinuity and difference-in-difference designs. Emphasis on application of these methods to economic issues with focus on computer exercises.
***Prerequisites: 01:220:320, 01:220:321, and 01:220:322, Calculus II and admission by special permission.***

**01:220:423** *Advanced Time-Series and Financial Econometrics (3)*
Application of multivariate time-series methods to economics and finance. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322,; and 01:640:136 or 152. Open to students doing honors research, and others by special permission. (Credit not given for both this course and 01:220:400.)***

**01:220:424** *Advanced Analytics for Economics (3)*
Advanced regression and classification methods applied to economic research questions; consideration of linear, graphical, kernel and neural network methods; emphasis on Bayesian methods for research design; consideration of broader social and distributional implications of the use of these methods.
***Prerequisites: 01:220:320, 321, and 322, and 01:640:136 or 152.¿***

**01:220:431 (3)** *Urban Economics*
Introduction to the economic forces shaping cities. Theoretical and empirical analysis of the location decisions of firms and households and the factors driving urban growth. Agglomeration economies, housing, land use, segregation, transportation, and local government policies.
***Prerequisites: 01:220:320 and 322.***

**01:220:432** *Environmental Economics (3)*
Economic basis of problems of air and water pollution and general environmental quality. Issues relating to externalities and public goods. Economic solutions to problems of environmental quality. Upper-level elective.
***Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:332 or 11:373:363.***

**01:220:433** *Health Economics (3)*
Medical care costs; production of health; demand for health care and insurance; health services personnel; physician and hospital behavior; cost containment; review and evaluation of public programs. Upper-level elective.
***Prerequisites: 01:220:320 and 322. (Credit not given for both this course and 01:220:433 (formerly 417) or 10:832:332.)***

**01:220:435** *International Trade (3)*
Theories analyzing the gains from, and causes of, the international exchange of goods and services. The impact of commercial policy and other government policies on these gains and resource allocation. Upper-level elective.
***Prerequisites: 01:220:320, 322. Major credit may be earned for only two of the three courses: 01:220:300, 435, 436. Credit not given for both this course and 01:220:335.***

**01:220:436** *International Finance and Macroeconomics (3)*
Theory of the balance of payments and balance-of-payments adjustment. International financial system, foreign exchange market, determinants of the trade balance and capital accounts, and the impact of government financial policies in the open economy. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322. Major credit may be earned for only two of the three courses: 01:220:300, 435, 436. Credit not given for both this course and 01:220:336.***

**01:220:437** *Economics of the European Union (3)*
Intraregional macroeconomic analysis of the European Union, elimination of all trade barriers, integration of capital and labor markets, coordination of monetary and fiscal policies, the Euro currency. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322. Credit not given for both this course and 01:220:337.***

**01:220:438** *Education Economics (3)*
Economic theory applied to educational policy issues. The nature of education and its relation to personal and societal development from economic perspectives. Upper-level elective.
***Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:338.***

**01:220:439** *Economic Development (3)*
Theories and experience of qualitative and quantitative changes involved in the process of raising living standards in less-developed countries. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322. Credit not given for both this course and 01:220:339.***

**01:220:440** *Economics of Income Inequality and Discrimination (3)*
Income distribution in the United States and elsewhere; the roles of occupation, education, and discrimination. Government policies concerning inequality, discrimination, and poverty. Upper-level elective.
***Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:340.***

**01:220:441** *Industrial Organization (3)*
Theories of firm and market behavior. Evidence on relationships between structure, conduct, and performance. Includes pricing, profitability, innovation, and advertising. Upper-level elective.
***Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:341.***

**01:220:442** *Economics of Innovation and Intellectual Property (3)*
Incentives to innovate, economic models of innovation, intellectual property protection including patents and copyrights, and government programs to stimulate innovation. Upper-level elective.
***Prerequisites: 01:220:203 and 322. Credit not given for both this course and 01:220:342.***

**01:220:443** *European Economic History (3)*
Emergence of the modern economy in Europe from the 16th to the 20th century. Price revolution and mercantilism. Industrial revolution in England and the continent, and the formation of international markets. The Great Depression and renewed prosperity. Upper-level elective.
***Prerequisites: 01:220:320 (or 203) and 321 (or 204) and 322. Credit not given for both this course and 01:220:343.***

**01:220:444** *Financial and Monetary History of the United States (3)*
Development of financial institutions, money, and capital markets. Central banking and the Federal Reserve system. Gold standard and floating exchange rates. Financial panics and economic crises. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322. Credit not given for both this course and 01:220:344.***

**01:220:445** *Advanced Topics in International Economics (3)*
Topics may include strategic trade, trade and economic growth, the political economy of trade policy, exchange rate determination, international coordination of macroeconomic policy, empirical issues in international economics, and foreign direct investment. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322. Credit not given for both this course and 01:220:433.***

**01:220:449** *Economics of Transition (3)*
Economic analysis of the policies and performance of the transition economies of the former Soviet Union and Eastern Europe. Upper-level elective.
***Prerequisites: 01:220:203, 204, and 322. Credit not given for both this course and 01:220:349.***

**01:220:460** *Public Economics (3)*
Rationale for the public sector; public expenditure theory; economics of political process; expenditure structure and growth; incidence and incentives of specific taxes; fiscal incidence; stabilization. Upper-level elective.
***Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:360.***

**01:220:463** *Economics of Taxation (3)*
Structure of the U.S. tax system. Effects on the allocation of resources and economic growth; distribution of the burden of taxation across income groups. Upper-level elective.
***Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:363.***

**01:220:464** *Personal Economics and Public Policy (3)*
Examination of how public policy affects and is affected by individuals' economic decisions and actions. Upper-level elective.
***Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:364.***

**01:220:469** *State and Local Public Finance (3)*
Evolution of federalism; analysis of expenditure and revenue decisions and intergovernmental grants; discussion of stabilizing and distributional aspects of state-local finances; and specific state-local fiscal problems. Upper-level elective.
***Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:369.***

**01:220:470** *Economic Growth (3)*
Theories, experience, and measurement of quantitative changes in output, employment, price levels, and other economic aggregates in modern developed countries. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322. Credit not given for both this course and 01:220:370.***

**01:220:471** *Economics of Regulation (3)*
Applied topics in rate-of-return regulation. Emphasis on underlying financial, accounting, and pricing issues in selected utilities industries. Upper-level elective.
***Prerequisites: 01:220:320 and 322.***

**01:220:475** *Women, Men, and the Economy (3)*
Description and analysis of women's economic status. Theories of discrimination against women in the labor market, including neoclassical, institutional, and Marxian. Women's work in the home analyzed from three perspectives: household utility maximization, patriarchy, and a sex-gender system. Application of theories to case studies. Upper-level elective.
***Prerequisites: 01:220:320 and 322. Credit not given for both this course and 01:220:375.***

**01:220:477** *Economics of Population (3)*
Theoretical and empirical study of the interrelations between population change and economic change in developed as well as less-developed countries. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322. Credit not given for both this course and 01:220:377.***

**01:220:480** *Behavioral and Experimental Economics (3)*
Alternative theories of anomalous behavior in economic settings. Choice under uncertainty, strategic interaction, and behavior in anonymous markets. Experimental methods for the study of economic behavior.
*Prerequisites: 01:220:320, 01:220:322, 01:640:136 or 01:640:152. Credit not given for both this course and 01:220:404 or 01:220:405.*

**01:220:481** *Economics of Uncertainty (3)*
Measurement of risk, attitudes toward risk, decision-making under uncertainty, Bayesian decision theory, applications to asset markets. Upper-level elective.
*Prerequisites: 01:220:320; 01:960:211 or 285; 01:640:136 or 152 all with grades of C or better. Credit not given for both this course and 01:220:405.*

**01:220:482** *Game Theory and Economics (3)*
Expected utility theory, zero and nonzero sum games, cooperative and noncooperative games, bargaining models, supergames, oligopoly, core market games, strategy-proof systems.
*Prerequisites: 01:220:320; 01:960:211 or 285; 01:640:136 or 152. (01:220:320 and; 01:960:211) or (01:220:320 and 01:960:285. Credit not given for both this course and 01:220:406 or for both this course and 01:640:355.*

**01:220:483** *Markets, Games and Information (3)*
Private and asymmetric information, moral hazard with optimal contracts, adverse selection with applications to signaling and screening, and incentive mechanisms such as auctions and tournaments. Upper-level elective.
*Prerequisites: 01:220:320; 01:960:211 or 285; 01:640:136 or 152. (01:220:320 and; 01:960:211) or (01:220:320 and 01:960:285). Credit not given for both this course and 01:220:407.*

**01:220:484** *Market Discipline (3)*
Theories and evidence of agency problems and firm performance at for-profit, not-for-profit, and mutual organizations; internal discipline of managerial performance derived from ownership structure, boards of directors, incentive compensation, and debt financing; external discipline derived from regulation and markets for products, capital, labor, and donors. Upper-level elective.
*Prerequisites: 01:220:320, 01:640:136 or 152, 01:220:322. Credit not given for both this course and 01:220:408.*

**01:220:485** *Advanced Microeconomic Theory (3)*
Consumer and producer theory, general equilibrium analysis, and game theory. Emphasis on rigorous mathematical approach to economics. Recommended for students interested in graduate-level study in economics. Upper-level elective.
*Prerequisites: 01:220:320, 321, and 322; 01:640:136 or 152. Credit not given for both this course and 16:220:585.*

**01:220:486** *Operations Research I (3)*
Application of quantitative methods to production management including decision theory, game theory, deterministic inventory theory, queuing, and linear programming. Upper-level elective.
*Prerequisites: 01:220:320 and 322. Credit not given for both this course and 33:623:386. Credit not given for both this course and 01:220:386.*

**01:220:487** *Operations Research II (3)*
Development and use of advanced techniques of production management, including advanced topics in linear programming, PERT, nonlinear programming, dynamic programming, stochastic inventory theory, and Markov analysis and simulation. Upper-level elective.
***Prerequisites: 01:220:320 and 322; 01:640:136 or 152. Credit not given for both this course and 01:220:410.***

**01:220:488** *Networks and Complexity in Economics (3)*
Analysis of network connections among economic agents; game- and information-theoretic considerations; complexity and the need for alternatives to traditional optimization methods for understanding complex environments; applications to neighborhood segregation, diffusion of information, contagion in financial markets; introduction to neuroeconomics. Upper-level elective.
***Prerequisites: 01:220:320, 321 and 322; 01:640:136 or 152.***

**01:220:489** *Topics in Advanced Economic Theory (3)*
Economic dynamics; variational methods with applications; economics under uncertainty; imperfect information and market structure; social choice; design of incentive-compatible systems; general equilibrium. Upper-level elective.
***Prerequisites: 01:220:320, 321 and 322; 01:640:136 or 152. Credit not given for both this course and 01:220:430.***

**01:220:490,491** *Advanced Independent Study and Research (3,3)*
Specialized research supervised by a faculty member. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322. Open to juniors and seniors by permission of instructor and department. Maximum of two independent study courses in economics allowed.***

**01:220:493** *Honors Research Seminar I (3)*
Workshop in which students, in conjunction with faculty advisers, formulate and develop individual research projects and present and discuss their research findings. Upper-level elective.
***Prerequisites: 01:220:320, 321, and 322. Pre- or corequisite: 01:220:401. Open to sophomores, juniors, and seniors by permission of department.***

**01:220:494** *Honors Research Seminar II (3)*
Workshop in which students, in conjunction with faculty advisers, complete individual research projects begun in 01:220:493 or in a research-oriented economics elective course and present and discuss their research findings.
***Prerequisites: 01:220:320, 321, 322. Pre- or corequisite: 01:220:401. Open to sophomores, juniors, and seniors by permission of department.***

**01:220:495,496** *Seminar in Economics (3,3)*
Readings, analysis, and discussion of topics announced in advance each semester. Upper-level elective.
***Open to juniors and seniors by permission of department.***

# Education 300 (GSE)

## EDUCATION 300

Graduate School of Education

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Education 300 (GSE)

# Programs

# Programs

The Graduate School of Education offers two different programs for undergraduates at Rutgers.

One program, the urban social justice teacher education program, begins in the senior year of undergraduate studies and continues into a fifth year of study, culminating in a master's degree. This program leads to state certification as a K-12 teacher, in one or more content areas, eligible for employment in New Jersey's public schools. The program offers a robust combination of coursework at the GSE combined with clinical experiences in carefully selected schools and classrooms that are part of the GSE-Community School Partnership Network (CSPN). By combining experiences in the university classroom, K-12 schools, and local communities, GSE's urban social justice teacher education program offers students a unique opportunity to blend theory and practice to develop best practices in teaching and in the service of some of the most underresourced students, schools, and communities in the state.

The other program is an educational minor with several tracks. Each track, or area of concentration, provides an opportunity for undergraduates to study deeply in a particular context in the field of education taking both a scholarly and practical point of view on the concentration area.

Both programs serve as a minor in the School of Arts and Sciences.

Education 300 (GSE)

# Noncertification Minor in Education as a Social Science

# Noncertification Minor in Education as a Social Science

Education as a social science minor is designed for students interested in investigating learning and teaching in a broad range of human contexts. This minor takes a multidisciplinary approach to the study of educative practices and is premised on several key assumptions:

- Learning and teaching are fundamental human and cultural processes.
- Education is intimately bound up with social, cultural, economic, and political systems.
- Reflection and inquiry are powerful tools for exploring teaching and learning in all human contexts.

Through a minor in education, students will examine each of these assumptions by investigating educative practices in and outside of formal settings. There are many ways in which a student can complete the minor.

1. Educational Policy and Social Justice. This concentration will permit students to focus on issues related to the history of American education, race and American schools, and queer issues in schools.
2. Creativity and Play. This concentration will permit students to focus on creativity and imagination in professional settings, the arts and the young child, and the role of play in education.
3. Global Education. This concentration will provide students with grounding in the areas of global education, issues of migration and education, and comparative education acrosscountries.
4. Exceptional Learners. This concentration provides students with knowledge of both gifted education and education for students with learning disabilities.
5. Digital Learning. This concentration will permit students to learn about education and computers, digital games and learning, and other topics related to learning in digital learningenvironments.
6. Community Studies and Civic Engagement. This concentration is for students interested in educational leadership in informal learning settings, such as museums and community organizations.
7. General Studies. This concentration will allow students to take a menu of courses in education tailored to ones own interests; this concentration is also appropriate for students in our five-year urban teacher education program.

See the GSE website and Degree Navigator for more information.

Education 300 (GSE)

# Certification Programs

# Certification Programs

The Graduate School of Education's (GSE) teacher preparation program is designed to develop professionals committed to excellence, equity, and social justice in their teaching practice. New Jersey is a uniquely diverse and urban state, as defined by the following: large numbers of students from historically marginalized linguistic, economic, and cultural backgrounds; high-poverty districts or schools; and population density combined with educational inequality. GSE's teacher preparation program aims to develop a generation of teachers with the knowledge, skills, and dispositions to teach and advocate for all students as well as the ability to learn from students

and their communities. Teachers prepared at the GSE learn to critically analyze the social politics of urban, rural, and suburban schools and use that analysis to inform their teaching practice as they advocate for each other and their students, and for best practices within schools. Our students benefit from working with some of the best education faculty in the world and gain real-world experience partnered with carefully selected mentor teachers in the economically, racially, ethnically, and linguistically diverse communities and schools in New Jersey. They engage in clinical work in school- and community-based settings located in urban partner districts where they develop unique skills to prepare them for success in our nation's increasingly diverse schools.

An urban and social justice teacher education program prepares candidates to

- develop meaningful understandings of diverse students, their experiences, and communities;
- analyze the social, economic, historical, and political dimensions of urban settings and schools;
- effectively teach diverse students, including those from historically marginalized linguistic, cultural, and economic backgrounds;
- identify and disrupt instances and patterns of discrimination and marginalization, and develop their students' critical and active citizenship capacities;
- balance constructivist, student-centered approaches with explicit instruction and scaffolding;
- deeply understand their disciplines and create learning experiences that make disciplinary content knowledge accessible to students; and
- be caring, competent, rigorous, and reflective practitioners.

Certification programs exist in the following teaching areas (K-12): agriculture, biological science, dance, English, foreign language (Chinese, French, German, Italian, Latin, Russian, and Spanish), mathematics, music, physics, physical science, social studies, and special education. A certification program in elementary education (K-6) with subject matter specialization for the middle grades (5-8) or preschool through grade 3 (P-3) is also available. Most of these programs are offered directly by the Graduate School of Education (GSE), but some are offered by other units of the university in cooperation with the GSE.

The certification program in music education is a four-year program and is offered by the Mason Gross School of the Arts. All of the other teacher preparation programs are sponsored by the GSE and are five-year programs. In these programs, the baccalaureate degree is awarded after four years by the School of Arts and Sciences, Mason Gross School of the Arts, or the School of Environmental and Biological Sciences, and the master's degree in education is awarded by the GSE after one more year of study. A recommendation is made to the state of New Jersey after the successful completion of the fifth year of the program.

***Admission:*** Students apply to and are admitted to these programs during the second semester of the junior year; the study of professional education begins during the junior or senior year and continues with an internship and advanced professional studies in the fifth year. Admission into the education programs is competitive.

To be considered for admission students must demonstrate proficiency in written and oral communication and have successfully completed a college-level mathematics course. Additionally, applicants must have successfully completed 05:300:200/201 Introduction to Education with Clinical Field Experience, and 05:300:306 Principles of Classroom Learning. Admission is based upon the cumulative grade-point average; passing/minimum required scores on one or more of the ACT, SAT, GRE, or Praxis Core Combined Exam for Educators; performance in the introductory education courses and related fieldwork; letters of recommendation; and a written personal statement.

***Program Requirements:*** Individuals preparing for subject area certification must major in the field in which they are planning to teach. Elementary education students and special education students must major in any appropriate liberal arts field.

In addition to the major, education programs include coursework in educational psychology, social and philosophical foundations of education, and methods of teaching, as well as fieldwork and student teaching. All programs also have a required distribution of liberal arts courses. Coursework is required in the following general education areas: arts, humanities, mathematics, science, technology, and psychology. Additionally, demonstration of competence in a foreign language at least equal to that of the second college semester is required.

Education 300 (GSE)

# For More Information

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Students seeking admission to any of the programs offered by the Graduate School of Education should meet with an education adviser to review program requirements as soon as possible or during their first year. Detailed information about all programs and advisement can be obtained from the Office of Academic Services, Graduate School of Education, 10 Seminary Place, New Brunswick, NJ 08901-1183; academic.services@gse.rutgers.edu or refer to the website.

Education 300 (GSE)

# Courses

# Courses

**05:300:200** ***Introduction to Education (3)***
Taking a multidisciplinary approach to the study of education, this course examines educative practices in and outside of school contexts. It focuses on critical issues in U.S. education, including: the structures of schools and schooling, theories of learning and teaching, students' experiences, teachers' experiences, inequality, family and community relationships, and contemporary school reform policies.
***Prerequisite for admission to the teacher education program.***

**05:300:201** ***Introduction to Education Field-Based Lab - Clinical Experience (.5)***
This clinical course is designed around five-to-six facilitated experiences in urban schools so that students can systematically and carefully begin to understand the unique challenges and opportunities of urban schools and communities. Students will have opportunities to meet with stakeholders at urban schools as well as observe in schools and communities.
***Corequisite: 05:300:200.***

**05:300:202** ***Introduction to How People Learn (3)***
Education occurs not just in schools but in nearly every setting where people live and work--workplaces, organizations, communities, families, museums, and so on. Nearly all professions involve educating others. This course helps students learn to be effective educators in out-of-school contexts. It examines processes of effective

learning and motivation in a variety of learning settings, such as learning through games, learning in after-school programs, and learning through cultural apprenticeships. It also examines connections of learning with issues of equity, diversity, and culture within and across these settings.

**05:300:303** ***Why We Play: Play in Children, Adults, and Animals (3)***
Play is a part of life among all social animals as well as among humans. Play begins in childhood, but transforms and has critical import for later life. Students will learn about how play has been considered from ancient times to the present and be able to interpret play in their own lives and lives of those around them. Activities include observation of children playing, playing yourself, and written assignments. This course offers the opportunity for students to determine their personal perspective on the question of play.

**05:300:304** ***Arts and the Young Child (3)***
This course will focus on drama, movement, visual art, music, and creative writing, individually and together, as well as imagination and creativity. Students in the course will experience the processes of these arts themselves and create products/presentations using various art forms. They will learn how to stimulate arts processes and lead art activities with young children, how to talk about these activities with children, and how to evaluate and assess these activities.

**05:300:305** ***Creativity and Imagination in Educational Settings (3)***
Students will become acquainted with the fields of creativity and mental imagery through online and live lectures, readings, and leading and or participating in a variety of activities designed to stimulate personal creativity. Students will respond to almost weekly probes and submit journal entries stimulated by those probes. Students will develop two different presentations that demonstrate their personal take on creativity. Students will work in groups to create two concluding pieces (a creativity box and an original text segment) that utilize the creative and imaginative skills and abilities of all participants in that group.

**05:300:306** ***Educational Psychology: Principles of Classroom Learning (3)***
Surveys areas of psychology most relevant to education. How children think, learn, and remember; influence of motivation; principles of measurement.
***Prerequisite: 01:830:101.***

**05:300:307** ***Human Development: Birth through the Transition to Adulthood (3)***
Introductory course in human development providing an overview of learning and developmental processes from birth through the transition to adulthood. Development during infancy, early childhood, middle childhood, adolescence, and early adulthood is considered. Changes in physical, neurological, social, cognitive, and emotional functioning during these periods are examined through the lenses of sociocultural, developmental, and learning sciences.

**05:300:308** ***Introduction to Motivation***
This course provides an overview of motivation in formal and informal educational settings from a psychological perspective. Most theories and research on motivation are framed around two major components of ones¿ motivation: Can I do this task? Why do I want to do this task? We will address these questions through the theoretical lenses of major theories of motivation including expectancy value theory, attribution theory, achievement goal theory, self-determination theory, theories of personal and situational interest, and engagement. We will examine how and why ones¿ responses to these questions shape their engagement and learning.

**05:300:313** ***Introduction to Tutoring***
Tutoring occurs not just in schools, but also in a variety of out-of-school contexts, standardized test preparation, museum exhibits, and so on. Tutors are typically more experienced peers, teachers, or anyone with expertise in a particular subject matter. The most effective tutors not only have expertise in their subject area, but also have a thorough understanding of the strategies needed to monitor and produce meaningful learning in both one-on-one and group settings. In this course, students learn to be effective tutors in K-12 settings, both inside and outside of the classroom. It also examines connections of learning and tutoring with issues of equity, diversity, and culture within and across these settings. Students in this course will engage in frequent role-playing activities to apply what they learn about effective tutoring.

**05:300:314** ***Presentation of Self in Professional Settings (3)***
Focuses on the theoretical foundations and the practical development of each student's personal presentation. Covers both theory and practice so that, by the end of the course, each student will be ready for graduate school, to be interviewed for a job, to interact with others in a new work situation, or to speak in front of a group.

**05:300:315** ***Interactive Training for Workplace and Community Settings (3)***
Focuses on how to use adult learning theory and interactive face-to-face and web-based strategies to design and implement training in a variety of settings including workplaces, community-based organizations, and schools.

**05:300:317** ***The Teacher in Film: Analyzing What Hollywood Has Been Telling Us about Teaching (3)***
Focuses on films in which a teacher is the central character. Students will study these films as a cinematic art form, as positive inspirational role models for students considering a teaching career, and as unrealistic examples that shape the public's view concerning teaching.

**05:300:318** ***The Teacher as Performer: The Presentation of Self (3)***
Focuses on the techniques and skills used in the theater by actors, directors, dancers, playwrights, and designers, all modified and transformed by each student to create a personal approach for dealing with various educational interactive settings. The course will be broken into three segments. The first will be primarily a skill-based segment during which the student participates in technical and improvisational work. The second section will focus on lecture and discussion of key theoretical ideas. The third will focus on each student's personal presentation of self within an educational setting.

**05:300:319** ***Community-Based Learning in Urban Environments (3)***
This course is designed to assist students in learning from local urban community centers, as well as from the families and individuals who use these services, and about how multiple organizations serve an educative function. Through readings and practical hands-on, community-based experiences, students will come to understand both the broad educative needs as well as the enormous resources that exist within the communities and families of urban and other diverse settings. At the same time, students will gain practical skills for working with and learning from families and individuals in community-based settings.

**05:300:320** ***Introduction to Gifted Education (3)***
This introductory course in gifted education focuses on the cognitive and psychosocial development of gifted individuals over a lifetime. Emphasis will be placed on exploring the characteristics of giftedness and the influences that support or hinder the development of potential talent. The relationship between creativity, intelligence, and giftedness will be explored, along with implications for educational settings.

**05:300:322** ***The Social and Emotional Needs of Gifted Learners (3)***
This course is designed to provide a strong background for students related to working with gifted children to promote positive affective development. It will feature core affective characteristics and needs, and demonstrate the connections to students' cognitive make-up. Emphasis will be on affective approaches to use in the classroom as well as more formalized programs and services in guidance and counseling deemed essential for their talent development. Course readings, discussions, and assignments focus on special issues and concerns for addressing the social and emotional needs of this population of learners including asynchronous development, perfectionism, risk avoidance, fear of failure, and over-excitabilities. Special emphasis will be placed on special populations of gifted learners--twice exceptional learners, students from poverty and minority groups, and underachievers.
***Prerequisite: 05:300:320.***

**05:300:324** ***Community-Based Learning: Theory and Practice***
Children and teens learn a great deal from community-based programs that take place outside of school. These programs contribute to the development of the whole child and are an important part of a healthy, balanced life. This course helps students learn about development from early childhood through adolescence in order to understand how to meet the needs of youth in out-of-school learning environments. It examines ways to develop youth¿s potential by developing positive relationships with youngsters within community-based programs. Students will better understand issues of equity, diversity, and culture as they pertain to community-based learning.

**05:300:326** ***Introduction to Teaching with Digital Tools***
This online course available to all graduate students at GSE was developed based on the philosophy that knowledge is socially constructed and that students and teachers learn best when learning by doing. Students will have various opportunities to engage in both individual and collaborative, project-based activities that emphasize learning through inquiry. They will explore theories of learning and how they inform the effective uses of technology in K-12 environments. Additionally, students will investigate what the latest research has to say about the integration of technology in K-12 classrooms, with emphasis being placed on the types of 21st-century skills that are required to be successful in today's digital age society. By engaging students in a variety of project-based activities throughout the semester, this course will introduce them to the various ways that new technologies are challenging traditional ways of communicating and learning. Students will be introduced to various online communication and collaboration tools while exploring how these new technologies are changing the teaching landscape. The course will also introduce students to the potential challenges and benefits that arise from these changes.

**05:300:328** ***Developing the Digital eLearning Environment***
Provides an in-depth overview of both theory and practice related to online distance education. The principles identified and the issues studied in the course are applicable across a variety of settings, including but not limited to: K-12 classrooms, universities, community colleges, business/industry, and health care. Also examines the theoretical framework, historical development, pedagogical issues, and practical applications of both online and hybrid eLearning education. Prerequisite: 05:300:326 or by instructor approval.
***Prerequisite: 05:300:326 or by instructor approval.***

**05:300:335** ***Informal Science Education (3)***
This course focuses on the teaching and learning of science in out-of-school contexts. These contexts are widely referred to as "informal learning" contexts and include: zoos, aquariums, science centers, natural history museums, docent-led walks/tours, after-school programs, and eco/enviro tours. As part of this course, we will read and discuss

literature on informal science education (ISE). Learning theory in this area draws heavily from sociocultural perspectives on knowing and learning, and we will discuss its influence, along with cognitive and educational psychology, on the teaching and learning of science in out-of-school contexts.

**05:300:336** *Climate Change: Course for Educators (3)*
Explores the science of climate change. Students will learn how the climate system works; what factors cause climate to change across different time scales and how those factors interact; how climate has changed in the past; how scientists use models, observations, and theory to make predictions about future climate; and the possible consequences of climate change for our planet. The course explores evidence for changes in ocean temperature, sea level, and acidity due to global warming. Students will learn how climate change today is different from past climate cycles and how satellites and other technologies are revealing the global signals of a changing climate. Finally, the course looks at the connection between human activity and the current warming trend and considers some of the potential social, economic, and environmental consequences of climate change. It is intended for educators and those who are interested in learning and teaching in this area.

**05:300:337** *Space, Time, and Motion: Course for Educators (3)*
Throughout history, humans have grappled with questions about the origin, workings, and behavior of the universe. This seminar begins with a quick tour of discovery and exploration in physics, from the ancient Greek philosophers on to Galileo Galilei, Isaac Newton, and Albert Einstein. Einstein's work then serves as the departure point for a detailed look at the properties of motion, time, space, matter, and energy. It is intended for educators and those who are interested in learning and teaching in this area.
*Prerequisite: Students should have taken an introductory physics course.*

**05:300:338** *The Solar System: Course for Educators (3)*
This course provides an overview of what we know about the solar system: how it began and evolved, its components and their properties, and how these elements interact as a system. However, much of our knowledge remains incomplete, and so unanswered questions and mysteries figure prominently in the story. This course addresses our scientific understanding of the solar system, how we know what we know, and many hotly debated questions at the cutting-edge of scientific research. It is intended for educators and those who are interested in learning and teaching in this area.

**05:300:339** *Earth Systems: Course for Educators (3)*
Though the geologic record is incredibly ancient, it has only been studied intensely since the end of the 19th century. Since then, research in fields such as plate tectonics and climate change, and exploration of the deep sea floor and the inner Earth have vastly increased our understanding of geological processes. This course delves into the five questions listed below in order to understand how our dynamic planet evolved and what processes continue to shape it. In the process, learners will get to know the Museum of Natural History's Hall of Planet Earth, explore geologic time, and gain an understanding of how scientists study vast Earth systems. It is intended for educators and those who are interested in learning and teaching in this area. 1. How do geologists "read" the rocks? 2. How has the Earth evolved? 3. What causes climate and climate change? 4. Why are there ocean basins, mountains, and continents? 5. Why is the Earth habitable?

**05:300:341** *High School Math Content: Teaching and Assessment (3)*
In-depth study and concentration of some key ideas in the high school mathematics curriculum. Viewing of mathematics in terms of the ideas built up in the minds of students.
*Prerequisites: 01:198:111 or equivalent; 01:640:250,251.*

**05:300:342** ***Supervised Undergraduate Tutoring in Mathematics (3)***
Develop teaching strategies, an interactive style, and an approach to high school mathematics content in a one-on-one tutorial or small group setting. Students work with other undergraduates in lower-level, E-credit mathematics courses.
***Prerequisites: 01:640:250,251.***

**05:300:350** ***Education and Computers (3)***
Establishes a foundation for using the computer and technology in a variety of educational settings across all subject areas. The course is hands-on in nature, with a focus on current trends. Additionally, learners can expect to discuss theory, practice, and social/philosophical issues related to the use of computers in education. Some familiarity with computers is recommended; no prior computer skills are required.

**05:300:361** ***Science: Knowledge and Literacy (3)***
Examines the emerging role of science education in society. Special attention given to the influence of professional societies. Places current trends in science education in a historical perspective that reflects the development of science in the United States.
***Prerequisite: Science course at the 200 level or above.***

**05:300:363** ***Public School Policy and Reform (3)***
This course is designed as an elective for upper-level undergraduate students interested in understanding policy and reform efforts related to elementary and secondary education in the United States. The course is built around readings of very recent books on education policy topics, ranging from racial residential segregation and the government policies that codified and reinforced that segregation, to modern education policies that further exacerbate racial inequality, the financing and economics of elementary and secondary education, issues with the measurement of the quality of our education systems, and the politics of teaching and the teacher workforce over time.

**05:300:364** ***History of American Education (3)***
A historical survey of American education from the colonial period to the present. Topics considered will include the following: 1) colonial American education, 2) the origins of common schools, 3) the development of a public school system, 4) 20th- and 21st-century educational reform.

**05:300:365** ***Contemporary Issues in Education (3)***
A critical examination of contemporary issues in educational theory, policy, and practice.

**05:300:371** ***Foundations of the Resident Assistant Experience I (1.5)***
This course has been designed to assist in the development of a more comprehensive understanding of the theoretical and practical knowledge needed for the Resident Assistant (RA) position at Rutgers University. The learning experience will provide an understanding of student and community development, leadership, communication, and diversity theories. Through exposure to theories, experiential learning situations, and the use of critical thinking and reflective analysis, participants will develop the background and knowledge that will allow them to conceptually understand their new leadership role.

**05:300:372** ***Foundations of the Resident Assistant Experience II (1.5)***
The course has been designed to assist in the development of a more comprehensive understanding of the theoretical and practical knowledge needed for the Resident Assistant (RA) position at Rutgers University. The learning experience will provide an understanding of the theories and their practical implementation processes for

peer counseling/advising; behavioral and mental health issues; conflict mediation; ethical and moral development; and group development. Through exposure to theories, experiential learning situations, and the use of critical thinking, and using their current experiences in the RA position, participants will develop the knowledge to create a richer, more comprehensive experience in the RA position and subsequently enhance the experience for the RA's students.

**05:300:383** ***Introduction to Special Education (3)***
Overview of the diverse physical, psychological, and social disabilities of special education children.

**05:300:385** ***Teaching English Language Learners (3)***
This introductory course provides preservice teachers and current practitioners with an understanding of how to teach English language learners or emerging bilinguals. Undergraduate students will be provided with the foundations of teaching English language learners and will be guided in constructing successful knowledge, skills, and dispositions for teaching students who are learning English.

**05:300:386** ***Language Learning and Community Engagement in Argentina (3)***
Provides students with an understanding of modern Argentinian culture and society in all its complexity, from national heritage to contemporary social problems, and the role language and education play in this society. This course entails service-learning, and as such students will participate in teaching activities in La Paz elementary and/or secondary school as scheduled in the syllabus. A critical component to this course is that students will also acquire and improve Spanish linguistic and communicative skills through experiential learning opportunities in the Rosario community. Students will be immersed in Spanish-speaking contexts through a combination of community engagement and coursework. Family stays are also a vital component of the course, which provide students with a personal perspective and knowledge of Spanish, Rosarino family lifestyles, and Argentine culture.

**05:300:401** ***Individual and Cultural Diversity in the Classroom (3)***
Focuses on the range of student diversity in contemporary classrooms, including cultural, linguistic, and academic differences. Emphasizes strategies to enhance academic success, promote interaction, and facilitate the inclusion of diverse students in the regular school setting.
***Prerequisite: 05:300:200.***

**05:300:402** ***Special Topics in Education (3)***
Seminar on selected topics of current interest. Topics differ each semester. Consult instructor for description of topic under study.

**05:300:403** ***Independent Study in Education (BA)***
Independent project in education to be carried out in consultation with appropriate faculty. Arrangements for a project supervisor must be made prior to registering for this course.

**05:300:406** ***Community-Based Language Learning (3)***
The Community-Based English Language Learning course is required for students who are new participants in the Conversation Tree: Community-Based Language Partnerships (formerly the SALSA Program). The course provides a curriculum-based service-learning experience built upon a community-identified need for English language instruction and aligns with the university's mission of contributing to the cultural and social well-being of the community. Course topics include demographic trends in the United States and New Jersey; an introduction to second-language learning theory and practice; and the meanings of civic engagement, community, and citizenship

in a multicultural society. The course provides opportunities to work with adult English language learners at a community center and to discuss these experiences, connecting practice to scholarly research.
***Prerequisite: Students must be admitted via an application process.***

**05:300:407** ***Community-Based Language Learning Leadership (1-3)***
The Community-Based English Language Learning Leadership course is required for returning Conversation Tree students who desire to take on a leadership role in the Conversation Café. The course provides a curriculum-based service-learning experience built upon a community-identified need for English language instruction and aligns with the university's mission of contributing to the cultural and social well-being of the community. Course topics focus on facilitation, session planning, leadership, communication, and troubleshooting for the Conversation Cafés. The course provides opportunities to act in a leadership capacity with adult English language learners at a community center hosting a Conversation Café and to discuss these experiences, connecting practice to scholarly research.
***Prerequisite: For returning Conversation Tree students only; students must have taken CBELE as a prerequisite.***

**05:300:408** ***Community-Based Language Learning Internship (3)***
The Community-Based Language Learning Internship is for language education students or students returning to the Conversation Tree: Community-Based Language Partnerships (formerly the SALSA program). The course provides a curriculum-based service-learning experience built upon a community-identified need for English language instruction and aligns with the university's mission of contributing to the cultural and social well-being of the community. In this internship, students continue to serve as an English conversation partner at community partner sites alongside students enrolled in the Community-Based Language Learning (CBLL) and CBLL Leadership courses. Students will continue to develop knowledge and skills to foster the language development of adult English language learners, as well as skills related to working together as a team (collaboration, communication, flexibility, etc.).
***Prerequisite: Students must have taken CBLL (05:300:406 or 04:300:403) or Principles of Second and Foreign Language Acquisition (05:300:430 or 15:253:520:80).***

**05:300:409** ***Children's Literature in the Early Childhood and Elementary School (3)***
Children's literature is studied based on genre and includes author and illustrator studies. Literature is connected to content area teaching and extended literary experiences to enhance literacy development.

**05:300:410** ***Learning and Development in a Social Context: Preschool and Primary Years (3)***
This is an advanced course in child development for prospective teachers with a focus on learning and development during the preschool, kindergarten, and primary years. Children's social and emotional development as well as emerging skills in language, representation, and problem solving are examined from a cognitive developmental-ecological framework. Students will integrate theory and research with observations of children in classroom and community contexts.
***Prerequisite: Admission to the teacher education program.***

**05:300:412** ***Learning and Teaching in the Early Childhood Classroom (3)***
Addresses teaching strategies and curricula appropriate for the young child aged 3 to 8. Emphasizes the role of play in learning and development and instructional strategies to foster cognitive, social, and emotional development. Curriculum planning around integrated, thematically related experiences explored.
***Prerequisite: Admission to the teacher education program.***

**05:300:413** ***Practicum in Early Childhood/Elementary Education I (1.5)***
Fieldwork in a local elementary school to observe and participate as a teaching assistant; one full day per week for nine weeks in a prekindergarten, kindergarten, or first- through third-grade classroom.
***Prerequisite: Admission to the teacher education program. Can be taken before or after 05:300:414. Coordinated with 05:300:412 and 494.***

**05:300:414** ***Practicum in Early Childhood/Elementary Education II (1.5)***
Fieldwork in a local elementary school to observe and participate as a teaching assistant; one full day per week for nine weeks in a fourth- through eighth-grade classroom.
***Prerequisite: Admission to the teacher education program. Can be taken before or after 05:300:413. Coordinated with 05:300:441, 461, 471, and 495.***

**05:300:420** ***Inquiry-Based Teaching, Learning, and Assessment (3)***
Students learn how teachers use students' experiences, interests, and ways of learning to plan responsive curricula. Through structured experiences, students learn that an inquiry approach to teaching and learning can teach specific content while helping children to learn how to learn in more formal contexts. Students learn how to integrate subject matter in a student-centered environment and practice methods of inquiry and sources of knowledge that can be used with elementary and middle school students.
***Prerequisite: Admission to special education and elementary education initial teacher licensure programs.***

**05:300:421** ***Language and Linguistics I (3)***
Examines sociocultural theories of language and considers the critique they offer of traditional school grammar. Explores the educational and political implications of teaching traditional school grammar in the light of these critiques.
***Prerequisite: Senior status.***

**05:300:422** ***Teaching Literature: Readers, Texts, and Contexts (3)***
Examines a variety of theories about what literary reading is and why it should be taught. Develop strategies for introducing, sequencing, and discussing literary texts as well as for integrating the study of literature into the other language arts. Field experience required.
***Prerequisite: Senior status.***

**05:300:423** ***Teaching Writing: Social and Cognitive Dimensions (3)***
Examines a variety of perspectives on the nature of the writing process. Considers research and theory on how teachers should teach and respond to writing. Field experience required.
***Prerequisite: 05:300:421.***

**05:300:424** ***Adolescent Literature (3)***
Allows teacher candidates the opportunity to engage with a range of adolescent and young adult literature for middle and high school students. The course structure allows for a view of adolescents as multiliterate beings with rich and diverse cultural worlds and identities, and an exploration of how literature can be used to engage adolescents in meaningful learning. The course is intended to provide a space for you to think and talk about how your own personal connections with literature texts inform your evolving personal theory of and professional approach to literacy instruction.

**05:300:430** ***Principles of Second/Foreign Language Acquisition (3)***
Introductory course that examines the research and theory on first and second language acquisition related to children, teens, and adults in the United States and abroad.
***Prerequisites: 05:300:200; admission to the teacher education program.***

**05:300:431** ***Introduction to World Language/Elementary Methods (3)***
Provides an introduction to the field of world language teaching and its methodology.
***Prerequisite: Admission to the language education program.***

**05:300:432** ***World Language Secondary Methods (3)***
Prepares world language teachers with pedagogical methods and techniques for secondary school language instruction.
***Prerequisite: Admission to the language education program.***

**05:300:433** ***Language and Culture (3)***
Relationship of linguistic, cognitive, attitudinal, and behavioral patterns within each culture and how they affect cross-cultural communication and language education.
***Prerequisites: 05:300:200; admission to the teacher education program.***

**05:300:434** ***Language Foundations I (3)***
Nature of language relevant to teachers involved with other languages and cultures. Topics include functional motivation of linguistic structure, linguistic sign, phonetics, phonemic and morphemic analysis, world semantics, and correctness.
***Prerequisites: 05:300:200; admission to the teacher education program.***

**05:300:438** ***Methods for Teaching and Assessing World Language Learners (3)***
Provides an introduction to methods of teaching and assessing world language learners. Through course readings, seminar discussions, clinical experiences, and in-class presentations, students will develop expertise in two main areas: 1) methods for teaching students of world languages; and 2) research-based best practices and policies for working in a variety of programs. The class includes a clinical experience that includes observations in a school in New Jersey.
***Prerequisite: Admission to language education programs.***

**05:300:439** ***Methods for Teaching and Assessing English Language Learners (3)***
Provides an introduction to methods of teaching and assessing English language learners. Through course readings, seminar discussions, clinical experiences, and in-class presentations, students will develop expertise in two main areas: 1) methods for teaching emergent bilinguals; and 2) research-based best practices and policies for working in a variety of programs. The class includes a clinical experience that includes observations in a school in New Jersey.
***Prerequisite: Admission to language education initial licensure program.***

**05:300:441** ***Teaching Mathematics in the Elementary School (3)***
Concrete, manipulative approach to teaching mathematics concepts. Psychology of learning mathematics; the elementary curriculum; effective teaching techniques.
***Prerequisites: 05:300:200; admission to the teacher education program.***

**05:300:442** ***Problem-Solving Processes in Mathematics (3)***
Focuses on understanding one's own mathematical problem-solving processes and how such processes develop in mathematics learners of all ages.
***Prerequisite: Admission to the teacher education program.***

**05:300:443** ***Methods of Teaching Secondary School Mathematics (3)***
Reviews the status of secondary mathematics teaching in the United States, the reform movement of the 1990s, and current thinking about issues of concern to practicing teachers. Encourages development of personal style and approach to teaching high school mathematics. Topics include instructional planning, assessment, individual differences, cultural and gender differences, and teaching styles.
***Prerequisite: Admission to the teacher education program.***

**05:300:444** ***Practicum in Teaching Secondary School Mathematics (3)***
Gives prospective secondary mathematics teachers an opportunity to observe experienced teachers, serve as an aide, work with individuals and small groups, and teach several class sessions in a high school setting.
***Prerequisite: Admission to the teacher education program. Corequisite: 05:300:443. Students spend two complete mornings in the school each week.***

**05:300:450** ***Urban Education I (1.5)***
Deepens students' understandings of the strengths and complexities of urban schools and communities, with the ultimate goal of developing the knowledge, skills, and dispositions essential to socially just teaching in urban and diverse settings. Through school- and community-based inquiry and critical reading students will become more knowledgeable about the contexts of students and the issues facing urban schools and communities.
***Prerequisite: Admission to the teacher education program.***

**05:300:451** ***Urban Education II (1.5)***
Deepens students' understandings of the strengths and complexities of urban schools and communities, with the ultimate goal of developing the knowledge, skills, and dispositions essential to socially just teaching in urban and diverse settings. Students will use their clinical placements to practice and reflect on the skills, knowledge, and dispositions that are necessary for successful teaching for social justice in urban settings.
***Prerequisite: Admission to the teacher education program.***

**05:300:452** ***Teaching Emerging Bilinguals in PK-12 Classrooms I (1.5)***
In this first module, our objective is to foster a set of dispositions toward emerging bilinguals, language, and power, and the social-political context of learning English in U.S. public schools. The goal is to introduce students to key terms and best practices that will be followed up on in content-specific settings in module II. By learning about emerging bilinguals, their experiences, and communities, students will consider their own positioning within and responsibility to language learners in their school communities.
***Prerequisite: Admission to the teacher education program.***

**05:300:453** ***Teaching Emerging Bilinguals in PK-12 Classrooms II (1.5)***
In this second module, our objective is to continue to sensitize students to the linguistic and cognitive demands of academic English within their disciplines. By learning about emerging bilinguals, their experiences, and communities, students will be able to take a critical stance toward the discourse within their disciplines regarding stereotypes, the achievement gap, and language deficits. They will continue to develop a funds-of-knowledge toolkit to disrupt mainstream views of emerging bilinguals. Students will learn instructional strategies for affording

emerging bilinguals equitable access to the teaching and learning interactions and the unique social life of the classrooms they are working within.
***Prerequisite: Admission to the teacher education program.***

**05:300:461** ***Science in the Elementary School (3)***
Presents science as an integrated body of knowledge using investigative and inquiry techniques. Thematic or problem-based approach to science teaching.
***Prerequisites: Completion of student's liberal arts school science requirement and admission to the teacher education program.***

**05:300:462** ***Demonstrations and Technology in Science Teaching (3)***
Creating science teaching support materials using resources available over the internet. For use in creating laboratory, demonstration, and related activities that would complement classroom practice. Involvement in the broad internet community of interest in science and science teaching.
***Prerequisite: Admission to the teacher education program.***

**05:300:463** ***Comparative Education (3)***
This course will investigate a wide variety of social, cultural, economic, and political issues in schooling in an international context. Included will be a study of implications of education for pressing contemporary social issues in Africa, western and eastern Europe, Oceania, the Americas, and the Near and Far East. The goal will be to develop a critical understanding of the impact of globalization on education, as well as an understanding of the dominant and alternative paradigms of education and development, and how these translate into educational policy and practice in communities, schools, and classrooms across the globe.

**05:300:464** ***Race and Ethnicity in American Schools (3)***
This course focuses on race and ethnicity in American schools. Beginning with a historical exploration of the social construction of race/ethnicity in the United States, the course aims to help students think about the meaning of race/ethnicity and its significance in U.S. society. Drawing on multiple disciplinary frameworks, the course examines schools as sites where racial/ethnic inequality is both produced and resisted.

**05:300:465** ***Sexuality, Gender, and the Politics of U.S. Public Schooling (3)***
As Americans became increasingly aware of differing sexualities and multiple genders, the public school site has become a venue for great battles over which understandings will be transmitted--and which will not. From early concerns over public schools creating "sissified boys" to the contemporary debates over sexuality education, teen pregnancy, and gay-straight alliances, the public school site has been an arena of much public concern and anxiety around issues of sexuality and gender.

**05:300:466** ***Urban Schools: Policy and Practice (3)***
This is an introduction to urban education. The course is designed to deepen your understanding of the complexity and challenge of providing quality education in urban schools. It also aims to inspire you with examples of innovative and successful education programs in urban settings. We will examine urban education from a variety of disciplines and perspectives. You will conduct research of urban communities and schools. The class is centered around the following key questions: How do urban contexts shape urban schools? What is the role of schooling both in producing and reducing economic inequality? How do youth develop as learners in urban settings? What practices push this development in a positive direction?

**05:300:467** ***Global Education: 21st-Century Trends and Issues (3)***
This course introduces students to critical global themes and issues shaping the design, delivery, and impact of educational policies and practices in the United States, as well as internationally. Students will analyze how rapidly evolving networks of global communication, patterns of world migration, trade and environmental change, efforts to manage regional and global conflicts, and movements to expand social justice and realize guarantees of human rights are changing both the content and processes used in diverse educational settings, including schools, workplaces, and other institutions. Competing (and often conflicting) conceptions of global citizenship will also be examined, along with their implications for what it means to be an educated person during the 21st century.

**05:300:468** ***Migration, Globalization, and U.S. Education (3)***
Globalization and mass migration are reconfiguring the modern world and reshaping the contours of nation-states. This course focuses on the experiences of the youngest members of these global migration patterns--children and youth--and asks: What do these global flows mean for educating young people to be members of the multiple communities to which they belong? What is globalization and why is it leading to new patterns of migration? How do children and youth experience ruptures and continuities across contexts of migration? How do language policies affect young people's capacity to be educated in a new land? What does it mean to forge a sense of belonging and citizenship in a "glocalized" world, and how does this challenge our models of national citizenship? How are the processes by which young people are incorporated into their new country entwined with structures of race, class, and gender? Drawing on fiction, autobiography, and anthropological and sociological research, this class will explore these questions from a variety of disciplinary perspectives.

**05:300:469** ***Queer Issues in School (3)***
Introduces students to queer issues as they arise in and around U.S. public schools. Draws on multiple disciplines (e.g., history, sociology, law) to examine the intersections of queer issues and queer theory, the experiences of queer students and queer educators historically and at the present, educational laws and policies, curricula and pedagogies, intersectionality and queer diversities, and queer activism. Using course readings, class discussions and activities, and written reflections, students will learn to apply queer theory to begin uncovering queer erasure, homophobia, and heterosexism in schooling contexts. In addition, students will collaborate toward designing more socially just formations of U.S. public schooling vis-a-vis queer issues.

**05:300:470** ***Human Rights and Education (3)***
Explores critical relationships between education in the United States and the core concepts, policies, and practices of international human rights. Course topics include: the historic development of international human rights law and policies, the rights of children, historic and contemporary conflicts in the United States dealing with the right to public education, and the theory and practices related to building a human rights culture in school settings. Course readings, activities, and assessments are designed for application to any school setting and are not focused on a single subject field or certification program. Online conferences with experts in the field of human rights education will be implemented during the semester for course participants.

**05:300:471** ***Teaching Social Studies in Elementary School (3)***
Examines strategies and materials for teaching social studies in the elementary school. Focuses on a cluster of teaching models to engage children in the active pursuit of knowledge, skills, and values.
***Prerequisite: Admission to the teacher education program.***

**05:300:472** ***Materials and Methods in Social Studies (3)***
Study of instructional practices, curricular trends, and teaching materials used in social studies.
***Prerequisites: 05:300:200. Open only to students who have been formally admitted to the social studies teaching program.***

**05:300:474** ***Integrated Curriculum with Young Children***
Students will learn how early childhood teachers use children's experiences, interests, and ways of learning (e.g., play) to plan responsive curricula that also teaches specific content and helps children to learn how to learn in more formal contexts. To understand how teachers of young children integrate subject matter in a student-centered environment, this class will focus on methods of inquiry and sources of knowledge that can be used with young children.

**05:300:480** ***Literacy for Students with Disabilities (3)***
This course focuses on instructional practices in special education. It explores special education approaches to teaching literacy to students with disabilities and/or at-risk learners. Procedures covered are applicable to inclusive, as well as more restrictive settings, and address the needs of students from a broad array of cultural, linguistic, and economic backgrounds. This course is taken in conjunction with a field placement, where students apply specific procedures and strategies from class.
***Open only to special education students.***

**05:300:481** ***Materials and Methods in Special Education (3)***
This course focuses on instructional practices in special education. Students will learn to plan instruction for students with disabilities. They will learn a variety of research-based instructional strategies for diverse learners. Students will learn to develop lesson plans for a variety of instructional settings and in collaboration with other professionals. Research-based practices will be used to plan instruction, implement instruction, and evaluate instructional effectiveness. This course is taken in conjunction with a field placement, where students apply specific procedures and strategies from class.
***Prerequisites: 05:300:200 and 383.***

**05:300:488** ***Dance Clinical Practice Phase 2A (2)***
This clinical practice requires a minimum of 181 hours of classroom practice (two full days per week) in an assigned GSE clinical partnership school under the supervision of a fully credentialed cooperating teacher in the candidate's area of anticipated licensure.
***Prerequisites: Admission to the teacher education program and successful completion of Clinical Experience Phase 1.***

**05:300:489** ***Dance Clinical Practice Phase 2B (2)***
This clinical practice requires a minimum of 181 hours of classroom practice (two full days per week) in an assigned GSE clinical partnership school under the supervision of a fully credentialed cooperating teacher in the candidate's area of anticipated licensure.
***Prerequisites: Admission to the teacher education program and successful completion of Dance Clinical Experience Phase 2A.***

**05:300:494** ***Literacy Development in the Early Years (3)***
Focus on literacy skills for children from birth through third grade. Emphasis on emergent literacy strategies, language and vocabulary development, word study, comprehension, writing, and parent involvement. Children's literature is explored.
***Prerequisites: 05:300:200; admission to the teacher education program.***

**05:300:495** ***Literacy Development in the Elementary and Middle School (3)***
Focus on literacy skills for grades 3 through 8. Emphasis on higher-order comprehension skills, vocabulary development, content area reading, writing, and struggling readers. Upper-elementary and adolescent literature is explored.
***Prerequisites: 05:300:200; admission to the teacher education program.***

**05:300:498** ***Clinical Experience Phase 1 (.5)***
This clinical internship requires 50-60 hours of structured observation and guided participation in a GSE partnership school. Activities include: working with individual and small groups of students; participating in school and community activities geared toward youth development; analyzing and understanding the context of urban schools; observing and analyzing the experiences of students in urban schools including emerging bilinguals and students with special needs.
***Prerequisite: Admission into initial licensure program.***

**05:300:499** ***Clinical Practice Phase 2 (4)***
This clinical practice requires a minimum of 181 hours of classroom practice (two full days per week) in an assigned GSE clinical partnership school under the supervision of a fully credentialed cooperating teacher in the candidate's area of anticipated licensure.
***Prerequisites: Admission to the teacher education program and successful completion of Clinical Experience Phase 1.***

# School of Engineering (ENG)

## SCHOOL OF ENGINEERING

Website: Here

- General Information
- Administration and Faculty
- Labs and Facilities
- Academic Policies and Procedures
- Degree Requirements
- Programs of Study
- Course Listing

# English (SAS)

## ENGLISH

(English: Creative Writing 351, English: Film Studies 354, English: Literature 358, English: Theories and Methods 359, English: Composition and Writing 355; English: As a Second Language 356)

Department of English, School of Arts and Sciences

**English Department Website:** Here

**Writing Program Website:** Here

**Chair:** Brad Evans

**Undergraduate Director:** Sean Silver

**Director of Writing Program:** Abigail Zitin

**Distinguished Professors:**

Lynn Festa, B.A., Yale; M.A., Ph.D., Pennsylvania

Lauren Goodlad, B.A., Cornell; M.A., New York; Ph.D., Columbia

Leah Price, A.B., Harvard; Ph.D., Yale

Jonah Siegel, B.A., Middlebury College; Ph.D., Columbia

Evie Shockley, B.A., Northwestern; J.D., Michigan; M.A., Ph.D., Duke

Carolyn Williams, B.A., Wellesley College; M.A., Ph.D., Virginia

Nancy Yousef, A.B., Harvard; Ph.D., Columbia

**Professors:**

Emily C. Bartels, B.A., Yale; A.M., Ph.D., Harvard

Ann Baynes Coiro, B.A., George Washington; M.A., Ph.D., Maryland

Brad Evans, B.A., Cincinnati; M.A., Ph.D., Chicago

Thomas Fulton, B.A., Wisconsin; Ph.D., Yale

Allan Punzalan Isaac, B.A., Williams College; Ph.D., New York

Colin Jager, B.A., Calvin College; Ph.D., Michigan

David Kurnick, A.B., Harvard; Ph.D., Columbia

Dana Luciano, A.B. Brown; M.A., Ph.D., Cornell

Meredith McGill, B.A., Williams College; M.A., Ph.D., Johns Hopkins

Richard E. Miller, B.A., St. John's; M.A., Massachusetts (Boston); Ph.D., Pittsburgh

Kurt Spellmeyer, B.A., Virginia; Ph.D., Washington

Michelle Stephens, B.A., SUNY (Stony Brook); M.Phil., Ph.D., Yale

Henry Turner, B.A., Wesleyan; M.A., Sussex (UK); Ph.D., Columbia

Maurice Wallace, A.B., Washington; Ph.D., Duke

**Associate Professors:**

Matthew Buckley, A.B., Princeton; M.A., M.Phil., Ph.D., Columbia

Sandy Flitterman-Lewis, B.A., M.A., Ph.D., California (Berkeley)

Martin Gliserman, B.A., Colby College; M.A., Ph.D., Indiana

Andrew Goldstone, A.B., Harvard; Ph.D., Yale

Christopher Iannini, B.A., Colby College; M.A., Johns Hopkins; Ph.D., CUNY

Olabode Ibironke, B.A., M.A., Obafemi Awolowo (Nigeria); M.A., Ph.D., Michigan State

Greg Jackson, B.A., B.S., Oregon State; Ph.D., California (Los Angeles)

Ann Jurecic, A.B., Bryn Mawr College; M.A.T., Brown; Ph.D., Princeton

Ryan James Kernan, B.A., Princeton; Ph.D., California (Los Angeles)

Stacy S. Klein, B.A., Dartmouth; M.A., Sussex (UK); Ph.D., Ohio State

Jeffrey Lawrence, B.A., Amherst; Ph.D., Princeton

Ronald Levao, B.A., Rutgers; M.A., Ph.D., California (Berkeley)

Mukti Mangharam, B.A., York (UK); M.Phil., Cambridge; Ph.D., Cornell

Carter Mathes, B.A., Virginia; Ph.D., California (Berkeley)

Ricardo Montez, PhD. NYU

Sarah Elliott Novacich, B.A., Brandeis; M.Phil., Ph.D., Yale

Imani Owens, B.A., Rutgers; M.A., M.Phil., Ph.D., Columbia

Stéphane Robolin, B.A., Tulane; M.A., Ph.D., Duke

Larry Scanlon, B.A., Brandeis; M.A., Ph.D., Johns Hopkins

Sean Silver, B.A., Claremont McKenna College; Ph.D., California (Los Angeles)

Abigail Zitin, B.A., Cambridge; B.A., Columbia; Ph.D., Ohio

**Assistant Professors:**

Jeehyun Choi, B.A., Brown; M.St., University of Oxford; PhD., University of California (Berkeley)

Naomi Extra, B.A., University of Rochester; M.A., University of Wisconsin (Madison); Ph.D., Rutgers

Kristin Grogan, B.A., M.A., University of South Wales (UK); D.Phil., Oxford

Talley Murphy, B.A., Barnard College; Ph.D., Brown

Kristin Grogan, B.A., M.A., University of South Wales (UK); D.Phil., Oxford

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**Professor of Professional Practice:**

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**Teaching Professors:**

Doaa Rashed, B.A. Alexandria, Egypt, Ph. D. Univ. Maryland Baltimore County

**Associate Teaching Professors:**

Jonathan Bass, B.A., Columbia; Ph.D., Rutgers

Brian Becker, B.A., George Washington; M.A., Chicago; Ph.D., Rutgers

Paul Bielecki, B.A., Temple; M.A., Ohio

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Lynda Dexheimer, B.A., Rutgers; M.Sc., London School of Economics, Ed.D., Rutgers

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William Magrino, B.A., SUNY (Albany); M.A., College of Staten Island; Ph.D., Indiana (Pennsylvania)

Regina Masiello, B.A., M.A., Rutgers, Ph.D. Rutgers

Joann Messina, B.A., J.D., Rutgers

Susan Miller, B.A., Virginia; M.F.A., New York

Peter Molin, B.A., Virginia; M.A., California (Berkeley); Ph.D., Indiana

Carl Nelson, B.A., M.A., Ph.D., Rutgers

Joshua November, B.A., Binghamton; M.F.A., Pittsburgh

Alison Powell, B.A., Indiana University, Ph.D., CUNY Graduate Center in New York,

Brendon Votipka, B.A., Muhlenberg; M.F.A., Rutgers

**Assistant Teaching Professors:**

Haemee Ahn, B.S., M.A., Western Michigan; M.Ed., College of New Jersey

Deborah Allen, B.A., Toronto; Ph.D., Rutgers

Anthony Alms, B.A., Wisconsin; M.M., Boston; Ph.D., CUNY

Janet Ansine, B.A., Kean; M.S., Purdue Global

Brie Ashley, B.A., M.F.A., Michigan

Alanna Beroiza, B.A. Bowdoin, M.A. Rice, Ph.D. Rice

Ian Bignall, B.A., Sara Lawrence College; M.A., Oxford; M.A., Rutgers

Sara Blomquist, B.A., Rutgers; M.F.A., Temple¿

Arete Bouhlas, B.A., Monmouth; M.C.I.S., Rutgers

Jennifer Bryan, B.A., Nebraska (Lincoln); M.F.A., Bowling Green State; Ph.D., Nebraska (Lincoln)

Mark Buchan, B.A., Cambridge; Ph.D., Michigan

Tracy Budd, B.A., M.A., Rutgers

Alexander Buzick, B.A. Dickinson, PH.D Fordham

Mihaela Carla Caponegro, B.A., Rutgers; M.A., Ph.D., Princeton

Claire Celi, B.A. Ramapo, M.A. Carnegie Mellon

Adam Dalva, B.A., Swarthmore College, M.F.A., New York University

Alex Dawson, B.A., Rutgers; M.F.A., Bennington

Elizabeth Decker ,B.A. Notre Dame, M.A. Saint Louis, Ph.D. The Graduate Center, CUNY

Natalie DeSorbo, B.A., Rutgers; M.Ed., College of New Jersey

Michael Duffy, B.A., DuPauw; M.F.A., Rutgers

Patricia Egbert, B.A. Rutgers, M.S. Texas A & M, Ph.D. Rowan

Hebatalla Elkhateeb, B.A., Cairo University (Egypt); M.Ed., Ed.D., Tennessee State

Joanna Fuhrman, B.A. University of Texas, M.F.A., University of Washington

Julie Flynn, B.A., Rutgers; M.A., Drew

Agnieszka Goeller, B.S., B.A., Wayne State; M.A., Rutgers

Michael Goeller, B.A. Rutgers, M.A. Rutgers

Timothy Hedges, B.S. Cornell, M.A.Ohio, M.F.A. Michigan

David Howland, B.A. Penn State, M.S. New Hampshire, Ph.D New Hampshire

Fiona Hu, B.A., Ed.M., Rutgers

Paul Hufker, B.F.A., Webster; M.F.A., Brooklyn College

Jordanco Jovanoski, B.A., Rutgers; M.A., Ph.D., New School

Madhav Kafle B.Ed. Mehaendra Ratna, M.A Tribhuvan, M.A. Delaware, Ph.D. Penn State

Debra Keates, B.A., Yale; M.A., Johns Hopkins

Demetri Lallas, B.A., Iowa; M.A., Ph.D., Wisconsin (Madison)

Snow Lee-Jones, B.A Oberlin, M.A Columbia, M.A. Rutgers, Ph.D. Rutgers

Dawn Lilley, B.A., Oakland; M.A., Rutgers

Reagan Lothes, B.A. Wittenberg, M.Phil., Ph.D., City University of New Jersey

John Maerhofer, B.A. SUNY Stony Brook, M.A. CUNY Queens College, Ph. D. CUNY Graduate School

Tara Malanga, B.A. Rutgers, M.Ed. Rutgers, Ph.D. Rutgers

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Michael Masiello, B.A., M.A., Ph.D., Rutgers

Jacqueline McDaniel, B.A., Rutgers; M.A., Seton Hall¿

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Michael Monescalchi, B.A.SUNY Albany, M.A., Ph.D Rutgers

Peter Morrone, B.A., Colgate; M.A., Brooklyn College; Ph.D., Mississippi

Raluca Musat, B.B.A., CUNY (Baruch College); M.A., Ph.D., CUNY

Kathryn Narramore, B.A., James Madison; M.A., Alabama; Ph.D., CUNY

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Robinson, A.B Davidson, J.D, Georgia, M.A. Mississippi, Ph.D. Emory

Puja Sahney, B.A.,,M.A.Univ of Pune, M.A. Utah State, Ph.D, Indiana Univ

George Schroepfer, B.A., M.L.S., Kean

William Schwartz, B.A. NYU, M.F.A Illinois

Elif Sendur, B.A. Bogazici Univ, M.A. Binghamton, Ph.D. Binghamton

Alexander Solomon, B.A., Rice; M.A., Ph.D., Rutgers

Ben Tam, B.A. Univ of Hoing Kong, M.A. Georgetown, Ph.D. Cornell

Willow Erin Tanner, B.A. California-Irvine, M.A., Ph.D. Rutgers

The Friend, B.A., Boston College, M.A. Boston University, M.F.A. Columbia University

Sarbani Vengadasalam, M.Phil., Madras (India); Ph.D., Poona (India)

Howaida Wahby E-Eraky, B.A. Alexandria Univ., M.A. American Univ, Cairo, PH.D. Alexandria Univ.

Daniel Walsh, B.A., Muhlenberg College; M.F.A., Columbia¿

Shelby Wardlaw, B.A. Vassar, M.A. Colorado, M.F.A Columbia

Brendon Votipka, B.A., Muhlenberg; M.F.A., Rutgers

John Warren, B.A., M.A., Rutgers

Simon Wickhamsmith, B.A., London; M.A., Ph.D., Washington

RAsheda Young, B.A. Hampton, M.A. CUNY,

Madeline Zehala, B.A., Caldwell College; M.A., Seton Hall

Qisi Zhang, B.A., Shenyang Normal (China); M.A., Liaoning (China); M.Ed., Bloomsburg; Ph.D., Indiana (Pennsylvania)

**Teaching Instructors:**

Chazarrae Freeman, B.A. Geneva, M.A. Southern New Hampshire

Lauren Kimball, B.A. Cornell, Ph.D. Rutgers

Lauren Fanelli -Teague, B.A. Cornell, M.F.A American, M.A. Rutgers

Lauren McConnell, B.A. Rider, M.A. Rutgers

**Executive Director of the Writing Program:**

Lynda Dexheimer, B.A., Rutgers; M.Sc., London School of Economics and Political Science, Ed.D. Rutgers

**Associate Executive Director of the Writing Program:**

Mark DiGiacomo, B.A., George Washington; M.A., Sussex (UK); M.A., Ph.D., Rutgers

**Faculty Emeriti:**

John Belton, B.A., Columbia; A.M., Ph.D., Harvard

Wesley Brown, B.A., City University of New York; MA., SUNY (Oswego)

Abena Busia, B.A., M.A., St. Anne's College (Oxford); Ph.D., St. Anthony's College (Oxford)

Harriet Davidson, B.A., Texas (Austin); M.A., Ph.D., Vanderbilt

Marianne DeKoven, B.A., Radcliffe; M.A., Ph.D., Stanford

Elin Diamond, B.A., Brandeis; M.A., Ph.D., California (Davis)

Richard Dienst, A.B., California (Berkeley); Ph.D., Duke

William C. Dowling, B.A., Dartmouth; M.A., Ph.D., Harvard

Mark Doty, B.A., Drake; M.F.A., Goddard

Kate Ellis

William Galperin, A.B., Chicago; A.M., Ph.D., Brown

Marcia Ian, B.A. Wellesley College; M.A., Ph.D, Virginia

Myra Jehlen, B.A., The City University of New York; Ph.D., Berkeley

Richard Koszarski, B.A., Hofstra; Ph.D., New York

John Kucich, B.A., California (Santa Cruz); M.A., Ph.D., SUNY (Buffalo)

Robert Kusch, B.A., Valparaiso; M.A., Ph.D., Northwestern

George Levine

John A. McClure, B.A., Tufts; M.A., Ph.D., Stanford

Michael McKeon, B.A., Chicago; M.A., Ph.D., Columbia

Jacqueline T. Miller, B.A., Rochester; M.A., Ph.D., Johns Hopkins

Alicia S. Ostriker, B.A., Brandeis; M.A., Ph.D., Wisconsin

Barry V. Qualls, B.A., Florida State; M.A., Ph.D., Northwestern

Dianne F. Sadoff, B.A., Oberlin College; M.A., Oregon State; Ph.D., Rochester (MA)

Carol H. Smith, B.A., Ohio Wesleyan; M.A., Ph.D., Michigan

English (SAS)

# Student Responsibility to Keep Informed

# Student Responsibility to Keep Informed

Before registering for the semester, students should consult the English department website. Students can also consult with advisers in the undergraduate office (Murray Hall, Room 102, 104, or 106, College Avenue campus). All English department information can be found online here.

English (SAS)

# Learning Goals

# Learning Goals

Students who major in English will demonstrate

1) knowledge of literatures in English: their historical, cultural, and formal dimensions and diversity;

2) strategies of textual interpretation, including an ability to use critical and theoretical terms, concepts, and methods;

3) the ability to write persuasively and precisely, in scholarly or creative forms; and

4) the ability to engage with the work of other critics and writers, using and citing such sources effectively.

English (SAS)

# Major Requirements

# Major Requirements

The major consists of a minimum of 36 credits in English above the 100 level, including at least 18 credits at or above the 300 level. All majors must fulfill the following requirements:

1. Principles of Literary Study, 01:359:201, which should be taken early in the major.

2. Four courses in different historical periods, taken at the 300 or 400 level: one each in four of the following five categories:

a. Medieval

b. Renaissance

c. Restoration/18th century

d. Nineteenth century

e. Twentieth century and contemporary

3. One course in African-American Literature, taken at the 300 or 400 level.

4. One course in Literature's of the Global South

5. One course in literary theory

6. One 400-level seminar

A course taken to fulfill a period requirement may also be used to fulfill the African-American, Ethnic American, or Global Anglophone literature or the seminar requirement, if it is so designated on the departmental webpage. Likewise, a seminar may be used to meet the literary theory or African-American, Ethnic American, or Global Anglophone literature requirement, if it is so designated. However, no course may be used to fulfill more than two requirements.

Courses that may count as credits toward the major and minor are listed under the subject codes 351 (English: Creative Writing), 354 (English: Film Studies), 355 (Writing Program only at the 300 level), 358 (English: Literature), and 359 (English: Theories and Methods).

A maximum of four English courses taken outside the Department of English at Rutgers University-New Brunswick may be applied toward the major. Students who participate in Study Abroad may apply a total of six courses from outside toward the major. Transfer students who wish to apply transfer courses toward the major must first obtain approval from the undergraduate director. Enrolled English majors who wish to take English courses outside Rutgers-New Brunswick must have prior approval from the undergraduate director. Students are urged to consult the English department for further information.

Grades of C or better must be earned in all courses used to fulfill the requirements of the major.

English (SAS)

# Minor Requirements

# Minor Requirements

The minor consists of 18 credits in English above the 100 level, including at least 12 credits at or above the 300 level. All minors are required to take at least one 300- or 400-level course designated as medieval, Renaissance, or Restoration/18th century (period a, b, or c, as indicated on the major requirements page). A maximum of 6 credits total in creative writing and in film may be counted toward the minor. A maximum of one 01:355:300-level Writing Program course may be counted toward the minor. Grades of C or better must be earned in all courses used to fulfill the requirement of the minor.

English (SAS)

# Minor in Creative Writing

# Minor in Creative Writing

The minor in creative writing gives students a rigorous background in the fundamentals of creative work by providing them with the opportunity to study with established poets, prose writers, and dramatists. At the same time, the minor also ensures that students pursue creative work within the larger context of academic study. The curriculum (21 credits) begins with a foundational course in creative writing, followed by a series of electives in a variety of genres and media, culminating in an advanced workshop. Concurrently with their course work in creative writing, students are also required to elect a total of two courses from the English department's offerings in literature (358), theory and methods (359), or film (354), thus further coordinating their creative pursuits with critical study.

**Creative Writing Minor** Program Learning Goals

Students who minor in creative writing will demonstrate

1) knowledge of the traditions and conventions of literary expression in a variety of genres and media;

2) the ability to engage deeply with the process of composition, and with the work of other writers and critics; and

3) the ability to write persuasively and precisely in creative and scholarly forms.

If English majors would like to minor in creative writing, NO creative writing minor courses can count toward the English major. There can, however, be overlap for literature classes.

In addition, if a student double-minors in creative writing and English, NO creative writing minor courses can count toward the English minor. There can, however, be overlap for literature classes.

Students also cannot complete the creative writing minor and the creative writing certificate at the same time. They must choose one or the other.

**Minor Requirements**

The minor consists of 21 course credits (seven courses). Grades of C or better must be earned in all courses used to fulfill the minor requirements:

*One (1) required introductory course:*

351:211 or 351:212 Introduction to Creative Writing

*Any three (3) of the following courses:*

351:209 Introduction to Multimedia Composition

351:220 Experimental Filmmaking

351:303 Screenwriting for Film

351:304 Screenwriting for Television

351:305 Creative Nonfiction

351:306 Form and Technique in Poetry

351:307 Form and Technique in Fiction

351:308 Form and Technique in Playwriting

351:309 Digital Composition (Digital Storytelling)

351:314 Documentary Filmmaking for Writers

*Any one (1) of the following courses:*

351:405 Advanced Workshop: Multi-Genre

351:406 Advanced Workshop: Poetry

351:407 Advanced Workshop: Fiction

*Any two (2) courses in literature (358) and/or theory (359)*

English (SAS)

# Minor in Business and Technical Writing

# Minor in Business and Technical Writing

The Writing Program offers a minor in business and technical writing to all interested undergraduates in the School of Arts and Sciences.

The primary goal of the business and technical writing minor is to enhance students' writing proficiency in order to increase their eligibility for employment in business and technical professions that require advanced writing competency. The minor provides students with writing training, research practice, computer knowledge, and an internship experience designed to give students professional writing experience. Students must complete a minimum of 18 credits for the minor and any one course cannot be used in more than one skill area. Twelve out of the 18 required credits must be completed from Writing Program (01:355) courses.

**Requirements**

The minor requires six courses (for a total of 18 credits) in four key skill areas. Students must achieve a grade of C or better in each of these courses in order to qualify for the minor.

**1. Writing Training (6 credits)** Since writing competence is at the heart of the minor, students must complete two writing courses intended to improve writing, editing, collaboration, and general communication skills. Electives may be chosen from among the following writing courses:

01:351:209 Introduction to Multimedia (3)

01:355:202 Technical Writing Essentials (3)

01:355:203 Business Writing Essentials (3)

01:355:315 Grant Writing (3)

01:355:342 Science Writing (3)

01:355:352 Writing as a Naturalist (3)

01:355:355 Writing in the Professions (3)

01:355:365 Technical Editing (3)

04:192:315 Professional Writing and Communication (3)

04:192:380 Public Speaking (3)

11:374:325 Environmental Communication

11:374:435 Advanced Communication in the Sciences

**2. Research Writing (3 credits)** In the information and technology economy, the ability to conduct research and use information to develop viable plans of action is essential to success and advancement. Students therefore must complete a research writing course in business or technical writing. These courses will also fulfill most students' second-level writing requirements (consult with your school's academic advising office for specific requirements in your program). Research writing courses include:

01:355:302 Scientific and Technical Writing (3)

01:355:303 Writing for Business and the Professions (3)

01:355:312 Writing for Biology (3)

01:355:315 Writing Grant Proposals (3)

01:355:322 Writing for Engineers (3)

**3. Digital Image Fundamentals (6 credits)** Basic computer knowledge and the ability to learn new programs quickly are essential to success in business and technical writing environments. Students in the program will be introduced to general and advanced writing software in many classes and they will be required to pass an introductory course in computer science.

a) Though several courses will expect students to learn relatively simple programs (such as Microsoft Word and PowerPoint), students are also required to take one of the following courses, which teach advanced writing software, covered in our upper-level workshop courses. These include:

01:351:312 Digital Literary Studies (3)

01:355:375 Collaborative Writing Practices (3)

01:355:402 Advanced Writing Workshop (3)

01:355:410 Composing Graphic Narratives (3)

01:355:415 Information Design (3)

01:355:425 Web Authoring (3)

11:374:240 Visualizing Information: Storytelling with Data (3)

b) Students will also need to pass one of the following introductory computer science courses:

01:198:107 Computing for Math and the Sciences (3)

01:198:110 Principles of Computer Science (3)

01:198:111 Introduction to Computer Science (4)

01:198:170 Computer Applications for Business (3)

04:189:103 Information Technology and Informatics (3)

04:547:220 Retrieving and Evaluating Electronic Information (3)

14:440:127 Introduction to Computers for Engineers (3)

**4. Internship Experience (3 credits)** Hands-on training in work environments offers an invaluable, practical component to the minor, providing students with useful experience while encouraging professional attitudes toward work. As part of the minor program, students must complete an independent internship in one of the following options:

01:355:395/396 Internship (3,3)

01:355:397/398 Writing Internship for Business and Technical Writing Minor (3, 3)

Please see the internships course webpage for more information.

**5. In addition, a minimum of 12 out of the 18 required credits are to be selected from Writing Program (01:355) courses.**

The Writing Program also offers Professional Writing and Technical Writing Certificates. Please see Certificates for more information. Please speak with your academic advising office regarding declaration of majors and minors. Students graduating with the minor may want to consider pursuing a Master of Business and Science degree in the field of User Experience Design-UDX.

There is also a BS/MS (4+!) for Rutgers undergraduate students.

English (SAS)

# Departmental Honors Program 350

# Departmental Honors Program 350

Departmental Honors Program

English Honors provides an opportunity for students to pursue an independent project under the guidance of Department faculty. Students choose one of two options: a critical/research thesis or a creative writing thesis. The program begins in the second half of spring semester junior year and runs through senior year.

Candidates for honors in English must have a cumulative grade point average of 3.0 or better and an average of 3.6 or better in English at the end of junior year. They will also have completed 359:201 and at least one 400-level course in either the 358 or 359 subject codes for a critical/research thesis or 351 subject codes for a creative writing thesis. (Note that students, especially transfer students, with strong records of achievement who have not fulfilled these requirements will be reviewed on a case-by-case basis.)

Interested students should register for the Junior Honors Seminar (359:496), a 1.5-credit mini course running in the second half of spring semester. Students who are studying abroad or have other obligations that take them off campus in the spring of junior year will be able to join the course remotely. Upon completion of the course, students continuing with departmental honors will have secured the approval of a faculty advisor for their thesis proposal.

Completion of English Honors entails a total of 9 credits of coursework: the Junior Honors Seminar (359:496, 1.5 credits); the Senior Honors Seminar (359:497, 1.5 credits); and two semesters of independent study, the Senior Honors Tutorials (359:498 and 359:499, 3 credits each). The completed thesis will be evaluated by the advisor and a second reader. A grade of B+ or better will be required in order to earn the honors designation.

Students wishing to complete an English honors project in conjunction with the Honors College, SAS Honors, or other College Honors Programs will also be required to secure the approval of the appropriate College Dean by the end of the spring semester of the junior year.

Consult the departmental website for more detailed information: https://english.rutgers.edu/.

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# Certificate Programs

# Certificate Programs

**Certificate in Drama and Performance Studies (16 credits)**

The certificate in drama and performance studies offers the opportunity for students pursuing the English major or minor to develop a specialized concentration in the study of the performing arts. The certificate program curriculum (a total of 16 credits) requires a foundational course in the field (Introduction to Dramatic Literature or Introduction to Performance Theory), four approved electives, and a 1-credit capstone in which students produce a portfolio.

Students who fulfill all requirements with a minimum grade-point average (GPA) of 3.0 in these courses will be awarded the certificate. For more information, contact the faculty director, Professor Thomas Fulton tfulton@english.rutgers.edu

The certificate consists of 16 course credits, with a minimum 3.0 GPA in the following courses:

*1. One (1) required introductory course:*

358:240 Introduction to Dramatic Literature

359:220 Introduction to Performance Theory

*2. Any four (4) of the following courses*:*

351:303 Screenwriting for Film

351:304 Screenwriting for Television

351:308 Creative Writing Playwriting

351:408 Advanced Creative Writing Workshop: Playwriting

358:202 Shakespeare

358:240 Introduction to Dramatic Literature*

358:310 Medieval Drama

358:313 Drama in the Age of Shakespeare

358:314 Shakespeare: The Elizabethan Plays

358:315 Shakespeare: The Jacobean Plays

358:320 Shakespeare in England

358:325 Restoration and 19th-Centurey Theater and Drama

358:335 19th-Century Theater and Drama

358:347 American Theater and Drama

358:356 Early 20th-Century Theater and Drama

358:357 Later 20th-Century Theater and Drama

358:372 Black Theater and Drama

358:378 Black Music and Literature

358:394 Theater and Drama by Women

358:426 Seminar: Shakespeare

359:220 Introduction to Performance Theory

*At the discretion of the faculty director of the certificate, new and other courses in the department not listed above, as well as courses in other departments, might also count.

**Other Certificate Programs (16-18 credits)**

The primary goal of the certificate programs is to enhance the writing proficiency of business and science students in order to increase their eligibility for employment in professions that require advanced writing competency. Any student working toward the business and technical writing minor is eligible to receive either the professional writing certificate or the technical writing certificate upon completion of all required courses with a grade of C or above.

These certificates are only available to students enrolled in the business and technical writing minor at Rutgers University.

**Professional Writing Certificate (16-18 credits)**

Any student may request this certificate upon completion of the minor. There is a significant need for college graduates who can research and communicate information at a high level of competence in business, industry, and government. The professional writing certificate is designed to give students a firm grounding in the skills of oral, written, and electronic communication and prepare them to enter professions that require extensive writing skills.

**Technical Writing Certificate (18 credits)**

This certificate is open to undergraduates with majors or minors in approved scientific or technical subject areas (such as biology, mathematics, engineering, or computer science). The need for technical writers capable of communicating scientific or technically sophisticated information to various audiences is well established, and technical writing skills are in demand in a wide range of fields. This certificate program is designed to give students with a science or technical background a strong foundation in the skills of oral, written, and electronic communication.

*Certificate Requirements*

Both certificates require six courses in four key skill areas:

*1. Writing Training (6 credits)*

Since writing competence is at the heart of the certificate program, students must complete two writing courses intended to improve writing, editing, collaboration, and general communication skills. Electives may be chosen from among the following writing courses:

01:355:202 Technical Writing Essentials (3)

01:355:203 Business Writing Essentials (3)

01:355:315 Grant Writing (3)

01:355:342 Science Writing (3)

01:355:352 Writing as a Naturalist (3)

01:355:355 Writing in the Professions (3)

01:355:365 Technical Editing (3)

01:355:375 Collaborative Writing Practices (3)

04:192:315 Professional Writing and Communication (3)

04:192:380 Public Speaking (3)

04:567:205 Digital News Reporting and Writing (3)

*2. Research Practice (3 credits)*

In the information and technology economy, the ability to conduct research and use information to develop viable plans of action is essential to success and advancement. Students therefore must complete a research writing course in business or technical writing. These courses will also fulfill most students' second level writing requirements (consult with your school's academic advising office for specific requirements in your program). Research writing courses include:

01:355:302 Scientific and Technical Writing (3)

01:355:303 Writing for Business and the Professions (3)

01:355:315 Grant Writing (3)

01:355:322 Writing for Engineers (3)

*3. Computer Knowledge (6 credits)*

Basic computer knowledge and the ability to learn new programs quickly are essential to success in business and technical writing environments. Students in our program will be introduced to general and advanced writing software in many classes, and they will be required to pass an introductory course in computer science.

a) Though several of our courses will expect students to learn relatively simple programs (such as Microsoft Word and PowerPoint), students are also required to take one of the following courses, which teach advanced writing software, covered in our upper-level workshop courses. These include:

01:355:402 Advanced Writing Workshop (3)

01:355:415 Information Design (3)

01:355:425 Web Authoring (3)

b) Students will also need to pass one of the following introductory computer science courses:

01:198:107 Computing for Math and the Sciences (3)

01:198:110 Introduction to Computers and Their Application (3)

01:198:111 Introduction to Computer Science (4)

01:198:170 Computer Applications for Business (3)

04:198:103 Information Technology and Informatics (3)

04:547:220 Retrieving and Evaluating Electronic Information (3)

*4. Internship Experience* (1 or 3 credits for a professional writing certificate; 3 credits for a technical writing certificate)

Hands-on training in the work environment offers an invaluable, practical component to the certificate program, providing students with useful experience while encouraging professional attitudes toward work. In our program, students will have the option of fulfilling an independent internship or taking credits through the CESEP Program:

01:355:395,396,397,398 Internship (3,3,3,3)

Please see the internships website for more information.

For information on the Writing Program's business and technical writing minor through the School of Arts and Sciences, please see the Minor in Business and Technical Writing page in this catalog. For more information on the certificate programs or the minor, please see http://wp.rutgers.edu.

Students completing the certificate should fill out the Application for Professional and Technical Writing Certificates form. This form should be completed and submitted to donald.dow@rutgers.eduDonaldDow@rutgers.edu. All information will be verified and the certificate will be processed.

English (SAS)

# Notice to All Students

# Notice to All Students

Successful completion of 01:355:101 College Writing (3), by coursework or exemption, is prerequisite to enrollment in all other English department courses except those at the 200 level. Students can find literature courses at all levels listed under 351 (English: Creative Writing); 354 (English: Film Studies); 358 (English: Literature); and 359 (English: Theories and Methods). Information regarding the English department is available at the department's website.

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# English Literature Courses (358)

# English Literature Courses (358)

**01:358:200** ***Once Upon a Time: Why We Tell Stories (4)***
Focusing on stories from Genesis and Homer to 21st-century best sellers, Once Upon A Time considers why we need stories and how we tell them.

**01:358:201** ***Introduction to Literature (3)***
Development of skills in close reading and interpretive writing; texts in various genres. Designed primarily for nonmajors.

**01:358:202** ***Shakespeare (3)***
One-semester introduction to Shakespeare, with readings in selected comedies, tragedies, and histories.

**01:358:203** ***Shakespeare and Film (3)***
Interpretation of Shakespeare's plays through a close reading of literary texts and films.

**01:358:204** ***Biblical Backgrounds of Literature in English (3)***
The Bible as Literature (3)The Bible, its literary variety, and the evolution of its text. Religious themes in literature, with attention to matters of rhetoric, style, and structure.

**01:358:205** ***The Coming Apocalypse (4)***
An interdisciplinary introduction to narrative using novels, films, and other contemporary representations of the world's imminent destruction.

**01:358:206** ***Introduction to Literary Studies (1.5)***
Fundamentals of literary interpretation, focusing on a particular period, genre, or author.

**01:358:207** ***Writing After the End of the World (3)***
An introduction to stories about the end of the world.

**01:358:210** ***British Literature from the Middle Ages to 1800 (3)***
Survey of poetry, prose, and drama from the Middle Ages through the 18th century.

**01:358:211** ***British Literature from 1800 to the Present (3)***
Survey of poetry, prose, and drama from the romantic period to the present.

**01:358:212** ***Introduction to American Literature (3)***
Survey of poetry, prose, and drama from the colonial period to the Civil War.

**01:358:213** ***Major Topics and Authors in American Literature (3)***
Survey of poetry, prose, and drama from the Civil War to the present.

**01:358:214** ***Introduction to 20th-Century Literature (3)***
Introduction to major works of 20th-century literature in English.

**01:358:215** ***Introduction to 21st-Century Literatures (3)***
Literary works and emergent forms of the current century.

**01:358:216** ***Introduction to World Literatures in English (3)***
Survey of English language literatures including Asian, African, and Caribbean in a global context.
***Credit not given for both this course and 01:195:216.***

**01:358:217** ***Black Literature from the Colonial Period to 1930 (3)***
Survey of poetry, prose, and drama from the 18th century through the Harlem Renaissance.

**01:358:218** ***Black Literature from 1930 to the Present (3)***
Survey of poetry, prose, and drama from 1930 to the present.

**01:358:222** ***Introduction to South Asian Literature (3)***
Overview of South Asian literatures of the 19th, 20th, and 21st centuries, including literatures representing historical events such as the independence struggle, partition, women's rights, religious conflicts, and caste politics.

**01:358:230** ***Major Topics and Authors in British Literature (3)***
Introduces major topics and authors in British literature.

**01:358:240** ***Introduction to Dramatic Literature (3)***
Major plays from several periods, chiefly British and American, with some attention to form, theory, and the development of the genre.

**01:358:241** ***Introduction to Poetry (3)***
Major poems from several periods, chiefly British and American, with some attention to form, theory, and the development of the genre.

**01:358:242** ***Introduction to the Novel (3)***
Major novels from several periods, chiefly British and American, with some attention to form, theory, and the development of the genre.

**01:358:243** ***Introduction to the Short Story (3)***
Major short stories from several periods, chiefly British and American, with some attention to form, theory, and the development of the genre.

**01:358:244** ***Introduction to Myth (3)***
Myths of various cultures; their structures and functions in social and especially literary contexts.

**01:358:245** ***Introduction to Folklore (3)***
Major genres of folklore, including folktale, folk song, and legend, with attention to the methods of collecting and analyzing these materials.
***Credit not given for both this course and 01:195:245.***

**01:358:246** ***Introduction to the Gothic (3)***
Genre of the Gothic from its beginnings in the 18th century to the present.

**01:358:247** ***Introduction to Comic Literature (3)***
Theory and practice of comedy organized around the topics of satire, farce, nonsense, parody, jokes, and the humor of daily life.

**01:358:248** ***Introduction to Tragic Literature (3)***
Literature and theory of tragedy from the Greeks through Shakespeare to the 20th century; chiefly plays, supplemented by some poetry and fiction.

**01:358:249** ***Introduction to Satiric Literature (3)***
Satire's variety of postures and games, across an array of such forms as novel, epigram, film, and cartoon, ranging from the Renaissance to the present.

**01:358:250** ***Introduction to Autobiography (3)***
Historical and formal development of autobiography in English, with special attention to theories of identity and narrative.

**01:358:251** ***Introduction to Travel Literature (3)***
Readings of works, mainly in English, concerning geographical exploration and speculation; relation to literary and nonliterary genres; and attention to imperial dimensions.

**01:358:252** ***Introduction to Children's Literature (3)***
Introduction to children's literature. Fairy tales, classics, and contemporary examples of literature for children and young adults.

**01:358:253** ***Introduction to Crime Fiction (3)***
Introduction to crime fiction. Works by such authors as Chandler, Highsmith, Himes, and Mankell.

**01:358:254** ***Introduction to Science Fiction (3)***
Introduction to science fiction. Works by such authors as Butler, Dick, Delany, and Gibson.

**01:358:255** ***Introduction to Modern Literary Fantasy (3)***
Literary conventions and distinctions between the surreal and the unreal, nonsense and the sublime in different forms of modern literary fantasy written in English.

**01:358:256** ***Introduction to the Graphic Novel (3)***
The history, techniques, structure, verbal-visual form, and thematic range of graphic narratives.

**01:358:260** ***Introduction to Multiethnic Literatures of the United States (3)***
Survey of multiethnic literatures of the United States through a comparative framework. Fiction, poetry, autobiography, graphic narrative, film, and personal essays by and about African Americans, Asian Americans, Native Americans, and Latinos/as.

**01:358:261** ***Introduction to the Study of Women Writers (3)***
Range of literature in English by women writers, analyzed in relation to the impact of authorial gender.

**01:358:262** ***Introduction to Literature and the Environment (3)***
General introduction to environmental writing, focusing on nonfiction, novels, and poems from the mid-19th century to the present day.

**01:358:263** ***Civilization and Its Discontents (3)***
Introduction to texts of fundamental importance for the imagination of the individual in society, focusing on the forms through which a culture understands itself including dialogue, tragedy, parable, and public address.

**01:358:275** ***The Cultural History of Now (3)***
Analysis of an issue of pressing global concern from a multidisciplinary perspective, but especially from that of literary and cultural history. Topics vary according to individual instructors; consult departmental information.

**01:358:301** ***History of the English Language (3)***
Growth and structure of the English language from its origins to the present with some attention to methods of linguistic description.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:302** ***Classical Backgrounds of Literature in English (3)***
Influence on literature in English of classical Greek and Roman epic, tragedy, comedy, and other literary forms.
***Credit not given for both this course and 01:195:346. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:303** ***Literature of Medieval Courts (3)***
Concepts of nobility, rule, courtship, and faith in works such as *Beowulf*, *Sir Gawain and the Green Knight*, *Pearl*, and Malory's *Morte d'Arthur*.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:304** ***Medieval Literature of Dissent (3)***
Traditions of dissent in later medieval England. Texts may include writings by Wulfstan and Ælfric, *Chronicle* poems, *Piers Plowman*, Lollard writings, macro-plays, the Wakefield cycle, and *The Book of Margery Kempe*.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:305** ***Medieval Romance (3)***
Medieval romances and their origins in the British Isles and on the continent, with emphasis on English versions of Arthurian material, especially *Sir Gawain and the Green Knight* and Malory's *Morte d'Arthur*.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:306** ***Chaucer (3)***
Selected works of Chaucer, with an emphasis on *The Canterbury Tales*.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:307** ***Medieval and Early Modern Women Writers (3)***
Selections from significant women writers of the medieval and early modern period, including Julian of Norwich, Margery Kempe, Aemelia Lanyer, Elizabeth Cary, Lady Mary Wroth, Katherine Philips, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:308** ***Cultures of the Middle Ages (3)***
Detailed introduction to a particular aspect of the rich cultural diversity of the European Middle Ages. Topics vary.
***Credit not given for both this course and 01:195:388 or 01:667:388. Prerequisite: 01:355:101 or equivalent.***

**01:358:309** ***Issues and Problems in Medieval Literature and Culture (3)***
Studies in particular themes, questions, forms, and historical issues in medieval literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:310** ***Medieval Drama (3)***
Surveys works of medieval drama, investigating relationships between history and religion, world and stage, work and play, and actors and audience.

**01:358:311** ***Renaissance Literature: The 16th Century (3)***
Poetry, plays, and prose from the Henrician to the Elizabethan periods.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:312** ***Renaissance Literature: The 17th Century (3)***
Poetry, plays, and prose from the Jacobean to Restoration periods.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:313** ***Drama in the Age of Shakespeare (3)***
Early modern drama, with emphasis on Marlowe, Jonson, Beaumont, Fletcher, Webster, and others.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:314** ***Shakespeare: The Elizabethan Plays (3)***
Selected comedies, tragedies, and English history plays written between the beginning of Shakespeare's career and the death of Elizabeth I in 1603.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:315** ***Shakespeare: The Jacobean Plays (3)***
Selected comedies, tragedies, and tragicomedies written after the succession of James I in 1603.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:316** ***Milton (3)***
*Paradise Lost*, *Paradise Regained*, *Samson Agonistes*, the shorter poems, and selected prose.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:317** ***Major Renaissance Writers (3)***
Selected writings of Milton studied in relation to other 16th- or 17th-century writers, such as Spenser, Shakespeare, Donne, Marvell, Cavendish, or Dryden.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:318** ***Sixteenth-Century Poetry (3)***
Forms, styles, and development of poetry from Skelton to Spenser.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:319** ***Seventeenth-Century Poetry (3)***
Forms, styles, and development of poetry from Jonson and Donne to Milton and Marvell.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:320** ***Issues and Problems in Renaissance Literature and Culture (3)***
Studies in particular themes, questions, forms, and historical issues in Renaissance literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:321** ***Renaissance Women Writers (3)***
Selections from significant women writers of the Renaissance including Mary Sidney, Emelia Lanyer, Mary Wroth, Anne Bradstreet, Margaret Cavendish, and Aphra Behn.

**01:358:322** ***Restoration and Early 18th-Century Literature (3)***
Poetry, prose, and drama by writers such as Dryden, Rochester, Behn, Pope, Haywood, Swift, and their contemporaries.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:323** ***Later 18th-Century Literature (3)***
Poetry, prose, and drama by writers such as Johnson, Sterne, Burney, Cowper, Sheridan, Equiano, Wollstonecraft and their contemporaries.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:324** ***Restoration and 18th-Century Poetry (3)***
Poems by authors such as Philips, Dryden, Behn, Swift, Pope, Gray, Cowper, and Wheatley.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:325** ***Restoration and 18th-Century Theater and Drama (3)***
Comedies and tragedies from the British modern age, by Congreve, Behn, Wycherly, Etheridge, Centlivre, Gay, Lillo, Sheridan, and others.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:326** ***Eighteenth-Century Novel (3)***
The early novel to Jane Austen, including authors such as Behn, Defoe, Haywood, Fielding, Richardson, Lennox, Sterne, and Burney.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:327** ***Restoration and 18th Century Women Writiers (3)***
Writing by women between the Restoration and the Romantic period, including authors such as Behn, Haywood, Montagu, Burney, Wheatley, and Austen.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:328** ***Issues and Problems in 18th-Century Literature and Culture (3)***
Studies in particular themes, questions, forms, and historical issues in Restoration and 18th-century literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:330** ***Early Romantic Literature (3)***
Works of poetry and prose by Austen, Blake, Coleridge, Wordsworth, and their contemporaries.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:331** ***Later Romantic Literature (3)***
Works of poetry and prose by Keats, P.B. Shelley, M. Shelley, Byron, Hemans, De Quincey, and their contemporaries.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:332** ***Victorian Literature (3)***
Poetry and prose from the 1830s to 1900, by Barrett Browning, Tennyson, Browning, Carlyle, Arnold, Christina Rossetti, the Brontës, Dickens, George Eliot, and Hardy.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:333** ***Late Victorian and Edwardian Literature (3)***
Poetry and prose of the transition to modernism by such authors as Pater, Wilde, the Decadents, the New Women novelists, Olive Shriner, Yeats, Hardy, Lawrence, and Woolf.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:334** ***Victorian Poetry (3)***
Major poetry of Tennyson, Barrett Browning, Browning, Arnold, the Pre-Raphaelites, Christina Rossetti, Hopkins, Yeats, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:335** ***Nineteenth-Century Theater and Drama (3)***
Drama from 1800 to the 1880s in England and America. Melodrama, the development of social realism, and the rise of modern drama. Plays by Holcroft, Jerrold, Boucicault, Taylor, Lewis, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:336** ***Nineteenth-Century British Fiction (3)***
Development of the novel into the major popular literary genre in England. Writers include Scott, Dickens, the Brontës, Thackeray, Gaskell, Eliot, Hardy, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:337** ***Nineteenth-Century Women Writers (3)***
Appearance of women writers as major public voices in British literature. Writers include Wollstonecraft, Austen, Mary Shelley, the Brontës, Gaskell, George Eliot, and Christina Rossetti.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:338** ***Issues and Problems in 19th-Century Literature and Culture (3)***
Studies in particular themes, questions, forms, and historical issues in 19th-century literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:340** ***Literature and Culture of the Colonial Americas (3)***
English writing of the New World, from exploration through colonization, on both sides of the Atlantic. Puritanism, the Enlightenment, empire, and the development of nationalism.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:341** ***Antebellum American Literature (3)***
American writing from Romanticism to the Civil War. Works by Equiano, Irving, Apess, Cooper, Sedgwick, Poe, Emerson, Fuller, Douglass, Hawthorne, Melville, Stowe, Thoreau, Whitman, Wilson, Jacobs, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:342** ***Nineteenth-Century American Poetry (3)***
Primary focus on Whitman and Dickinson, with additional readings in Wheatley, Bryant, Sigourney, Longfellow, Emerson, Fuller, Poe, Whittier, Horton, Melville, Harper, Dunbar
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:343** ***Nineteenth-Century American Fiction (3)***
Novels, stories, and sketches by Irving, Cooper, Poe, Fern, Stowe, Hawthorne, Melville, Alcott, Twain, James, Wharton, Chesnutt, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:344** ***American Realism and Naturalism (3)***
American writing from the Civil War to modernism. Works by Dickinson, Alcott, Twain, James, Howells, Jewett, Chopin, Sui Sin Far, Zitkala-Sa, Crane, Wharton, Dreiser, Du Bois, Johnson, Cather.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:345** ***Early 20th-Century American Literature (3)***
Writing by American authors from 1900 to 1945.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:346** ***Later 20th-Century American Literature (3)***
Writing by American authors from 1945 to the end of the century.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:347** ***American Theater and Drama (3)***
American theatrical traditions from the 18th century to the present, with emphasis on such 20th-century playwrights as O'Neill, Hellman, Williams, Miller, Albee, Hansberry, Wilson, Mamet, and Baraka.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:348** ***American Women Writers (3)***
Writing by American women including Bradstreet, Wheatley, Sedgwick, Wilson, Stowe, Jacobs, Child, Dickinson, Stoddard, Harper, Hopkins, Chopin, Wharton, Cather, Hurston, O'Connor, Le Guin, Angelou and Morrison
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:349** ***American Autobiography (3)***
Changing representations of self in narrative form. Readings range from conversion, captivity, and slave narratives, to modern autobiographies and memoirs.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:351** ***Literatures of the Americas (3)***
Literatures of the Western Hemisphere from the 19th century to the present.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:352** ***Early 20th-Century Literature (3)***
Writing from 1900 to 1945, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:353** ***Later 20th-Century Literature (3)***
Writing from 1945 to the end of the century, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:354** ***Early 20th-Century Poetry (3)***
Poetry from 1900 to 1945, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:355** ***Later 20th-Century Poetry (3)***
Poetry from 1945 to the end of the century, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:356** ***Early 20th-Century Theater and Drama (3)***
Drama from the 1880s to the 1920s in relation to modernism and contemporary social movements. Plays by Ibsen, Strindberg, Chekhov, Wilde, Jarry, Glaspell, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:357** ***Later 20th-Century Theater and Drama (3)***
Expressionism through the Absurd (1920s through 1960s), in artistic and social contexts. Plays by Pirandello, O'Neill, Brecht, Genet, Beckett, Pinter, Williams, Hansberry, and others.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:358** ***Early 20th-Century Fiction (3)***
Fiction from 1900 to 1945, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or equivalent.***

**01:358:360** ***Later 20th-Century Fiction (3)***
Fiction from 1945 to the end of the century, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:361** ***Twentieth-Century Literature in a Global Context (3)***
Twentieth-century writing in English other than British and American.
***Credit not given for both this course and 01:195:324. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:362** ***Twentieth-Century Women Writers (3)***
Twentieth-century writing by women, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:363** ***Issues and Problems in 20th-Century Literature and Culture (3)***
Studies in particular themes, questions, forms, and historical issues in 20th-century literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:365** ***Twenty-First-Century Literature (3)***
Writing from the last 20 years, including one or more of the following: American, British, and other literatures in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:370** ***Black Narrative (3)***
Historical and stylistic range of prose forms; slave narratives, folklore, biography and autobiography, short fiction; social, literary, and cultural criticism; Douglass, Du Bois, Toomer, Hurston, and Walker.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:371** ***Black Poetry (3)***
History of black American poetry, including the influence of oral traditions; poems by such writers as Wheatley, Dunbar, Hughes, and Brooks.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:372** ***Black Theater and Drama (3)***
Work of modern black American playwrights, including Hansberry, Baraka, Baldwin, Bullins, Gordone, Fuller, and Shange.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:373** ***Black Novel (3)***
Thematic and structural development of the black novel as a voice for social and political change, including works by Wright, Ellison, Baldwin, Marshall, Walker, and Morrison.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:374** ***Black Autobiography (3)***
Examination of self-representation by major black autobiographers, including Frederick Douglass, Harriet Jacobs, Solomon Northup, Booker T. Washington, Maya Angelou, and Malcolm X.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:375** ***Nineteenth-Century Black Literature (3)***
Prominent African-American writers of fiction, poetry, autobiography, and essays of the 19th century, including Frederick Douglass, Harriet Wilson, Pauline Hopkins, Charles Chesnutt, and W.E.B. Du Bois.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:376** ***Harlem Renaissance (3)***
Black literature during the 1920s and 1930s in the context of African-American social and cultural history; essays, poems, and novels by such authors as Cullen, Hughes, Hurston, McKay, and Toomer.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:377** ***Black Writers and the 1960s (3)***
Innovations in black literature of the 1960s in light of the tumultuous social, cultural, and political movements of the decade.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:378** ***Black Music and Literature (3)***
Thematic and structural influences of black music on American poetry, fiction, and drama; writers may include Sterling Brown, Hughes, Baraka, Cortez, Bambara, Kerouac, Shepard, and August Wilson.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:379** ***Black Women Writers (3)***
Fiction and poetry by African-American women such as Brooks, Hurston, Marshall, Morrison, and Alice Walker; discussion of issues of literary influence and comparable traditions.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:380** ***Literature of the Black World (3)***
Comparative study of writing in English by African-American, Caribbean, and African authors, including Derek Walcott, V.S. Naipaul, Paule Marshall, and Chinua Achebe.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:381** ***Issues and Problems in Black Literature (3)***
Studies in particular themes, questions, forms, and historical issues in black literature and culture. Sections designed by individual instructors; students should consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:382** ***Southern African Literature (3)***
Study of selected literary works from the region of Southern African written or translated in English. Topics vary; consult departmental announcement.

***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:383** ***Readings in Colonial and Postcolonial Literature (3)***
Study of literature and criticism that explore facets of Western imperial expansion.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:384** ***Literatures of Migration, Immigration, and Diaspora (3)***
Writings that feature representations of place, community, and identity in relation to national and international movement and displacement.
***Credit not given for both this course and 01:195:336. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:385** ***Literatures of Africa in English (3)***
Study of selected literary works from Africa written in English. Topics vary; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:386** ***Literatures of Asia in English (3)***
Study of selected literary works from Asia written in English. Topics vary; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:358:387** ***Ethnic Literature in the United States (3)***
Selected literary works by Asian-American, black, Chicano/Chicana, and Native American writers. Topics vary; consult departmental information.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:358:388** ***Native American Literatures in English (3)***
Fiction, poetry, and autobiography by such writers as Apes, Momaday, Welch, Silko, and Erdrich. Attention to issues of Native American representation.
***Credit not given for both this course and 01:050:376. Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:358:389** ***Asian-American Literatures in English (3)***
Theme or genre-based study of selected Asian-American writing in English. Topics chosen by individual instructors; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:050:377.***

**01:358:390** ***Chicano/Chicana Literature (3)***
Theme or genre-based study of selected Chicano/Chicana literature; attention to comparative contexts (Puerto Rican, Cuban, and Dominican).
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:358:391** ***Irish Writing in English (3)***
Works of Irish writers in English from 1800 to the present.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:358:393** ***Independent Study (3)***
Individual work on a topic designed by the student in conference with an instructor who directs the project.
***Prerequisite: Permission of department. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:394** ***Theater and Drama by Women (3)***
Selected plays in English by women writers, with emphasis on the study of forms, conventions, and cultural contexts. Topics vary; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:395** ***Fiction by Women (3)***
Selected works of fiction in English by women writers, with emphasis on the study of forms, conventions, and cultural contexts. Topics vary; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:396** ***Poetry by Women (3)***
Selected poetry in English by women writers, with emphasis on the study of forms, conventions, and cultural contexts. Topics vary; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:398** ***The English Bible (3)***
The English Bible, its literary variety, and the evolution of its text. Special attention will be given to problems of interpretation and translation and their Hebrew and Greek origins.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:411** ***Old English Language and Literature (3)***
Intensive study of the English language and an introduction to its literature.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:412** ***Seminar: Old English Language and Literature (3)***
Intensive study, in a discussion-oriented format, of Old English poems, such as *Beowulf*, and prose writings studied in their original language. Topics vary according to individual instructors; consult departmental information.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:358:420** ***Seminar: Chaucer (3)***
Intensive study of *The Canterbury Tales, Troilus and Criseyde*, and other selected works.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:422** ***Seminar: Topics in Medieval Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of medieval literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:424** ***Seminar: Spenser (3)***
*The Faerie Queene*, *The Shepherd's Calendar*, *Amoretti*, *Epithalamion*, and selected minor works.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:426** ***Seminar: Shakespeare (3)***
Special studies in selected plays and poems. Consult departmental announcement.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:428** ***Seminar: Milton (3)***
Special studies in Milton's poetry and prose.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:434** ***Seminar: Topics in Renaissance Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of Renaissance literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:435** ***Seminar: Topics in Restoration and 18th-Century Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of 18th-century literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:436** ***Seminar: Topics in 19th-Century Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of 19th-century literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:437** ***Seminar: Topics in 20th-Century Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of 20th-century literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:438** ***Seminar: Topics in 21st-Century Literature (3)***
Focuses on topics and issues in 21st-century literature of all genres.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:440** ***Seminar: Topics in Genre (3)***
Intensive study, in a discussion-oriented format, of a particular genre (e.g., pastoral, epic, comedy, and lyric) or relationship among genres. Topics vary; consult departmental information.
***Credit not given for both this course and 01:195:440. Prerequisites: 01:359:201 or 202; English major.***

**01:358:441** ***Seminar: Topics in American Literature and Culture to 1800 (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of American literature and culture to 1800. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:442** ***Seminar: Topics in 19th-Century American Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of 19th-century American literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:445** ***Seminar: Topics in Black Literature and Culture (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of black literature and culture. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:452** ***Seminar: Special Topics in American Literature (3)***
Special studies in particular ideas, themes, forms, and historical units in American literature. Sections designed by individual instructors; consult departmental announcement.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:460** ***Seminar: Topics in Colonial and Postcolonial Literature (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of colonial and postcolonial literature. Topics vary; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:491** ***Seminar: Special Topics in Literature (3)***
Special studies in particular ideas, themes, forms, and historical units in literature. Sections designed by individual instructors; consult departmental announcement.
***Prerequisites: 01:359:201 or 202; English major.***

**01:358:493** ***Independent Study (3)***
Individual work on a topic designed by the student in conference with an instructor who directs the project.
***Prerequisites: Permission of department; 01:359:201 or 202; English major.***

**01:358:495** ***Independent Study (BA)***
Individual work on a topic designed by the student with an instructor who directs the project.
***Prerequisites: 01:359:201 or 202; English major.***

# English Theories and Methods Courses (359)

# English Theories and Methods Courses (359)

**01:359:201** ***Principles of Literary Study (3,3)***
An introduction to principal methods and materials in contemporary literary studies. This course will include close attention to works from at least two genres and two historical periods to be selected by the instructor. The course will introduce students to the meaning and use of key terms in literary studies.
***Required of all English majors.***

**01:359:205** ***Introduction to Research Methods (3)***
Workshop in advanced library skills and the use of secondary scholarship.
***Open only to junior English majors in the departmental honors program.***

**01:359:207** ***Data and Culture (3)***
Introduction to understanding and using data in humanistic scholarship.

**01:359:209** ***Introduction to Health, Medicine, and Literature (3)***
Examines how literature about disease, disability, or the body opens questions concerning language, metaphor, narrative traditions, and the shifting cultural meanings of health, medicine, and human experience.

**01:359:210** ***Introduction to Literary Theory (3)***
Literary theory through the close reading of texts with common themes; representation of diverse historical periods and theoretical frameworks.

**01:359:211** ***The Culture of Sport (3)***
Explores the cultural aspects of sport, focusing on basketball, soccer, and American football, using literature, film, journalism, televised events, and some secondary material.

**01:359:220** ***Introduction to Performance Theory (3)***
Interdisciplinary course introduces students to key concepts of performance and performativity from a variety of critical perspectives, including those of literary studies, critical theory, philosophy, theatre history, and anthropology, among others.

**01:359:310** ***History of Literary Theory I (3)***
Literary and rhetorical theory from antiquity to the Enlightenment.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:311** ***History of Literary Theory II (3)***
Selected trends and texts of literary theory from Romanticism to the present.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:312** ***Issues and Problems in Literary Theory (3)***
Close investigation of a specifically defined area of literary theory. Topics vary according to individual instructors; consult departmental information.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:315** ***Theories of Genre (3)***
Introduction to the ways in which criticism has theorized literature according to genre, form, and kind.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:316** ***Issues and Problems in Genre Theory (3)***
Formal and cultural issues within the development of a particular genre, or in the relation between genres, in literature in English.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:320** ***Cultural Theory in Literary Studies (3)***
Approaches to defining what culture is and how to theorize culture in relation to the production and consumption of literary and nonliterary texts.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:321** ***Popular Culture (3)***
Exploration of how popular forms like TV, movies, music video, rap, rock, comics, magazines, and advertising shape meaning and value in contemporary America.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:322** ***Marxist Literary Theory (3)***
Marxist analysis of literature, culture, and society. Attention to dialectical philosophy, the problem of base and superstructure, and theories of ideology and fetishism.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:325** ***Psychoanalytic Literary Theory (3)***
Impact of psychoanalysis upon theories of literature, language, and interpretation; Freud and beyond; attention to theories of subjectivity, trauma, affect, sexuality, textuality, and culture.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:326** ***Literature and Psychology (3)***
Exploration of interrelationships of literature and psychology (from Freud to feminists and contemporary theorists); topics include subjectivity, affect, trauma, gender, intersubjectivity, and identity.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:330** ***Theories of Gender and Sexuality (3)***
History and critique of gender and sexuality as discursive categories. May include nonliterary as well as literary texts and involve various theoretical perspectives.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:331** ***Literature and Sexuality (3)***
Themes and assumptions of sexual literature and its basis in sexual fantasy, including gender issues. Reading in major works of sexual literature.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:335** ***Feminist Theory in Literary Study (3)***
"Woman," "gender," and related concepts as discursive categories deployed in theoretical, literary, philosophical, and popular texts. Attention to historical issues and current debates.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:336** ***Issues and Problems in Feminist Literary Studies (3)***
Themes, questions, forms, and historical issues in feminist literary studies. Sections designed by individual instructors; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:340** ***Deconstruction and Poststructuralist Theory (3)***
Poststructuralism and its origins in France in the late 1960s; attention to the theoretical writings of Derrida, Barthes, Kristeva, and de Man.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:345** ***Colonial and Postcolonial Theory (3)***
Theories of colonial and postcolonial discourse; attention to issues of imperialism, primitivism, creolization, and globalization in fiction, film, and travel narratives.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:359:347** ***Serial Storytelling (3)***
Investigation of serial narrative as a modern mode of storytelling, from serialized novels in 19th-century Britain and Russian through the multimedia serials of our digital age. Exploration of this narrative form's enduring power, in multiple media, to interweave fiction with the course of current events and the rhythms of everyday life, and to bring together international audiences shaped by cultural, social, and geographical differences.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for 359:347 and either 01:195:345 or 01:860:345.***

**01:359:351** ***Literature and Medicine (3)***
Literature about medicine, exploring the meeting place of disease, medical treatment, and literary culture, along with shifting understandings of patient and healer, health and illness, and the reach and responsibility of medicine.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:352** ***Literary and Scientific Writings (3)***
Readings in English that explore the impact of science upon literary writing and the literary and discursive dimensions of selected scientific texts.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:360** ***Theories of Text and Image (3)***
Exploration of the field of media theory, especially as it has developed in dialogue with literary and cultural studies. Course materials and class projects will include works in multiple media.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:361** ***Literature and Visual Culture (3)***
Interactions of word and image on the page, on the stage, and onscreen. Examples may include graphic narratives, tableaux, public spectacles, photography, film, and digital culture, read alongside literary and theoretical texts.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:362** ***Digital Literary Studies (3)***
The relationship between literary practices and the technologies of recording, transmitting, data mining, and archiving. Topics: the history of the book, media shift, the history of reading, literature in relation to other media, hypertext, and digital literacies and analysis.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:365** ***Literature, Religion, and Theory (3)***
Relationships between theological and literary ways of reading texts, including both sacred and secular examples.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:366** ***Literary Approaches to Sacred Texts (3)***
Literary analysis of the formation and structure of the major texts of several world religions. Attention to style, genre, and cross-cultural interpretation.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:370** ***Literary Editing and Publishing (3)***
The place and purpose of literary journals within the publishing world; history and current state of the publishing industry, including mainstream book publishing, independent presses, and literary magazines.

***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:359:394** ***Independent Study (3)***
Individual work on a topic designed by the student in conference with an instructor who directs the project.
***Prerequisites: Permission of department and 01:355:101 or equivalent.***

**01:359:395** ***Junior Honors Seminar (3)***
Focus on particular text, theme, or approach in order to develop reading and writing skills using critical and theoretical materials.
***Open only to junior English majors in the departmental honors program.***

**01:359:410** ***Seminar: Topics in Literary Theory (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of literary theory. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:359:425** ***Seminar: Topics in Literature and Psychology (3)***
Examines literary texts and the processes of reading them through the lens of psychological theory, including psychoanalytic and cognitive.
***Prerequisites: 01:359:201 or 202; English major.***

**01:359:435** ***Seminar: Topics in Feminist Theory (3)***
Intensive study, in a discussion-oriented format, of a specifically defined area of feminist theory. Topics vary according to individual instructors; consult departmental information.
***Prerequisites: 01:359:201 or 202; English major.***

**01:359:460** ***Seminar: Media Theory (3)***
Explores the field of media theory, especially as it has developed in dialogue with literary and cultural studies.
***Prerequisites: 01:359:201 or 202; English major.***

**01:359:470** ***History and Theory of Tragedy (3)***
Explores, contextualizes, and assesses the most prominent and influential works in the history and theory of tragedy, beginning with the dramas of Greek antiquity and extending through modern philosophy.
***Prerequisites: 01:  359:201 or 202; English major***

**01:359:494** ***Independent Study (3)***
Individual work on a topic designed by the student in conference with an instructor who directs the project.
***Permission of department; 01:359:201 or 202; English major.***

**01:359:495** ***Independent Study (3)***
Individual work on a topic designed by the student in conference with an instructor who directs the project.

***Prerequisites: Permission of department; 01:359:201 or 202; English major.***

**01:359:496** ***Junior Honors Seminar (1.5)***
Workshop focusing on methodological and theoretical aspects of literary study or creative writing, with particular emphasis on preparing to write an honors thesis.
***Open only to junior English majors in the departmental honors program.***

**01:359:497** ***Senior Honors Seminar (3)***
Workshop focusing on methodological and theoretical aspects of literary study, with particular emphasis on the senior thesis.
***Open only to senior English majors in the departmental honors program.***

**01:359:498,499** ***Senior Honors Tutorial (3,3)***
Workshop focusing on methodological and theoretical aspects of literary study, with particular emphasis on the senior thesis.
***Open only to senior English majors in the departmental honors program.***

English (SAS)

# English Creative Writing Courses (351)

# English Creative Writing Courses (351)

**01:351:209** ***Introduction to Multimedia Composition (3)***
Introduction to composition across digital media platforms, with attention to the conceptual challenges it poses. Individual digital media projects, blog posts, and group exercises to provide experience composing and sharing works that are both thought provoking and entertaining.

**01:351:211,212** ***Introduction to Creative Writing (3,3)***
Practice in creative writing in various forms (fiction, poetry, drama, and essay); critical analysis of students' manuscripts in class and/or individual conferences.

**01:351:220** ***Writing for Experimental Film (3)***
A hands-on film making experience focusing on writing and producing experimental film.

**01:351:303** *Screenwriting for Film (3)*
Practice in screenwriting for film focused on dramatic action, narrative structure, and character.
***Prerequisite: 01:351:211 or 212.***

**01:351:304** *Screenwriting for Television (3)*
Practice in screenwriting for television focused on dramatic action, scene structure, and character.
***Prerequisite: 01:351:211 or 212.***

**01:351:305** *Creative Nonfiction (3)*
Investigation, through weekly reading and writing assignments, of creative nonfiction, emphasizing modes of first-person writing such as memoirs, travel narratives, and personal essays.
***Prerequisite: 01:351:211 or 212.***

**01:351:306** *Form and Technique in Poetry (3)*
***Prerequisite: One 200-level course in creative writing or permission of instructor. Pre- or corequisite: A literature course in poetry.***

**01:351:307** *Form and Technique in Fiction (3)*
***Prerequisite: One 200-level course in creative writing or permission of instructor. Pre- or corequisite: A literature course in fiction.***

**01:351:308** *Form and Technique in Playwriting (3)*
***Prerequisite: One 200-level course in creative writing or permission of instructor. Pre- or corequisite: A literature course in drama.***

**01:351:309** *Digital Composition (3)*
Filmmaking as creative writing, including study of film language, grammar, and narrative structure, with focus on visual composition, placement of dialogue, and editing to assemble a story for the screen.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:351:314** *Documentary Filmmaking for Writers (3)*
This course focuses on the importance of storytelling in documentaries and teaches students about the various filmic techniques, elements, and choices needed to create their own successful short film.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:351:405** *Advanced Workshop: Multi-Genre (3)*
Advanced work in creative writing; criticism of manuscripts in individual conferences and/or class.
***Prerequisite: One 300-level course in creative writing or permission of instructor.***

**01:351:406** *Advanced Workshop: Poetry (3)*
Advanced workshop in poetry.
***Prerequisite: One 300-level course in creative writing and/or permission of instructor.***

**01:351:407** *Advanced Workshop: Fiction (3)*
Advanced workshop in fiction.
***Prerequisite: One 300-level course in creative writing and/or permission of instructor.***

**01:351:408** *Advanced Workshop: Playwriting (3)*
Advanced workshop in playwriting.
***Prerequisite: One 300-level course in creative writing and/or permission of instructor.***

English (SAS)

# English Film Studies Courses (354)

# English Film Studies Courses (354)

**01:354:201** *Introduction to Film I (3)*
Film study, with emphasis on basic concepts of film analysis (narrative, editing, mise-en-scène, and sound) and the historical development of cinema as an institution.
***Credit not given for both this course and 01:175:201.***

**01:354:202** *Introduction to Film II (3)*
Film study, with emphasis on commercial cinema as an institution (genres, directors, and stars) and on nonnarrative types of film (documentary, experimental).
***Credit not given for both this course and 01:175:202.***

**01:354:205** *Cinema Today (4)*
This course surveys contemporary cinema from 2000 to the present.

**01:354:210** *Close Readings of Cinema (4)*
Formal analyses of six or seven individual films; emphasis on visual track, sound track, and scenario-narrative construction.
***Credit not given for both this course and 01:175:210. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:250** *The Films of Alfred Hitchcock (4)*
A survey of the major films of the "master of suspense" from the silent era through the 1970s.

**01:354:270** *American Screen Comedy (4)*
Classical American screen comedy: American screen comedy from the 1920s to the 1960s, ranging from the films of comedians to those of writers and directors.

**01:354:301** *Digital Cinema (4)*
A study of the role played by digital technology in shaping the imaging and sound practices found in the contemporary cinematic landscape from the 1990s to the present.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:308** *The Craft of Screenwriting (3)*
Nature and theory of the screenplay; practice in writing for the screen, from short scenes to longer projects.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:312** *Cinema and the Arts (3)*
Relationship between film and aesthetic movements in literature and the arts, such as expressionism, cubism, futurism, constructivism, and surrealism.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:315** *American Cinema I (3)*
American film from the silent period to 1940; emphasis on the development of American cinema both as a social institution and a symbolic form.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:316** *American Cinema II (3)*
American film from 1940 to the present; emphasis on the height of the Hollywood studio and its decline in the late 1950s and 1960s.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:175:316.***

**01:354:318** *Cinema of New York and New Jersey (4)*
A history of the development of the motion picture industry in New York and New Jersey, where filmmakers unhappy with conditions of industrial mass production on the west coast worked to create an alternative "Hollywood on the Hudson."
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:320** *World Cinema I (3)*
Developments in French, Italian, British, Russian, and other national cinemas from 1896 to World War II; also examines cross-influences between foreign and American cinema.
***Credit not given for both this course and 01:195:320 or 01:175:320. Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:354:321** *World Cinema II (3)*
Developments in French, Italian, British, Russian, Japanese, and other national cinemas after World War II; also examines cross-influences between foreign and American cinema.
***Credit not given for both this course and 01:195:321 or 01:175:321. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:330,331** *Critical Methodology in Film (3,3)*
Critical methodology, reviewing genre theory, theories of authorship, Marxist, feminist, cultural-materialist, and psychoanalytic criticism as applied to film.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:354:335** *Film Sound (4)*
An international history of film sound with emphasis on the development of sound technology, the stylistic and aesthetic conventions of film sound, and theoretical discourses surrounding sound in the cinema.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent***

**01:354:350,351** *Major Filmmakers (3,3)*
Questions of meaning in film through the work of such major directors as Ford, Renoir, Hawks, Ophuls, Bergman, Mizoguchi, and Hitchcock.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:175:350, 351.***

**01:354:355** *Films of John Ford (4)*
A study of films made by American cinema's poet laureate that explores topics such as Ford, Lincoln, and history; race and ethnicity; populism and politics; and women, native Americans, and the West.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:356** *Films of Jean Renoir and Fritz Lang (4)*
A comparison of the work of two European directors who, after achieving international prominence in their respective countries (France, Germany), fled Hitler and came to Hollywood in the 1940s
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:360** *Film Noir (4)*
Survey of American hard-boiled cinema from the early 1940s to 1958 with a focus on private eyes, lone wolves, femme fatales, and losers.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:370** *Film Genres (3)*
Analysis of film genres, such as the western, comedy, horror film, film noir, and the musical; theory of genre; and history of genre criticism. May cover more than one genre.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:175:370.***

**01:354:371** *Film Melodrama (4)*
Survey of film melodrama from the silent era to the present, including subgenres such as the family melodrama, the romantic melodrama, melodramatic triangles, the maternal melodrama, and race and melodrama.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:373** *The Documentary (3)*
History, theory, and practice of documentary film, including ethnographic film, propaganda, newsreel, direct cinema, video verite, social activist film, postmodern documentary, and antidocumentary.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:175:373.***

**01:354:374** *Science Fiction Film (4)*
A survey of science fiction cinema that explores the relationship between the human and the inhuman, the fantastic and the realistic, the familiar and the "other," and the present and the future.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for both this course and 01:050:322 or 01:175:322.***

**01:354:375** *Film and Society (3)*
Analysis of films in their sociopolitical contexts, including issues of race, class, and gender; relation between film as art form and the politics of culture.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:385** *Theories of Women and Film (3)*
Basic concepts in feminist film theory; the female voice in cinema; representations of women in classical Hollywood film; and films made by women.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:391,392** ***Special Topics in Film Studies (3,3)***
Intensive study of a particular national cinema, period in film history, studio, or genre. Sections designed by individual instructors; consult departmental announcement.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:354:410** ***Seminar in Film Studies (3)***
Contemporary issues in film studies, ranging from the return to history to questions about the role of theory in the age of post-theory.
***Prerequisite: 01:359:201 or 202.***

**01:354:420** ***Seminar: Film Theory (3)***
Major developments in film theory from the silent era to the present; writings on film by Eisenstein, Kracauer, Bazin, Metz, Barthes, and others; practice in using different methods to analyze films.
***Prerequisites: 01:359:201 or 202 plus any 200-level English department film course (01:354:201, 202, or 210). Credit not given for both this course and 01:175:420.***

English (SAS)

# English Composition and Writing Courses (355)

# English Composition and Writing Courses (355)

**Learning Goals**

Students who complete English 201 and 301 will be able to read and understand specialized texts from a range of disciplines; cite and explicate key passages in support of specific claims; evaluate the claims of individual texts and synthesize information provided by multiple sources; engage in independent research using print and online sources; develop a written argument with a thesis supported by reasoning, explanation, illustration, and the use of evidence; understand the major conventions of argument, quotation, paraphrase, and citation; understand the conventions of standard written English including paragraphing, grammar, and punctuation; evaluate the quality of information; and make a public presentation of their course research.

Students who complete Writing Program courses beyond 201 will be able to demonstrate proficiencies in the specialized areas indicated by the course title and description.

**01:355:090** ***Grammar Workshop (E1.5)***
The Grammar Workshop is a support class in grammar skills featuring both group and individualized instruction.
***Open to all students in Writing Program courses.***

**01:355:096** ***Writing Center (E1.5)***
At the tutorial centers located on the College Avenue, Livingston, and Douglass campuses, registered students receive concentrated assistance in specific writing skills.
***The Writing Center is open to all undergraduates.***

**01:355:100** *Basic Composition (4.5)*
Basic Composition focuses primarily on the reading-comprehension skills necessary for success in Expository Writing (01:355:101) and in future college courses. Students read eight complex nonfiction essays and write four expository papers.
*Prerequisites: 01:355:099 or 01:355:098 or 01:356:156.*

**01:355:101** *Expository Writing I (3)*

College Writing introduces students to the strategies and practices necessary to become a successful writer at the university level and beyond. As the required writing course for undergraduate students at Rutgers University-New Brunswick, College Writing challenges students to reflect upon and cultivate their strengths as readers and writers at this new stage of their education careers. College Writing is required of all students except those who are exempt through AP credit or transfer equivalency. Prerequisites: Placement,.

*May not be used for credit toward the English major or minor. Prerequisites: 01:355:100, 01:356:156, or placement.*

**01:355:103** *Exposition and Argument (3)*

Exposition and Argument is an intensive writing course for first-year students who demonstrate advanced reading and writing skills.

Open only to honors students, and is not open to students who have taken 01:355:101. Credit is not given for both this course and 01:355:101.

*Prerequisites: Placement in 01:355:101.*

**01:355:104** *College Writing Extended (4.5)*
College Writing Extended introduces students to the strategies and practices necessary to become a successful writer at the university level and beyond. Students develop their critical reading abilities and written communication skills through meaningful writing projects of diverse genres, including multimodal composition. Satisfies The College Writing core curricular requirement. Prerequisites: placement.
*Prerequisites: placement.*

**01:355:197** *SAS Summer Writing Practicum (1)*
The Summer Writing Practicum will focus on developing reading strategies that encourage connective and analytical thinking, drafting an academic paper that presents a coherent and independent claim, and revising a rough draft for submission. Students will read nonfiction texts, discuss those texts, and develop claims of their own using textual evidence.

**01:355:201** *Research in the Disciplines (3)*
Research in the Disciplines promotes further development of competence in reading, thinking, and writing, with emphasis on the intellectual and practical skills required for the research paper.
*May not be used for English major or minor credit. Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:202** *Technical Writing Essentials (3)*
Technical Writing Essentials is designed to meet the fundamental workplace communication needs of students and professionals in a wide range of fields, including scientific and technical careers. The course teaches students how to effectively communicate using various kinds of documents common to the workplace including memos, business

letters, research reports, and instructions.
*May not be used for English major or minor credit. Credit not given for both this course and 01:355:203. Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:203** *Business Writing Essentials (3)*
Business Writing Essentials is designed to meet both the basic communication needs of students planning careers in business and the writing improvement needs of current working professionals. The class writing assignments will be structured around scenarios where students will apply both writing and critical thinking skills in the context of real business situations.
*May not be used for English major or minor credit. Credit not given for both this course and 01:355:202. Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:301** *College Writing for Transfer Students (3)*
If you have received WC credit for English 101 College Writing, consider taking English 301 College Writing for Transfer Students to fulfill one of your upper-level Core Curriculum WCr or WCd writing requirements. Students will write two four page essays that emphasize the writing, reading, and critical thinking skills valued by Rutgers, then complete an 8-10 page research paper on a subject of personal interest.
*Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:302** *Scientific and Technical Writing (3)*
Scientific and Technical Writing offers students practice in the forms and discourses of scientific and technical writing as they develop, research, and revise an independent project. The purpose of the class is to prepare students for their professional lives in scientific, technical, or public service fields by helping them organize their knowledge while exploring ways of applying it, thus developing their professional expertise.
*Credit not given for both this course and 01:355:303. Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:303** *Writing for Business and the Professions (3)*
Writing for Business and the Professions offers students practice writing for a business or professional audience as they develop, research, and revise an independent project. The purpose of the class is to prepare students to think as managers capable of putting information to practical use.
*Credit not given for this both course and 01:355:302. Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:312** *Writing for Biology and Natural Science(3)*
This project-focused course is designed to address the needs of students doing research in natural sciences. Coursework covers grant proposals, research papers, and journal publications.
Prerequisites 01:355:101 or 01:355:103 or 01:355:104.

*Prerequisites 01:355:101 or 01:355:103 or 01:355:104.*

**01:355:315** *Writing Grant Proposals (3)*
This course focuses on the theory and practice of grant writing to support research, education, or community. It includes a focus on identifying appropriate sources of grant funding, organizing research, and tailoring projects to specific audiences.
*Prerequisite: 01:355:101 or 103 or 104 or equivalent.*

**01:355:322** ***Writing for Engineers (3)***
This project-focused course is designed to address the needs of students in engineering. Covers project proposals, patent applications, technical reports, and other engineering documents.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:342** ***Science Writing (3)***
This course provides students with practice in writing about science for general readers and presenting scientific issues or information in the genres common to journals, magazines, newspapers, and the internet.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:352** ***Writing as a Naturalist (3)***
Advanced writing course focusing on observing and writing about animals and the natural world.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:355** ***Writing in the Professions (3)***
Provides specialized writing training for professional, business, scientific, or technical fields.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:365** ***Technical Editing (3)***
Practice editing technical documents for grammar, syntax, organization, style, emphasis, and audience awareness.

***Prerequisites: 01:355:101 or or 01:355:103 or 01:355:104.***

**01:355:375** ***Collaborative Writing Practices (3)***
Students will engage in the theory and practice of managing collaborative writing in organizations. Students will collaborate on group projects involving planning, writing, presentation, and editing tasks.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:395,396,397,398** ***Internship (3,3,3,3)***
These internships include the application of skills learned in literary studies in professional settings and an appropriately designed academic project resulting in a paper.
***Prerequisite: Permission of department required to enroll in these internships. Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:399,400** ***CESEP Internship (1,1)***
The Civic Engagement and Service Education Partnerships (CESEP) internship is a one-credit community service placement in English.
***Not for English major or minor credit. Must be taken in conjunction with designated Civic Engagement and Service Education Partnerships (CESEP) program course in the English department.***

**01:355:402** ***Advanced Writing Workshop (3)***
Focuses on advanced work in expository, scientific, technical, or business writing. Topics vary from semester to semester.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent.***

**01:355:410** ***Composing Graphic Narratives (3)***
Composing Graphic Narratives is an advanced writing workshop devoted to producing both fiction and non-fiction comics and other forms of text image communication. We'll explore ways to communicate information, construct

arguments, and tell stories through the medium of graphic narrative. The course approaches graphic narrative as a flexible form of writing that uses images, text, narrative structure, and page design as active parts of its language. ***Prerequisites: 01:350:101 or 01:355:101 or 01:350:103 or 01:355:103.***

**01:355:415** ***Information Design (3)***
This project-focused workshop course uses specialized writing software to design and produce a portfolio of user-friendly documents for a specific audience and purpose.
***Prerequisite: Complete 01:355:101 or 103 or 104 or equivalent before enrolling.***

**01:355:425** ***Web Authoring (3)***
This project-focused workshop course uses specialized software to design, research, generate content for, and publish a website.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. May not be used for major or minor credit.***

English (SAS)

# English for Academic Purposes Courses (356)

# English for Academic Purposes Courses (356)

**01:356:152** ***Discussion and Presentation Skills (1)***This course improves listening and note-taking skills and builds confidence to speak in front of groups through individual and collaborative projects. Skills acquired through this course include planning oral presentations, developing visual aids such as PowerPoint, and responding to audience questions.***Pre- or corequisite: 01:356:155 or 156.***

**01:356:155** ***English for Academic Purposes I: Writing Across Cultures (4.5)***First-year writing course for learners of English as an additional language. Reading, responding to, and critically analyzing texts from a range of perspectives and fields addressing the relationship between culture and communication.***Prerequisite Note: Placement required**

**01:356:156** ***English for Academic Purposes II: Academic Writing in the United States (4.5)***First-year writing course for learners of English as an additional language. Narrative, analytical, and synthetic writing assignments, a discipline specific research project, and a final digital project showcasing critical thinking and composition.***Prerequisite: EAP I: Writing Across Cultures (01:356:155)**

# Entomology 370 (SEBS)

## ENTOMOLOGY 370

**Degree:** B.S.

**Director:** Chloe Hawkings (c.hawkings@rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

The entomology major is the study of insects and their arthropod relatives. Insects are one of the most diverse and abundant organisms on the planet and play important roles in their ecosystems. Insects are exceptional models for understanding fundamental aspects of genetics, ecology, and evolution. Society benefits from diverse roles of insects as critical pollinators, sources of food in agricultural and wildlife food chains, as well as decomposers; on the flip side, many insects as well as ticks pose a danger to human health, our structures, and agriculture. Students in the Entomology major gain career opportunities in corporate and private agribusiness, urban pest management companies, scientific and technical organizations, public health agencies, local, state, and federal governments, and international organizations. Employment also exists in conservation biology, scientific policy, and environmental quality assurance. Our curriculum is flexible so students may expand their knowledge to interdisciplinary areas to meet their career goals. Students interested in the major or a double major should contact an academic advisor for additional information.

In addition to offering a major in entomology, the School of Environmental and Biological Sciences offers a minor in entomology.

Entomology 370 (SEBS)

# Learning Goals

# Learning Goals

Graduates of the undergraduate entomology major will have demonstrated:

1. Broad knowledge of the systematics, anatomy, physiology, ecology, and biochemistry of insects
2. Ability to explain and assess the detrimental and beneficial impacts that insects have on plants, animals, and humanity
3. Ability to design, implement, and analyze experiments or pest management programs and interpret data
4. Communication of entomological information to the scientific community and to the general public
5. Ethical principles required in professional fields

Entomology 370 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of the entomology program major requirements, courses, and course sequences, please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

Options are chosen from lists of courses certified in each learning goal: Here.

*Note: The SEBS Core Curriculum requirements differ slightly from SAS Core Curriculum requirements*

**I. Contemporary Challenges** (total 6 credits, 3 in CCO and 3 in CCD)
Suggested Course: 11:373:101 Economics, People, and Environment (CCO)
Suggested Course: 11:550:371 Agriculture and the Landscape (CCD)

**II. Natural Sciences** (total 6 credits, 3 in A and 3 in B)
A. Life Sciences (3 credits)
Required: 01:119:115 or 116 General Biology (4)

B. **Physical Sciences** (3 credits)
Required 01:750:193 Physics for the Sciences (4)

**III. Historical Analysis** (3 credits)
Suggested Course: 01:070:102 Introduction to Human Evolution

**IV. Social Analysis** (6 credits)
Suggested Course: 11:373:362 Natural Resource Economics
Suggested Course: 11:372:202 Environmental Issues in the USA
Suggested Course: 11:373:101 Economics, People, and Environment*
**also counted under Contemporary Challenge.*

**V. Arts and the Humanities** (3 credits)
Suggested Course: 01:190:101 Word Power
Suggested Course: 01:730:103 Introduction to Philosophy

**VI. Writing and Communication** (6 credits)
One from 01:355:101 Expository Writing (3) or 01:355:103 Exposition and Argument (3)
One from 01:355:302 Scientific and Technical Writing (3), 01:355:312 Writing for Biology and Natural Science (3), or 01:355:342 Science Writing (3)

**VII. Quantitative and Formal Reasoning** (6 credits)
Major required: 01:640:135 Calculus I (4)
One from 01:960:211 Statistics I (3), or 01:640:136 Calculus II for the Quantitative Social and Life Sciences (3)

**VIII. Experiential Learning** (3 credits)
All students are required to obtain practical experience in an area of entomology. Students can demonstrate appropriate employment or volunteer service with a public agency, private industry, nonprofit organization, or fulfill the requirement by research or field experience in suitable courses. Before starting an experienced-based course students must get the approval of their adviser. Possible courses include:
11:370:493, 494 Research problems in Entomology
11:015:497, 498 George H. Cook Scholars Program
11:902:300 and 400 SPIN Student to Professional Internship Network

**Required: Entomology Major**
*Total 44-45 credits*

01:119:115-116, 117 General Biology and Lab (4,4,2).
*Note: 4 credits can be counted as SEBS core - Natural Sciences*

01:160:161-162, 171 General Chemistry & Lab (4,4,1)
*Note: 4 credits can be counted as SEBS core - Natural Sciences*

01:640:135 Calculus I (4) or 01:960:211 Statistics I (3)
or 11:216:369 Analytical Methods in EENR (3)

11:216:351 Principles of Ecology (3)

11:370:350 Agricultural Entomology & Pest Management (3)
11:370:381 Insect Biology (4)
11:370:409 Insect Classification (4)
11:370:403 Insect Structure and Function (4)
11:370:407 Careers and Professional Development in Entomology (1)
11:370:495, 496 Seminar in Entomology (3)

*Note: Seminar in Entomology is 1 credit per semester. Students are required to take a total of three times to equal 3 credits*
*Note: Juniors and seniors may, with the permission of the instructor and the graduate dean, register for appropriate graduate courses in entomology for elective credits.*

**Entomology Electives**
*At least 5 (15+ credits)*

11:370:308 Apiculture (3)
11:370:355 Applied Acarology (3)
11:370:414 Forensic Entomology (3)
11:370:352 Toxicology of Insecticides (3)
11:776:408 Turfgrass Pest Science (4)
11:370:406 Medical & Veterinary Entomology (3)
11:370:430 Urban Entomology (3)
11:370:404 Insect Structure & Function (4)
11:370:415 Decomposition Ecology (3)
11:370:380 Insect Biotechnology (3)

*Note: Additional entomology electives can be taken and counted for approved elective credits*

*Note: For Careers in Pest Management, the following entomology elective courses are recommended:*
*11:370:430 Urban Entomology (3)*
*11:370:352 Toxicology of Pesticides (3)*
*11:776:408 Turfgrass Pest Science (4)*
*11:370:380 Insect Biotechnology (3)*

**Approved General Electives**
*At least 8 (24+ credits)*

11:573:232 Fundamentals of Environmental Geomatics (4)
11:216:371 Intro to Remote Sensing Image Analysis (3)
11:776:302 General Plant Pathology (3)
11:776:402 Principles of Weed Science (3)
11:776:405 Plant Biosecurity Issues & Technologies (3)
01:160:209 Elementary Organic Chemistry (4)
01:160:307-308 Organic Chemistry (4,4)
01:447:380 Genetics (4)
11:115:301 Introductory Biochemistry (3)
11:115:403 Biochemistry (4)
11:115:404 Biochemistry (4)
11:776:305 Plant Genetics (4)
11:216:302 Parasite Ecology (4)
11:216:317 Conservation Ecology (3)
11:216:324 Invertebrate Zoology (4)
11:216:332 Plant Ecology (4)
11:216:411 Plant Diversity & Evolution (3)
11:216:421 Wetland Ecology (3)
11:216:441 Animal Behavior (3)
11:216:464 Wildlife Ecology & Conservation (3)
11:375:407 Environmental Toxicology (3)
11:776:210 Principles of Botany (4)
11:776:382 Plant Physiology (4)
11:680:390 General Microbiology (4)
11:216:269 Evolution of Animal Behavior (3)
11:067:328 Animal Genetics (3)
11:126:481 Molecular Genetics (3)
11:126:484 Tools for Bioinformatic Analysis (3)
11:776:485 Functional Genomics for Research (3)
11:776:391 Weeds, Disease, and Insects of Plants (3)
11:020:436 Sustainable Agriculture (3)
11:020:321 Principles and Practices of Organic Farming (3)
11:375:453 Soil Ecology (3)

*Note: For Careers in Pest Management, the following courses nonentomology elective courses are recommended:*
*11:115:301 Introductory Biochemistry (3)*
*11:115:403 Biochemistry (4)*
*11:115:404 Biochemistry (4)*
*11:375:407 Environmental Toxicology (3)*

# Environmental and Business Economics 373 (SEBS)

## ENVIRONMENTAL AND BUSINESS ECONOMICS 373

**Degree:** B.S.

**Director:** Isaac Vellangany; Cook Office Building Room 112, 848-932-9131, isaacv@sebs.rutgers.edu

**Program Webpage:** Here

**Department of Environmental and Business Economics Webpage:** Here

The environmental and business economics program provides students with a foundation in the principles of economics, a knowledge of practical economic and analytical problem-solving techniques, an ability to apply economic concepts to the analysis of public and private policy issues, and an understanding of the institutional factors underlying and influencing policy decisions. The program qualifies students for a broad spectrum of positions in business and government, or for continued study at the graduate level.

To encourage students to develop depth in their understanding of the applications of economics, the curriculum offers the following four options:

***Business Economics.*** This option includes all of the same foundation courses required in traditional business school curricula plus the additional analytical tools provided in the program's economic courses. It is this rich blend of courses such as Finance, Management, Marketing, Demand and Price Analysis, and Economics of Production that make graduates of this option so attractive to employers in business and industry as well as to those in government agencies and nonprofit organizations. Indeed, many of the graduates from this option are among the ranking economists, analysts, financial advisers, managers, marketing specialists, consultants, and policy directors in agencies and companies ranging from biotechnology and pharmaceutical industries on Wall Street to smaller organizations including small business and entrepreneurial ventures. The option familiarizes students both with analytical and decision-making techniques used in the business world and with the public and private institutional framework within which businesses operate. It is also appropriate for students who are interested in graduate studies in business management or economics.

***Environmental and Natural Resource Economics.*** This option emphasizes the application of economics to policy issues associated with environmental problems and the utilization of natural resources. It familiarizes students both with analytical and decision-making techniques used in assessing problems of the environment and natural resources and with the institutional framework within which environmental policy must be developed. It is appropriate for students interested in employment either by private organizations concerned with environmental policies or by government agencies responsible for policies relating to the environment and natural resources and for students interested in graduate study in environmental or natural resource economics.

***Food Industry Economics.*** This option emphasizes the application of economics in the areas of food policy, marketing, and finance. It is appropriate for students interested in employment in the food industry or by federal or state departments of agriculture and for students interested in graduate study in agricultural economics.

***Food Science and Management Economics.*** This option, offered in cooperation with the food science curriculum, is designed for students with a strong interest in the management aspects of food science, process, production, and product development. While the option requirements of both programs are similar, students seeking degrees in environmental and business economics take additional courses in economics. This option is appropriate for students interested in employment in the food industry or in graduate study in agricultural economics, economics, or business administration.

Environmental and Business Economics 373 (SEBS)

# Learning Goals

# Learning Goals

After completing the program in environmental and business economics students will be able to:

1. utilize and explain core economic, management, financial, and accounting concepts;

2. apply economic theories and concepts to contemporary social issues, as well as the formulation of policy;

3. demonstrate quantitative reasoning skills;

4. recognize the role of ethical values in economic decisions; and

5. demonstrate critical and effective communication skills.

Environmental and Business Economics 373 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

Official admission to the major requires completion of introductory courses in micro- and macroeconomics, a semester of calculus, and a semester of statistics, with grades of C or better. These four courses are prerequisites to junior- and senior-level courses in the required option areas. Students may, however, declare the major before completing these four courses.

Environmental and Business Economics 373 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of environmental and business economics major requirements, courses, and course sequences please refer to the program webpage.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent [WC] and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

## Major Requirements for All Students Regardless of Matriculation Date

**Proficiency in Environmental and Business Economics (55-70 credits)**

**A. REQUIRED COURSES (22-23)**

*Quantitative Skills (10)*

11:373:211 Applied Mathematical Concepts in Ag Economics I (4) or 01:640:1__ CALC1 (4)

11:373:215 Applications of Statistics in Business Economics (3) or 01:960:285 Introductory Statistics for Business (3) or 01:960:211 Statistics I (3)

11:373:200 Agricultural Accounting (3) or 33:010:272 Introduction to Financial Accounting (3)

*Computer and Information Technology Competence (3)*

11:373:210 Business Decision Computer Tools (4) or 01:198:170 Computer Applications for Business (3)

**Professional Ethics**

11:373:201 Corporate Social Responsibility (3)

*Additional Requirements (9)*

11:373:241 Introduction to Management (3)

11:373:321 Economics of Production (3)

11:373:422 Demand and Price Analysis (3)

**B. OPTIONS (33-44)**

Majors must complete all option-required courses with a grade of C or better. No more than one grade of D is allowed in the remaining option elective courses.

*1. Business Economics (33-35)*

Required courses (12)

11:373:201 Corporate Social Responsibility (3) or equivalent

11:373:231 Introduction to Marketing (3)

11:373:341 Organizational Dynamics (3)

11:373:351 Business Finance I (3)

Electives (21-23)

At least three of the following business/economics courses:

01:220:300 International Economics (3)

01:220:301 Money and Banking (3)

01:220:302 Labor Economics (3)

01:220:308 Introduction to Managerial Economics (3)

01:220:311 Methods of Cost Benefit Analysis (3)

01:220:322 Econometrics (3)

01:220:394 Economics of Capital Markets (3)

01:220:415 Portfolio Theory (3)

11:373:331 Economics of Food Marketing Systems (3)

11:373:352 Economics of Futures Markets (3)

11:373:402 Global Marketing (3)*

11:373:403 Innovation and Entrepreneurship (3)*

11:373:425 Econometric Applications (3)

11:373:451 Business Finance II (3)

11:373:465 Business Research (4)*

At least two of the following policy courses:

11:373:202 Sustainability Decision Tools (3)

11:373:218 Sustainable Food Policy for Developing Countries (3)

11:373:323 Agricultural and Food Policy (3)

11:373:335 Energy Economics and Policy (3)

11:373:361 Land Economics (3)

11:373:362 Natural Resource Economics (3)

11:373:363 Environmental Economics (3)

11:373:371 Food, Nutrition, and Health (3)

11:373:404 Bioscience Policy (3)

11:373:431 International Trade Policy (3)

11:374:313 Environmental Policy and Institutions (3)

11:374:314 Human Dimensions of Natural Resource Management (3)

01:790:237 Political Economy and Society (3)

01:790:305 Public Policy Formation (3)

01:790:327 International Political Economy (3)

01:790:337 American Political Economy (3)

01:790:338 Government and Business (3)

11:374:315 International Environmental Policy (3)

At least two additional courses in environmental and business economics (373), economics (220), or Calculus II.

*2. Environmental and Natural Resource Economics (33-34)*

Required courses (12)

11:373:201 Corporate Social Responsibility (3) or equivalent

11:373:361 Land Economics (3)

11:373:362 Natural Resource Economics (3)

11:373:363 Environmental Economics (3) or 01:220:332 Environmental Economics (3)

Electives (21-22)

At least three of the following courses in problem solving or policy analysis:

01:220:311 Methods of Cost Benefit Analysis (3)

01:220:386 Operations Research I (3)

01:220:395 Law and Economics (3)

01:790:305 Public Policy Formation (3)

01:960:337 Managerial Statistics (3)

11:372:232 Fundamentals of Environmental Geomatics (3)

11:373:351 Business Finance I (3)

11:373:425 Application of Econometrics in Agricultural Economics (3)

11:375:333 Environmental Law I (3)

11:375:409 Environmental Statement and Impact (3)

At least one of the following courses in policy applications:

01:450:140 The Greenhouse Effect (3)

01:450:370 Global and Regional Climate Change (3)

11:373:231 Introduction to Marketing (3)

11:373:335 Energy Economics and Policy (3)

11:373:404 Bioscience Policy (3)

11:374:315 International Environmental Policy (3)

11:375:301 Environment and Health (3)

11:375:410 Workshop in Environmental Assessment and Impact (3)

11:375:421 Air Pollution (3)

11:628:401 Science in Shoreline Management (3)

11:704:451 Ecosystems Ecology and Global Change (3)

At least one of the following interdisciplinary courses:

01:512:323,324 History of the North American Environment (3,3)

10:975:315 Theory and Methods of Land-Use Planning (3)

11:372:231 Fundamentals of Environmental Planning (3)

11:372:384 A Systems Approach to Environmental and Agricultural Issues (3)

11:373:431 International Trade Policy (3)

11:375:333,334 Environmental Law I,II (3,3)

11:704:351 Principles of Ecology (3)

Two additional courses in environmental and business economics (373), economics (220), or Calculus II.

*3. Food Industry Economics (33-35)*

Required courses (12)

11:373:201 Corporate Social Responsibility (3) or equivalent

11:373:231 Introduction to Marketing (3)

11:373:331 Economics of Food Marketing Systems (3)

11:373:341 Management: Human Systems Development (3)

Electives (21-23)

Four of the following courses, of which at least three must come from group A:

A. Courses in business strategy/policy

11:373:205 Small Business Essentials (3)

11:373:323 Agriculture and Food Policy (3)

11:373:351 Business Finance I (3)

11:373:352 Economics of Futures Markets (3)

11:373:371 Food, Nutrition, and Health (3)

11:373:402 Global Marketing (3)*

11:373:403 Innovation and Entrepreneurship (3)*

11:373:425 Econometric Applications (3) *or* 01:220:322 Econometrics (3)

11:373:451 Business Finance II (3)

11:373:465 Business Research (4)*

B. Courses in environmental/resource economics

11:373:335 Energy Economics and Policy (3)

11:373:361 Land Economics (3)

11:373:362 Natural Resource Economics (3)

11:373:363 Environmental Economics (3)

At least 3 credits of courses in one of the following areas: animal science (067), soils (in environmental sciences 375), food science (400), nutritional sciences (709), or plant biology (776).

At least two additional courses in environmental and business economics (373), economics (220) or Calculus II.

*4. Food Science and Management Economics (43-44)*

Required courses in the sciences (26)

01:160:209 Elementary Organic Chemistry (3)

11:400:201 Principles of Food Science (3)

11:400:301 Food Processing Technologies (4)

11:400:405 Sensory Evaluation of Foods (3)

11:400:411 Food Chemistry (3)

11:400:412 Food Product Development (3)

11:400:423 Food Microbiology (3)

11:680:390 General Microbiology (4)

Required courses related to business management (17-18)

11:373:201 Corporate Social Responsibility (3) or 11:400:314 Current Issues in Food Science (2) or equivalent

11:373:231 Introduction to Marketing (3)

11:373:321 Economics of Production (3)

11:373:323 Agricultural and Food Policy (3) or 11:373:371 Food, Nutrition, and Health (3)

11:373:351 Business Finance I (3)

11:373:422 Demand and Price Analysis (3)

**Fulfills SEBS Experience-Based Education requirement.*

**Unspecified Electives**

In addition to courses meeting the above requirements, students can take other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 120 (matriculated 2018 or later) or 128 (matriculated prior to 2018) required for graduation.

# Minors and Certificate Programs (SEBS)

## MINORS AND CERTIFICATE PROGRAMS

The following minors and interdisciplinary certificate programs in a number of the mission areas of the School of Environmental and Biological Sciences are open to all undergraduate students at Rutgers. Options in several of the minors indicate either a subject-matter emphasis or a degree of expertise in cognate fields represented by the courses of the option. Certificates are awarded only with or subsequent to the awarding of a baccalaureate degree in an approved major. The minors are listed first (alphabetically), followed by the certificate programs.

Minor in Agriculture and Food Systems (18 credits)

Minor in Agroecology (21-24 credits)

Minor in Animal Science (22-24 credits)

Minor in Biochemistry (23-25 credits)

Minor in Community Health Outreach (22 credits)

Minor in Creative Expression and the Environment (18 credits)

Minor in Culinary Nutrition

Minor in Ecology, Evolution, and Natural Resources (20-23 credits)

Minor in Entomology (19-26 credits)

Minor in Environmental and Business Economics (21-23 credits)

Minor in Environmental Geomatics (19 credits)

Minor in Environmental Planning (18 credits)

Minor in Environmental Policy, Institutions, and Behavior (21 credits)

Minor in Environmental Sciences (21 credits)

Minor in Fisheries Science (21-22 credits)

Minor in Food Science (18-21 credits)

Minor in Green Technology (20 credits)

Minor in Horticultural Therapy (18 credits)

Minor in Landscape Design

Minor in Leadership Skills (21-22 credits)

Minor in Marine Sciences (18 credits)

Minor in Medicinal and Economic Botany (18-19 credits)

Minor in Meteorology (18 credits)

Minor in Microbiology (19-21 credits)

Minor in Nonprofit Leadership (23 credits)

Minor in Nutrition (20-24 credits)

Minor in Plant Science (18-20 credits)

Minor in Public Garden Management

Minor in Science Communication (18 credits)

Minor in Sustainable Global Food Systems (18 credits)

Minor in Sustainability

Minor in Urban Forestry (21 credits)

Certificate in Environmental Geomatics (19 credits)

Certificate in Environmental Planning (21 credits)

Certificate in Evolutionary Medicine

Certificate in Food Systems Education and Administration (21-22 credits)

Certificate in Horticultural Therapy (34-37 credits)

Certificate in Medicinal and Economic Botany (25 credits)

Certificate in Plant Biosecurity (25 credits)

Turfgrass Science Certificate Program (25-28 Credits)

# Environmental Planning 573 (SEBS)

## ENVIRONMENTAL PLANNING 573

**Degree:** B.S.

**Director:** Frank Gallagher (gallagher@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

The Environmental Planning curriculum provides a broad educational experience emphasizing an understanding of planning and management of the physical and cultural environments. The program strives to consider our relationship with the land, in an effort to foster ethical planning solutions. A program that promotes sustainability regardless of location, strives for social equity, and envisions a post-industrial landscape that provides ecological services.

***Environmental Planning Major:*** The environmental planning curriculum provides a broad educational experience emphasizing an understanding of planning and management of the physical and cultural environments. The program strives to consider our relationship with the land, in an effort to foster ethical planning solutions. The program promotes sustainability regardless of location, strives for social equity, and envisions a postindustrial landscape that provides ecological services.

**Environmental Planning Minor**: Environmental planning requires the integration of environmental information into the planning process and is concerned with the protection and enhancement of environmental systems while meeting demands for growth and development. This minor is intended for students from any discipline, who are interested in pursuing professional careers in environmental planning and related areas. It also provides a basis for graduate and professional studies. An environmental planning certificate program is also available for students in other programs of study as well as all minors of this major. View course requirements for minor.

**Environmental Geomatics Minor:** Environmental geomatics synthesizes a number of concepts and techniques, including remote sensing, spatial analysis, geographic information systems (GIS), and global positioning systems (GPS) that are used to improve the planning and management of natural resource systems. These techniques include the development of complex spatial databases from a wide range of data sources and the application of this information to solve environmental problems. The minor is intended for students interested in pursuing professional careers in environmental planning/management, remote sensing, and geomatics, and provides a basis for graduate and professional studies. An environmental geomatics certificate program also is available for students in other programs of study as well as all minors of this major. View course requirements for minor.

**Green Technologies Minor:** As individuals, businesses, and communities seek solutions to pressing environmental concerns, the green technology minor is positioned as an emerging source of innovation, entrepreneurialism, and action towards the development of sustainable land use practices. This minor seeks to provide students with a broad-based education in preparation for careers in landscape-related industries such as contracting, maintenance, nursery production, and garden-center operations. While covering pragmatic issues associated with the maintenance and management of gardens and properties, the curriculum also gives students opportunities to study best practices and new approaches to on-site stormwater management, energy production, and healthy ecological systems. View course requirements for minor.

**Urban Forestry Minor:** Urban and community forestry is the fastest growing segment of the forestry profession, especially in the northeast, where the total expenditure of time and money on community forestry (nursery, planting, pruning, removals, and line clearance) exceeds that spent on woodlands. This certificate is designed to provide students with the necessary credentials for employment by providing the fundamental knowledge and expertise required for this field. View course requirements for minor.

# Learning Goals

# Learning Goals

1) Understand, analyze, and incorporate natural features and systems in planning and land management practices.

2) Analyze and incorporate social, cultural, and behavioral factors in planning.

3) Understand the history of environmental planning and policy, including contemporary and sustainable practices and their impact on people and the land.

4) Evaluate implications of institutions and policy in terms of their ability to shape sustainable regions.

5) Effectively communicate with the public, communities, and policy makers on issues of land stewardship, environmental justice, and social well-being.

Environmental Planning 573 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of environmental planning major requirements, courses, and course sequences, please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning**(3 credits)*Students must participate in a certified experience that meets this goal*[EL]

**Natural Sciences**(6 credits)*Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences*[NS]

**Historical Analysis**(3 credits)*Students must take one course*[HST]

**Social Analysis**(6 credits)*SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis*[SCL]

**Arts and Humanities**(3 credits)*Students must complete one course*[AH]

**Writing and Communication**(6 credits)*Students must take 01:355:101 or its equivalent [WC] and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry*[WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

# Graduation Requirements: Major in Environmental Planning (573)

The environmental planning curriculum provides a broad educational experience emphasizing an understanding of planning and management of the physical and cultural environments. The program strives to consider our relationship with the land, in an effort to foster ethical planning solutions. A program that that promotes sustainability regardless of location, strives for social equity and envisions a post-industrial landscape that provides ecological services.

| Course Number | Credits | Name | SEBS |
|---|---|---|---|
| ***Requirement I*** | ***9*** | ***Physical Sciences*** | ***Core*** |
| 01:119:103 | 3 | Principles Biology | |
| *Plus 3 credits from:* | | | |
| 01:450:101 | 3 | Earth Systems *or* | |
| 01:460:100 | 3 | Planet Earth *or* | NS |
| 11:776:102 | 3 | Soil and Society | |
| *Plus 3 credits from:* | | | |
| 11:670:102 | 3 | Intro. Climate Science *or* | |
| 11:670:101 | 3 | Intro. Meteorology | |
| ***Requirement II*** | ***4*** | ***Quantitative Methods*** | |
| 01:640:115 | 4 | Pre-calculus College Math | |
| 01:640:111 | 2 | Pre-calculus I *plus* | QQ |
| 01:640:112 | 2 | Pre-calculus II | |
| ***Requirement III*** | ***34*** | ***Environmental Planning Core*** | |
| 11:573:202 | 3 | Environmental Issues | |
| 11:573:231 | 3 | Fundamentals of Environmental Planning | |
| 11:550:231 | 5 | Intro. Environmental Design | |
| 11:573:232 | 3 | Fundamentals of Environmental Geomatics | |
| 11:573:233 | 1 | Fundamentals of Environmental Geomatics Laboratory | |
| 11:550:237 | 3 | Visualization I-Drawing and Drafting | |
| 11:573:413 | 3 | Open Space Planning and Management | |
| 11:550:241 | 4 | Construction I: Mapping and Engineering | |
| *Plus 5-6 credits from:* | | | |
| 11:573:232 | 3 | Intro. Geomatics | |
| 11:372:462 | 3 | Adv. Geomatics | |
| 11:573:409 | 3 | Challenges and Opportunities | |

| | | | |
|---|---|---|---|
| 11:550:301 | 3 | Social and Cultural Aspects of Design | EBE |
| 11:550:331 | 5 | Environmental Planning Studio | |
| *Plus 3 credits from:* | | | |
| 11:550:442 | 3 | Planting Design | |
| 11:373:202 | 3 | Sustainability Decision Tools | |
| 11:216:101 | 3 | Intro. Ecology | |
| ***Requirement IV*** | ***9*** | ***Environmental Sequence*** | |
| *3 credits from:* | | | |
| 11:375:360 | 4 | Soils and Water | |
| 11:776:440 | 3 | Soil Fertility | |
| 11:776:102 | 3 | Soils and Society | |
| *Plus 3 credits from:* | | | |
| 11:216:272 | 4 | Dendrology | |
| 11:550:233 | 3 | Landscape Plants I | |
| *Plus 3 credits from:* | | | |
| 11:375:101 | 3 | Intro. Environmental Science | |
| 11:573:445 | 3 | Ecological Design and Stewardship | |
| 11:216:332 | 3 | Plant Ecology | |
| 11:216:351 | 3 | Principles of Ecology | |
| ***Requirement V*** | ***6*** | ***History/Theory Sequence*** | |
| 11:550:230 | 3 | Environmental Design Analysis | |
| 11:550:250 | 3 | History of Landscape Architecture | AH/ CC |
| 11:573:302 | 3 | Ecological History of North America | |
| ***Requirement VI*** | ***9*** | ***Planning Electives*** | |
| 3 credits from: | | | |
| 11:375:202 | 3 | Water and Wastewater Treatment | |
| 11:375:307 | 3 | Solid Waste Management and Treatment | |

| | | | |
|---|---|---|---|
| 10:762:335 | 3 | Gender, Family, and Public Policy | |
| 10:762/832/971:202 | 3 | Designing Healthy Cities (studio format) | |
| 11:373:362 | 3 | Natural Resource Economics | |
| 11:373:363 | 3 | Environmental Economics | |
| 11:573:437 | 3 | Sustainability Decision Tools | |
| *Plus 3 credits from:* | | | |
| 11:573:444 | 3 | Watershed Planning and Management | |
| 10:762:233 | 3 | Urban World | |
| 10:762/833/843:210 | 3 | Principles of Public Policy | |
| 10:762/971:201, 10:762:306 | 3 | Intro. Urban Planning and Design | |
| 10:762:413 | 3 | Urban Revitalization | |
| *Plus 3 credits from:* | | | |
| 11:550:332 | 5 | Praxis Studio I (Junior) Section CD | EBE |
| 11:550:332 | 5 | Praxis Studio I (Junior) Section EC | EBE |
| 11:550:332 | 5 | Praxis Studio I (Junior) Section OD | EBE |
| 11:550:234 | 3 | Landscape Plants II | |
| 11:550:235 | 3 | Herbaceous Plants in the Landscape | |
| 11:573:437 | 3 | Spatial Data Visualization | |
| 16:550:545 | 3 | Intro. Geomatics | |
| 11:216:474 | 3 | Adv. Geomatics | |
| | | | |
| **TOTAL** | **71** | | |
| | | | |
| *Cannot use planning electives twice within the major.* | | | |

**List of suggested but not required certificates/minors and required number of credits:**

**Certificate Programs:**
Environmental Geomatics (19)

**Minor Programs:**
Agroecology (21-24)
Ecology, Evolution, and Natural Resources (20-23)
Environmental and Business Economics (21-23)
Entomology (19-26)
Environmental Policy, Institutions, and Behavior (21)
Environmental Sciences (21)
Marine Sciences (18)
Meteorology (18)
Plant Science (18-20)
Urban Forestry (21)

# Environmental Policy, Institutions, and Behavior 374 (SEBS)

## ENVIRONMENTAL POLICY, INSTITUTIONS, AND BEHAVIOR 374

**Degree:** B.S.

**Director:** Rachael Shwom (shwomrac@sebs.rutgers.edu)

**Program Website:** Here

**Managing Department (Department of Human Ecology):** Here

**Program Description**

Environmental policy, institutions, and behavior (EPIB) examines the human dimensions of environmental problems. It addresses such issues as how human actions affect the environment; how societies adapt to changes in natural resource availability; and how individuals, nations, and international agencies respond to environmental hazards. Courses in the program deal with local, regional, and national differences in the use of resources; social and environmental aspects of health and illness; alternative strategies for environmental management; ethical, moral, and legal dimensions of environmental and resource issues; and the roles of governmental and nongovernmental agencies in environmental affairs.

To understand these topics, students are exposed to a multidisciplinary view of the environment and draw upon concepts from a variety of fields, including anthropology, ecology, economics, geography, sociology, political science, and psychology.

The objectives of the curriculum are to teach basic concepts and methods from the social, biological, and physical sciences as they relate to the interactions among people and the environment; to train students in the techniques of empirical research; to provide opportunities for experiences in real-world situations; to guide students in acquiring practical skills such as environmental assessment, professional writing, data analysis, and demographic analysis; and to broaden students' knowledge regarding environmental problems and how people cope with them.

Graduates are prepared for careers in health and environmental agencies at all levels of government, nonprofit organizations in the United States and internationally, and private companies, including environmental consulting firms, pharmaceutical companies, and green businesses. Some students also pursue graduate or professional studies in the social sciences, public health and medicine, public administration, law, and international development.



# Learning Goals

# Learning Goals

Learning goals for the environmental policy, institutions, and behavior major:

**Goal 1**

Students graduating from the major will understand and analyze the varied perspectives offered by the social and natural sciences regarding the causes and consequences of social, ecological, and environmental change. This includes interactions among natural resources, climate, population, energy use and technology, health, forces of globalization, social institutions, and cultural values.

*Graduates should be able to:*

1.1 Describe major patterns and drivers of natural resource use, pollution, and climate and environmental change.

1.2 Identify different approaches to the governance and management of human activities that affect the environment, both in the United States and abroad, including institutions, property relations, management regimes, politics, and policies.

1.3 Explain characteristics of human populations, including population growth, demographic transitions, social stratification, consumption, and indicators of human welfare.

1.4 Describe technological trends affecting human well-being and the environment including energy use and development, biotechnology, and geospatial and communication technologies.

1.5 Evaluate major issues in health, including race, gender, and socioeconomic position, food and nutrition access and policies, cultural factors, and understanding of risk and vulnerability.

1.6 Discuss the dynamics of development and globalization, including historical antecedents, current trends and pathways, and local responses to global forces.

1.7 Explain how social forces, cultural values, and behavior affect human environmental interactions, including issues such as political and economic relations, inequality, access to resources, and interactions between human diversity and biological diversity.

**Goal 2**

Students will acquire the skills to use appropriate conceptual and methodological tools to structure inquiries about human-environment interactions.

*Graduates should be able to:*

2.1. Assess the relevant contexts for addressing environmental problems at the appropriate spatial, temporal, and organizational scale(s).

2.2. Identify the relevant biological, historical, sociocultural, governance, and political issues that need to be addressed.

2.3. Identify what constitutes valid and relevant evidence to address the question and demonstrate an ability to understand and work with quantitative information.

2.4. Conduct ethical primary and secondary research using appropriate methods and considering relevant community norms.

2.5. Analyze and interpret evidence.

2.6. Identify appropriate governance tools to manage human-environment impacts and be capable of engaging with regulatory, legislative, and other democratic processes.

2.7. Apply this understanding to identify policies and plans that address the problem.

2.8. Identify different decision-making processes and criteria for selecting from among alternatives.

2.9. Evaluate the alternatives' environmental and differentiated social consequences.

2.10. Identify relevant audiences, determine communication goals, and communicate the results in oral and/or written form in a manner effective for each targeted audience.

2.11. Work effectively in team settings.

**Goal 3**

Students will undertake their work guided by ethical considerations. They will identify their own values with respect to environmental, health, and food issues. They will evaluate and address the ethical dimensions and implications of related problems, assessments, plans, and communication, including their differentiated social impacts.



# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of environmental policy, institutions, and behavior major requirements, courses, and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges (6 credits)** *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning (3 credits)** *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences (6 credits)** *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis (3 credits)** *Students must take one course* [HST]

**Social Analysis (6 credits)** *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities (3 credits)** *Students must complete one course* [AH]

**Writing and Communication (6 credits)** *Students must take 01:355:101 or its equivalent* [WC] *and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning (6 credits)** *Students must take two courses* [QQ; QR]

## Major Requirements for All Students Regardless of Matriculation Date

**Requirement V8: Foundation courses (15 credits)**

11:374:101 Introduction to Human Ecology
11:374:279 Politics of Environmental Issues
11:374:305 Globalization, Development, and Environment
11:374:312 Environmental History
11:374:460 Environmental Law and Policy

**Requirement V9: Methods (9 credits)**

*Statistics (choose one):*
01:960:211 Statistics I
01:960:401 Basic Statistics for Research
10:762:205 Basic Statistical Methods for Policy, Planning, and Health
11:374:302 Data Analysis in Human Ecology

*Required:*
11:374:110 Theories and Reasoning in Human Ecology
11:374:201 Research Methods

**Requirement V10: Math Proficiency**

Notes: All students must place in Precalculus or higher or complete Intermediate Algebra (01:640:026)

**Requirement V11: Skills (9 credits)**

*Required:*
11:374:220 Environmental Solutions
11:374:280 Careers in EPIB

*Communication, choose one:*
11:374:225 Environment in Society and Mass Media
11:374:240 Visualizing Information: Storytelling with Data
11:374:310 Storytelling About Science
11:374:311 Environmental Writing
11:374:325 Environmental Communication

**Requirement V12: Experiential Learning Requirement (3 credits)**

*Choose one:*
11:374:399 Practicum in Sustainability
11:374:481 Watershed Management Internship
11:374:482 Climate Action Internship
11:374:483 Science and Communication Internship
11:374:490 Readings and Practicum in Human Ecology
11:374:492 Environmental Studies Internship

**Requirement V13: Policy, Governance, and Management Cluster (3 credits)**

*Choose one:*
11:374:175 Energy and Society
11:374:115 Water and Society
11:374:313 U.S. Environmental Policy
11:374:314 Natural Resource Policy
11:374:428 Marine Fisheries Policy
11:374:462 International Environmental Law

**Requirement V14: Food, Health, and Disease Cluster (3 credits)**

*Choose one:*
11:374:141 Health and Society
11:374:430 Risk, Health, and Safety
11:374:436 Segregation and Health
11:374:437 Culture and Health
11:374:438 Health in the Latino Community

**Requirement V15: Globalization, Development, and Sustainability Cluster (3 credits)**

*Choose one:*
11:374:289 Sustainable Food: Politics, Policy, and Ethics
11:374:299 Introduction to Sustainability
11:374:426 Climate Change Policy
11:374:429 Agrarian Landscapes

**Requirement V16: People, Communities, and the Environment Cluster (3 credits)**

*Choose one:*
11:374:223 Urban Society and Environment
11:374:322 Environmental Behavior
11:374:335 Communities and Environmental Change
11:374:440 Race and the Environment
11:374:416 Environmental Education
11:374:433 Environmental Justice

**Requirement V17: Upper-Level Classes (6 credits)**

Choose two additional 374 courses at the 300-400 level that are not being counted to fulfill other requirements. **Please note: 11:374:490, 11:374:491, and 11:374:492 cannot count toward this requirement.**

**Requirement V18: Capstone (3 credits)**

*Choose one:*
11:374:499 Capstone in Human Ecology
11:015:497 George H. Cook Honors
11:015:498 George H. Cook Honors
11:374:491 Capstone Independent Study

**Unspecified Electives**

In addition to courses meeting the above requirements, students can take other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 120 (matriculated 2018 or later) or 128 (matriculated prior to 2018) required for graduation.

# Environmental Sciences 375 (SEBS)

## ENVIRONMENTAL SCIENCES 375

**Degree:** B.S.

**Department:** Environmental Sciences

**Department Chair:** Donna Fennell

**Department Website:** Here

**Undergraduate Program Director:** Jeffra Schaefer

The environmental sciences program is designed to provide students with an understanding of the application of the biological, chemical, and physical sciences to problems in the environment. The core emphasizes the chemical, physical, and biological principles, and options and electives allow specialization in the study of air, water, or soils, as well as pollution and treatment sciences, and environmental health.

With the consultation of a faculty adviser, students can design a program to meet the requirements for graduate study or to provide the basis for a professional career in government, education, consulting, or industry.

The program offers a bachelor of science (B.S.) in environmental sciences, as well as a minor in environmental sciences. Within the B.S. program, we offer three options: environmental science, applied environmental science, and environmental health. The differences between the options are not large, but generally the environmental science option is more theoretical and is preferred by students considering graduate school, while the applied option is more practical and is intended to prepare students for careers in the environmental field. The environmental health option is geared toward careers in health, such as the occupational health and safety arena.

Environmental science offers a co-terminal 4+1 BS+MS program where students can pursue a 5-year joint Bachelor of Science (B.S.) and Master of Science (M.S.) degree in environmental science (website: here). Likewise, students can apply for the Accelerated Bachelors and Masters of Public Health degrees (BS/MPH) at Rutgers (website: here). Students interested in this either opportunity should discuss specific course requirements with their adviser or the undergraduate program director of environmental science.

Students can meet the requirements for the 40-hour OSHA Hazardous Waste Operations and Emergency Response certification by including the following course in their program:

11:375:434 Principles of Industrial Hygiene (3)

Environmental Sciences 375 (SEBS)

# Learning Goals

# Learning Goals

**Students completing this program will be able to:**

1. Apply knowledge, skills, and techniques from the sciences and mathematics to identify, characterize and provide solutions to environmental problems
2. Design and conduct experiments, analyze, and interpret data to draw informed conclusions
3. Communicate technical information effectively (orally, in writing, and through electronic media)
4. Function effectively on teams to accomplish collaborative tasks
5. Recognize and discuss the ethical and professional responsibilities of environmental scientists in addressing contemporary environmental science issues and the impact of environmental science in a global and societal context

Environmental Sciences 375 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of the environmental science major requirements, courses and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

*Options are chosen from lists of courses certified in each learning goal: Here.*

**Note: The SEBS Core Curriculum requirements differ slightly from SAS Core Curriculum requirements**

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future [CC-O]*

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *One course* [HST]

**Social Analysis** (6 credits) *Two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *One course* [AH]

**Writing and Communication** (6 credits) *01:355:101 or its equivalent* [WC] *and one course in communicating effectively in modes appropriate to a discipline or area of inquiry* [WCD]

**Quantitative and Formal Reasoning** (6 credits) *Two courses* [QQ; QR]

## Graduation Requirements for the Major

Students matriculating prior to the fall semester 2015 in the School of Environmental and Biological Sciences (SEBS) must complete the SEBS general education requirements. In addition, students majoring in environmental sciences must complete the major requirements described below.

Students matriculating fall 2015 or after and transfer students matriculating in 2016 and after must complete a goal-based Core Curriculum in place of general education requirements. The goal-based core is described here. Courses are certified for the Core Curriculum by a faculty committee. A current list of certified courses can be found here. Environmental sciences major requirements are as described below.

For an up-to-date description of environmental sciences major requirements, courses, and course sequences please refer to the program website here.

**PROFICIENCY IN THE ENVIRONMENTAL SCIENCES (63-82 credits)**

**1. Biological and Physical Sciences (24-34)**

01:119:103 Principles of Biology (3) or 01:119:115-116 General Biology I & II (3,3)1
01:160:161-162 General Chemistry (4,4)1
01:160:171 Introduction to Experimentation (1)
01:160:209 Elementary Organic Chemistry (3) or 01:160:307-308 Organic Chemistry (4,4)
01:750:193-194 Physics for the Sciences (4,4) or 01:750:203-204 General Physics (3,3)1
11:216:351 Principles of Ecology (3)

**2. Quantitative Skills (7)**

Calculus I (4)2
Choose one of the following:

i. 01:960:211 Statistics I (3)3 or equivalent
ii. 11:375:303 Numerical Methods in Environmental Science (3)
iii. 11:573:232 Fundamentals of Geomatics (3)

**3. Environmental Sciences (12)**

11:375:201 Biological Principles of Environmental Sciences (3)
11:375:202 Chemical Principles of Environmental Sciences (3)
11:375:203 Physical Principles of Environmental Sciences (3)
11:375:310 Analytical Environmental Chemistry Laboratory (3)4

**4. Environmental Science Lab Course, *choose one* (2-4)**

11:375:312 Environmental Microbiology Laboratory (2)
11:375:360 Soils and Water (4)
11:375:424 Air Sampling Techniques (3)

**Also choose from one of the following options:**

**Environmental Science Option (25)**
01:640:1 Calculus 2 (4)
11:375:423 Environmental Fate and Transport (3)
Environmental Science Option Courses, choose *three* (9)
11:375:346 Introduction to Atmospheric Chemistry (3)
11:375:340 Environmental Applications of Organic Chemistry (3)
11:375:302 Water and Wastewater Treatment (3)
11:375:411 Environmental Microbiology (3)

11:375:444 Water Chemistry (3)
11:375:453 Soil Ecology (3)
Electives, *see below (9)*

**Applied Environmental Option (24)**
11:375:302 Water and Wastewater Treatment (3)
11:375:307 Solid Waste Management and Treatment (3)
11:375:430 Hazardous Waste (3)
11:375:407 Environmental Toxicology (3)
Electives, *see below (12)*

**Environmental Health Option (23-25)**
11:375:302 Water and Wastewater Treatment (3)
11:375:307 Solid Waste Management and Treatment (3)
11:375:407 Environmental Toxicology (3) or ENOH 0594 Environmental and Occupational Toxicology (3)*
10:832:335 Epidemiology (3) or PHCO 0502 Principles and Methods of Epidemiology (3)*
Microbiology course, choose one (2-4):
11:375:312 Environmental Microbiology Laboratory (2) (if not already used for other major requirement)
11:680:201 Introduction to Microbiology (3)
11:680:390 General Microbiology (4)
*Electives*, see below (9)

*School of Public Health classes for B.S./M.P.H students or B.S. students with permission.

**ELECTIVES**

Students can choose from any 300- or 400-level 375 course or any of the following list of non-375 courses. **Note that to satisfy as an elective course, it must not already be used to satisfy other environmental science major or option requirements.**

*Possible electives:*
11:680:201 Introduction to Microbiology (3)
11:680:390 General Microbiology (4)
11:374:460 Environmental Law and Policy I - Nature, Law, and Society (3)
11:375:302 Water and Wastewater Treatment (3)
11:375:303 Numerical Methods (3)
11:375:307 Solid Waste Management and Treatment (3)
11:375:322 Energy, Technology, and its Environmental Impact (3)
11:375:340 Environmental Applications of Organic Chemistry (3)
11:375:346 Introduction to Atmospheric Chemistry (3)
11:375:360 Soils and Water (4)
11:375:407 Environmental Toxicology (3)
11:375:411 Environmental Microbiology (3)
11:375:421 Principles of Air Pollution (3)
11:375:423 Environmental Fate and Transport (3)
11:375:424 Air Sampling and Analysis Techniques (3)

11:375:430 Hazardous Wastes (3)
11:375:434 Principles of Industrial Hygiene (3)
11:375:444 Water Chemistry (3)
11:375:450 The Terrestrial Carbon Cycle (3)
11:375:453 Soil Ecology (3)
11:375:474 Coastal Biogeochemical Cycles in a Changing World (3)

_____

1Satisfies SEBS Natural Science [NS] requirement
2Satisfies SEBS Mathematical or Formal Reasoning [QR] requirement
3Satisfies SEBS Quantitative Information [QQ] requirement
4Satisfies SEBS Discipline-Based Writing and Communication [WCd] requirement

# Environmental Studies 381 (SAS)

## ENVIRONMENTAL STUDIES 381

Department of Geography, School of Arts and Sciences

**Website:** Here

**Chair:** Kevin St. Martin

**Director of Undergraduate Studies:** Asa K. Rennermalm

The environmental studies program provides an interdisciplinary curriculum that spans the natural sciences, social sciences, and humanities. Distribution requirements enable students to develop a broad understanding of complex environmental issues that entails thinking beyond existing disciplinary frameworks and boundaries. Through their coursework, environmental studies students acquire skill sets--in historical and scientific inquiry; critical thinking and effective communication; and social, cultural, and political analysis--that are essential to solving contemporary environmental problems. Students in the program are trained in the use of digital mapping and spatial analytical tools that are increasingly in demand by governmental agencies, nonprofit organizations, and the private sector, preparing them for a range of professional opportunities.



# Learning Goals

# Learning Goals

This program has four learning goals. Students who complete the programs will:

*1. Environmental Literacy: Understand and be able to articulate, both orally and in writing, the core principles, concepts, and theories that form the field¿s interdisciplinary foundation in the humanities, social sciences and natural sciences.*

*2. Environmental Justice: Be aware of the ways that social inequality and unequal power structures shape people¿s exposure and vulnerability to environmental risks/problems.*

*3. Environmental Methods/Techniques/Strategies of Interpretation: Be able to demonstrate proficiency in at least one method, technique, or strategy of interpretation for environmental inquiry in the natural sciences, social sciences and/or humanities.*

*4. Environmental Problem Solving Be able to apply perspectives from the social sciences, natural sciences and humanities in an integrated fashion to analyze concrete environmental problems and evaluate diverse approaches to addressing these problems.*

Environmental Studies 381 (SAS)

# Major Requirements

# Major Requirements

The major in environmental studies (ENVS) is available only as a second major to students within the School of Arts and Sciences. It consists of 36 credits of coursework reflecting the program's four-field approach (natural sciences, humanities, social sciences, and methods/techniques).

At least 18 of these credits must be earned through coursework at the 300 level or higher. No more than 9 of these credits can be double-counted for either the student's primary major or any other degree. No more than one D grade will be accepted for credit toward the major.

**Dual Major Requirement**

The major in environmental studies is designed as a second major and it is meant to complement a student's primary major in another field. All requirements for both majors must be met before the major in environmental studies can be conferred. A student's primary major may be drawn from any major recognized by the School of Arts and Sciences.

**Approved Courses**

Courses not included in the lists below must be approved by the ENVS undergraduate program director before being applied toward meeting ENVS degree requirements. Courses marked with an asterisk [*] have prerequisites in their home departments.

*Introduction to Environmental Studies (3 credits)*

01:381:101 Introduction to Environmental Studies

*Natural Science (NS) Requirement (6 credits)*

*No more than 3 credits from the following list:*

01:070:111 Extinction

01:119:160 Biology, Society, and Ecological Issues

01:450:101 Earth Systems (or 01:460:101 Introductory Geology)

01:460:100 Planet Earth

01:460:101 Introductory Geology (or 01:450:101 Earth Systems)

01:460:110 Sea Change

01:556:143 Energy and Climate Change

11:216:110 Evolution, Disease, and Medicine

11:375:103 Introduction to Environmental Health

11:670:102 Introduction to Climate Science (or 01:450:213 Global Climate System)

*At least 3 credits from the following list:*

01:070:213 Environment and Human Evolution

01:070:336 Primatology, Wildlife Ecology, and Conservation in Kenya (note: summer field school in Kenya)

01:070:337 Field Methods and Analysis in Primatology in Kenya (note: summer field school in Kenya)

01:070:345 Study Abroad - Applied Conservation in Ecosystem Management

01:070:402 Primate Conservation Biology*

01:160:439 Physical Chemistry of the Environment

01:450:212 Water Resources (or 01:460:204 The Water Planet)

01:450:213 Global Climate System (or 11:670:102 Introduction to Climate Science)

01:450:214 Conservation

01:450:306 Global Ecosystems and Biodiversity

01:450:313 Climate Change

01:450:413 Climate System and Global Climate Change

01:450:414 Geographical Hydrology

01:450:417 Coastal Geomorphology

01:460:202 Environmental Geology

01:460:203 Building and Maintaining a Habitable Planet

01:460:204 The Water Planet (or 01:450:212 Water Resources

01:460:207 Earth Resources and Sustainability

11:216:320 Controversies in Sustainability

11:573:444 Watershed Planning and Management: An Interdisciplinary Perspective

***Environmental Humanities (EH) Requirement (6 credits)***

01:195:220 Our World: Social Justice and the Environment

01:358:205 The Coming Apocalypse

01:359:209 Introduction to Health, Medicine, and Literature

01:358:262 Introduction to Literature and the Environment

01:450:409 Geohumanities

01:470:364 Big Bang: The Literature of Chaos and Order

01:506:251 History of Science and Society

01:512:111 Race, Place, and Space in American History

01:512:320 American Frontier History

01:512:324 History of the North American Environment

01:512:329 Technology and Nature in American History

01:730:249 Bioethics

01:730:250 Environmental Ethics

01:730:252 Eating Right: The Ethics of Food Choices and Food Policy

11:550:250 History of Landscape Architecture

***Environmental Social Science (ESS) Requirement (6 credits )***

*No more than 3 credits from the following list:*

01:070:111 Extinction

01:450:211 Environment, Society and Justice

01:450:214 Conservation

01:920:227 Population and Society

01:920:232 Sociology of Food and Eating

01:988:240 Gender and Science

11:374:115 Water and Society

11:374:141 Health and Society

11:374:175 Energy and Society

11:374:220 Environmental Solutions

11:374:269 Population, Resources, and Environment

11:374:279 Politics of Environmental Issues

11:550:230 Environmental Design Analysis

11:572:202 Environmental Issues in the United States

11:573:231 Fundamentals of Environmental Planning

*At least 3 credits from the following list:*

01:070:302 Culture and the Environment*

01:070:486 Gender, Development, Environment: Policies, Politics, Perspectives

01:220:334 Energy Economics*

01:220:432 Environmental Economics*

01:450:311 Natural Hazards and Disasters

01:450:317 Geography of Energy Resources

01:450:360 Cultural and Political Ecology

01:450:370 Climate Change and Society

01:790:350 Environmental Politics - U.S. and International

01:920:359 Environmental Sociology*

01:988:409 Gender, Environmental Justice, and Health

11:374:462 International Environmental Law

11:550:271 Agriculture and the Landscape

***Environmental Methods/Techniques/Modes of Inquiry (EMTM) Requirement (3 credits)***

01:450:320 Spatial Data Analysis

01:450:321 Geographic Information Systems (or 11:573:232 Fundamentals of Environmental Geomatics)

01:450:322 Remote Sensing

01:450:355 Principles of Cartography

01:450:356 Advanced Cartography*

01:450:402 Field Geography

01:450:421 Advanced Geographic Information Systems*

11:216:315 Conservation Techniques

11:375:197 Environmental Science Literacy

11:550:237 Landscape Drawing & Drafting¿

11:550:301 Social and Cultural Aspects of Design

11:573:232 Fundamentals of Environmental Geomatics (must also enroll for 1-credit lab)

11:573:233 (or 01:450:321 Geographic Information Systems)

*Environmental Studies Capstone (ESC) Requirement (3 credits)*

The environmental studies capstone requirement is typically met through participation in the upper-level environmental studies seminar listed below. The ENVS seminar is an integrative, problem-based, project-oriented course for students in their junior or senior years who have declared the ENVS major and completed the bulk of their ENVS coursework. This faculty-led seminar is structured to facilitate interdisciplinary student work. Seminar participants work collaboratively over the course of a semester on a selected environmental issue, demonstrating through specific assignments how perspectives representing each of the ENVS fields can be brought to bear on a given environmental problem. The ESC requirement may also be met through an internship, service-learning experience, study abroad, or honors project with approval of the undergraduate adviser. Students fulfilling the ESC requirement through one of these alternative means may also enroll in the ENVS seminar as an elective.

01:381:400 Environmental Studies Seminar (3 credits)

*Electives (9 credits)*

Electives may be drawn from among any of the approved courses listed above. Special topics courses taught in ENVS or other departments may also be counted toward particular degree requirements with permission of the undergraduate director. Similarly, the following special courses may be applied to meet any of the ENVS distribution requirements with the approval of the undergraduate director, depending on their contents. No course may be used to satisfy more than one degree requirement, however.

01:381:371,372 Environmental Studies Topics

01:381:485,486 Environmental Studies Internship

01:381:491,492 Environmental Studies Independent Study

01:381:495,496 Honors in Environmental Studies

Study abroad courses not listed above.

**Departmental Honors Program**

The distinction of Honors in Environmental Studies is awarded to graduating seniors who achieve: (1) a GPA of 3.50 or higher within the major at the end of their penultimate semester prior to graduation; or (2) a GPA of at least 3.35 within the major at the end of the penultimate semester, followed by the successful submission and defense of an approved honors thesis. The distinction of Highest Honors in Environmental Studies is awarded to students who achieve a cumulative GPA of 3.50 or higher within the major at the end of the penultimate semester, and successfully submit and defend an approved honors thesis.

The honors thesis is produced under the supervision of a faculty committee. This committee consists of two faculty members: a principal thesis supervisor, who works closely with the student on the honors project over the course of a full academic year; and a second reader of the thesis, who reviews the final product and participates in the thesis defense. Faculty members who teach approved ENVS courses typically serve as thesis advisers. Students should recruit their advising team at the end of the junior year. Thesis research and writing fulfills the requirements of Honors in Environmental Studies 381:495 and 381:496 (3 credits per semester scheduled during senior year). After completing relevant research and producing a finished draft of the thesis, the student gives an oral presentation of their work and defends the thesis by responding to questions posed by the primary supervisor and second reader. Final revisions to the thesis must be completed to meet degree completion deadlines--typically mid-April for a spring degree--if the student plans to graduate with honors on the basis of the thesis option.



# Minor Requirements

# Minor Requirements

The minor in environmental studies (ENVS) consists of 18 credits of coursework reflecting each of the program's major fields. Detailed course list is available on Degree Navigator.

***Requirement 1:*** 01:381:101 Introduction to Environmental Studies (3)

***Requirement 2:*** Natural Sciences. A total of 3 credits (See detailed course list on Degree Navigator.)

***Requirement 3:*** Environmental Humanities. A total of 3 credits (See detailed course list on Degree Navigator.)

***Requirement 4:*** Environmental Social Sciences. A total of 3 credits (See detailed course list on Degree Navigator.)

***Requirement 5:*** ENVS Methods/Techniques. A total of 3 credits (See detailed course list on Degree Navigator.)

***Requirement 6:*** Elective. A total of 3 credits (See detailed course list on Degree Navigator.)

A maximum of 6 credits toward the minor in ENVS can be earned at the 100 level.

At least 6 credits toward the minor in ENVS must be earned at the 300-400 level.

No more than 6 of these credits can be double-counted for another program.

No more than one course with a grade of D may be used in the minor in ENVS.

Environmental Studies 381 (SAS)

# Courses

# Courses

**01:381:101** ***Introduction to Environmental Studies (3)***
Introduction to the field of environmental studies, including biophysical, social science, and humanities-based frameworks. Integrated, interdisciplinary approach to contemporary environmental issues.

**01:381:371,372** ***Environmental Studies Topics (3,3)***
Focused review of current research on a contemporary environmental topic.

**01:381:400** ***Environmental Studies Seminar (3,3)***
Integrative, problem-based, project-oriented course. Students work collaboratively over the course of a semester on a selected interdisciplinary environmental issue.

**01:381:485,486** ***Environmental Studies Internship (3,3)***
Application of environmental studies skills in a professional employment setting. Individually designed and evaluated experience under supervision of internship adviser.

**01:381:491,492** ***Environmental Studies Independent Study (BA,BA)***
Research on topic in environmental studies for environmental studies students in their junior or senior year. Individually designed and evaluated experience under supervision of faculty member.

**01:381:495,496** ***Honors in Environmental Studies (3,3)***

# European Studies 360 (SAS)

## EUROPEAN STUDIES 360

Center for European Studies, School of Arts and Sciences

**Website:** Here

**Director:** Belinda Davis

The program in European studies seeks to enrich Rutgers University students' understanding of the historical and ongoing transformations of Europe's peoples, cultures, societies, and politics through an interdisciplinary approach. The major encourages the comparative and transnational analysis of various issues concerning the construction of Europe itself and its place in a global context. The program defines Europe broadly and focuses primarily if not exclusively on the modern (post-1700) period.

The faculty supports the idea that different disciplinary approaches to European studies complement each other and enable students to examine the complex variety of ways that Europe can be understood. For this reason, the two core course requirements are situated in several disciplines; for remaining courses, majors, and minors may choose from the range of relevant courses across the University. Students should be in close contact with a program adviser in designing their course of study.

European Studies 360 (SAS)

# Learning Goals

# Learning Goals

Students will develop a historically informed, contextual, and interdisciplinary understanding of modern Europe. Students will gain an appreciation of the historical, social, political, linguistic, and geographic forces that shaped European cultures with courses from history, geography, the social sciences, and language and literature departments. The program breaks with the traditional distinctions between the study of eastern and western Europe, enabling students to explore the broader boundaries of Europe and its role in the global context. European studies is committed to encouraging linguistic and cultural knowledge. Majors will become familiar with one or more European cultures via language acquisition and in-country experience through study abroad of at least six weeks. With their adviser, majors will develop an individual concentration. European studies majors and minors will be able to apply their knowledge to analyze current global challenges, including the relationship of Europe (the European Union [EU], and also well beyond) to the rest of the world.

European Studies 360 (SAS)

# Disciplinary Tracks

# Disciplinary Tracks

The curriculum offers a choice among three general tracks. The European environment and geography and the European culture tracks reflect orientations to inquiry that have traditionally been associated with the (natural and social) sciences and the humanities, respectively. The European politics, economics, and society track emphasizes interdisciplinary approaches to contemporary public issues.

Students with interests in the evolution, transformation, or management of Europe's physical environments or the role of science and technology in European affairs should choose the European environment and geography track. Within this track it is possible to choose either an earth and atmospheric science focus or a bioscience-ecological (including human ecological) science focus.

Students with interests in the development of distinctive European ideas, identities, and cultural achievements should choose the European culture track. Within this track it is possible to specialize in the study of belief systems or creative expression and communication systems.

Students with interests in contemporary processes of European social, political, and economic restructuring should choose the European politics, economics, and society track. Within this track it is possible to specialize in sociological, anthropological, economic, political, institutional, and spatial dimensions of contemporary change in the context of an expanding Europe and its evolving role in global affairs.

European Studies 360 (SAS)

# Major Requirements

# Major Requirements

The major consists of 36 credits. Except for the core courses, all courses chosen, including electives, must first be approved by an adviser. See the complete list of European studies courses online.

*Core Courses (15 credits)*

All majors are required to take the following courses:

01:510:101 Ancient and Medieval Europe (3)

01:510:102 Europe in the Global Age (3)

01:360:301 The Construction of Contemporary Europe (3)

01:360:401 The Idea of Europe: 18th Century to the Present (3)

01:450:332 Eastern Europe and Eurasia (3) *or* 01:450:334 Western Europe (3)

*Focus:* 12 credits within a chosen track.

*Electives:* 9 credits (may include up to 3 credits for language instruction). In addition to 01:510:101, students are encouraged to take an elective course that covers a period earlier than 1700.

A grade of C or better in all courses credited toward the major is required for graduation.

European Studies 360 (SAS)

# Focus

# Focus

Students, with the help and approval of an adviser, will develop an idea or theme of special interest, which they will explore in four courses (12 credits) within their chosen track. At least two courses must be at the 300 level or above. Special topics courses in different disciplines may be used to satisfy these requirements with the prior permission of the program director. One independent study course may be used to satisfy part of these requirements. Students may develop an individualized concentration that focuses on a period before the 18th century.

European Studies 360 (SAS)

# World Language Requirement

# World Language Requirement

All majors are required to demonstrate proficiency in at least one European language other than English. The minimum requirement is fulfilled by demonstrated proficiency equivalent to four semesters of college-level study with an average grade of B or better. A standardized test can be used to satisfy this requirement.

European Studies 360 (SAS)

# Study Abroad Requirement

# Study Abroad Requirement

All students are required to complete an approved study abroad program in Europe of at least six weeks in duration. Students are strongly encouraged to spend a semester or academic year abroad. Courses taught by Rutgers faculty in Europe can be used to fulfill this requirement. Under special circumstances this requirement may be waived. Credit from approved study abroad courses may be applied to fulfill the focus or elective requirements.

European Studies 360 (SAS)

# Minor Requirements

# Minor Requirements

Students must complete 18 credits with a grade of C or better in the following courses:

01:510:101 Ancient and Medieval Europe (3)

01:510:102 Europe in the Global Age (3)

01:360:301 The Construction of Contemporary Europe (3)

01:360:401 The Idea of Europe: 18th Century to the Present (3)

01:450:332 Eastern Europe and Eurasia (3) *or* 01:450:334 Western Europe (3)

One elective course focusing on Europe, to be approved by the director of the European studies program (3)

There is no foreign language or study abroad requirement for the minor.

European Studies 360 (SAS)

# Honors

# Honors

The program is intended for senior majors in European studies. Students who have successfully completed at least 15 credits in European studies with a grade-point average of 3.4 or better in these courses and a grade-point average of 3.0 or better overall are invited to apply. Eligible candidates may pursue honors in one of two ways.

The first is a two-semester 6-credit senior thesis option in which students are expected to conduct original research and prepare an original piece of scholarship as their senior thesis. Both semesters must be completed in order to receive credit. Students are responsible for recruiting an appropriate faculty member to supervise their research and thesis. Interested students should draft a thesis proposal and consult with faculty members whose expertise lies in an appropriate area. During the second semester of work, a faculty committee will conduct an oral examination in which the honors candidate will defend his or her findings and demonstrate a grasp of the literature in the area encompassed by the research undertaken.

Alternatively, students may elect to achieve honors through one of the school honors programs or Honors College. Successful completion of any of the school honors programs under the supervision of a faculty member in the European studies program will automatically result in the award of departmental honors.



# Courses

# Courses

**01:360:101** ***Perspectives on Europe (3)***
Multidisciplinary perspectives on European cultures, politics, languages, and histories. Topics and instructors may vary.
***Primarily for first- and second-year students.***

**01:360:292** ***Topics in European Studies (3)***
Selected topics, varying by semester. Specific titles announced at the time of registration.

**01:360:301** ***The Construction of Contemporary Europe (3)***
A survey of the politics, history, economics, geography, economy, and culture of the European Union.
***Prerequisites: 01:510:101,102.***

**01:360:320** ***Politics and Social Policy: Lessons from Europe (3)***
European approaches to 21st-century policy challenges in common with the United States, such as health care, climate change, education, a fractured social safety net, an aging population, high unemployment, and growing deficits.
***Credit not given for both this course and 01:360:290 or 01:790:290 or 01:790:320.***

**01:360:401** ***The Idea of Europe: 18th Century to the Present (3)***
Philosophical-historical dimensions of European identity and unity. Readings of primary sources central to the invention and ongoing redefinitions of the concept of Europe. Focuses on European identity, boundaries, and "otherness" in their historical development.
***Prerequisites: 01:510:101,102. Credit not given for both this course and 01:510:401.***

**01:360:490** ***Independent Study (3)***
Independent study in the field of European studies. Topic subject to approval of director of program in European studies.
***Prerequisite: Permission of program director.***

# Exercise Science 377 (SAS)

## EXERCISE SCIENCE 377

Department of Kinesiology and Health, School of Arts and Sciences

**Website:** Here

**Chair:** Brandon Alderman

**Vice Chair Education and Administration:** Joanne Hunt

**Vice Chair Research:** Marsha Bates

**Undergraduate Academic Director:** Andrea Spaeth

**Distinguished Professors:**

Marsha Bates, B.A., Indiana (Pennsylvania); M.S., Ph.D., Rutgers

Labros Sidossis, B.S., Thessaloniki (Greece); M.S., CUNY (Queens College); M.A., Texas (Austin); Ph.D., Texas Medical Branch (Galveston)

**Professor:**

Peter Kokkinos, B.S., Bowie; M.A., Ph.D., Maryland

Jennifer Buckman, B.A., Rutgers; M.S., Ph.D., Oregon Health and Science; M.B.A., Rutgers

**Associate Professors:**

Brandon Alderman, B.S., B.A., M.S., Wyoming; Ph.D., Arizona State

Sara Campbell, B.S., M.S., Bloomsburg, Ph.D., Florida State

Steven K. Malin, B.S., King¿s College; M.S., Delaware; Ph.D., Massachusetts Amherst

Andrea Spaeth, B.A., Elon; M.A., William and Mary; M.A., Ph.D., University of Pennsylvania

**Assistant Professors:**

Ryan Dougherty, B.S., Wisconsin; M.S., Wisconsin; Ph.D., Wisconsin

Erik Hummer, B.S. Pacific Lutheran, M.S., Western Washington, Ph.D. Tennessee

Assistant Teaching Professors:

Anthony Delli Paoli, B.S. Rutgers, M.S. Michigan State, Ph. D Michigan State

Jason Henderson, B.S., Rutgers; M.M.S., Duke University; J.D., Rutgers

Joanne Hunt, B.S., Pennsylvania State; M.A., New York

Nicole Nagle, B.S., Rutgers; D.P.T., New York Medical College

Javier Robles, B.A., Rutgers, J.D. Seton Hall Law

Lisa Rossman-Murphy, B.A., Rutgers; B.S., M.S., CUNY (Staten Island); D.P.T., Arcadia

Latisha Forster Scott, B. A. Hofstra; M.S. Brooklyn College (CUNY); Ph.D., Temple

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Latisha Forster Scott, B. A. Hofstra; M.S. Brooklyn College (CUNY); Ph.D., Temple

**Teaching Instructors:**

Jaime Cosloy, B.S., Rutgers, J.D., Baltimore

Adam DiVine, B.S., Rutgers

Reubinedde Malamug, B.S., Rutgers, M.H.A., Drexel

Morgan Murray B.S., Rutgers, M.S., Rutgers

Nadyne Venturin-Trindade: M.Sc., Federal University of Paraná

# Learning Goals

# Learning Goals

Exercise science majors will demonstrate mastery of concepts crucial to an understanding of basic human anatomy and physiology. After two years of basic math and science (biology, chemistry, physics, calculus, and statistics), upper-level students study human physiology as it relates to exercise and physical activity via such courses as system physiology, exercise physiology, kinesiology, motor learning, exercise and aging, administration, biomechanics, and movement for special populations. Upon completion of the undergraduate science program, students are qualified for graduate or professional programs in medicine, exercise physiology, physical and occupational therapy, cardiac rehabilitation, corporate fitness, athletic training, nurse practitioner, physician assistant, as well as most other health-related professions.

Exercise Science 377 (SAS)

# Major Requirements

# Major Requirements

**Declaring the Major**

Students who wish to declare a major in exercise science must:

1. Have completed a minimum of one semester at Rutgers University with a minimum overall grade-point average of 2.0

   OR

   Have transferred in to Rutgers University with a minimum of 15 credits
2. Attend a department declaration meeting
   Meetings for declaring a major are scheduled throughout the fall and spring semesters. At the start of each semester, the link to register for a declaration meeting posted on the department website.

Meetings for declaring a major are scheduled throughout the fall and spring semesters. At the start of each semester, the link to register for a declaration meeting posted on the department website.

Students in the Schools of Arts and Sciences (SAS) or the School of Environmental and Biological Sciences (SEBS) use the MyMajor system to submit the major declaration request. The declaration request is approved after the student attends the mandatory department declaration meeting.

Students from other schools within Rutgers University can declare a major in exercise science only with approval of the dean of their school and attendance at the declaration meeting.

**Course Requirements**

To graduate with a degree in exercise science, students must have at least a 2.0 grade-point average in the required courses.

*The following courses are required for the exercise science major:*

01:119:115-116 General Biology I,II (4,4)
01:119:117 Biological Research Lab (2)
01:146:356 Systems Physiology (3)
01:160:161-162 General Chemistry I,II (4,4)
01:160:171 Introduction to Experimentation (1)
01:377:140 Foundations of Kinesiology and Health (1.5)
01:377:205 Principles of a Healthy Lifestyle (1.5)
01:377:223 Functional Human Anatomy (3)
01:377:224 Functional Human Anatomy Lab (1)
01:377:275 Basic Statistics for Exercise Science (3)
01:377:301 Psychology of Sport and Exercise (3) or 01:377:455 Exercise Psychology (3)
01:377:310 Motor Learning (3)
01:377:350 Biomechanics (3)
01:377:370 Exercise Physiology (3)
01:377:371 Exercise Physiology Lab (1)
01:377:407 Administration of Exercise Science (1.5)
01:377:410 Exercise Testing and Prescription (3)
01:377:493 Internship in Exercise Science (3)
01:640:135 Calculus I (4)
01:750:193-194 Physics for the Sciences I,II (4,4)
01:830:101 General Psychology (3)

*Elective Requirement - must complete 6 credits of electives*

The exercise science major requires 6 credits of electives. Students should consult the university online catalog, Degree Navigator, or speak to the Department of Kinesiology and Health Academic Adviser to determine if any of the courses have prerequisites or restrictions.

A minimum of 3 elective credits must be within the department (377 or 955 subject code). At least 3 elective credits must be at the 300+ level. A maximum of 3 elective credits can be at the 200 or lower level.

**DPT 4 + 3 Program**

Within the exercise science major, there is a Pre-Physical Therapy Concentration. This Pre-PT concentration is only available to first-year students enrolled in the School of Arts and Sciences or the School of Environmental and Biological Sciences. This concentration is designed to prepare students who will be applying to the Rutgers University doctor of physical therapy (D.P.T.) program after graduation and provides seminars, career development workshops, and volunteering opportunities.

Students who meet the following requirements are eligible to apply for this concentration:

- Declare exercise science major in the spring of their first year. It is recommended students attend one of the first two declaration meetings.

- Apply to the Pre-PT concentration application. This opens February 1 each year and access to the application is granted by emailing Dr. Nagle at nmnagel@kines.rutgers.edu.
- Complete the following courses at Rutgers University during their first-year fall semester: 01:119:115 General Biology and 01:377:140 Foundations of Kinesiology and Health. If you have not completed these courses email Dr. Nagle at nmnagle@kines.rutgers.edu to discuss.
- Maintain a minimum of 3.3 GPA during first-year fall semester at Rutgers University and can have no more than one C in any course
    - If a grade of C is received, that course must be retaken by the time of application into the DPT 4+3 program, and a letter grade of B or better needs to be achieved in that course.

Exercise Science 377 (SAS)

# Internship Program

# Internship Program

Students in the exercise science major must complete a 3-credit internship 01:377:493 (126 hours) during their senior year. The option is also available to complete a 6-credit internship 01:377:498 (252 hours). The internship provides students with the opportunity to practice and/or apply knowledge and skills in various professional environments.

To qualify for the senior internship, students must satisfy the following criteria:

1. Complete a minimum of 90 credits, with a minimum of 20 credits in the major.
2. Overall GPA must be at least 2.0.
3. Major GPA must be at least 2.0.
4. Meet all deadlines for submission of the application document.
5. Attend the mandatory pre-internship Canvas page as well as a course meeting prior to the start of the start of their internship hours.

Exercise Science 377 (SAS)

# Departmental Honors

# Departmental Honors

**Departmental Honors**
There are three categories of honors in exercise science: honors, high honors, and highest honors. The criteria for achieving honors involves academic performance, as evidenced by the student's major grade-point average (GPA).

**Honors Criteria**
***Honors:*** 3.600 major GPA

***High Honors:*** 3.800 major GPA

***Highest Honors:*** 4.00 major GPA

Exercise Science 377 (SAS)

# Courses

# Courses

**01:377:140** ***Foundations of Kinesiology and Health (1.5)***

Historical, philosophical, and scientific foundations of the discipline.

***Not open to seniors.***

**01:377:160** ***Introduction to Physical Therapy (PT) (1.5)***
Introduction to the health care rehabilitation specialty of physical therapy prior to a subsequent clinical experience.

**01:377:161** ***Observation in Physical Therapy (1.5)***
A minimum of 50 hours of supervised exposure in a clinical physical therapy setting for those interested in pursuing the field. Clinical application of academic coursework.
***Prerequisite: 01:377:160.***

**01:377:170** ***Principles of Strength and Conditioning (1.5)***
Organization, implementation, and supervision of strength training programs, with an emphasis on the anatomical and kinesiological aspects of strength training.

**01:377:180** ***Exercise and Relaxation (1.5)***
Utilizes the components of fitness with an emphasis on cardiorespiratory endurance and flexibility to achieve fitness. Modalities used for stress reduction include progressive relaxation techniques and humor.

**01:377:191** ***Cardiovascular Conditioning (1.5)***
Individualized programming of aerobic activities based on needs and interests of adult populations; designing aerobic fitness programs for specific populations.

**01:377:205** ***Principles of Healthy Lifestyle (1.5)***
Introduction to the concept of healthy lifestyle for prevention and treatment of lifestyle-related diseases such as cardiovascular diseases, diabetes, strokes and obesity. Concept of wellness and the role of lifestyle in health promotion and disease prevention. Focus on evidence-based knowledge to design and promote an integrated health approach.
***Credit not given for this course and 01:377:240.***

**01:377:213** ***Functional Human Anatomy (4)***Systemic and regional study of gross structure of the human body emphasizing functional interdependency among anatomical systems. Human cadaver lab.
***Lec./Lab. Prerequisites: 01:119:115-116.***

**01:377:215** ***Techniques of Athletic Training (3)***
Techniques of athletic training including evaluation, treatment, and rehabilitation of injuries common in athletics.
***Prerequisite: 01:377:223-224 or 01:119:128.***

**01:377:223** *Functional Human Anatomy (3)*
Systemic and regional study of gross structure of the human body emphasizing functional interdependency among anatomical systems.
*Prerequisites: 01:119:115-116*

**01:377:224** *Functional Human Anatomy Lab (1)*

Human cadaver lab.

*Pre-requisites: 01:119:115-116. Co-requisite: 01:377:223*

**01:377:225** *Contemporary Health Topics (3)*
Principles in healthful living. A concept of total health, influence factors, and issues of mental health, family living, consumer education, disease prevention and control.

**01:377:246** *Safety Education and Emergency Care (3)*
Prevent, and manage and treat life-threatening illnesses and injuries. Topics to include both emergent and nonemergent injuries and illnesses. This course leads to certification in First Aid, Adult, Child and Infant CPR, and AED.

**01:377:252** *Health and Wellness in Underserved Populations (3)*
Health and Wellness in Underserved Populations examine issues of health equity, health disparities, and social justice in often underserved and marginalized communities.

**01:377:275** *Basic Statistics for Exercise Science (3)*
Introduction to applied descriptive and inferential statistics for exercise science.
*Prerequisite: 01:640:026 or above. Credit not given for both this course and 01:955:276.*

**01:377:282,283** *Current Topics in Kinesiology and Health (1.5,3)*
Current issues in kinesiology and health. Topics vary by interest of instructor and students.

**01:377:301** *Psychology of Sport and Exercise (3)*
Psychological theories and principles applied to sport. Sport influence on the quality of life at all levels of sport proficiency. Psychological techniques related to performance enhancement.
*Prerequisite: 01:830:101.*

**01:377:304** *Exercise and Aging (3)*

Examination of the effects of exercise and chronic activity on the physiological and psychological changes that occur with aging and of the factors to consider when structuring exercise programs for the aged.

*Prerequisite: 01:377:223.*

**01:377:310** *Motor Learning (3)*
Study of the processes that underlie learning and performance of motor skills.
*Lec./Lab. Prerequisites: 01:377:223 or 01:119:128, and 01:830:101.*

**01:377:315** ***Advanced Techniques of Athletic Training (3)***
In-depth analysis of athletic injury mechanisms, injury evaluation techniques, use of modalities and anatomy of the extremities.
***Prerequisite: 01:377:215.***

**01:377:324** ***Movement Experiences for Individuals with Disabilities (3)***
Survey of major mental and physical conditions that may require consideration in movement experiences.
***Prerequisite: 01:377:223-224.***

**01:377:325** ***Methods and Lifestyle Assessment (3)***
Introduction to lifestyle assessment methodology. Specific assessment tools for body composition, diet, physical activity, stress, and readiness for behavioral change. Interpretation of assessment results in holistic, integrated manner stressing the importance of overall lifestyle components in health promotion and wellness. Lab reinforces the practical application of assessment methodologies.
***Lecture/Lab. Prerequisite: 01:377:370.***

**01:377:327** ***Field Experience for Special Populations (1.5)***
Provides supervised exposure to professional opportunities with children/adults with disabilities or senior citizens. Must have completed at least 60 credits to enroll.

***Must have completed at least 60 credits to enroll.***

**01:377:334** ***Physical Activity and Health (3)***
Physical, social-psychological, and neurobiological responses to physical activity and the health benefits associated with physically active lifestyles; psychological theories of health-oriented exercise behavior; and interventions for increasing behavioral adherence to physical activity. Examines health consequences of physical inactivity and sedentary living. Focus on obesity, anxiety, depression, cancer, cardiovascular diseases, and the psychodynamics of rehabilitative medicine.
***Prerequisite: 01:377:140.***

**01:377:336** ***Sleep, Health and Performance (3)***
Functions of the brain and body underlying sleep and circadian rhythms with a focus on the relationship between sleep, health, performance, and safety. Introduction to the causes and treatments of insufficient sleep and sleep disorders. Personal and public policy towards sleep.
***Prerequisite: 01:119:115,116 and 01:830:101***

**01:377:340** ***Pediatric Physical Development and Fitness***
Provides a basic framework of knowledge on pediatric development from birth through maturation; the relationship between exercise and growth and the unique needs of the pediatric population; current trends and health protocols including youth sports participation; and the impact of technology on the wellness of today's youth as it pertains to physical fitness.
***Prerequisite: 01:377:223 or 01:119:128.***

**01:377:343,344** ***Workshop in Exercise Science (1,1)***
Laboratory experience in analyzing and evaluating human movement.
***Open only to junior and senior majors by permission of department.***

**01:377:350** ***Biomechanics (3)***

Study of human movement through the application of basic mechanical principles and cinematographic procedures; emphasis on analysis of sport skills from a quantitative perspective.

*Prerequisites: 01:377:223-224 or 119:128 and 01:750:193 or 01:750:201 or 01:750:205.*

**01:377:360** *Cannabis: From Counterculture to Cure-All (3)*
Basic principles of numerous scientific fields, such as neuroscience, physiology and pharmacology, from the vantage of Cannabis Sativa. Covers the plant's biological and genetic characteristics and the pharmacology, physiology and neurobiology of its well-known active ingredients THC and CBD. Influence of THC and CBD on human health and behavior and addiction potential.
*Prerequisites: 01:119:115-116 and 01:830:101.*

**01:377:362** *Independent Study in Exercise Science (3)*
Supervised individual research or study in the field of exercise science.
*Open only to junior and senior majors by permission of department.*

**01:377:370** *Exercise Physiology (3)*
Selected topics dealing with the physiological responses to exercise stress and the adaptive changes that occur with training.
*Prerequisites: 01:377:223-224 or 01:119:128 and 01:160:162 and 01:160:171*

**01:377:371** *Exercise Physiology Laboratory (1)*
Laboratory to accompany 01:377:370.
*Pre-requisite: 01:377:223-224 or 01:119:128 and 01:160:162 and 01:160:171 Pre/Co-requisite: 01:377:370.*

**01:377:381** *Metabolic Adaptations to Exercise (3)*
Essential concepts of biochemistry--molecular biology, basic chemistry, metabolism, and transcription regulation--as applied to the exercising human, as well as current understanding of sports nutrition.
Pre- or corequisite: 01:146:356 and 01:377:370.

*Pre- or corequisite: 01:146:356 and 01:377:370.*

**01:377:401** *Theory of Strength and Conditioning (3)*
The purpose of this course is to equip exercise science students with the knowledge, skills and abilities required of a strength and conditioning professional. This course will also prepare students for the Certified Strength and Conditioning Specialist (CSCS) exam administered by the National Strength and Conditioning Association (NSCA).
Prerequisite: 01:377:370

*Prerequisite: 01:377:370*

**01:377:404** *Research Methods for Exercise Science (1.5)*

Logic and design of experiments typical in the field of exercise science; analysis and interpretation of data; writing of formal research reports.

*Prerequisite: 01:377:275 or 413 or 01:830:200 or 01:960:212 or 401. Open only to majors.*

**01:377:407** *Administration of Exercise Science (1.5)*

Application of managerial processes to include management concerns in both clinical settings and fitness management.

Open only to senior majors. Prerequisite: Must have 90 credits. Recommended as corequisite for internship.

*Open only to senior majors. Prerequisite: Must have 90 credits. Recommended as corequisite for internship.*

**01:377:408** *Exercise and Epidemiology of Chronic Disease (3)*
The relationship between health-related behaviors and chronic diseases such as cardiovascular diseases, diabetes, and obesity. Evidence of the effect of lifestyle practices including diet, exercise, and stress on the human metabolism and the overall health. Etiology of major chronic diseases and early life determinants on health.
*Prerequisite: 01:377:370.*

**01:377:410** *Exercise Testing and Prescription (4)*

Application of physiological principles and development of practical skills for fitness evaluation and exercise prescription.

Prerequisites: 01:377:370-371 and 01:377:275 or 01:830:200 or 01:960:212 or 01:960:401.

*Prerequisites: 01:377:370-371 and 01:377:275 or 01:830:200 or 01:960:212 or 01:960:401.*

**01:377:412** *Advanced Exercise and Aging - Health Outcomes and Risk Assessment (3)*
Students will explore the relationship between health-related and chronic diseases more prevalent in the elderly such as sarcopenia, osteoporosis, atrial fibrillation, and stroke. Students will gain evidence-based knowledge on how to assess fitness status in the elderly, risk associated with certain exercise, medication-exercise interaction, and cardiac responses during exercise and their clinical significance.
*Prerequisites: 01:377:370 and 01:377:304.*

**01:377:415** *Lifestyles of the Mediterranean - Greece (3)*
Study abroad opportunity in Greece. Students will study and experience the adoption of the Mediterranean lifestyle in everyday life, combining lectures with experiential activities to cover its fundamental principles and components. These include the adoption of the Mediterranean diet, along with a physically active lifestyle (emphasis on group outdoor activities), and other lifestyles habits that have been found beneficial for health (e.g., adequate rest, relaxation, hydration, conviviality).

**01:377:416** *Exploring the Origins of the Mediterranean Diet in Crete Island - Greece (6)*

Study abroad in the Crete Island. Study of the Mediterranean diet in its place of origin. Sustainable food production and consumption patterns emphasizing traditional Mediterranean practices.

**01:377:417** *Pediatric Health: Contemporary and Cultural Factors (3)*
This course examines contemporary and cultural factors impacting physical activity and health of the developing child. Areas of study will include environmental conditions, climate change, obesity, use of new technology, risk behavior, substance use, and cultural differences and their effect on stress levels, participation in physical activity, and overall healthful living and development for the pediatric population.
Prerequisites: 01:830:101 and 01:377:223 or 01:119:128

*Prerequisites: 01:830:101 and 01:377:223 or 01:119:128*

**01:377:454** *Advanced Exercise Physiology (3)*
Contemporary research topics in exercise physiology that include acute and chronic adaptations to exercise, central and peripheral neuromotor function, neuroendocrine response to exercise, environmental physiology, biochemical monitoring of exercise, and performance enhancement/training theory.
***Prerequisites: 01:377:370.***

**01:377:455** *Exercise Psychology (3)*
Major psychological theories that have been employed to study human behavior in the context of physical activity. Includes theories in the areas of personality, anxiety, motivation, goal-setting, and social support among others.
Prerequisite: 01:830:101

***Prerequisite: 01:830:101***

**01:377:475** *Nutrition and Fitness (3)*
The interactions between nutrition and exercise by integrating metabolism and physiology concepts in the context of recreational physical fitness training. Topics include fluid, macronutrient, and micronutrient requirements for sport and explore specific roles that carbohydrates, fats, proteins, vitamins, and minerals play in fueling the body for exercise. Special topics include nutritional concerns of athletes and dietary supplements.
***Credit not given for both this course and 11:709:475. Prerequisites: 01:377:370 or 01:119:115-116 and 11:709:255. Open only to juniors and seniors.***

**01:377:480** *Honors Seminar in Exercise Science (3)*
Design of an original research project in exercise science complete with a literature survey, problem statement, research hypotheses, experimental design, research procedures, appropriate data analyses, and potential implications.
***Prerequisite: 01:377:275 or 01:377:413 or 01:830:200 or 01:960:212 or 01:960:401. Open only to juniors in departmental honors program.***

**01:377:481** *Honors Research in Exercise Science (3)*
Independent study for seniors who have been accepted into the departmental honors program.
***Prerequisites: 01:377:480 and permission of department.***

**01:377:482** *Topics in Kinesiology and Health (1.5)*
Current issues within the fields of kinesiology and health. Contact the department for titles, descriptions, and requirements of each section offered.

**01:377:483,484,485** *Topics in Kinesiology and Health (BA)*
Current issues within the fields of kinesiology and health. Contact the department for titles, descriptions, and requirements of each section offered.

**01:377:491** *Independent Study (BA)*
Supervised individual research or study.
***Prerequisite: Permission of department. Open only to majors.***

**01:377:493** *Internship in Exercise Science, 3 credit (3)*
Supervised individual fieldwork in exercise science.
***Prerequisites: Permission of department via its application process, 90 credits, and a 2.0 cumulative grade-point average both overall and in the major. Open only to exercise science majors.***

**01:377:496** ***EKG: Use and Interpretation (3)***
Evaluation of the scientific basis and utility of the EKG and exercise stress test. Information on obtaining and interpreting EKGs.
***Prerequisite: 01:146:356. Recommended: 01:377:370.***

**01:377:497** ***Internship 2 in Exercise Science (3)***
Additional supervised individual fieldwork.
***Prerequisites: 01:377:493 or 01:377:498. Permission of department via its application process and a 2.0 cumulative grade-point average both overall and in the major. Open only to majors.***

**01:377:498** ***Internship in Exercise Science, 6 credit (6)***
Supervised individual fieldwork in exercise science.
***Prerequisites: Permission of department via its application process, 90 credits, and a 2.0 cumulative grade-point average both overall and in the major. Open only to exercise science majors.***

# Cinema Studies 175 (SAS)

## CINEMA STUDIES 175

School of Arts and Sciences

**Website:** Here

**Program Director:** Susan Martin-Márquez

**Faculty:**

Sandy Flitterman-Lewis, English; Ph.D., California (Berkeley)

David Fresko, Cinema Studies; Ph.D., Stanford

Regina Karl, German; Ph.D., Yale

Susan Martin-Márquez, Spanish and Portuguese; Ph.D., Pennsylvania

Albert G. Nigrin, Cinema Studies; M.F.A., Rutgers

Meheli Sen, AMESALL; Ph.D., Emory



# Learning Goals

# Learning Goals

Majors and minors will achieve mastery of the close textual analysis of moving image media, a crucial form of visual literacy in the 21st century. They will be able to demonstrate knowledge of the history of the film medium and major international film movements and creative figures, and will gain familiarity with the conventions of narrative and

genre in the cinema, as well as with more experimental forms of filmmaking. Majors and minors will employ critical thinking and basic theoretical concepts to achieve an understanding of the interrelationship of film with shifting social, political, and cultural trends. They will also develop their critical writing skills, and produce an extended analytical and/or research paper in a seminar setting in the program's capstone course.

Cinema Studies 175 (SAS)

# Major Program

# Major Program

The interdisciplinary major in cinema studies consists of 11 courses, completed with the grade of C or better, and with a minimum of five courses at the 300 level or above. All majors must complete the following core requirements:

1. Both semesters of 01:175:201,202 Introduction to Film I,II (01:175:210 may be substituted for either 01:175:201 or 202);

2. Three electives, from the list of preapproved electives or from among other courses approved by the program director; and

3. Senior Seminar in Cinema Studies (01:175:425) or the Seminar: Film Theory (01:175:420).

A flyer listing qualifying elective courses is circulated during each preregistration period, and course descriptions are posted on the program's website. Cinema studies majors are encouraged to complete other courses in film history, analysis, or theory before enrolling in a filmmaking/production course.

Please note that cinema studies courses generally include an additional mandatory weekly meeting time for screenings, or require students to view films outside of class.

Courses that are primarily about film and may count as credits toward the major and minor are listed under the subject codes 175 (Cinema Studies), 354 (English/Film Studies), 013 (AMESALL), 050 (American Studies), 082 (Art History), 195 (Comparative Literature), 420 (French), 470 (German), 560 (Italian), 565 (Japanese), 563 (Jewish Studies), 940 (Spanish and Portuguese), and 988 (Women's, Gender, and Sexuality Studies).

01:175:210 may be substituted for either 01:175:201 or 202. No course may be used to fulfill more than two requirements.

Transfer students and study-abroad students must obtain approval of courses for the major from the program director. Students are urged to consult the program director for further information.

Grades of C or better must be earned in all courses used to fulfill the requirements of the major.

Cinema Studies 175 (SAS)

# Major Requirements and Options

# Major Requirements and Options

**Major Requirements**

The major consists of a minimum of 11 courses and offers two options, one in history and theory and one in production and criticism. Please see the program director for an up-to-date list of preapproved electives.

All majors must complete the following core requirements:

1. Both semesters of 01:175:201,202 Introduction to Film I,II (01:175:210 may be substituted for either 01:175:201 or 202);

2. Three electives, from the list of preapproved electives; and

3. Senior Seminar in Cinema Studies or Seminar: Film Theory.

**Options within the Major**

The program offers two options by which to structure the major. Each option requires students to complete 11 courses, including the core requirements listed above. Please see the program director for an up-to-date list of preapproved electives.

*A. History and Theory Option*

In addition to the requirements listed under Major Requirements above, this option requires the following:

1. Survey courses: American Cinema I (01:175:315) and American Cinema II (01:175:316) OR World Cinema I (01:175:320) and World Cinema II (01:175:321);

2. Non-U.S. cinemas: two courses selected from a preapproved list; and

3. One theory course: Seminar in Film Theory (01:175:420) OR Theories of Women in Film (01:354:385).

Students may include as electives additional courses listed as non-U.S. or theory, if they are not used to fulfill core or option requirements.

*B. Production and Criticism Option*

In addition to the core requirements listed under Major Requirements above, this option requires the following:

1. Two survey courses: World Cinema I (01:175:320) and World Cinema II (01:175:321)

2. One course in auteur and genre studies, from list below or from other preapproved courses:

    01:175:350 Major Filmmakers I (3)

    01:175:351 Major Filmmakers II (3)

01:175:352 Hitchcock and Beyond (3)

01:175:390 Global Horror (3)

01:175:370 Film Genres I (3) (may take twice, if different subtitles)

01:354:372 Film Genres II (3) (may take twice, if different subtitles)

01:354:360 Film Noir (4)

01:354:371 Film Melodrama (4)

01:354:374 Science Fiction Film (4)

01:560:320 Mafia Movies: Approaches to Genre Italian and American Film (3)

3. Two production courses, from list below or from other preapproved courses:

01:351:220 Writing for Experimental Film (3)

01:351:303 Creative Writing: Screenwriting for Film (3)

01:351:309 Creative Writing: Digital Composition (3)

01:351:314 Documentary Filmmaking for Writers (3)

01:354:308 The Craft of Screenwriting (3)

07:081:243 Media I-A Introduction to Media Art: Screen/Image/Sound (4)

07:081:244 Media I-B Experimental Practices and Techniques (4)

07:081:343 Media II-A Media Art Installation and Expanded Cinema (4)

07:081:344 Media II-B Media and Performance (4)

07:211:120 Cinematography (3)

07:211:230 2-D Animation

Students may include as electives additional production courses, or courses listed as non-U.S., auteur/genre, or theory, if they are not used to fulfill core or option requirements.

Cinema Studies 175 (SAS)

# Minor Program

# Minor Program

The interdisciplinary minor in cinema studies consists of seven courses, completed with a grade of C or better, and with a minimum of three courses at the 300 level or above. The courses must be distributed as follows: 1) three required courses, both semesters of 01:175: 201,202 Introduction to Film I,II (01:175:210 may be substituted for either 01:175:201 or 202), and Senior Seminar in Cinema Studies, 01:175:425 (01:175:420 may be substituted for 01:175:425); and 2) four elective courses, chosen from the list below, or from among other courses approved in advance by the program director. A flyer listing qualifying elective courses is circulated during each preregistration period, and posted on the program's website. Please note that only one production/filmmaking course may be counted toward the minor. Cinema studies minors are encouraged to complete several other courses in film history, analysis, or theory before enrolling in a filmmaking course.

Students pursuing a minor in cinema studies must select five courses for the minor that are outside their major. Exception: English majors who pursue a cinema studies minor may include more than two 01:354 courses in their minor program, but only two of those may be counted toward the major.

Please note that cinema studies courses generally include an additional mandatory weekly meeting time for screenings, or require students to view films outside of class.

**Required Courses:**

01:175:201 Introduction to Film I (3)

01:175:202 Introduction to Film II (3)

As indicated above, 01:175:210 Close Readings of Cinema (3) may be substituted for Introduction to Film I OR Introduction to Film II (01:175:201 or 202)

01:175:425 Senior Seminar in Cinema Studies (3)

As indicated above, 01:175:420 Seminar: Film Theory (3) may be substituted for Senior Seminar in Cinema Studies (01:175:425)

Cinema Studies 175 (SAS)

# Courses

# Courses

**01:175:201** ***Introduction to Film I (3)***
Film study, with emphasis on basic concepts of film analysis (narrative, editing, mise-en-scène, sound) and the historical development of cinema as an institution.

**01:175:202** ***Introduction to Film II (3)***
Film study, with emphasis on commercial cinema as an institution (genres, directors, stars) and on nonnarrative types of film (documentary, experimental).

**01:175:210** ***Close Readings of Cinema (3)***
Formal analyses of six or seven individual films; emphasis on visual track, soundtrack, and scenario-narrative construction.

**01:175:265** ***American Experimental Film and Video (3)***
Survey course focusing on the history and development of the various American experimental cinema movements from its beginnings to the present. In-depth analyses of the structure and content of films by Andy Warhol, Maya Deren, Stan Brakhage, Sidney Peterson, Kenneth Anger, Bruce Baillie, Yoko Ono, and others.
***Credit not given for both this course and 01:050:265.***

**01:175:266** ***Cult Films in American Culture (3)***
The cult film from its origins in the 1920s to its evolution in American culture. Close analyses of cult films paired with readings by J. Hoberman and Jonathan Rosenbaum, Sigmund Freud, and others.
***Credit not given for both this course and 01:050:266.***

**01:175:267** ***American Film Directors (3)***
In-depth analyses of the structure and content of films of Stanley Kubrick, Orson Welles, John Frankenheimer, David Lynch, Val Lewton, Andy Warhol, and others. Emphasis on the mise-en-scène, narrative form, set design, sound, and special effects in the films of these celebrated filmmakers.
***Credit not given for both this course and 01:050:267.***

**01:175:268** ***David Lynch and the American Film Avant-Garde (3)***
Focuses on the surreal films of David Lynch and the American Film Avant-Garde. Includes in-depth analyses of the structure and content of many of Lynch's bizarre and unique films including *Eraserhead*, *Mulholland Drive*, and *Blue Velvet*.
***Credit not given for both this course and 01:050:268.***

**01:175:306** ***Modern French Cinema (in English) (3)***
Survey of the development of French cinema from World War II to the present day. Emphasis on the historical, sociopolitical, and aesthetic context of films screened.
***Credit not given for both this course and 01:420:306.***

**01:175:320** ***World Cinema I (3)***
Developments in French, Italian, British, Russian, and other national cinemas from 1896 to World War II; also examines cross-influences between foreign and American cinema.
***Credit not given for both this course and 01:195:320 or 01:354:320.***

**01:175:321** ***World Cinema II (3)***
Major developments in global filmmaking from the 1950s to the present, with an emphasis on specific national and transnational cultures and their industrial and artistic practices.
***Credit not given for both this course and 01:195:321 or 01:354:321.***

**01:175:352** ***Hitchcock and Beyond (3)***
A close examination of the films of Alfred Hitchcock and the influence they have cast upon other filmmakers.

**01:175:360** *Classics of German Cinema: From Haunted Screen to Hyperreality (3)*
Canonical films of the Weimar, Nazi, and post-war period. Focuses on class, gender, nation, cultural context, and the changing sociopolitical and historical climates in which they arose. Special attention to the issue of film style and to the question of what constitutes the film canon in particular in the case of recent works.
*Credit not given for both this course and 01:470:360.*

**01:175:365** *Bollywood (3)*
A broad overview of the Bollywood industry and its cinematic productions over the years.
*Credit not given for both this course and 01:013:365.*

**01:175:377** *Topics in World Cinema (3)*
Study of a particular region, time period, movement, or theme in world cinema.
*Credit not given for both this course and 01:195:377. May be taken more than once, if content is different.*

**01:175:390** *Global Horror (3)*
Engaging with the horror genre both as a local and transnational phenomenon, interrogation of a vast range of horror films from the 1930s to the present, in order to understand how the often-dismissed genre articulates and amplifies an array of issues.

**01:175:398** *Internship in Cinema Studies (3)*
Professional, supervised work in an approved organization or agency; an appropriately designed academic project required.
*Prerequisite: Permission of the program before registration. NOTE: This internship is for enrichment and may not be used as elective credit toward the cinema studies major or minor.*

**01:175:420** *Seminar: Film Theory (3)*
Major developments in film theory from the silent era to the present; writings on film by Eisenstein, Kracauer, Bazin, Metz, Barthes, and others; practice in different methods to analyze films.

**01:175:425** *Senior Seminar in Cinema Studies (3)*
One or more topics selected for their relevance to the interdisciplinary study of film. Emphasis on advanced problems and issues together with methodology and theory. Extended research paper required on a topic chosen in consultation with the instructor.
*Prerequisite: Permission of program director.*

**01:175:477** *Advanced Topics in World Cinema (3)*
Intensive study of a particular issue in world cinema, with special attention paid to theoretical approaches. Specific topic announced at preregistration time.
*Prerequisite: Permission of instructor. Credit not given for both this course and 01:195:477. May be taken more than once, if content is different.*

# Elective Courses (other courses may be preapproved for elective credit)

# Elective Courses (other courses may be preapproved for elective credit)

01:175:210 Close Readings of Cinema (3)

01:175:265 American Experimental Film and Video (3)

01:175:266 Cult Films in American Culture (3)

01:175:267 American Film Directors (3)

01:175:268 David Lynch and the American Film Avant-Garde (3)

01:175:315,316 American Cinema I,II (3,3)

01:175:320,321 World Cinema I,II (3,3)

01:175:350,351 Major Filmmakers I,II (3,3)

01:175:352 Hitchcock and Beyond (3) (cannot count alongside 354:250 The Films of Alfred Hitchcock)

01:175:360 Classics of German Cinema: From Haunted Screen to Hyperreality (3)

01:175:365 Bollywood (3)

01:175:370 Film Genres (3)

01:175:373 The Documentary (3)

01:175:377 Topics in World Cinema (3)

01:175:390 Global Horror (3)

01:175:420 Seminar: Film Theory (3)

01:050:315 American Documentary (3)

01:175:477 Advanced Topics in World Cinema (3)

01:351:303 Creative Writing: Screenwriting for Film (3)

01:354:205 Cinema Today (4)

01:354:250 Films of Alfred Hitchcock (4) (cannot count alongside 175:352 Hitchcock and Beyond)

01:354:270 American Screen Comedy (4)

01:354:301 Digital Cinema (4)

01:354:308 The Craft of Screenwriting (3)

01:354:318 Films from Here: The Cinema of New York and New Jersey (4)

01:354:330,331 Critical Methodology in Film (3,3)

01:354:335 Film Sound (4)

01:354:355 Films of John Ford (4)

01:354:356 Films of Jean Renoir and Fritz Lang (4)

01:354:360 Film Noir (4)

01:354:370 Film Genres (3)

01:354:371 Film Melodrama (4)

01:354:374 Science Fiction Film (4)

01:354:375 Film and Society (3)

01:354:385 Theories of Women and Film (3)

01:354:391,392 Special Topics in Film Studies (3,3)

01:420:306 Modern French Cinema (in English) (3)

01:420:307,308 The French Film in French (3,3)

01:420:371,372 Topics in French Cinema (3,3)

01:420:471,472 Advanced Topics in French Cinema (3,3)

01:470:349 Contemporary German Cinema (3)

01:560:320 Mafia Movies: Approaches to Genre Italian and American Film (3)

01:560:345 Classics of Italian Cinema (3)

01:560:346 Contemporary Italian Cinema (3)

01:940:345,346 Spanish Film - English (3)

01:940:347,348 Latin American Cinema - English (3)

# 390 Finance (RBS-NB)

## 390 Finance

Major requirements for students who entered RBS ***prior to the fall 2023 semester***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (junior or senior year, 33:140:320 required if double majoring in Accounting)
33:390:310 Financial Management for Finance Majors (3)**
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Finance Courses**

33:390:380 Investment Analysis (3) (prerequisite: 33:390:310)
33:390:420 Derivatives (3) (prerequisite: 33:390:380)
33:390:400 Corporate Finance (3) (prerequisite: 33:390:310)

**Four Finance Electives (12)**

If you major in Finance as your first, second, or third major, you are required to take 33:390:310 Financial Management for Finance Majors. You will not earn credit for taking 33:390:300 Financial Management.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)

33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Finance Courses**

33:390:380 Investment Analysis (3) (prerequisite: 33:390:310)
33:390:420 Derivatives (3) (prerequisite: 33:390:380)
33:390:400 Corporate Finance (3) (prerequisite: 33:390:310)

**Four Finance Electives (12)**

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

# Food Science 400 (SEBS)

## FOOD SCIENCE 400

**Degree:** B.S.

**Director:** Chitra Ponnusamy (chitra.ponnusamy@rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

Food science is the study of the chemical, biological, and engineering aspects of food and its components. While this curriculum applies principles acquired in biology, chemistry, physics, and mathematics to food, there is emphasis on the development of important problem-solving skills, giving students experience in reasoning and the use of

scientific and mathematical techniques. Attention also is devoted to current issues, innovations, and ethical issues in foods and food processing. Finally, students are given an opportunity to utilize their creative abilities in a course devoted to the development of new foods and food products.

All Food Science majors are required to complete basic sciences and Food Science courses, along with the current SEBS Core Curriculum. Starting Fall 2022, all Food Science majors must follow One Pathway to Food Science Major. Upon graduation, students can choose to apply for jobs in food, beverage, and related industries or pursue graduate studies.

Food Science 400 (SEBS)

# Learning Goals

# Learning Goals

Program Goal 1: Graduates will demonstrate and apply knowledge of the core competencies in food processing and engineering.

Program Goal 2: Graduates will demonstrate and apply knowledge of the core competencies in food chemistry and analysis.

Program Goal 3: Graduates will demonstrate and apply knowledge of the core competencies of food microbiology.

Program Goal 4: Graduates will demonstrate critical thinking and quantitative reasoning skills to solve technical and applied problems in food science.

Program Goal 5: Graduates will effectively communicate food science issues.

Program Goal 6: Graduates will demonstrate effective professional and leadership skills.

Food Science 400 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of food science major requirements, courses, and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges**(6 credits)*Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning**(3 credits)*Students must participate in a certified experience that meets this goal*[EL]

**Natural Sciences**(6 credits)*Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences*[NS]

**Historical Analysis**(3 credits)*Students must take one course*[HST]

**Social Analysis**(6 credits)*SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis*[SCL]

**Arts and Humanities**(3 credits)*Students must complete one course*[AH]

**Writing and Communication**(6 credits)*Students must take 01:355:101 or its equivalent*[WC]*and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry*[WCD]

**Quantitative and Formal Reasoning**(6 credits)*Students must take two courses*[QQ; QR]

**Graduation Requirements for One Pathway to Food Science (400) Major**
Starting Fall 2022, all Food Science majors must follow One Pathway to Food Science Major. One Pathway provides all majors with a unified, comprehensive education in Food Science major. All Food Science majors are required to complete basic sciences and Food Science courses, along with the current SEBS Core Curriculum. Upon graduation, students can choose to apply for jobs in food, beverage, and related industries or pursue graduate studies.

**A. CORE + FOOD SCIENCE MAJOR REQUIRED COURSES (18 Cr)**

QQ - 01:640:135/151 (4) Calculus I
QR - 01:960:211/285/401/11:373:215 (3) Statistics
NS - 01:119:115 (4) General Biology I
NS - 01:160:161 (4) General Chemistry I
EL - 11:400:493/494/11:902:300 SPIN (3) Experiential Learning

**B. SEBS CORE COURSES (24 cr)**

WC - 01:355:101 (3) Expository Writing
CC Contemporary Challenges (6)
A & H Arts and Humanities (3)
HST, SCL Historical, Social Analysis (9)
WCD 2nd writing course (3)

**C. REQUIRED FOOD SCIENCE COURSES (38 cr)**

**11:400:103 OR 104 (3) Science of Food/Food and Health**
[Satisfies NS-core requirements]. This course satisfies Food Science Program Learning Goal: Graduates will effectively communicate food science issues.
Prerequisites: None. Need to complete only one.

**11:400:201+ 202 (5) Principles of Food Science + lab**
This course satisfies the Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies in food chemistry and analysis.
*Prerequisites: General Biology I and II (01:119:115-116) and General Chemistry I and II (01:160:161-162). Pre- or corequisites for 201: Organic Chemistry (01:160:209 or 307).*
*Co-requisite for 202: Principles of Food Science (11:400:201)*

**11:400:301 (4) Food Processing Technologies**
This course satisfies the Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies in food processing and engineering.
*Prerequisites: Physics I (01:750:193 or 201 or 203 and 205) and Calculus I (01:640:135 or 151).*

**11:400:302 (3) Food Process Engineering**
This course fulfills Food Science Program Learning goal: Graduates will demonstrate and apply knowledge of the core competencies in Food Processing and Engineering.
*Pre-requisite: Food Processing Technologies 11:400:301*

**11:400:304+305 (4) Food Analysis + Laboratory**
This course fulfills Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies in Food Chemistry and analysis. Students MUST register for 304 and 305 in the same semester.
*Pre-requisites for 304: Principles of Food Science (11:400:201), Organic Chemistry (01:160:209)*
*Co-requisite for 305: Food Analysis (11:400:304).*

**11:400:314 (2) Current Issues in Food Science Food Laws**
This course satisfies Food Science Program Learning Goal: Graduates will effectively communicate food science issues.
*Prerequisite: Principles of Food Science (11:400:201).*

**11:400:405 (3) Sensory Evaluation of Foods**
This course satisfies Food Science Program Learning Goal: Graduates will demonstrate critical thinking and quantitative reasoning skills to solve technical and applied problems in food science.
*Prerequisite: Statistics (01:960:211/285/401 or 11:373:215).*

**11:400:411+ 413 (4) Food Chemistry + laboratory**
This course satisfies Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies in food chemistry and analysis.
*Prerequisites for 411: Principles of Food Science 11:400:201; Must have previously taken Biochemistry (11:115:301 or 403) or be registered this semester.*
*Co-requisite for 413: Food Chemistry 11:400:411*

**11:400:412 (3) Food Product Development**
This course satisfies Food Science Program Learning Goal: Graduates will demonstrate effective professional and leadership skills.
*Prerequisites: Food Processing Technologies (11:400:301) and Current Issues in Food Science and Food Law (11:400:314) and Food Chemistry (11:400:411) and Sensory Evaluation of Foods (11:400:405).*
*Pre-or corequisite: Food Microbiology (11:400:423).*

**11:400:419 (3) Food Physical Systems**
This course satisfies Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies in Food Chemistry and analysis.
*Prerequisite: Biochemistry 11:115:301 or 403.*

**11:400:423+ 424 (4) Food Microbiology + laboratory**
This course satisfies Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies of food microbiology.
*Prerequisite: Elementary Organic Chemistry (01:160:209) OR Orgo I (01:160:307) OR Introduction to Microbiology (11:680:201) OR General Microbiology (01:447:390/11:680:390)*
*Pre- or corequisite: Food Microbiology 11:400:423*

**D. REQUIRED SCIENCE COURSES (22 cr)**

| | |
|---|---|
| 01:160:209+ 211 (4) | Elementary Organic Chemistry + lab |
| 01:750:193/201/203,205(4) | Physics with lab |
| 11:115:301 OR 01:694:301 (3) | Biochemistry |
| 01:119:116 + 117 (6) | General Biology II + lab |
| 01:160:162 + 171 (5) | General Chemistry II + lab |

**E. ELECTIVE COURSES (18 cr)**
Students can choose their area of specialization using elective course credits. There is sufficient flexibility for each student to add a minor of their choosing (although some minors will require credits beyond the 120 required for graduation.) This flexibility allows students to build expertise in a complementary field (Microbiology, Spanish, Entrepreneurship, etc.) that may enhance their career prospects in food technology ( Business Economics for management positions, Sustainability for specialized positions, Animal Sciences to work within pet food industries, etc.) or even to satisfy a purely personal academic interest (philosophy, history, linguistics, etc.).

**Elective Courses offered by the Food Science department**

| | |
|---|---|
| 11:400:106 (3) | Food as Medicine |
| 11:400:107 (3) | Foods: from Field to Table |
| 11:400:315 (3) | Food and Sustainability: Study abroad in Thailand |
| 11:400:316 (3) | Sustainable Food Production: Study abroad in Ireland |
| 11:400:350 (1.5) | Wine Basics from Field to Glass |
| 11:400:410 (3) | Nutrigenomics and Nutraceuticals |
| 11:400:422 (3) | Food Safety: Fads, Facts, and Politics |
| 11:400:490 (3) | Applying immersive learning to rural Agro-Food issues: Study Abroad in Southern India |

# French 420 (SAS)

## FRENCH 420

Department of French, School of Arts and Sciences

**Website:** Here

**Chair:** Lorraine Piroux

**Undergraduate Director:** Carole Allamand

**Professors:**

Carole Allamand, B.A., M.A., Geneva; M.A., Ph.D., Cornell

Andrew Parker, B.A., Princeton; M.A., Ph.D., Chicago

Richard Serrano, B.A., Stanford; M.A., Ph.D., California (Berkeley)

James B. Swenson Jr., B.A., Brown; M.A., Ph.D., Yale

**Associate Professors:**

Ana Pairet-Viñas, B.A., Paris IV; M.A., Ph.D., Pennsylvania

Lorraine Piroux, B.A., M.A., Paris III; M.A., Illinois; Ph.D., Northwestern

Jennifer Tamas-Le Menthéour, B.A., M.A., Ph.D., Paris IV; Ph.D., Stanford

**Assistant Professor:**

Shanna Jean-Baptiste, B.A., City College of New York; M.A., Ph.D., Yale

Anaïs Maurer, B.A., M.A., Paris IV; M.A., Tulane; Ph.D., Columbia

**Assistant Teaching Professor:**

Myriam Alami, B.A., M.A., Oregon

**Instructor:**

Anne-Catherine Aubert, B.A., M.A., Neuchâtel (Switzerland); M.A., Indiana; Ph.D., Rutgers

**Faculty Emeriti:**

François Cornilliat, B.A., M.A., Paris IV; Doctorat 3e cycle, Doctorat d'Etat, Paris VIII

Uri Eisenzweig, B.A., Tel Aviv; M.A., Doctorat 3e cycle, Paris VIII

Jerry Aline Flieger, B.A., Wisconsin; M.A., Ph.D., California (Berkeley)

Renée Larrier, B.A., Hofstra; M.A., Atlanta; Ph.D., Columbia

Mary Shaw, B.A., Arizona; M.A., M.Phil., Ph.D., Columbia

Mary Speer, B.A., Duke; M.A., Ph.D., Princeton

# Placement

# Placement

Students are placed in French courses according to performance on the online placement test taken upon entering the university as first-year or transfer students.

French 420 (SAS)

# Learning Goals

# Learning Goals

1. Cultural Awareness: understand the diversity of cultural expression in French-speaking areas around the world; develop cultural competence, cross-cultural skills, and global literacy.

Students are exposed to a wide range of forms of cultural expression in French-speaking areas across the globe. Course materials and topics promote awareness of linguistic and cultural diversity, facilitate intercultural connections, and help learners develop cross-cultural skills. Students with no prior knowledge of French may explore Francophone cultural issues through courses taught in English.

2. Communicative Competence: gain proficiency in oral and written French

In lower-division 100-level courses, students practice listening to French, and learn to speak, read, and write in French through oral practice, readings, and written assignments. In 200-level and upper-division courses taught in French, students develop comprehension and communication skills (interpretive, interpersonal, presentational) both spoken and written. Majors and minors will attain Advanced Mid language proficiency as defined in the American Council on the Teaching of Foreign Languages (ACTFL) proficiency guidelines.

3. Critical Thinking and Interpretive Skills: analyze oral, print, film, and digital cultural production in French

In advanced and upper-division courses, students will develop skills in critical thinking and in the comprehension, analysis, and interpretation of written, audio, visual or multimodal texts in relation to specific historical, political, social, and environmental contexts.

4. Career Readiness and Project-Based Skills

Through teamwork, experiential learning and capstone experiences in upper-level courses, students apply their linguistic proficiency and cross-cultural literacy to collaborative projects and independent research on French and Francophone topics. Study abroad programs and courses with a practical component (French for the health professions; outreach to French learners in K-12; business French) encourage experiential learning.

Majors in French will develop readiness for education careers and international postgraduate study as well as for professions where language and cultural competence are expected. By taking a senior seminar or equivalent capstone, majors will develop research skills as applied to French and Francophone topics and perfect their command of interpretive and presentational modes of communication.

Eligible majors may complete the Honors Thesis in French or the Interdisciplinary Honors Thesis in French or in English. In preparing this 25 to 50-page document students will develop research and communication skills that prepare them for entry into graduate programs or jobs requiring research and communication in multilingual contexts.



# Major Requirements

# Major Requirements

The French major consists of 33 credits. Students majoring in French may choose between the Language Intensive and the Interdisciplinary options. All French majors are strongly urged to spend at least one semester in residence in the French Language & Culture Living-Learning Community and/or to participate in a program of study in a French-speaking country.

A grade-point average of 2.0 in all French courses taken at Rutgers is required of all majors.

*Language Intensive Option*

The Language Intensive Option is designed for students who want to build advanced language proficiency in French. The option fosters cultural fluency, intercultural skills, and global literacy through critical exploration of cultural production in French. It consists of 33 credits above the introductory level including:
1. 9 credits in French language above the elementary level (or numerically above 420:128), with a minimum of 3 credits at the advanced level (or numerically above 420:200)
2. 6 credits in French and Francophone literatures (215 or 217; 216 or 218).
3.15 credits at the 300-level and above, with 3 credits in the study of French and Francophone civilization (315 or 316). Students may take up to 9 credits in approved English-taught courses. All students must take a senior seminar (480, 481) or an equivalent capstone at the 400-level, usually in the fall of their senior year. 6 of the required upper-level credits must be taken with faculty in the Department of French (New Brunswick).

*Interdisciplinary Option*

The Interdisciplinary Option allows students to combine knowledge, skills and abilities acquired in several disciplines or areas of study, including French. It is designed to foster language proficiency, cultural awareness, intercultural skills and global literacy through critical exploration of cultural production in French-speaking regions. It consists of 33 credits, including:
1. 12 credits in French language above 101, with a minimum of 3 credit at the advanced level (or numerically above 420:200).
2. 3 credits in French and Francophone literatures (215 or 217; 216 or 218).
3. 18 credits in Electives, with a minimum of 9 credits at the 300-level or above taught in English or French, including a 3-credit capstone course. Up to 6 credits may be taken in another department, provided that the courses focus on subjects relevant to French/Francophone cultures and are approved in writing by a departmental advisor. At least 6 of the required upper-level credits must be taken with faculty in the Department of French (New Brunswick).

French 420 (SAS)

# Minor Requirements

# Minor Requirements

The minor in French consists of a sequence of at least six 3-credit courses above the elementary level (or numerically above 420:128). It must include one of the following: 01:420:215, 01:420:216, 01:420:217, 01:420:218, and another 200-level course taught in French.

In addition, two courses at the 300-level or above are required. Only one of the following may be counted towards the minor: 420:132, 420:137.

French 420 (SAS)

# Departmental Honors Program

# Departmental Honors Program

Students majoring in French may elect to prepare an honors thesis during their senior year. An overall cumulative grade-point average of 3.0 and a grade-point average of 3.4 or better in French are required. Credits earned in the honors program may be counted toward the major requirements. Students interested in undertaking a thesis should, select a topic in the spring of the junior year. Students select either the comprehensive examination and honors paper option, 01:420:495-496 (6 credits), or an interdisciplinary thesis option, 01:420:498 (3 credits). Interested students are invited to obtain a full program description from the honors coordinator at the department.

At the introductory level, 01:420:217 and 218 are offered as honors courses to students with strong placement scores or who participate in school honors programs. Also, each semester, the department designates an advanced course (01:420:395, 396) for students in the department of college honors program.

French 420 (SAS)

# Teaching Certificate Option

# Teaching Certificate Option

Students intending to seek certification as secondary teachers should obtain information about application requirements from the Graduate School of Education no later than the second year.

French 420 (SAS)

# Summer Program in Paris

# Summer Program in Paris

Each summer the Department of French offers the Rutgers Summer Program in Paris. This immersion program, staffed by faculty from the department and from universities in Paris, offers an opportunity to earn 6 credits in a native French setting and provides cultural and extracurricular activities to acquaint students more fully with French life. To participate in this program, a student must have at least one year of college-level French or the equivalent. Inquiries should be addressed to the Department of French.

French 420 (SAS)

# Study Abroad Programs in France

# Study Abroad Programs in France

Rutgers offers yearlong, one-semester, and three-week programs of study in Paris and in other cities in France, includng Aix-en-Provence (Winter Session). The programs, which offer courses in most disciplines, can be very beneficial to prospective French majors and minors, particularly if attended in the sophomore year. The prerequisites for participation in the program differ for sophomore and junior years. Detailed information is available from the French department or Rutgers Global-Study Abroad.

French 420 (SAS)

# Certificate of Basic Knowledge in French

# Certificate of Basic Knowledge in French

The department awards a certificate of basic proficiency in French based on demonstrated ability to comprehend, speak, read, and write French as attested by a grade of B or better in 6 credits of work taken in courses conducted entirely in French at the 200 level or above. Qualified students should apply before the seventh week of their last semester of residence. French majors and minors are not eligible.

French 420 (SAS)

# Diploma in French Commerce

# Diploma in French Commerce

This internationally recognized diploma is granted by the Chambre de Commerce de Paris to those successfully completing a special examination offered at Rutgers each May after the final examination period. Details are available from the Department of French.

French 420 (SAS)

# Information for Students

# Information for Students

Each semester, the department makes available in its offices a detailed description of its programs and all courses to be offered the following semester. Students are strongly encouraged to consult this information and the departmental advisors.

Program and course information is also available on the department's website.



# Courses in English

# Courses in English

**01:420:105** ***French for Reading Knowledge I (3)***
Development of reading skills to intermediate-mid level. Readings in standard French drawn from contemporary journalism and introductory texts in the humanities and social sciences.
***Not open for credit to students who have completed two or more years of secondary school French or have completed 01:420:132, 137.***

**01:420:106** ***Frenchb for Reading Knowledge II (3)***
Continuation of 01:420:105. Development of reading skills to intermediate-high level. Readings from more advanced texts in the humanities and social sciences, with some selections chosen for pertinence to students' research or interest.
***Prerequisite: 01:420:105 or permission of department. Not open for credit to students who have completed two or more years of secondary school French or 01:420:132, 137.***

**01:420:140** ***Translation Workshop (1.5)***
Introduction to basic translation theory and strategies with intensive practice in written translation of short texts from a variety of cultural, literary, journalistic, and media sources from French to English and English to French.
***Prerequisite: 01:420:102 or 01:420:121 or 01:420:128 or placement in 131.***

**01:420:160** ***Short Stories of France (3)***
Some of the most important French short stories in English translation. Close reading and historical overview. Authors include Beckett, Camus, Maupassant, Nerval, Sartre, Stendhal, and Voltaire.

**01:420:161** ***Belonging in Francophone Literature and Film (3)***
Critical examination of the concepts of belonging and exclusion in contemporary literature and film, as an essential measure by which identities and lives are shaped in the global Francophone world.

**01:420:230** ***Understanding the French Enlightenment (3)***
Critical examination, through major philosophical and literary works of the history, of the concepts and the values of the French Enlightenment, with particular emphasis on their relevance in past and present debates about civil

society, political institutions, nature, morality, artistic creation, scientific progress, religion, and changing notions of selfhood.
***Credit not given for both this course and 01:195:233.***

**01:420:241,242** ***Major French Writers in Translation (3,3)***
Landmarks of French literature from the Renaissance to the present. Plays, novels, and essays of such authors as Molière, Voltaire, Rousseau, Balzac, Flaubert, Sartre, and Camus.
***Credit not given for both 01:420:241 or 242 and 01:195:251.***

**01:420:243** ***20th Century Women Writing in French (3)***
Range of literature by 20th century women writers translated from the French, analyzed in relation to literary and social contexts.
***Credit not given for both this course and 01:988:263.***

**01:420:251** ***France in the World--the World in France (3)***
An exploration through architecture, cinema, music, literature, and visual arts of 21st-century France's place in the world and the rest of the world's conception of France.

**01:460:260** ***The Theater of France (3)***
An introduction to important plays in the history of French theater in English translation. Approach combines close reading with discussion of historical context and staging practices.

**01:420:261** ***Life Writing in France (3)***
Critical interpretation of autobiographical texts, with particular attention to the distinction of fact and fiction, and theories of subjectivity, identity, and memory.
***Credit not given for both this course and 01:195:262.***

**01:420:271** ***Francophilia: Literature and Sexuality in Modern France (3)***
Explores cultural representations of nonconforming sexualities in France from the late-19th century to the present. Approach combines writing exercises with close reading and analytical discussion of literature, theory, and film within evolving historical context.
***Credit not given for both this course and 01:888:291.***

**01:420:272** ***Major French Plagiarists: Literature between Repetition and Originality (3)***
Critical examination of the history and practice of literary plagiarism, with particular emphasis on the pre-modern tradition of imitation and past and present debates about originality, creativity, plagiarism, and changing values of authorship.
***Credit not given for both this course and 01:195:274.***

**01:420:281** ***French and Francophone Text(s) and Image(s) (3)***
Explorations of the relationship between the visual arts and landmark texts written in French during various periods from the Middle Ages to the present, with particular emphasis on the ways visual arts have influenced and been influenced by the literature of France and Francophone cultures.

**01:420:282** ***Music, Culture, and Memory in the French-Speaking World (3)***
The place of music in French and Francophone culture, with particular attention to its role in historical events and in the way they are remembered.
***Credit not given for both this course and 01:195:282.***

**01:420:283** *French Gastronomy and Global Food Culture (3)*
Cultural codes and socioeconomic contexts that shape the preparation and consumption of food in France and the United States. Cross-cultural interdisciplinary perspectives on contemporary issues such as technology and cultural identity, cultural heritage in a globalized world, food and migration, sustainable communities, food insecurity, food justice, and food sovereignty.
***Credit not given for both this course and 01:070:382.***

**01:420:306** *Modern French Cinema (in English) (3)*
Survey of the development of French cinema from World War II to the present day. Emphasis on the historical, sociopolitical, and aesthetic content of films screened.
***Credit not given for both this course and 01:420:308 or 01:175:306.***

**01:420:313** *Gender and Sexuality in Modern France and the Francophone World (3)*
Survey of modern and contemporary works from France and the Francophone world that challenge conventional representations of gender and sexuality. Works to be discussed (from comparative feminist, queer, trans, and critical race approaches) include narrative fiction, memoir, drama, essay, and graphic novel. The focus will shift at the end of the term to films that explore the impact of the AIDS pandemic and the legacy of French colonialism.
Credit not given for this course and 01:988:313.

**01:420:314** *Contemporary French Critical Thought (3)*
Introduction to contemporary French intellectual trends, with emphasis on poststructuralist movements. Readings of such writers as Barthes, Derrida, Foucault, and Lacan.

**01:420:391** *Topics in French/Francophone Literature and Culture (3)*
Special topics selected to meet the interests and needs of the students.

**01:420:407** *Francophone Linguistics (3)*
Study of problems in French and Francophone dialects and creoles in conjunction with theoretical problems in linguistics.
***Prerequisite: 01:420:333 or 01:615:201, or permission of instructor. Credit not given for both this course and 01:615:407.***



# Courses in French

# Courses in French

***Prerequisites***

French 01:420:215, 216, 217, or 218, or 3 credits at the 300 level are prerequisites to 300 and 400-level courses in culture and literature taught in French, except 01:420:301, 303, 318, 324, 499.

**01:420:100** *Intensive Elementary French I (3)*
Functional use of the language in speaking, writing, and reading modern French. Part of three-week intensive Winter Session program in Aix-en-Provence, France.
***Not open to students with two or more years of high school French. Credit not given for both 01:420:100 and 01:420:101.***

**01:420:101-102** ***Elementary French (4,4)***
Functional use of the language in speaking, writing, and reading modern French. Laboratory exercises.
***Not open for credit to students who have had two or more years of secondary school French. Credit not given for both 01:420:101 and 01:420:100. Credit not given for both 01:420:102 and 01:420:128.***

**01:420:103,104** ***Elementary French Laboratory (1,1)***
Instructor-guided practice to ¿¿develop listening comprehension and speaking skills in French at the introductory level. Communicative activities involve media, individual and group activities, and assessment of pronunciation and fluency.
***Corequisites: (103) 01:420:101; (104) 01:420:102.***

**01:420:121** ***French Fundamentals (4)***
Intensive review and practice of the fundamentals of French conversation, reading, and composition. Laboratory exercises.
***Prerequisite: Placement test.***

**01:420:128** ***Intensive Elementary French II (3)***
Functional use of the language in speaking, writing, and reading modern French. Part of three-week intensive Winter Session in Aix-en-Provence, France.
***Prerequisite: 01:420:101; 01:420:105,106; 01:420:121; placement; or permission of the department. Credit not given for both 01:420:128 and 01:420:102. 01:420:128 will substitute for 01:420:102 in prerequisite for 01:420:131.***

**01:420:131-132** ***Intermediate French (4,4)***
Development of fluency in written and spoken French. Conversation, composition, and grammar review using short literary texts and audiovisual materials.
***Prerequisites: (131) 01:420:102 or 121 or 128 or placement test. (132) 01:420:131, or placement test.***

**01:420:133,134** ***Intermediate French Lab (1,1)***
Instructor-guided practice to develop listening comprehension and oral skills in French at the intermediate level. Communicative activities involve media, individual and group activities, and assessment of pronunciation and fluency.
***Prerequisite: 01:420:102 or 01:420:121 or equivalent. Corequisites: (133) 01:420:131; (134) 01:420:132.***

**01:420:137** ***Accelerated Intermediate French (4)***
Development of fluency in written and spoken French. Conversation, composition, and grammar review using short literary texts and audiovisual materials in a one-semester format.
***Prerequisites: 01:420:102, 121 and permission of department. Corequisite: 01:420:133.***

**01:420:171** ***French Theater Workshop (1.5)***
Production of selected scenes in French.

**01:420:201** ***Francophone Culture and Language for Heritage Speakers (3)***
Culture and composition through contemporary arts and media. Development of all linguistic skills with emphasis on vocabulary building, grammar structures, and writing skills.
***Prerequisite: Special permission required; contact department.***

**01:420:210** *Intensive French Conversation (3)*
Development of facility and accuracy in oral expression and listening comprehension. Class exercises and discussion, written work, and extensive audio and video laboratory work.
*Prerequisite: Placement test or 01:420:132.*

**01:420:213** *Advanced French I: Stories of Scandals and Mysteries (3)*
Study of the forms and structures of the French language to complete mastery of foundations for advanced courses. Written work, class discussion, audio-visual materials.
*Prerequisite: placement test or 01:420:132.*

**01:420:214** *Advanced French II: Writing Styles (3)*
Study and practice in composition to perfect skills for written French. Analysis of writing styles and forms; vocabulary development, syntax.
*Prerequisite: placement test or 01:420:213 or equivalent.*

**01:420:215** *Modern Literature in French (3)*
Introduction to literature and culture from the 18th century to the present, through close reading of selected texts; focusing on significant themes, genres, and artistic movements.
*Prerequisite: 01:420:132 or equivalent. Credit not given for both 01:420:215 and 217.*

**01:420:216** *French Literature from the Middle Ages to the Enlightenment (3)*
Introduction to literature through the reading of representative authors from the 13th to the 18th century; focusing on significant themes, literary forms, and genre.
*Prerequisite: 01:420:132 or equivalent. Credit not given for both 01:420:216 and 218.*

**01:420:217** *Modern Literature in French Honors (3)*
Introduction to literature and culture from the 18th century to the present, through close reading of selected texts; special attention to the nature of literary work, and to the goals and methods of literary analysis.
*Prerequisite: 01:420:132 or equivalent. Honors status by special permission or placement test. Credit not given for both 01:420:215 and 01:420:217 or for both 01:420:216 and 01:420:218.*

**01:420:218** *French Literature from the Middle Ages to the Enlightenment Honors (3)*
Introduction to French literature through reading of representative authors from the 13th to the 18th century; special attention to the nature of literary work, and to the goals and methods of literary analysis.
*Prerequisite: 01:420:132 or equivalent. Honors status by special permission or placement test. Credit not given for both 01:420:215 and 01:420:217 or for both 01:420:216 and 01:420:218.*

**01:420:224** *French for Healthcare (3)*
Necessary linguistic, writing and oral communicative tools for students who plan to enter the medical profession, work with French-speaking patients, or volunteer in a Francophone country in a medical setting.
*Prerequisites: 01:420:132, 137, or one 200-level course in French, or placement, or special permission. No prior knowledge in the healthcare field is necessary.*

**01:420:297,298** *French Cultural Experience (1.5,1.5)*
Special topics in French and Francophone cultures selected to meet the interests and needs of the students. Required of the residents of the Leupp French House.
*Prerequisite: 01:420:102, 106, 121, 128, or placement test. May be repeated for credit.*

**01:420:301** ***Learning and Sharing French I (1.5)***
Development of articles reflecting upon acquisition of a second language and promoting French language and culture, via an online magazine to be shared with K-12 students.

***Prerequisites: 01:420:210, 213, 214, 215, 216, 217, 218, 224, or placement.***

**01:420:303** ***Advanced French Conversation (3)***
Discussion of topics to develop fluency of speech and command of idioms. Group conversations and debates.
***Prerequisite: 01:420:210 or 216. Not open to native speakers or to students returning from junior year in France.***

**01:420:307,308** ***The French Film in French (3,3)***
Film as a major expression of French culture; viewing and analysis of films by such directors as Truffaut, Chabrol, Rohmer, Renoir, Clair, and Cocteau. Introduction to methods of criticism.
***Credit not given for these courses and 01:420:305,306. Prerequisites: 01:420:215, 216, 217, 218, or placement.***

**01:420:310** ***Introduction to Francophone Literature (3)***
Survey of texts in French from Africa (including Maghreb and Madagascar), the Caribbean, North America, and Southeast Asia.

**01:420:315** ***French Civilization from the Middle Ages to the Revolution (3)***
Analysis of Old Régime foundations of French culture; concentration on interaction and evolution of social and intellectual phenomena.
***Prerequisites: 01:420:215, 216, 217, 218, or placement.***

**01:420:316** ***French Civilization from the Revolution to the Present (3)***
Analysis of development of modern French culture; concentration on interaction and evolution of social and intellectual phenomena.
***Prerequisites: 01:420:215, 216, 217, 218, or placement.***

**01:420:318** ***Learning and Sharing French II (1.5)***
Development of an interactive presentation reflecting upon acquisition of a second language and promoting French language and culture, to be shared with K-12 students.
***Prerequisites: 01:420:210, 213, 214, 215, 216, 217, 218, 224, or placement.***

**01:420:319** ***Women Writers from 1789 to the Present (3)***
Analysis and discussion of the cultural contexts, modes of expression, and self-definitions of women writers in modern France from the Revolution of 1789 to the post-1968 revolutions in feminist theory and practice.
***Prerequisites: 01:420:215, 216, 217, 218, or placement.***

**01:420:320** ***Theater Workshop (3)***
Reading, discussion, and production of representative texts from French dramatic literature.

**01:420:324** ***French Commerce (3)***
Fundamental principles governing commercial organizations in France. Practical business correspondence.
***Prerequisites: 01:420:210, 213, 214, 215, 216, 217, 218, 224, or placement.***

**01:420:332** ***French Sounds (3)***
French phonetics in theory and practice. A comparative study of English and French sounds. Exercises in transcription and correct pronunciation.
***Prerequisite: 01:420:132. Not open to first-year students.***

**01:420:333** ***French Linguistics (3)***
Introduction to the methods and concerns of modern theoretical linguistics and to the practice and theory of syntax through the study of particular problems in the syntax of French.
***Prerequisite: 200-level French course or permission of instructor.***

**01:420:335,336** ***The French Novel (3,3)***
Forms and techniques of the novel from *La Princesse de Clèves* to the present.
***Prerequisites: 01:420:215, 216, 217, or 218.***

**01:420:337** ***The French Theater (3)***
Analysis of dramatic structure and meaning in texts selected from the classical tradition to the Theater of the Absurd.

**01:420:338** ***French Poetry (3)***
Critical interpretation of French poetry with particular attention to the unique problems of French prosody and poetic theory. Selected texts from the 16th century to the 20th century.
***Prerequisites: 01:420:215, 216, 217, or 218.***

**01:420:341,342** ***One French Writer (3,3)***
Intensive study of the work of a single author. Analysis of elements such as writer's place in literary or cultural history, critical approaches, the writer's role in a given genre. Author chosen each semester/year dependent on faculty and student interest.
***Prerequisites: 01:420:215, 216, 217, or 218.***

**01:420:351** ***Literature in French Society (3)***
Exceptional role of literature in French culture, politics, and day-to-day life. Generally studies one topic in a given historical period.

**01:420:371,372** ***Topics in French Cinema (3,3)***
Topics such as relations between film and other genres (novel, theater); film in relation to cultural history; introduction to critical approaches to film. Consult departmental announcement.
***Recommended: One course in French cinema, 01:420:305, 306, 307, or 308.***

**01:420:391** ***Topics in French/Francophone Literature and Culture (3,3)***
Special topics selected to meet the interests and needs of the students.
***Prerequisites: 01:420:215, 216, 217, 218, 315, 316, or 318.***

**01:420:393,394** ***Topics in French Literature and Culture (1.5,1.5)***
Special topics selected to meet the interests and needs of the students. Seven-week courses.

**01:420:395,396** ***Junior Honors Seminar (3,3)***
In-depth examination of a problem, topic, or theme in French literature or culture, in order to develop analytic and research skills. Subject announced by department.
***Open to students in departmental or school honors programs or by permission of department.***

**01:420:401** ***Translation (3)***
Techniques of translation; study of dictionaries and specialized vocabularies; texts selected from the humanities and the social sciences.

**01:420:402** ***Advanced Stylistics and Composition (3)***
Study of rhetoric through the detailed stylistic analysis of literary texts and the imitation of writing techniques.
***Prerequisite: One 300-level course conducted in French.***

**01:420:403** ***History of the French Language (3)***
Development of the French language from its origins to the present; suggestions of possible future evolution. Emphasis on phonology, morphology, syntax, and lexicon; consideration of cultural forces influencing linguistic stability or change at crucial points in French history.
***Prerequisites: 01:420:315 or 316.***

**01:420:405,406** ***Modern France (3,3)***
First semester: economic and social background; interpretive analysis of major problems affecting French life; audiovisual materials. Second semester: analysis of major trends in French culture and institutions.

**01:420:409** ***Studies in Cultures of the Francophone World (3)***
Analysis of the cultural production (including film, music, visual and performing arts, and literature) of regions in which the French language plays a major role.

**01:420:410** ***Sub-Saharan African Literature (3)***
Study of literature in French by writers in or from sub-Saharan Africa.
***Credit not given for both this course and 01:016:410.***

**01:420:411** ***North African Literature (3)***
Study of literature in French by writers in or from the Maghreb.
***Credit not given for both this course and 01:016:411.***

**01:420:412** ***Canadian Literature (3)***
Study of literature in French by writers in or from Québec and other regions of Canada.

**01:420:413** ***Caribbean Literature (3)***
Study of literature in French by writers in or from the Caribbean (Haiti, Martinique, Guadeloupe, French Guiana).

**01:420:415** ***Medieval French Literature (3)***
The French Middle Ages: readings in epic, romance, didactic literature, and lyric poetry of the 12th through the 15th centuries; texts usually read in modern French translations.

**01:420:416** ***Sixteenth-Century French Literature (3)***
The French Renaissance: tradition and innovation in the writings of such authors as Marot, Rabelais, Marguerite de Navarre, Montaigne, and the poets of the Pléiade.

**01:420:421** ***French Poetry and Prose of the 17th Century (3)***
Selected works from the major writers representing the aesthetic and intellectual currents of the age.

**01:420:422** ***French Classical Drama (3)***
Major plays of Corneille, Molière, and Racine.

**01:420:431,432** ***The Age of Enlightenment (3,3)***
Great writers of the 18th century--Montesquieu, Voltaire, Diderot, and Rousseau--and their relationship to the social, literary, and intellectual currents of the period.

**01:420:441** ***Romanticism in France (3)***
French romanticism, its origins, psychology, and development, with readings from Madame de Staël, Hugo, Balzac, Stendhal, and their contemporaries.

**01:420:451** ***Twentieth-Century French Drama (3)***
French drama from Claudel through Beckett to Koltès; new concepts in dramatic art. Relations among authors, actors, the public, and the period.

**01:420:452** ***Twentieth-Century French Novel (3)***
Readings in works by such authors as Proust, Gide, Camus, Sartre, Duras, and Perec; the "nouveau roman." The novel in relation to social, philosophical, and political thought.

**01:420:455,456** ***Major Currents of French Thought (3,3)***
Critical and formal analysis of literary texts selected to illustrate the development of ideas in France from the *Roman de la Rose* to the present.

**01:420:469,470** ***Topics in French Studies (3,3)***
Topics such as detailed studies of issues in French culture, civilization, or literature; in-depth study of an author, movement, genre, or period.
***Offered only in the Rutgers Summer Program in Paris. Consult departmental announcement.***

**01:420:471,472** ***Advanced Topics in French Cinema (3,3)***
Topics such as detailed studies of issues in film theory, analysis, or history; in-depth study of schools, movements, or specific filmmakers. Consult departmental announcement.
***Prerequisites: 6 credits from the following courses: 01:420:305, 306, 307, 308, or 371.***

**01:420:480** ***Senior Seminar in French Literature (3)***
Thorough and probing study of an important theme, topic, or movement within the history of French literature. Subject announced by the department.

**01:420:481** ***Senior Seminar in French Culture (3)***
In-depth examination of a problem or period in French civilization, with a focus on development of interpretive and analytic skills. Subject announced by the department.
***Prerequisites: 01:420:315 or 316.***

**01:420:490** ***Advanced Topics in French and Francophone Linguistics (3)***
***Prerequisites: 01:420:333 and 01:615:201, or permission of instructor.***

**01:420:491,492** *Advanced Topics in French/Francophone Literature and Culture (3,3)*
Special topics selected to meet the interests and needs of the students.
***Prerequisites: 01:420:315 or 316.***

**01:420:493,494** *Independent Study (BA,BA)*
***Prerequisites: Permission of instructor and undergraduate director.***

**01:420:495** *Senior Honors Thesis I (3)*
Preparation for written and oral honors examination and honors paper based on research under the direction of the departmental honors committee.
***Prerequisite: Permission of departmental honors committee.***

**01:420:496** *Senior Honors Thesis II (3)*
Preparation for written and oral honors examination and honors paper based on research under the direction of the departmental honors committee.
***Prerequisite: Permission of departmental honors committee.***

**01:420:498** *Senior Honors Thesis: Interdisciplinary (3)*
Represents research and writing in French complementing honors theses written in English on a French-related topic in other disciplines such as history, art history, or political science. Research thesis and defense under the direction of the departmental honors committee.
***Prerequisite: Special permission.***

**01:420:499** *French for Oral Proficiency (1)*
Instructor-guided oral proficiency practice sessions in advance of the Oral Proficiency Interview (OPI).
***Prerequisite: Open only to junior and senior majors and minors in French or permission of department.***

**05:300:331** *Materials and Methods in French (3)*
Solutions to classroom problems. Course planning: teaching aims, pedagogical devices, language content, cultural background, selections of text.
***Only for students in the French teaching program (MAT); others by permission of instructor. May count as education credit.***

# Gender and Media 438 (SAS)

## GENDER AND MEDIA 438

**Department of Women's, Gender, and Sexuality Studies, School of Arts and Sciences**

**Website:** Here

**Chair**: Mary Trigg

**Director of Undergraduate Studies:** Yana Rodgers

**School of Communication and Information**

**Website:** Here

**Director of Interdisciplinary Studies:** Mary Chayko

Gender and Media 438 (SAS)

# Program Information

# Program Information

Complementing any major, the gender and media minor is a cross-unit, interdisciplinary undergraduate minor offered jointly by the School of Communication and Information and the School of Arts and Sciences' women's, gender, and sexuality studies program. Students are introduced to the minor through a foundational course that offers a shared vocabulary for analyzing issues of power and representation within the media. Students then have the choice of taking two electives in media production, as well as two electives in critical media/feminist theory. At the end of the program, students apply skills and knowledge of gender and the media in the completion of a project in a capstone course that offers internship, service learning, and multimedia project options.

Gender and Media 438 (SAS)

# Program-Level Learning Goals

# Program-Level Learning Goals

The gender and media minor provides a course of study designed for students interested in a combination of theory and practice perspectives on the representation and production of gender in the media.

- Students will apply technical skills as media producers with the ability to add their own critical voices and unique perspectives.
- Students will demonstrate critical thinking skills that enable them to critique and improve current conditions of media production and consumption.
- Students will articulate, create, examine, inform, and improve systemic and individual power dynamics of the contemporary landscape for gender and media.

Gender and Media 438 (SAS)

# Minor Requirements

# Minor Requirements

The minor is open to all majors at Rutgers. Students are required to complete six 3-credit courses with a grade of C or better, for a total of 18 credits. There is one foundational course, two practice/production courses, two conceptual courses, and a capstone project course. Students are strongly encouraged to speak with an adviser to create a plan for completing the program. Note that courses taken to fulfill requirements in the gender and media minor **will count** toward the requirements of any other major or minor in the School of Communication and Information (SC&I) and/or for the program in women's, gender, and sexuality studies (WGS).

**Foundation Course (3 credits/one course)**

Choose one of the following foundational courses:

- 01:988:202 Gender, Culture, and Representation (3)
- 04:567:215 Gender, Race, and Class in the Media (3)

**Practice/Production Courses (6 credits/two courses)**

The first practice/production course is required:

- 01:988:200 Gender, Digital Media, and Social Curation (3)

Choose one of the following courses for the second course:

- 04:189:251 Strategic Presentation Methods in Digital Media (3)
  04:567:200 Writing for Media (3)

**Conceptual Courses (6 credits/two courses)**

Only one of these course (3 of the 6 credits) may be taken at the 200 level; the other must be taken as a 300 level.

Choose one of the following for the first conceptual course:

- 04:567:274 Consumer Media Culture (3)
- 04:567:380 Media and Social Change (3)
- 04:547:340 Gender and Technology (3)
- Relevant Special Topics courses (SC&I)

Choose one of the following for the second conceptual course:

- 01:988:255 Gender, Art, and Society (3)
- 01:988:257 Gender and the Body: Representations and Pornography (3)
- 01:988:258 Gender, Race, and Contemporary Art (3)
- 01:988:259 Homosexuality and Visual Culture (3)
- 01:988:317 Gender and Consumption (3)
- 01:988:341 Gender and Popular Culture(3)
- 01:988:376 Theories of Women and Film (3)
- Relevant Special Topics courses (WGS)

**Capstone Course (3 credits/one course)**

Students may enroll in the capstone after completing a minimum of 12 credits in the minor. Choose one of the following courses to fulfill the capstone requirement:

- 01:988:499 Capstone in Gender and Media (course within the women's, gender, and sexuality studies program)
- 04:567:499 Capstone in Gender and Media (course within the journalism and media studies program)

# Courses Offered in Women's, Gender, and Sexuality Studies

# Courses Offered in Women's, Gender, and Sexuality Studies

**01:988:200** *Gender, Digital Media, and Social Curation (3)*
This course investigates the relationship between the construction of gender and technologies of digital media. Students will engage with theories of new media, as well as critical intersectional scholarship on gender, race, sexuality, and ability. Central to the course are questions of materiality and embodiment in the digital age; the impact of digital interactivity on the construction and production of gender, race, and sexuality; and the digital distribution of power relations, discipline, and surveillance. While this course does not focus on the acquisition of technical skills for the making and curation of digital media, students will complete a digital media project developed over a large portion of the semester.
***Prerequisite: 01:988:202 or 04:567:215.***

**01:988:202** *Gender, Culture, and Representation (3)*
Examines how gender is represented in cultural texts and artifacts; introduces students to theories of representation.

**01:988:255** *Gender, Art, and Society (3)*
Women artists, their achievements, and impact. Social and cultural reasons for their neglect in the visual arts and how that neglect is being remedied today. Different ways in which men and women are depicted in art and how those differences relate to culture and society.
***Please note that this is an online course.***

**01:988:257** *Gender and the Body: Representation and Pornography (3)*
Examination of representations of gendered bodies in art, sexuality, gender, politics, and pornography. Examines how to understand who defines what is obscene and why some work is called pornography.

**01:988:258** *Gender, Race, and Contemporary Art (3)*
Intersection of gender and race in contemporary American art. Black and white racial politics in relation to gender and contemporary art in the United States. Special focus on African-American artists.

**01:988:259** *Homosexuality and Visual Culture (3)*
Central role of homosexuality and homoeroticism in visual culture in the distant and recent past as well as the present. Marginalization of homosexual artists, critics, and patrons despite direct participation in cultural production of art and popular culture.

**01:988:317** *Gender and Consumption (3)*
Introduces feminist approaches to consumption through readings that examine the relation of consumption to body, race, nation, and sex work.
***Prerequisite: 01:988:101 or 201 or 235 or permission of instructor.***

**01:988:385** *Theories of Women and Film (3)*
Basic concepts in feminist film theory; the female voice in cinema; representations of women in classical Hollywood film; films made by women.

**01:988:396** ***Topics in Women's and Gender Studies: Gender, Race, and Technoscience (3)***
Selected topics in women's and gender studies. Topics vary each semester. Consult department or the course schedule for each semester's offering.

**01:988:499** ***Capstone in Gender and Media (3)***
In this capstone to the Gender and Media minor, students will develop, discuss, produce, and critique a project related to gender, media, and technology. Students will articulate and present the project in written and oral formats and will have the option to also (1) create an in-depth multimedia component to the project; 2) complete an internship; or 3) complete a service learning experience.
Note: students in the minor, especially those who are not otherwise SC&I majors, may choose to enroll in the capstone through the program in Women's and Gender Studies, course number 01:988:499.
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***Prerequisite: 12 or more credits in the minor Corequisite: none***

Gender and Media 438 (SAS)

# Courses Offered in the School of Communication and Information

# Courses Offered in the School of Communication and Information

**04:189:251** ***Strategic Presentation Methods in Digital Media (3)***
This course examines theories and techniques for analyzing, producing, and disseminating messages. Students will learn how to use web-based and multimedia presentation tools to connect with a variety of audiences and convey a desired message. Each student will craft a message to support some social change by developing and shaping the message into compelling digital media presentations in a range of formats.
***This course counts toward the digital communication, information, and media minor.***

**04:547:340** ***Gender and Technology (3)***
The course analyzes gender in relation to race, class, nationality, culture, religion, and sexuality in the context of technological innovation. Its focus is on fundamental concepts, the feminist critique of the social construction of technology, and the impact of gender issues on the workplace. By studying inclusiveness and equity in a transnational and historical perspective, the course examines the effects of gender on the development and use of information technologies and on gender-based information and technology preferences.

**04:567:205** ***Digital Newswriting and Reporting (3)***
Fundamentals of gathering information and journalistic writing. By the end of the course, students will learn basic journalistic newswriting and reporting techniques and concepts, including writing in journalistic style, fact-gathering, conducting observation, freedom of information, and professional ethics. (Foundational course)
***Prerequisites: 04:189:102; 04:567:200.***

**04:567:215** ***Gender, Race, and Class in the Media (3)***
Content, treatment, and effects of women and minority group coverage in television, newspapers, magazines, popular music, and film. (Foundational course)
***Formerly numbered 04:567:334.***

**04:567:274** ***Consumer Media Culture (3)***
Provides a critical understanding of advertising's role in modern society. Examines the history of advertising, the commercial and social aspects of the messages conveyed by ads, and the advertising industry's influence on social relations and institutions. (Conceptual course)

**04:567:380** ***Media and Social Change (3)***
This course looks at how past and present social movements (e.g., environmental, civil rights, labor movements) challenge dominant social, economic, and political structures and how they have been portrayed in the mass media. It also examines how social activists use media technologies to organize themselves and communicate their messages to wide audiences in order to achieve social change. (Conceptual course)

**04:567:499** ***Capstone in Gender and Media (3)***
In this capstone to the gender and media minor, students will develop, discuss, produce, and critique a project related to gender, media, and technology. Students will articulate and present the project in written and oral formats and will have the option to also (1) create an in-depth multimedia component to the project; 2) complete an internship; or 3) complete a service-learning experience. Note: Students in the minor, especially those who are not otherwise SC&I majors, may choose to enroll in the capstone through the program in women's, gender, and sexuality studies, course number 01:988:499.
***Prerequisite: Minimum of 12 credits in the minor must be completed before enrolling in the capstone.***

# Life Sciences (SAS)

## LIFE SCIENCES

Division of Life Sciences, School of Arts and Sciences

**Website:** Here

**Dean:** Lori R. Covey

**Director, Office of Undergraduate Instruction:** Martha Haviland

**Chair, Department of Cell Biology and Neuroscience:** Megerditch Kiledjian

**Chair, Department of Genetics:** Tara C. Matise

**Chair, Department of Kinesiology and Health:** Brandon Alderman

**Chair, Department of Molecular Biology and Biochemistry:** Barth Grant

The following majors are available in the Division of Life Sciences:

**Biological Sciences 119**
**Cell Biology and Neuroscience 146**
**Exercise Science 377**
**Genetics 447**
**Molecular Biology and Biochemistry 694**
**Sport Management 955**

Students interested in the life sciences also may consider related tracks within major programs offered by the Department of Chemistry and Chemical Biology (chemical biology option) and the Department of Psychology (specialization in behavioral neuroscience).

The Division of Life Sciences coordinates, fosters, and integrates the instructional and research activities of a broad range of faculty with interests in the biological sciences. The principal units of the division include four departments: Cell Biology and Neuroscience, Genetics, Kinesiology and Health, and Molecular Biology and Biochemistry, as well as two sections, the biological chemistry section of the Department of Chemistry and Chemical Biology, and the biopsychology and behavioral neuroscience section of the Department of Psychology. The division's primary goal is to provide a high caliber of interdisciplinary teaching and research in the life sciences as it trains the next generation of teachers, researchers, and future health professionals.

Instruction in the life sciences has undergone enormous changes over the past 15 to 20 years. These changes reflect the intellectual revolution of the last two decades, as well as technical advances that have expanded greatly the tools available to life scientists. Today, students majoring in the life sciences at Rutgers University-New Brunswick experience an exciting atmosphere of learning that exposes them to the concepts and methods of these intellectual and technological advances. The students have open to them a plethora of learning avenues, ranging from thought-provoking lecture presentations to original and cutting-edge research opportunities in state-of-the-art laboratories. A first-class faculty and modern laboratory equipment reflect the division's commitment to provide its students with the best learning environment.

The division offers a wide spectrum of majors for students interested in the life sciences. These options range from a division-based major in biological sciences, designed to provide a general life sciences education, to department-based majors in cell biology and neuroscience, exercise science, genetics, molecular biology and biochemistry, and sport management aimed at providing specialized training, with a strong emphasis on research. Graduates of the division will be highly competitive for a range of postbaccalaureate opportunities, including graduate education and research, health-professions training, and biomedical and biotechnological research positions, as well as teaching careers in the sciences.

The first two years of the student's tenure at Rutgers is expected to revolve around the life sciences core curriculum, a series of basic offerings designed to provide the general background required for pursuing upper-division courses in any of the individual majors. Regardless of the major chosen, students are encouraged to participate in independent study within a research laboratory in order to take advantage of the rich expertise of the many life sciences faculty in New Brunswick and Piscataway. The exercise science and the sport management majors require an internship experience. The division also has a highly developed advising system, with dedicated and knowledgeable faculty advisers available to work with individual students in their selection of courses, completion of major requirements, and preparation for future careers.

Students may not major in more than one of the following majors in the Division of Life Sciences: Biological Sciences (119), Cell Biology and Neuroscience (146), Exercise Science (377), Genetics (447), Molecular Biology and Biochemistry (694), or Sport Management (955). Furthermore, students majoring in one of these four majors may not minor in Biological Sciences (119). Life science majors or minors may not be combined as double majors or as major/minors with Biomathematics (122), Biochemistry (115), or Microbiology (680).

No more than 16 credits from among the life science courses required for completion of any Division of Life Sciences major may be fulfilled by credits transferred from any school outside of Rutgers-New Brunswick.

For additional information and announcements about the Division of Life Sciences, please visit the division's website.

Life Sciences (SAS)

# Life Sciences Core Curriculum

# Life Sciences Core Curriculum

The life sciences core curriculum is a set of courses that include a series of introductory- and intermediate-level courses in the physical and life sciences forming a foundation of knowledge necessary to understand modern biology and to prepare for the more advanced courses required for each major. Following are core courses:

1. 01:119:115-116 General Biology (4,4)

2. 01:119:117 Biological Research Laboratory (2)

3. 01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)

4. 01:160:171 Introduction to Experimentation (1)

5. 01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)

6. 01:160:311 Organic Chemistry Laboratory (2)

7. 01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics (3,3)*

8. 01:750:205-206 General Physics Laboratory (1,1)*

9. 01:640:135,136 Calculus for the Life and Social Sciences (4,4) or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)**

10. 01:447:380 Genetics (4)***.

*01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

**Basic Statistics for Research (01:960:401, 3 credits), Basic Probability and Statistics (01:960:379, 3 credits), or Statistics I and II (01:960:211 and 212) may be substituted for the second semester of Calculus.

***Students majoring in genetics must take 01:447:384-385 (4,4) instead of 01:447:380

Life Sciences (SAS)

# Biological Sciences 119

# Biological Sciences 119

**Website:** Here

**Director:** Martha Haviland

**Director of Advising:** Anne Carr-Schmid

**Teaching Professor:**

Martha B. Haviland, B.A., Rutgers; M.S., A.M., Ph.D., Michigan[AC1] [SB2]

**Associate Teaching Professor:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Daniel Stern Cardinale, B.S., College of New Jersey; Ph.D., Rutgers

Monica S. Torres, B.S., National University of La Plata (Argentina); M.S., Ghent (Belgium); Ph.D., Rutgers

**Assistant Teaching Professors:**

Christy A. Beal, B.S., Rutgers; M.S., Ph.D., Delaware

Cominski, Tara, B.S., St. Peter's; M.S., Seton Hall; Ph.D. Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin (Stevens Point); M.S., Kansas State; Ph.D., Wisconsin (Madison)
Anne Keating, B.S., M.S., Ph.D., Rutgers

Lu, Haiyang, B.S., Hebei Univ. (China); M.S., Beijing Normal Univ. (China); Ph.D. City Univ. of NY

Nelson, Cassandra, B.S., Marquette; M.S., Indiana University School of Medicine; Ph.D., Marquette

Soliman, Mai, B.S., M.Sc. Montclair State; Ph.D., Rutgers

Gregg Transue, B.S., Pennsylvania State; M.S., Ph.D., Rutgers

Anthony J. Uzwiak, B.A., Ph.D., Rutgers

Villegas, Gabriel, B.A., Ph.D., Rutgers

Walczak, Alexandra, B.S., Ramapo College, Ph.D., Rutgers

Yu, Calvin, B.A. Skidmore; M.A., New York University; Ed.M. Rutgers


- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Minor Requirements

- Independent Study and Research in Biology
- Departmental Honors Program
- Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)
- Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)
- Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)
- Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)
- Courses


Life Sciences (SAS)

# Learning Goals

# Learning Goals

Our overarching goal for educating our students majoring in biological sciences is to inspire them to want to discover and understand the natural world. In the process of achieving this goal, we expect our students to acquire not only facts and concepts, but also skills and perspectives. We hope that our learning goals will both prepare our students for a variety of career objectives and supply them with the tools to become lifelong learners in the ever-evolving world of biological sciences.

*Learning Goals:*

I. To acquire the appropriate factual and conceptual knowledge that provides students with a foundation to further their education and career in the areas of life science or health science. Students will be able to demonstrate basic knowledge (e.g., identify, define, explain, etc.) of the concepts, practices, and principles that comprise the biological sciences.

II. To develop data analysis and statistical reasoning skills that prepare students for a society increasingly reliant on the use of data and information. Students will be able to interpret/evaluate patterns in data presented in tables, figures, and graphs, as well as be able to organize, summarize, and present data.

III. To develop the ability to use scientific reasoning as embodied by the structured process commonly known as the scientific method to empower students with the ability to generate and refine knowledge. Students will be able to evaluate and apply the practice of science.

IV. To develop critical thinking and problem-solving skills necessary to prepare students to evaluate, synthesize, and generate knowledge that provides them with a competitive advantage to adapt to an evolving, global, and knowledge-based society. Students will be able to demonstrate application of higher-order thinking (e.g., classify, diagnose, evaluate, synthesize, hypothesize, etc.). Students will develop an understanding of not only the connections within biology, but also the connections between biology and other scientific disciplines.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in biological sciences must have completed two semesters of General Biology and Biological Research Laboratory with a grade of C or better in each course. Both semesters of General Biology must have been completed at the same institution or on the same campus at Rutgers. No more than two courses with a grade of D may be used to fulfill the requirements of the major. A 2.0 grade-point average must be maintained in the life sciences core and elective courses applied toward the major. Students must meet with an adviser before they can successfully declare their major.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The program in biological sciences, administered through the Division of Life Sciences Office of Undergraduate Instruction, is intended to provide a broad and comprehensive training in modern biology. This course of study is recommended for those who wish to study biology as part of their liberal arts education, preparing them for a career in one of the health professions, graduate studies in biology, a teaching career in secondary schools (courses in education also are required), as well as employment in various areas of the life sciences. If a student wishes to concentrate his or her studies in a specific area of biology, he or she should consider a major offered by one of the departments in the Division of Life Sciences or in the School of Environmental and Biological Sciences. Faculty advisers are available to assist each student with course selection and program requirements.

A minimum of 20 credits of coursework from among general biology, genetics, and life sciences electives must be completed in residence. In other words, no more than 16 credits in this part of the major requirements may be transferred from any institution outside of Rutgers University-New Brunswick. This rule is intended to assure that students receiving degrees from Rutgers-New Brunswick have taken a minimum number of courses in their major with this faculty. Please keep in mind that although a course may transfer from another institution into one of the Rutgers-New Brunswick schools, it will not necessarily be accepted toward the major in biological sciences. Therefore, all transfer courses must be evaluated and accepted by the advising office of the Office of Undergraduate Instruction in order to count toward the major. As indicated earlier, students must complete both semesters of general biology at the same institution or on the same campus of Rutgers before becoming eligible to declare the biological sciences major. Any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation. Credits for cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major.

The course requirements for the biological sciences major are divided into two sections: the life sciences core courses and the life sciences electives.

*Required Life Sciences Core Courses (47 credits)*

01:119:115-116 General Biology I,II (4,4)
01:119:117 Biological Research Laboratory (2)
01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)
01:160:171 Introduction to Experimentation (1)
01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)*
01:160:311 Organic Chemistry Laboratory (2)
01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics***
01:750:205-206 General Physics Laboratory (1,1)***
01:640:135,~~138~~136 Calculus for the Life and Social Sciences (4,4)** or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)
01:447:380 Genetics (4)
* With approval from a Biological Sciences Advisor, 01:160:308/316 may be replaced by another elective course. Please meet with an Advisor to discuss.

**01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).
***Calculus II 01:640:13~~8~~6(4) may be substituted by 01:960:379 Basic Probability and Statistics (3), 01:960:401 Basic Statistics for Research (3), or 01:960:211-212 Statistics I,II (3,3).

*Life Sciences Electives (24 credits)*

It is highly recommended that students meet with a life sciences adviser in the Division of Life Sciences Office of Undergraduate Instruction when planning their elective courses. It is important that the courses taken complement each other as much as possible and are not merely a collection of unrelated topics.

The electives must include at least three laboratory courses, only one of which may be satisfied by research work. Biological Research Laboratory and "library research" do not qualify for this requirement. A minimum of six courses (18 credits) must be at the 300 or 400 level, including at least three separate laboratory courses or three courses with a laboratory component. The laboratory associated with genetics (01:447:382 or equivalent), if taken, may be used to satisfy one of the three laboratory requirements.

No course at the 100 level may be used to satisfy the life sciences elective requirements. A maximum of 6 credits of independent study/research/honors research may be used toward the 24 elective credits. Please keep in mind that a minimum grade-point average of 2.8 is required to enroll in an independent study/research course in biological sciences. Research courses can satisfy only one of the three laboratory requirements, regardless of number of credits. Courses taken on a pass/fail basis may not be used to satisfy requirements for the major in biological sciences. A grade-point average of 2.0 or better in courses credited toward the major is required. No more than two courses with a grade of D may be used to fulfill the requirements of the major.

The elective courses must include at least one course (3 or 4 credits) each from the Departments of Cell Biology and Neuroscience 146, Genetics 447, Molecular Biology and Biochemistry 694, and Ecology, Evolution, and Natural Resources 11:216 at the School of Environmental and Biological Sciences. A list of approved courses in subject areas in addition to those in the Division of Life Sciences (Biological Sciences 119, Cell Biology and Neuroscience 146, Genetics 447, and Molecular Biology and Biochemistry 694) will be published by the advising office of the Office of Undergraduate Instruction. It is strongly recommended that students consult this list, which is available

on the website, prior to registering for their courses. Generally, acceptable courses from other departments on any campus of Rutgers University have a year of general biology as a prerequisite; however, there are exceptions. It is imperative for students to consult the published list and meet with an adviser. Credits from cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks if double majoring with another permitted life sciences major, at least four of the 3-4 credit life science courses applied to the Biology major may not overlap with courses used to fulfill second major requirements. Given that biological sciences is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation.

Life Sciences (SAS)

# Minor Requirements

# Minor Requirements

The minor requires four courses of at least 3 credits each in life sciences subjects as well as General Biology and Biological Research Laboratory. Both semesters of General Biology must be completed at the same institution or on the same campus at Rutgers. No other course at the 100 level may be used to satisfy the minor. A minimum of 11 credits must be taken at Rutgers University-New Brunswick. A maximum of 3 credits of research in a life sciences subject may be used toward the minor. A minimum of three courses at the 300 level or above is required. If majoring in a permitted life sciences major, no more than two of the four life science courses applied to the minor requirements may overlap with courses used to fulfill major requirements. Only life sciences courses acceptable for the biological sciences major may be used for the minor. Courses in chemistry, mathematics, or physics do not count toward the minor. A grade-point average of 2.0 or better in courses credited toward the minor is required. No more than one course with a grade of D may be used to fulfill the requirements of the minor.

Life Sciences (SAS)

# Independent Study and Research in Biology

# Independent Study and Research in Biology

A minimum cumulative grade-point average of 2.8 is required for a student to register for an independent study/research course in biological sciences. A maximum of 6 credits of laboratory-based independent study, research, or honors projects may be used to fulfill the elective credits requirement in biology. The independent study/research form, available from the advising office of the Office of Undergraduate Instruction, must be completed and signed by the professor in whose laboratory the student will study prior to initiating the research project. Approval of a research proposal by the director of advising and a special permission number from the Office of Undergraduate Instruction is necessary for registration. Students may not earn academic credit for laboratory projects for which they are being paid. Students wishing to apply research credits from other departments toward the major in biological sciences must get approval from the advising office of the Office of Undergraduate Instruction, Division of Life Sciences, prior to beginning their research project.

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have a cumulative grade-point average of 3.0 or better and an average of 3.4 or better in life sciences core and elective courses credited toward the biological sciences major at the end of the junior year and previous research experience. At that time, the student should apply formally to the advising office of the Office of Undergraduate Instruction. Accepted students are expected to complete at least 6 credits over two semesters in an independent research project, resulting in a thesis, and to pass an oral examination before a faculty committee in the general field of the student's program of emphasis. If the research is done in a laboratory outside of the Division of Life Sciences, the examination committee must include at least one individual from the Division of Life Sciences faculty. Departmental Honors is completed in the fall and spring of senior year. Students accepted into special programs (e.g. BA/MD) may complete honors during junior year.

Honors students must register either for an honors course sequence in life sciences or for a course sequence in a school honors program. These decisions should be discussed with an adviser. An approval form (available in the advising office) must be completed.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

**Rutgers Undergraduate/Robert Wood Johnson Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

This program is designed for high-achieving premedical students of Rutgers University who are in their sophomore year. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and Robert Wood Johnson Medical School (RWJMS).

Application to this program is open to all undergraduate students enrolled at Rutgers University, New Brunswick. It is not directly associated with any one school within the university but see below for specific restrictions.

Admission is a two-stage and highly competitive process. In the first stage, undergraduate students are admitted into the program by an executive committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools of Rutgers University who have spent at least a year here. Prospective applicants from Rutgers University-Newark and Rutgers University-Camden must transfer to one of the units in New Brunswick for their sophomore year and complete at least 30 credits here. All applicants must have completed 4 semesters of college with a minimum of 60 credits. Applicants with an Associate¿s Degree, regardless of whether it was earned as a dual degree in high school or as a traditional degree after high school,

are ineligible to apply for the program. Admitted students will need to complete all of the core requirements of their undergraduate unit and major requirements with the exception of Biological Sciences and Cell Biology and Neuroscience majors, who may apply credit from the first professional year toward the major requirements. During the fourth year, students will be full time at the medical school and elective credits will count towards the undergraduate degree. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second stage occurs typically after the fourth year of study. It is the responsibility of the RWJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the RWJMS Admissions Committee. The purpose of this second, noncompetitive review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B (Honors or High Pass) in courses taken at both universities. However, recommendation is not automatic. The final decision rests with the RWJMS Admissions Committee. Upon approval by this admissions committee, the student will be permitted to continue into the fifth year of study and will be matriculated formally as a candidate for the M.D. degree at RWJMS.

Applicants to the B.A./M.D. program must be in their fourth semester at Rutgers University. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers, New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester and sustain it through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers University, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers-New Brunswick (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, two semesters of English, and organic chemistry lab must complete these requirements by the end of the third year of study. Students who did not take the SAT or ACT but who are admitted to the program will be required to take the MCAT by April of the junior year and score competitively with a total score of at least 508 (minimum single sub score of 123). An application form has been developed that allows the student to provide the executive committee with information it deems useful for its deliberations.

The bachelor's degree will be awarded upon completion of the undergraduate college and major requirements, by the end of year four. Upon satisfactory completion of year seven and all RWJMS requirements, the student will receive the medical degree.

Students who wish to pursue a major other than biological sciences must discuss their plans with the appropriate department in order to establish the requirements they need to complete for their major. For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from RWJMS will be applied toward the major (as stipulated below). The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements, usually by the end of year four. The number of credits, however, is not directly translated between the two universities; no more than 4 credits per laboratory course and 3 credits per non-laboratory course taken at RWJMS may be used toward the bachelor's degree at Rutgers.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and Intro to Biochemistry (01:694:301) and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must complete an additional approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick.

Students in the program must meet with advisers at the medical school and at their undergraduate school when planning their elective courses. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers' undergraduate units and RWJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

**Rutgers Undergraduate/New Jersey Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

The Rutgers Undergraduate/New Jersey Medical School joint program started in the fall of 2003. The purpose of the program is to permit students to begin their medical education after their third year or at least 96 degree credits at Rutgers. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and New Jersey Medical School (NJMS).

This program is only open to students enrolled in Rutgers University-New Brunswick schools.

Admission is a two-phase and highly competitive process. In the first phase, undergraduate students are admitted into the program by the Joint Program Executive Committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools at the New Brunswick location of Rutgers University who have been enrolled here for at least one year. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the NJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B in courses taken at Rutgers. Students must complete the Medical College Admission Test (MCAT) by January of the junior year before matriculating at NJMS and be required to be in the competitive range of other accepted NJMS students. This second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the NJMS Admissions Committee. However, recommendation is not automatic. The final decision

rests with the Medical School Admissions Committee. Upon approval by the Medical School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the M.D. degree at the New Jersey Medical School.

Applicants for the program must be in their fourth semester at Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, organic chemistry lab, and two semesters of English must complete these requirements by the end of the third year of study. An application form has been developed that allows the student to provide the committee with information the committee deems useful for its deliberations.

Students will be admitted at the end of the spring semester of year two and be formal members of the program beginning with year three. Prior to leaving the Rutgers undergraduate unit, students must satisfy all college and major requirements, except for the credits which they will receive from NJMS (please see next paragraph). For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from NJMS will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements by the end of year four. Upon satisfactory completion of year seven or eight, as well as all New Jersey Medical School requirements, the student will receive the medical degree.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and NJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

**Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine Joint Bachelor of Arts/Doctor of Medicine in Dentistry (B.A./D.M.D.) Program**

Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine joint program started in the spring of 2002. The purpose of the program is to permit students to begin their dental education after their third year or at least 98 credits at Rutgers. Specially selected students will obtain bachelor's and dental degrees in a seven-year program of study taken at Rutgers undergraduate units and Rutgers School of Dental Medicine.

This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick. The program is administered by the Health Professions Office.

Admission is a two-phase and competitive process. In the first phase, undergraduate students are admitted into the program by the Executive Committee of the Joint Program consisting of faculty from the appropriate units. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the Rutgers School of Dental Medicine Admissions Committee to review the credentials of students recommended by the articulated program executive committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for admission to the dental school. It is expected that students will have grades of A or B in courses taken at Rutgers University. Students must complete the Dental Admissions Test (DAT) and earn scores of 20 or better in Total Science, Academic Average, Organic Chemistry, General Chemistry, and Biology. Students may only take the DAT one time to qualify for this program. The second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the Rutgers School of Dental Medicine Admissions Committee. However, recommendation is not automatic. The final decision rests with the Dental School Admissions Committee. Upon approval by the Dental School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the Doctor of Medicine in Dentistry (D.M.D.) degree at the Rutgers School of Dental Medicine.

Applicants to the program must be in their fourth semester at the School of Arts and Sciences, Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at the School of Arts and Sciences, Rutgers-New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester, which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, two semesters of college-level mathematics (Calc I and either Calc II or an approved Statistics course) and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded

advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). If AP credit was granted for general chemistry, then organic chemistry I and II and laboratory and a course in biochemistry at Rutgers are required. If AP credit was granted for English, upper level English at Rutgers is required with the same amount of credit work. If AP credit was granted for physics, two approved courses from Physics or Kinesiology & Health at Rutgers are required. Those students who are admitted to the program without having two semesters of physics, biochemistry, organic chemistry lab, and two semesters of English, must complete these requirements by the end of the third year of study.

The B.A./D.M.D. program is a seven-year program with year one being the first undergraduate year. Students will be admitted at the end of the spring semester of year two and be formal members of the articulated program beginning with year three. Prior to leaving the School of Arts and Sciences, Rutgers-New Brunswick, students must satisfy all college and major requirements, except for the credits which they will receive from Rutgers School of Dental Medicine (please see below). For a student at the School of Arts and Sciences, Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from Rutgers School of Dental Medicine will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the general education and major requirements by end of year four. Upon satisfactory completion of year seven or eight, as well as all Rutgers School of Dental Medicine requirements, the student will receive the dental degree.

A student enrolled in the joint program completing a major in biological sciences at Rutgers-New Brunswick is required to complete any remaining Life Sciences Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers-New Brunswick, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/ research course may be applied toward the biological sciences major for students in the B.A./D.M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers-New Brunswick and Rutgers School of Dental Medicine.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

**Rutgers School of Arts and Sciences/Rutgers School of Health Professions Joint Bachelor of Arts/Master of Science Degree (B.A./M.S.) Physician Assistant Program**

This is a six-year (3+3) program offered jointly by the School of Arts and Sciences and the School of Health Professions (SHP). The program can be looked at as a two-phase program, an undergraduate phase followed by a professional phase. This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick, who are U.S. citizens, permanent residents of the United States, or international individuals currently on a student visa. At a minimum, applicants must be enrolled for one year at Rutgers-New Brunswick earning at least 30 credits.

The first phase of the program includes three years of undergraduate liberal arts and basic science education. Students may apply to the second (professional) phase in April of their second year by applying to the Physician Assistant (PA) program. Personal interviews will be required of those applicants being considered for admission. The interview will serve to determine the applicant's emotional and intellectual maturity, ability to communicate, and the potential to achieve career satisfaction within the physician assistant role. Applicants must have a cumulative and science GPA of 3.2. In cases where individuals may show high potential by improved performance, exceptions to this requirement may be considered. Please note that acceptance by Rutgers University does not guarantee acceptance by the PA program.

Applicants to the program must have completed the following courses with a grade of C or better: at least one semester (3 credits) of English composition, applied statistics or biostatistics (from Psychology, Biology, or Math departments), General Biology I and II with lab (119:115, 116, and 117, or equivalents); General Chemistry I and II with lab (160:161,162 and 171, or equivalents); and General Psychology (830:101, or equivalent). If the student has been granted AP credit by Rutgers for science courses, additional science courses will be required.

All applications must be received by June 1 and final notices of acceptance will be made by August 1. If the applicant is accepted into the program, it will be contingent on maintaining a 3.2 GPA through the end of the third undergraduate year at Rutgers-New Brunswick, and on all requirements for the undergraduate degree being met before the beginning of the fourth year. Students who are accepted into the second phase of the program will begin this phase at the beginning of their senior year. At the end of the senior year, these students will receive a bachelor of arts degree conferred by the School of Arts and Sciences, Rutgers University-New Brunswick. After completion of the remaining two years of the PA program, graduates will receive a master of science degree awarded by Rutgers School of Health Professions.

Before entering the second (professional) phase, a student accepted by this program must also complete for the PA program, Functional Human Anatomy (01:377:223), General Microbiology (01:447:390), Intro to Biochemistry (01:694:301) and Systems Physiology (01:146:356) (waived if Gen Bio II is completed at Rutgers-NB and not AP credit), and 6-8 additional credits of life science electives. Students majoring in biological sciences are required to have completed, in addition to the School of Arts and Sciences core distribution requirements, the Life Sciences Core requirements, Intro to Biochemistry (01:694:301) and General Microbiology (01:447:390) and one (three credit or more) course from the 216 subject area approved electives. Students with AP or transfer credit of General Biology I and II and lab must take an additional life science elective course for 3 or more credits. A maximum of 14 credits from SHP courses will be accepted toward the biological sciences major. Please be sure to meet with a biological sciences adviser when selecting life sciences elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and SHP.

For a complete description of the requirements for the major in biological sciences, please read the appropriate section under the Division of Life Sciences in this catalog.

For more information about this program, you may contact the PA program office at the School of Health Professions, 675 Hoes Lane, Piscataway, NJ 08854, at 732-235-4444; or the Division of Life Sciences, Health Professions Office at Rutgers University, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Courses

# Courses

With the exception of 01:119:115,116, and 117 General Biology I and II and Biological Research Laboratory, courses numbered at the 100 level may not be used for major credit in any of the majors within the Division of Life Sciences.

**01:119:098** ***Foundations for Biological Science (E2)***
Selected topics in general biology: introduction to cellular organization, metabolism, genetics, reproduction, and organ systems. Development of analytical reasoning and science-oriented study techniques.
***Preparation for college-level general biology.***

**01:119:103** ***Principles of Biology (4)***
Selected topics in general biology, including cell structure, genetics, plant and animal diversity, basic plant and animal biology, ecology, and evolution.
***Lec. 3 hrs., lab. 3 hrs. Designed for students who must take a one-semester laboratory course in introductory biology to meet major requirements. Credit not given for this course if student has already completed 01:119:115. Not for life sciences major credit.***

**01:119:109,110** ***Biology Practice Group (1,1)***
Students will work actively to (1) organize the lecture content, (2) identify what they are expected to do with that content (outcomes), (3) prepare and explain study aids (organizers) to ensure that they correctly understand the week¿s content, and (4) begin the self-evaluation process to gauge exam preparedness. Discussion of the basic methods and principles.
***Corequisite for 109 is 01:119:115; corequisite for 110 is 01:119:116.***

**01:119:111,112** ***Reading in General Biology (1,1)***
Discussion and reading providing extensive and advanced coverage of selected topics.
***Corequisite for 111 is 01:119:115; corequisite for 112 is 01:119:116.***

**01:119:115** ***General Biology I (4)***
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics. Lec. 3 hrs., Wkshp. 80 min.
***Prerequisite has two parts: writing (prerequisite of 01:355:101, 01:355:103, or 01:355:104, or placement into 355:101 or 355:104) and math (prerequisite of 01:640:026 or placement into 640:CMA, 640:PCA, 640:CLG, or 640:CLS).***

**01:119:116** *General Biology II (4)*
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics.
*Lec. 3 hrs., Wkshp. 80 min. Prerequisite: 01:119:115 with a grade of C or better. Credit not given for both this course and 01:119:102.*

**01:119:117** *Biological Research Laboratory (2)*
Laboratory designed to introduce and explore principles of research in the biological sciences by engaging in semester-long research projects requiring students to analyze data, synthesize new experiments, and evaluate findings.
*Prerequisite: 01:119:115 with a grade of C or better. Corequisite: 01:119:116.*

**01:119:120** *STEM Success Seminar (1.5)*
Increases ability to control academic success and improve transition to the university environment in furtherance of educational and career goals. Reflection on recent and current academic experience and career aspirations. Setting of priorities and alignment of time and effort towards those ends.
*By special permission only.*

**01:119:127-128** *Anatomy and Physiology: Health Sciences (4,4)*
Structure and function of human organ systems. Some microanatomy and biochemical aspects of physiology included.
*Lec. 3 hrs., lab. 3 hrs. For nursing, medical technology, physical therapy, and other professional students. Not for life sciences major credit.*

**01:119:131** *Microbiology for the Health Sciences (3)*
Introduction to microbes with emphasis on the nature and behavior of microorganisms, the interrelationships between microbes and the human host in health and disease, and the principles of prevention and control of infectious disease.
*Not open to students who have taken 01:447:390. For nursing and other professional students. Not for life sciences major credit. Prerequisites: 01:199:115-116 or 01:119:127-128.*

**01:119:132** *Microbiology for the Health Sciences Laboratory (1)*
Laboratory to accompany 01:119:131.
*Lab. 3 hrs. Pre- or corequisite: 01:119:131.*

**01:119:140** *The DNA Revolution (Honors) (3)*
Introduction to fundamentals of molecular genetics, biotechnology, and modern genetics, including a laboratory research project using molecular biology and bioinformatics techniques. Intended primarily for nonscience majors, but may also appeal to prospective chemists, physicists, engineers, and computer scientists.
*Restricted to first-year and sophomore students in the School of Arts and Sciences Honors Program or the Honors College. Credit not given for both this course and 01:119:140 or 01:694:215 or 315, or 01:447:315. Not for life sciences major credit.*

**01:119:148** *Moving Bodies: The Biology of Movement (3)*
Considers fundamental processes that allow humans and other animals to move, including structural basis (bones and muscles), control (brain and nervous system), conversion of food into energy (digestion and nutrition),

movement of food and oxygen to muscles (circulation), and some common and familiar injuries and illnesses and their treatments.
*Credit not given for both this course and 01:119:100, 103, 115-116, or 127-128. Not for life sciences major credit.*

**01:119:150** *Biology, Society, and Biomedical Issues (3)*
Discussion of current topics and issues in human health and medicine from a biological perspective.
*Credit not given for both this course and 11:115:100. Not for life sciences major credit.*

**01:119:154** *Genetics, Law, and Social Policy (3)*
Principles of human and behavioral genetics and their legal, ethical, and social implications. Topics include genetic screening, counseling, and engineering; reproductive regulation; and human behavior genetics.
*Prerequisite: Sophomore standing. Not for life sciences major credit or related major.*

**1:119:155** *Human Genetics (3)*
How our genes influence our development and health, how both normal traits and diseases are transmitted through families, how genetics is used in forensics and personalized medicine, and the genetic tests that are offered directly to consumers.
*Not for life sciences major credit.*

**01:119:156** *Genetics, Evolution, and Human Health (4)*
The human body and human behavior, shaped by more than four billion years of evolutionary processes. Scientific and social implications of current ideas and controversies of evolution and genetics.
*Not for life sciences major credit.*

**01:119:160** *Biology, Society, and Ecological Issues (3)*
Ecological and evolutionary ideas affecting space ecology; population increase, food supply, air and water pollution, war, and nuclear energy.
*Not for life sciences major credit or related major.*

**01:119:182** *Essentials of Human Reproduction (3)*
Anatomical and physiological bases of human sexuality; biological and cultural aspects of sexual differentiation and psychosexual development, contraception, venereal disease, and sexual lifestyles.
*Not for life sciences major credit or related major.*

**01:119:195** *Brain, Mind, and Behavior (3)*
Honors course discussing the interrelationship between the brain, the mind, and behavior.
*Open to students in the School of Arts and Sciences Honors Program or the Honors College. Not for life sciences major credit or related major.*

**01:119:199** *Preparation for General Biology (4)*
For first- and second-year students planning science majors. Enrollment based on placement scores. Selected concepts in biology, proven learning strategies for college science courses, and instruction in the scientific method. Prepares students for success in the General Biology sequence (01:119:115-117).
*Lec./rec. 3 hrs., lab. 3 hrs. Enrollment restricted by placement. Not for life sciences major credit.*

**01:119:201-202** ***Independent Study in Biology (1-3,1-3)***
Independent study under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. May not be used to fulfill a laboratory requirement.***

**01:119:204** ***Outreach in Biology (1)***
Introduction to the basic principles and best practices of outreach in the biological sciences. Emphasis on understanding how to translate technical concepts and techniques to lay audiences incorporating best practices in active learning, public speaking and curriculum development. Recommended for students interested in teaching careers and related positions in science communication.
***Prerequisites: 01:119:115, 01:119:116, and 01:119:117. By special permission.***

**01:119:205** ***Internship in Life Sciences (3)***
Development of experience and knowledge regarding the expectations, qualifications, competencies and responsibilities of professionals working within the life sciences through an internship experience with academic component. Integration of knowledge from life science coursework with the internship experience, development of new skills, and reflection on the learning experience.
***Prerequisites: 01:119:116 and 01:119:117. Open only to 119 Biology Majors.***

**01:119:307-308** ***Research in Biology (1-3,1-3)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to students majoring (or minoring) in biological sciences.***

**01:119:310** ***Communication in Biology (1)***
Effective skills for communicating science to a variety of audiences in a variety of forms including papers, grant proposals, teaching, and presentations to scientists and others. Provides support for students completing the 10-page research paper required for Research in Biology.
***Prerequisites: 01:119:307, 308, 407, or 408. Corequisites: 01:119:307, 308, 407, or 408.***

**01:119:311** ***Current Topics in Life Sciences (1)***
Directed readings and discussion of selected scientific topics and career stories with Rutgers Life Sciences Alumni.
***Junior or senior status and Division of Life Sciences major (subject code: 119, 146, 694, 447).***

**01:119:401** ***Clinical Practicum in the Health Professions (3)***
Development of advanced knowledge of and reflection on the qualifications, competencies, and responsibilities of physician health care providers through an internship experience and academic component integrating knowledge from life science coursework and the health care setting.
***Prerequisites: 3.4 science GPA. By special permission of the Office of Undergraduate Instruction only.***

**01:119:406-407** ***Research in Biology (1-4,1-4)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report is required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to seniors majoring (or minoring) in biological sciences.***

**01:119:408-409** ***Honors in Biology (3-6,3-6)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written thesis, oral presentation, and defense are required.
***Prerequisites: Declared biological sciences major. Permission of the Office of Undergraduate Instruction. Open only to seniors majoring in biological sciences who meet the requirements for departmental honors.***

**01:119:410** ***Honors Communication in Biological Sciences (1)***
Instruction on effective communication of scientific ideas and findings for both the scientific community as well as the general public. Support in writing honors theses and preparing for oral thesis defenses.
***Prerequisite: 01:119:408. Corequisite: 01:119:409.***



# Cell Biology and Neuroscience 146

# Cell Biology and Neuroscience 146

Department of Cell Biology and Neuroscience, School of Arts and Sciences

**Website:** Here

**Chair:** Megerditch Kiledjian

**Vice Chair and Undergraduate Director:** Gabriella D'Arcangelo

**Distinguished Professors:**

Joanna Burger, B.S., SUNY (Albany); M.S., Cornell; Ph.D., Minnesota

Megerditch Kiledjian, B.A., Rutgers; Ph.D., University of Pennsylvania

Melitta Schachner, Diploma in Biochemistry, Tübingen (Germany); Ph.D., Max-Planck Institut für Biochemie (Germany)

Wise Young, B.A., Reed; Ph.D., Iowa; M.D., Stanford

**Professors:**

Lori R. Covey, B.S., California (Riverside); Ph.D., Columbia

Gabriella D'Arcangelo, B.S., Bari (Italy); Ph.D., SUNY (Stony Brook)

Robin L. Davis, B.S., Pennsylvania State; M.A., San Diego State; Ph.D., Stanford

Bonnie Firestein, B.S., Michigan; Ph.D., California (San Diego)

Martin Grumet, B.S., Cooper Union; Ph.D., Johns Hopkins

Ronald P. Hart, B.S., Connecticut; Ph.D., Michigan

Arnold G. Hyndman, A.B., Princeton; Ph.D., California (Los Angeles)

Alice Y.-C. Liu, B.S., Chinese University of Hong Kong (China); Ph.D., Mount Sinai School of Medicine

Gary F. Merrill, B.S., Weber State; Ph.D., Michigan State

Kathleen M. Scott, B.A., Brown; Ph.D., Yale

**Associate Professors:**

Qian Cai, M.D., Shanghai Railway Med College (China); Ph.D., National Institutes of Health-Shanghai Second Medical University

Wei Dai, B.S., M.S., Beijing Normal (China); M.S., Texas Health Science Center; Ph.D., Baylor College of Medicine

Dunne Fong, B.S., Massachusetts; M.A., Ph.D., Princeton

Shu-Chan Hsu, B.S., Ph.D., British Columbia

Peng Jiang, B.S., Soochow (China); Ph.D., University of Science and Technology of China

Kelvin Y. Kwan, B.S., California Institute of Technology; Ph.D., Harvard

David Margolis, B.S., Brown; Ph.D., Washington (Seattle)

Ping Xie, B.S., Nanjing (China); Ph.D., Hong Kong University of Science and Technology

**Assistant Professors:**

Victoria Abraira, B.S., Southern California; Ph.D., Harvard

Santiago Cuesta, B.A., M.S., Ph.D., National University of Rosario (Argentina)

Brian Daniels, B.A., B.S., Southern Wesleyan (Central); Ph.D., Washington (Seattle)

Rafiq Huda, B.A., Carleton College; Ph.D., Northwestern University (Chicago)

Natasha O¿Brown, B.S., Davidson College; Ph.D., Stanford

Max Tischfield, B.A., Rutgers; Ph.D., Harvard

**Associate Research Professors:**
Xinfu Jiao, B. S., Xinxiang Medical College (China); M.S., Tongji Medical University (China); Ph.D., Shanghai Institute of Hematology (China)

Patricia Morton, B.S., Northwestern University; M.S., Ph.D., University of Wisconsin

**Assistant Research Professor:**

Dongming Sun, B.S., Beijing Medical University (China); Ph.D., Columbia University

**Assistant Teaching Professors:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Tara Cominski, B.S. St. Peter's University; Ph.D., Rutgers

Anne Keating, B.S., M.S., Ph.D., Rutgers

- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Options
- Departmental Honors Program
- Courses

Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Cell Biology and Neuroscience offers a course of study that provides fundamental and comprehensive training in the areas of cell biology and neuroscience. The major objective of this program is to prepare students for graduate studies in cell biology and neuroscience; entry into professional schools in medicine, dentistry, or other health-related fields; or employment in industrial and pharmaceutical companies.

*Learning Goals*

Students will:

I. master factual and conceptual knowledge in cell biology and neuroscience that will provide a solid foundation for success in advanced training and professional careers;

II. develop an ability to summarize, integrate, and organize information; and

III. use scientific reasoning to evaluate the potential for current research and new discoveries to improve our understanding of cell biology and neuroscience and its relevance to human health and to our society.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

The major in the Department of Cell Biology and Neuroscience is open to students after their first year who have completed Fundamentals of Neurobiology (01:146:245) or Fundamentals of Cell Biology (01:146:270), with a grade of C or better. Departmental approval is required.

A grade of C or better in all courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The Department of Cell Biology and Neuroscience offers a program of study from which students can select one of two tracks, depending upon particular interests and career goals: a general track (default) and an honors track. Students can apply to enter the honors track at the beginning of the senior year. This track requires a minimum GPA of 3.4 in courses credited toward the major, and departmental approval. A number of core courses are required of all students in the cell biology and neuroscience major, regardless of the chosen track. No more than 16 credits from among the life science courses required for completion of the cell biology and neuroscience major may be fulfilled by credits transferred from any school outside of Rutgers University-New Brunswick. Any life science courses applied to the major should be taken within 10 years of graduating.

***Required Core Courses (65 or more credits)***

01:119:115-116 General Biology (4,4)

01:119:117 Biological Research Laboratory (2)

01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)

01:160:171 Introduction to Experimentation (1)

01:160:307-308 or 01:160:315-316 Organic Chemistry (4,4)

01:160:311 Organic Chemistry Laboratory (2)

01:750:203-204 General Physics (3,3) or 01:750:193-194 Physics for the Sciences(4,4)*or 01:750:271-272 Honors Physics (3,3)

01:750:205-206 General Physics Laboratory (1,1)

01:640:135,136 or 01:640:151-152 Calculus I and II (4,4) or 01:640:135 and 01:960:401 Basic Stat for Research (3) or 01:960:379 Basic Prob and Stat or 01:640:135 and 01:960:212 Statistics II (3)**

01:447:380 Genetics (4)

01:146:245 Fundamentals of Neurobiology (3)

01:146:270 Fundamentals of Cell Biology (3)

01:694:395 Biochemistry for Life Sciences (3) or 01:694:407 Biochemistry (3)

Advanced Cell Biology and Neuroscience Courses: choose three of the following:

01:146:445 Synapses, Neurons, and Circuits (3)

01:146:447 Clinical Neurobiology (3)

01:146:465 Neurobiology of Pain and Addiction (3)

01:146:472 Developmental Biology (3)

01:146:473¿ Genetic Regulation in Cell Biology¿(3)

01:146:474 Immunology (3) or 01:146:476¿ Honors Immunology (3)

01:146:481 Protein Dynamics in Cell Biology (3)

* with approval from the Undergraduate Director or CBN Advisor 01:160:308 may be replaced by an additional elective course.
** Students who take who take Physics for the Sciences 01:750:193-194 (4,4) do not need an additional Physics laboratory.
*** Students with AP statistics equivalent of 01:960:211, transfer credit for 01:960:211, or who have taken 01:960:211 at Rutgers must take 01:960:212.

Life Sciences (SAS)

# Options

# Options

*General Track; 4 credits*

This track is for students who, upon graduation, seek immediate employment or plan to attend professional schools in health-related fields. In addition to the required core courses, students must take the following courses:

1. One elective lecture courses at the 300-400 level in the life sciences area (equaling 36 or more credits)
2. One laboratory or research course (1-3 credits). Students can take a lecture course with an associated laboratory component (3-4 credits) to satisfy both requirements, or a stand-alone lecture plus a laboratory or research course.

*Honors Track; 12 credits*

This area of concentration is for students interested in research who, upon graduation, plan to attend graduate school or professional schools in health-related fields. A student must qualify for admission into the honors track. See the departmental honors program page in this catalog for student qualifications. In addition to the required core courses, students must complete the following courses, produce a written research thesis and an oral thesis presentation:

1. One elective lecture course at the 300-400 level in the life sciences area (3 or more credits).
2. 01:146:405 Honors Seminar (3).
3. 01:146:408-409 Honors Research (3,3).

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

Honors in cell biology and neuroscience are awarded to students who have successfully completed the honors track course requirements, submitted a written research thesis, and defended the thesis orally. To qualify for the honors track, a student must have attained a grade-point average of 3.4 or better in courses required for the major. The student should apply formally to the department for acceptance into the honors program by the end of the second semester of the junior year.

Life Sciences (SAS)

# Courses

# Courses

**01:146:201,202** *Independent Study in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. May not be used to fulfill a laboratory requirement. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:245** *Fundamentals of Neurobiology (3)*
Introduction to the biology of the nervous system. Topics covered include nerve cell signaling, sensory and motor systems, and higher brain processes.
***Prerequisites: 01:119:115-116.***

**01:146:270** *Fundamentals of Cell Biology (3)*
Principles of cell biology. Structure, function, and macromolecular organization of cellular organelles.
***Prerequisites: 01:119:115-116.***

**01:146:295** *Essentials of Cell Biology and Neuroscience (3)*
Provides a background in the biology of neural cells and cognition.
***Prerequisites: 01:119:115-116. Not intended for cell biology and neuroscience majors.***

**01:146:307,308** *Research in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research on an original problem under the direction of a member of the Rutgers faculty.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:322** *Human Histology (4)*
Structure of the tissues and organs of the human body. Lec. 3 hrs., lab. 3 hrs.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:328** ***Human Parasitology (3)***
Cell biology, epidemiology, pathogenesis, and clinical manifestations of human parasitic diseases.
***Prerequisites: 01:119:115-116.***

**01:146:329** ***Human Parasitology Laboratory (1)***
Laboratory to accompany the Human Parasitology lecture course 01:146:328. Lab. 3 hrs.
***Pre- or corequisite: 01:146:328.***

**01:146:340** ***Virology (3)***
Principles of virology including the molecular and cellular events that occur during virus replication, the host cell response, and pathogenesis. Emphasis on animal viruses that impact human health and disease. Strategies for controlling viruses.
***Prerequisite: 01:146:270.***

**01:146:350** ***Introduction to Light Microscopy for the Life Sciences (1, minicourse)***
This course offers a comprehensive exploration of advanced imaging techniques essential for studying tissues, cells, and organelles in the life sciences.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:356** ***Systems Physiology (3)***
Comprehensive study of the principal organ systems of laboratory animals and humans.
***Prerequisites: 01:119:115-116 and 01:160:161-162 or 163-164, and 171 Credit not given for both this course and 11:067:300.***

**01:146:357** ***Systems Physiology Laboratory (1)***
Laboratory to accompany the Systems Physiology lecture course 01:146:356. Lab. 3 hrs.
***Pre- or corequisite: 01:146:356.***

**01:146:405** ***Honors Seminar (3)***
This course is intended to help students prepare a written research thesis and practice the oral thesis presentation.
***Requires departmental permission. Open only to senior honors students majoring in cell biology and neuroscience. This course fulfills the SAS WCd core requirement.***

**01:146:406, 407** ***Research in Cell Biology and Neuroscience (1-3,1-3)***
Research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. Open only to students majoring in cell biology and neuroscience.***

**01:146:408-409** ***Honors Research (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member. Written report and oral presentation required. Culminates in a written thesis and oral thesis defense.
***Permission of department and an instructor willing to sponsor the student are required. Open only to seniors majoring in cell biology and neuroscience who meet the requirements for the departmental honors program.***

**01:146:410-411** ***Research Thesis in CBN I and II (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member and the course coordinator.
***Prerequisites: 01:146:307 or 01:146:308. Requires departmental permission and acceptance by a faculty mentor who will***

*host the student in the laboratory. Requires submission of a written thesis draft (I = Fall semester), and submission of a final written thesis and oral defense (II = Spring semester). Open to senior students majoring in cell biology and neuroscience who are not enrolled in the departmental honors program.*

**01:146:445** *Synapses, Neurons, and Circuits (3)*
Cellular and systems features of neurons and the fundamental unit of signaling in the nervous system, focusing on a small number of advanced topics. Focus on how to test hypotheses related to the topics addressed: intra- and inter- cellular communication; construction of neuronal networks; protein interactions at the synapse; and signal transduction pathways.
*Prerequisites: 01:146:245 and 01:146:270.*

**01:146:447** *Clinical Neurobiology (3)*
Development and function of the nervous system with an emphasis on diseases and disorders. Topics include neurodevelopment, demyelination, tumors, and viral infections; neurological disorders/diseases; injury to the spinal cord and brain and repair; and clinical trials and the future of spinal cord and brain trauma.
*Prerequisites: 01:146:245 and 01:146:270. Intended for senior students majoring in cell biology and neuroscience.*

**01:146:456** *Advanced Physiology (3)*
Preparation for advanced graduate study in physiology and for medical physiology (first-year medical school). Focus on mammalian physiology and the whole animal (whole organ) approach to classical experimental physiology.
*Prerequisites: 01:146:356. Intended for senior and junior students.*

**01:146:464** *Topics in Cell Biology and Neuroscience (3)*
Directed readings and discussion of selected topics in cell biology and neuroscience.
*Prerequisites: 01:146:245 and 01:146:270. Open to junior or senior students majoring in cell biology and neuroscience.*

**01:146:471** *Advanced Cell Biology Laboratory (3)*
Advanced laboratory methods in cell biology. Emphasis on light and electron microscopy, imaging, immunocytochemical techniques, tissue culture, and methods of identifying and separating macromolecules.
*Prerequisite: 01:146:270 or permission of instructor.*

**01:146:472** *Developmental Biology (3)*
Genetic, molecular and cellular processes that lead from egg to embryo to mature organism.
*Prerequisite: 01:146:270 or 01:447:380 or 01:447:384.*

**01:146:473** *Genetic Regulation in Cell Biology (3)*
Advanced topics in cell biology, focusing on genetic animal models, genomics, chromatin function, gene expression, and RNA biology.
*Prerequisite: 01:146:270.*

**01:146:474** *Immunology (3)*
Fundamental principles of immunology with emphasis on antibody formation, immunoglobulin molecules and genes, hypersensitivity reactions, and the cellular basis for the immune response.
*Prerequisites: 01:119:115-116 and 01:447:380 or 01:447:384. Recommended: 01:447:390.*

**01:146:475** ***Laboratory in Immunology (1)***
Biochemical and molecular analysis of immune cell function. Application of immunological techniques to the examination of normal and diseased states.
***Pre- or corequisite: 01:146:474.***

**01:146:476** ***Honors Immunology (3)***
Introduction to the immune system, with a focus on mammalian organisms (particularly humans). Focus on critical thinking and problem-solving abilities, as well as introduction to primary research addressing contemporary immunological questions. Open only to students enrolled in the Honors College, SAS Honors Program or CBN Honors Program.
***Prerequisites: 01:447:380 or 01:447:384. Credit not given for both this course and Immunology 01:146:474.***

**01:146:481** ***Protein Dynamics in Cell Biology (3)***
Advanced topics in cell biology, focusing on signal transduction (module 1), cell adhesion and protein transport (module 2) and cytoskeletal dynamics controlling cell movement (module 3).
***Prerequisite: 01:146:270.***

Life Sciences (SAS)

# Genetics 447

# GENETICS 447

Department of Genetics, School of Arts and Sciences

**Website:** Here

**Chair:** Tara C. Matise

**Vice-Chair & Undergraduate Director**: Gary A. Heiman

**Distinguished Professors:**

Maureen M. Barr, B.A., Rutgers; Ph.D., Columbia

James A. Knowles, B.S., Michigan; M. Sc., M.D., Ph.D., Albert Einstein Medicine

Tara C. Matise, B.S., Cornell; M.S., Ph.D., Pittsburgh

Jay A. Tischfield, B.S., City University of New York; M.Phil., Ph.D., Yale

Lei Yu, B.S., Jiangnan University (China); M.S., Institute of Genetics, National Academy of Sciences (China); Ph.D., California Institute of Technology

**Professors**:

Gary A. Heiman, B.A., Boston Univ.; M.Sc., Sarah Lawrence; Ph.D., Columbia

Kim S. McKim, B.A., Simon Fraser; Ph.D., British Columbia

Bryce E. Nickels, B.S., Miami; Ph.D., Harvard

Christopher G. Rongo, B.A., University of California, San Diego; Ph.D., Massachusetts Institute of Technology

Gleb P. Shumyatsky, B.A., Moscow State University; Ph.D., Institute of Molecular Biology (Moscow, Russia)

Andrew W. Singson, B.S., University of California, Davis; Ph.D., University of California, San Diego

Karen Schindler, B.S., Loyola; Ph.D., Thomas Jefferson

Michael Verzi, B.A., The College of New Jersey; Ph.D., University of California, San Francisco

Jinchuan Xing, B.S., Nankai (China); Ph.D., Louisiana State

**Associate Professors:**

Chris Ellison, B.A., Lewis and Clark; Ph.D., University of California, Berkeley

Derek Gordon, B.A., Rochester; Ph.D., State University of New York at Stony Brook

**Assistant Professors:**

Christina M. Bergey, B.A., M.A., Ph.D., New York University

Devanshi Jain, B.Sc. Hons., Ph.D., University College, London

Tetsuya Nakamura, B.S., Ph.D., Osaka (Japan)

Srujana Samhita Yadavalli, B. Tech., Anna University (India); Ph.D., Ohio State

Jiekun Yang B.S., Renmin University (China), M.S. UW-Madison, Ph.D. University of Virginia

**Associate Research Professors:**

Juan Wang, B.S., Ph.D., China Agricultural University (Beijing)

**Assistant Research Professors:**

Marco Azaro, B.A., Ph.D., Brown

**Teaching Professor:**

Martha Haviland, B.A. Rutgers; MS, AM, Ph.D. Michigan

**Associate Teaching Professor:**

Jessica Rispoli, B.S., Richmond; M.G.C., Maryland

Christine Seymour, B.S., Scranton; M.S. Arcadia University

**Associate Research Professor:**

Oleg Evgrafov, B.S., Moscow Physical Engineering Institute; M.S., Moscow Physical Engineering Institute; Ph.D,. Institute of General Genetics (Moscow); D.Sc., Research Center for Med. Genetics (Moscow)

**Assistant Teaching Professors:**

Tara P. Cominski, B.S, Saint Peter's; M.S., Seton Hall; Ph.D., Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin; M.S., Kansas State; Ph.D., Wisconsin

Anne Keating, B.S., Ph.D., Rutgers

Haiyang Lu, B.S., Hebei University, China; M.S., Beijing Normal University, China; Ph.D., City University of New York

Shama Khan, B.A., Rutgers University; M.P.H., Tulane; M.S. Epidemiology, Tulane University; M.S. Genetic Counseling, Arcadia University

Mai Soliman, B.S., M.Sc., Montclair State; Ph.D., Rutgers

Zainab Tanvir, B.A. Stonybrook University, M.S. Univ. Delaware, Ph.D., Rutgers

Alexandra Walczak, B.S., Ramapo College of NJ, Ph.D., Rutgers

**Faculty Emeriti:**

David E. Axelrod

Linda Brzustowicz

Terry McGuire

Howard C. Passmore

Amrik S. Sahota

Lee D. Simon

Navin K. Sinha

Ann C. St. John


- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Elective Courses
- Departmental Honors
- Undergraduate Certificate Programs
- Courses

# Learning Goals

# Learning Goals

**Learning Goals:**

The Department of Genetics is committed to teaching science through the way we do science: through the process of doing research. The curriculum of the Department of Genetics is centered around four main goals. These goals shape our innovative courses and provide the basis for lifelong learning.

I. Knowledge specific goals: Know the terms, concepts, and theories of genetics.

II. Integrate the material from multiple courses and research to think holistically and to see the whole as well as the parts.

III. Use genetic information and ideas to critically analyze published research articles in genetics.

IV. At the end of four years, all of our students will be able to design an experiment, carry out the research using the appropriate laboratory techniques, and analyze and interpret their data. They will also be able to communicate their discoveries through a written article appropriate for publication in a peer-reviewed genetics journal, and through talks or posters appropriate for scientific meetings.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in this department must have been enrolled at Rutgers for at least one semester. In addition, students must:

1. Be an SAS student

2. Have a cumulative GPA of at least 2.00, and a GPA of at least 2.8 at the time of taking research for credit.

3. Have earned a C or better in these prerequisite courses or equivalents (25-26 credits):

a. General Biology I 01:119:115

b. General Biology II 01:119:116

c. General Biology Lab 01:119:117

d. General Chemistry I either 01:160:161 or 01:160:163

e. General Chemistry II either 01:160:162 or 01:160:164

f. Calculus I either 01:640:135 or 01:640:151

g. Calculus II or Statistic either 01:640:136, or 01:640:152, or 01:640:192, or 01:960:401, or 01:960:212, or 01:960:379

4. Students with an overall GPA < 3.0 must meet with the UGD before declaring the major.

a. Genetics is a credit-intensive major and has a requirement of a 2.80 GPA at the time of taking research for credit

b. Students entering the major with a GPA of < 3.0 may struggle to complete the major on time

5. Watch a Genetics Major Declaration Video

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The department offers a major with a strong emphasis on research. A minimum of 20 credits of coursework in the life sciences must be completed in residence. Genetics is a credit-intensive major. Excluding the prerequisite courses (25-26 credits) to get into the major (see above), there are between 54-56 credits to complete the major (60-62 for honors). A grade of "C" or better in courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades. Students may not double major in two Division of Life Sciences majors.

The requirements of the major consist of:

**A. Life Science Core Courses (19-21 credits)** - Required for all DLS Majors (Approved AP and Transfer credits may be substituted)

a. Intro to Experimentation 01:160:171

b. Organic Chemistry I 01:160:307 or 01:160:315

c. General Physics I (01:750:203 + 205 lab), or (01:750:271 + 275 lab), or 01:750:193, or 01:750 201
Note: 193 & 201 have integrated lab

d. General Physics II (01:750:204 + 206 lab) or (01:750:272 + 276 lab) or 01:750:194 or 01:750:202
Note: 194 & 202 have integrated lab

**B. Genetics Core (17 credits) -** Required for all Genetics Majors- All below credits must be completed at Rutgers

a. Genetic Analysis I 01:447:384

b. Genetic Analysis II 01:447:385

c. Lab Course Req. 01:447:315, or 01:447:302, or 01:447:203, or 01:447:303, or 01:694:214, or 01:694:215, or 01:694:316

d. Biochemistry for the Life Sciences 01:694:395 or 01:694:407

e. Communications in Genetics 01:447:430 or 01:447:414 + 01:447:415 (Honors, Thesis Writing senior year)

**C. Genetics Independent Scholarship (minimum 6 credits but 12 credits for honors**

Note: 2.8 minimum GPA to register for research

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

**D. Genetics Electives (6 credits)**

Fifty percent must be taken within the Genetics Major (i.e.; 01:447)

a. Genetics Electives See electives table

b. Genetics Electives See electives table

c. Genetics Electives See electives table

**E. Electives OR Independent Scholarship (6 credits)**

Note: Additional Genetics Lab may be used as an elective

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

c. Genetics Electives See electives table below

**Lab Note:** 01:694:214 and 01:694:215 are only offered to first-year students with AP Biology credit and AP General Chemistry credits (or taking General Chemistry concurrently). 01:447:203 is only offered to first-year students in the SAS Honors Program or the Honors College. Students cannot receive credit for both 01:447:203 and 01:447:302.

**Organic Chemistry Note:** If you are planning to pursue a graduate degree in which a full year of organic chemistry is suggested/required (e.g., med/dental school), we strongly recommend taking Organic Chemistry II + lab as an elective (6 credits)

Life Sciences (SAS)

# Elective Courses

# Elective Courses

**Approved Genetics Electives**

(01:160:308 or 01:160:316) and (01:160:311 or 01:160:314-15) Organic Chemistry II + lab (6)

01:198:111 Introduction to Computer Science (4)

01:198:112 Data Structures (4)

01:447:203 Honors Computational Genetics (Honors) (3)

01:447:216 Analysis of Scientific Literature (Honors) (3)

01:447:245 Intro to Cancer (3)

01:447:302 Quantitative Biology and Bioinformatics (3)

01:447:303 Computational Genetics of Big Data (3)

01:447:315 Introduction to Research in Genetics (3)

01:447:354 Social, Legal, and Ethical Implications of the New Genetics (3)

01:447:356 Evolutionary Medicine (3)

01:447:370 Developmental Genetics (3)

01:447:390 General Microbiology (3)

01:447:392 Pathogenic Microbiology (3)

01:447:451 Genomes (3)

01:447:460 Genetics of Compulsive Behavior (3)

01:447:465 Genetic Approaches & Research Analysis (3)

01:447:470 Evolutionary Developmental Biology (3)

01:447:478 Special Topics in Genetics (3)

01:447:479 Special Topics in Genetics (3)

01:447:480 Topics in Molecular Genetics (3)

01:447:484 Behavioral and Neural Genetics (3)

01:694:411 Molecular Pathways and Signal Transduction (3)

01:694:412 Proteomics and Functional Genomics (3)

01:694:413 Chromatin and Epigenomics (3)

01:694:420 Membrane Dynamics in Health and Disease (3)

01:694:421 Spec. Top. Mol. Bio. & Biochem (3)

01:694:492 Gene Regulation in Cancer and Development (3)

11:126:427 Methods and Applications in Molecular Biology (4)

11:126:483 Nucleotide Sequence Analysis (3)

11:126:485 Bioinformatics (3)

11:680:480 Microbial Genetics and Genomics (3)

16:681:535 Human Genetics (3)

Life Sciences (SAS)

# Departmental Honors

# Departmental Honors

**Departmental Honors**

The Department of Genetics recognizes graduating students who have made outstanding academic achievements by awarding **departmental honors**. The department awards two types of departmental honors (see below) and these are awarded at the discretion of the Genetics Honors Committee. To be considered, students must meet all criteria for that type of honors and submit the honors request application by the deadline (April 1st of senior year).

The two types of departmental honors and their criteria are as follows:

**1. GENETICS HONORS- RESEARCH**

a. GPA requirement: a student must have attained, at the end of the junior year, a cumulative GPA of at least 3.4 and a Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete 6 or more credits of Honors in Genetics (01:447:408-409) during senior year

c. Complete a total of 12 or more research credits (including the 6 credits of 01:447:408-409)

d. Complete Honors Thesis and Communication in Genetics 447:414 and 415 during senior year

e. Complete and defend a research thesis before a faculty committee (see Thesis Guidelines)

f. Present at Honors Day

Students can apply to do an Honors thesis by completing the relevant sections of the Independent Scholarship Form. Students must register either for an Honors course sequence in Genetics (01:447: 408 and 409) or for a course sequence in a college Honors Program (See Handbook). These decisions should be discussed with an advisor and approved by the Department Vice Chair. Accepted students are expected to complete at least 12 credits in an independent research project, resulting in a thesis. Students may do research with Rutgers faculty outside of the Department with the approval of their advisor and the Vice Chair. Students will prepare a thesis and present an oral defense to a committee of three faculty. At least one member of the committee must come from the Department of Genetics. Students will present their research at a Departmental Symposium in April. Students contemplating an Honors thesis should refer to the much more detailed instructions and details in Section IX and Section X of the Student Handbook. For information on the thesis, see Thesis Guidelines.

**Level of Honors:** In determining the level of honors, the honors/awards committee takes into consideration multiple factors in aggregate, including but not limited to (1) cumulative GPA, (2) thesis defense committee recommendation, (3) research mentor evaluation, (4) faculty evaluation of presentation at Honors Day, and (5) whether or not the student took the honors versions of Genetic Analysis 1 and/or 2 (i.e., 01:447:384:H1 and/or 01:447:385:H1) and the grades received in those courses.

**2. Genetics Honors - Certificate Program**

a. GPA requirement: A student must have attained, by April 1st of senior year, a cumulative GPA of at least 3.4 and Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete a departmental certification program (i.e.; CompGen, Cancer or Genetic Counseling).

c. By April 1st, the student must formally apply to request consideration for Certificate Honors by completing the Genetics Honors- Certificate Program Form

* *The honors committee may award Honors, High Honors or Highest Honors*

Life Sciences (SAS)

# Undergraduate Certificate Programs

# Undergraduate Certificate Programs

The Department of Genetics offers two certificate programs. Students who complete one of these Certificates are eligible to receive Departmental Honors.

1) Genetic Counseling Certificate Program

The Department of Genetics offers an undergraduate **Genetic Counseling Certificate Program (GCCP).** The GCCP program is intended for a select group of students interested in applying to the masters-level programs in genetic counseling. The goal is to provide students with guidance, coursework, and relevant clinical experience to improve their graduate school applications. This is a highly competitive option and is **only open to declared genetics majors**. Not all applicants will be accepted. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in genetics and does not replace minors. The certificate is NOT in lieu of completing the masters-level programs in genetic counseling. At the end of the program students will:

- understand genetic counseling as a profession ·
- understand application requirements for masters-level programs
- gain experience in talking with people who are in crisis
- gain experience in a clinical genetic counseling clinic

2) Certificate in Computational Genetics

The Department of Genetics offers a Certificate in Computational Genetics (CCG) for Genetics majors. The volume of data being generated in Genetics and related life science fields has been expanding tremendously in recent years, and career opportunities for geneticists with computational and quantitative expertise are simultaneously growing. This certificate program is intended for students who are either interested in applying to graduate-level programs,

or planning careers, in Computational Genetics/Biology, Statistical Genetics, Bioinformatics, or other programs in quantitative biomedical related research. The goal of the CCG is to provide students with guidance, coursework, and relevant data design and analysis experience to prepare them for graduate studies in the field or entry-level informatics jobs. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained competence in genetic data analysis using basic computer programming and statistical analysis.
- Be prepared to apply to M.S. or Ph.D. graduate programs in the areas of Computational Genetics and Bioinformatics.
- Be prepared to apply for career positions in industry, biotech companies, pharmaceutical companies, medical centers, or universities

3) Cancer Research Certificate

The Department of Genetics offers a Certificate in Cancer Research (CCR) for Genetics majors. Completion of the Certificate in Cancer Research will provide an advantage when applying to MD, PhD, and MS programs and facilitate transitions to careers with Cancer-related missions. The goal of the CCR is to provide students with a rigorous and Cancer-specialized curriculum. Students will do at least one year of research in a nation-leading Cancer Research Lab and students will be expected to participate in community engagement and develop skills to build community outside of academia. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained knowledge in Cancer Genetics with an expanded curriculum focused on Cancer biology.
- Have at least one year of experience conducting laboratory research in a Cancer research lab.
- Be prepared to apply to M.S., MD, or Ph.D. graduate programs in the areas of Cancer Genetics or for career positions in industry, biotech companies, pharmaceutical companies, medical centers, policy-driving institutes, or universities.

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# Courses

# Courses

**01:447:203** ***Honors Computational Genetics (Honors) (3)***
Honors computational genetics is a computer-based laboratory course that introduces students to the use of computers in biological research. This course is for students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. In the first half of the course, students will receive instruction in introductory computer programming (Python). In the second half of the course, students will practice writing code in Python via in-depth computational projects in genetics and genomics. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on

assignments. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and genomic data analysis. Prior experience with computer programming is neither necessary nor is it expected for students who enroll in this course.

This course is for freshman or sophomore Honors students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major.The course fulfills the laboratory requirement for the Genetics major.
***Prerequisites: Students must be in their first or second year at Rutgers in an approved Honors program (e.g., the Honors College or the SAS Honors Program). General Biology I (01:119:115) and be at least co-registered for General Biology II (01:119:116)) or have placed out of these two courses (e.g., through AP credit or approved transfer credit). Credit not given for both 01:447:203 and 01:447:302.***

**01:447:216** ***Analysis of Scientific Literature (Honors) (3)***
A systematic approach to the reading, analyzing, and understanding of primary literature in genetics; emphasis will be placed on data analysis and experimental design and demystifying the process of reading a scientific journal article.
***Prerequisites: 01:119:115-116. Highly recommended: 01:694:215. Open only to freshmen and sophomores in the SAS or SEBS Honors Program. By permission only.***

**01:447:245** ***Introduction to Cancer (3)***
Introduction to Cancer provides the student with an overview of conventional and state-of-the-art aspects of oncogenesis. Students will become familiar with the process involved in neoplastic transformation to the cancer phenotype through aspects of epidemiology, pathophysiology, virology, in vitro and in vivo cellular transformation and genetics. They will then apply these aspects to the understanding of classic therapeutic modalities and new state-of-the-art rational therapies. This comprehensive course will concentrate on the human disease process by applying clinical aspects of oncogenesis during a series of Grand Rounds discussions that will include recent patient clinical cases and their outcomes.
***Prerequisites: 01:119:115-116. Credit not given for both this course and 01:447:495.***

**01:447:302** ***Quantitative Biology and Bioinformatics (3)***
Introduction to the use of computers and computer programming to develop applications for research in genetics and molecular biology. Application topics will include evolutionary genetics, association analysis and genetics mapping, and structural biology.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill an elective requirement or taken instead of 01:447:315 Introduction to Research in Genetics by students majoring in Genetics. Credit not given for both 01:447:203 and 01:447:302***

**01:447:303** ***Computational Genetics of Big Data (3)***
The main focus of this course is the application of R programming to the analysis of genetic data, particularly big data sets with multiple measurements. The primary data sets considered will contain RNA-seq and/or other expression data for multiple/all genes in a given set of individuals. This course is for junior or senior students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. Students will learn how to acquire such data, format it for R, plot the data, and perform statistical analyses. In addition, students will learn how to simulate data under different hypotheses, and how to perform power and sample size calculations

for different statistical methods applied to real or simulated data. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on assignments. Guest investigators will frequently make short presentations (in person or by skype) to provide illustrations of how programming and informatics is critical for their research. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and data analysis.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course.***

**01:447:315** *Introduction to Research in Genetics (3)*
Basic principles and methods of research with microbial model systems used in the analysis and manipulation of genes, followed by a research project in molecular genetics.
***Prerequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 (or equivalent) or 01:160:163-164, 171. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course. Credit not given for both this course and 01:694:315. Open only to genetics majors***

**01:447:354** *Social, Legal, and Ethical Implications of the New Genetics (3)*
Social, legal, and ethical implications of new modern genetic techniques, for example: genetic screening, stem cells and cloning, forensic genetics, genetic engineering of plants, animals, and humans, genetic enhancement, gene therapy, and the new eugenics.
***Prerequisites: Genetics (01:447:380) or Genetics Analysis (01:447:384)***

**01:447:356** *Evolutionary Medicine (3)*
In this course, we examine human health from an evolutionary perspective, exploring the impact that our evolutionary heritage has on modern human diseases, both chronic and infectious. We will learn how the framework of evolutionary biology and modern genetic tools can inform our understanding of issues relevant to clinical and public health. Rather than focus on the immediate mechanisms underlying disease, we will endeavor to understand the ultimate factors that influence susceptibility, such as past natural selection. The course topics are wide-ranging, but particular attention is paid to emerging infectious diseases, as well as non-communicable diseases that may be exacerbated by facets of modern lifestyles.

Through lectures, critical analysis of the primary literature and popular science news, and class discussions, students will learn how evolutionary principles can be practically applied to medicine. Key readings each session will focus on genetic techniques for understanding evolutionary medicine, while additional readings will incorporate perspectives from diverse fields.

By fully participating in this course, students will be able to appreciate how modern susceptibility to non-communicable and infectious diseases has been influenced by past evolutionary processes; critically evaluate evolutionary hypotheses related to health and medicine, including those found in popular science articles; and know how genetic techniques are applied within an evolutionary framework to understand ultimate reasons for disease.
***Prerequisites: (01:447:380 or 384) AND (01:960:401 or 01:960:212).***

**01:447:370** *Developmental Genetics (3)*
How genes influence the developmental processes of an organism. Topics include gene regulatory networks, signaling pathways, stem cell biology, and the role of developmental genetics in human disease.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:380** *Genetics (4)*
Introduction to the mechanisms of heredity and evolution. Mechanisms of Mendelian inheritance, meiosis, recombination, gene mutation, and mapping, and an introduction to modern biochemical, molecular, and population genetics.
*Lec. 3 hrs., rec. 1 hr. Prerequisites: 01:119:115-116 and 01:160:161-162 or 01:160:163-164. Credit not given for both this course and 01:447:384-385 or 11:067:328 or 11:776:305.*

**01:447:382** *Genetics Laboratory (1)*
Laboratory to accompany 01:447:380. Not accepted for elective credit for Genetics majors.
*Lab. 3 hrs. Pre- or corequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)*

**01:447:384-385** *Genetic Analysis I,II (4,4)*
Experimental methods and concepts in genetics, with emphasis on their application to genetic research. Part I covers transmission genetics and breeding analyses, basic molecular genetics, isolation and characterization of mutations, and chromosome structure and function. Part II covers mathematical genetics, recombinant DNA, genomics, and special topics relevant to modern genetic research.
*Open only to majors in genetics or by permission of instructor. Credit not given for both this course and 01:447:380 or 11:067:328 or 11:776:305. Prerequisites for 01:447:384 are 01:119:115-116 (General Biology I & II) or 01:160:161-162 or 01:160:163-164 (General Chemistry I & II). Prerequisite for 01:447:385 is 01:447:384.*

**01:447:390** *General Microbiology (4 includes laboratory)*
Microorganisms are an essential component of the human environment and are significant not only for the disease they cause, but also for their ecological, agricultural, pharmaceutical, and industrial benefits. This course will introduce students to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms and their applications. The lab component of the course will introduce microscopy and staining techniques, the growth cycle and generation of a standard curve, physiological characteristics of microorganisms, and bacterial transformation. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include: History and Overview of Microbiology, Cell Structure and function, Microbial Growth, Nutrition, culture, and metabolism, Virology, Bacterial genetics, Microbial evolution and systematics, Bacteria and Archaea, Nutrient cycles, Genetic Engineering and Biotechnology, Waste treatment, Anaerobic respiration and Nitrogen fixation, Antibiotics and chemotherapeutic agents, Normal Flora, Virulence, Toxins, Epidemiology, and Microbial Diseases.

This is an upper-level course that focuses on the basic principles of microbiology. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include:
*Prerequisites: General Biology 01:119:115-116-117 or 01:119:101-102 and General Chemistry 01:160:161-162-171 (or higher) and Organic Chemistry 01:160:307. Credit not given for both this course and 11:680:390.*

**01:447:392** *Pathogenic Microbiology (3)*
This course will integrate basic microbiology and infectious diseases. The first quarter of the course will provide the conceptual basis of microbial morphology, metabolism and growth, heredity and variation, pathogenicity and antimicrobial chemotherapy. Then this course will introduce the students to one real life patient case study each week, moving the course toward an understanding of specific human diseases (e.g., pharyngitis, meningitis) as might be expected in a clinical environment. Each case will include a patient history, differential diagnosis, clinical cues, laboratory data, pathogenesis, treatment and prevention, additional points and references. The objective is not to attempt to cover every infectious disease or microorganism, but rather to use examples that would stress the key

principles of microbial pathogenesis, differential diagnosis and appropriate treatment and prevention. This course is intended for Life Science majors or those with a strong background in the Biological Sciences.
***Prerequisites: General Biology (01:119:115-117), General Chemistry (01:160:161-162-171), and Organic Chemistry (01:160:305. and 01:160:315. Systems Physiology is recommended.***

**01:447:406-407** ***Research in Genetics (3)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Permission of department and cumulative grade-point average of 2.8 or better. Open only to students majoring in Genetics.***

**01:447:408-409** ***Honors in Genetics (3-6,3-6)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Open by permission to seniors majoring in genetics who meet the requirements for the departmental honors program. Corequisite: 01:447:414 (fall) and 415 (spring).***

**01:447:410** ***Research in Genetics - Writing Intensive (3)***
Research in Genetics- Writing Intensive is intended to provide you with an opportunity to engage in original laboratory research under the direct supervision of a faculty mentor, usually in the faculty member¿s research laboratory. You are expected to carry out your own research project. NOTE: this research requires a heavy commitment of time and effort and can impact your performance in coursework, especially if you have not yet managed the foundational material for the discipline. Fulfills the writing and communication requirements of the SAS Core Curriculum.
***Prerequisites: 01:447:302, 447:315, or permission of department. Registration is by special permission only. Cumulative grade-point average of 2.8 or better. Declared genetics major.***

**01:447:414** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods, and reference sections of their thesis and outline the results and discussion.
***Corequisites: 01:447:408. For seniors completing departmental honors; by special permission only.***

**01:447:415** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods and reference sections of their thesis and outline the results and discussion.
***Prerequisite: 01:447:408. Corequisite: 01:447:409. For seniors completing departmental honors; by special permission only.***

**01:447:430** ***Effective Communication Skills in Genetics (3)***
Communication is an essential part of science. Whether it is communicating research findings to other scientists or conveying complex concepts to a lay audience, a scientist must be able to effectively communicate their research to succeed. Communication in science is typically through publications, posters, or oral presentations. The goal of this course is to provide students practice in effectively communicating scientific findings. This includes preparing and revising an introduction for scientific papers, writing a research description for general audience, and preparing and

giving presentations (both oral and poster).
***Prerequisites: Declared major in Genetics; must have completed one semester of Research in Genetics, Advanced Independent Study, or Genetic Counseling Rotation. By special permission only.***

**01:447:451** *Genomes (3)*
This course will focus on Genomics, Proteomics and Bioinformatics from a Genetics perspective. Special attention will be given to the organization and functioning of the human genome.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:460** *Genetics of Compulsive Behavior (3)*
Compulsive urge can be channeled toward productive endeavors such as a strong drive to succeed in competitions, schooling, and career. On the other hand, improper handling of compulsive urge may lead to problematic behaviors such as alcoholism, drug use, gambling, and other undesirable behaviors. There are also conditions that are medically defined as disorders, with certain types of compulsive behaviors as part of the diagnostic symptoms, such as OCD and ADD/ADHD. There is evidence that genetics contribute to compulsive behavior in humans, and research in animal models has begun to uncover the molecular factors that underlie the genetic basis of compulsive behavior. Discussion of primary literature and other scientific publications that deal with the molecular and genetic basis of compulsive behavior. Emphasis will be placed on the development of skills for critical thinking and effective writing.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:465** *Genetic Approaches and Research Analysis (3)*
This class will teach students how to read, interpret and analyze research articles. The class will follow an active learning format, where we will discuss seminal and recent research articles in depth: What was the scientific question or problem? What methods and strategies were used to address it? What were the findings and conclusions? What are the alternative interpretations and methods that could have been applied? What questions are remaining?
This class will expose students to a diverse selection of research literature, involving genetic and molecular analyses in model organisms such as mice, worms, flies and yeast. The class series will begin with a research article presented by the teacher. During the majority of the class series, students will be divided into groups of 4-5. Each group will be assigned one research article and be required to work together to a) interpret, b) analyze and c) present the article in the form of an oral presentation to the class. Students will be graded on their ability to perform each of these tasks and on active participation during presentations by other groups. All groups will also be required to complete and be graded on a written discussion summary assignment at the end of each article discussion. This summary assignment may take many forms, e.g., preparation of a graphical abstract, subway advert, or other creative forms of expression.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:470** *Evolutionary Developmental Biology (3)*
Evolutionary origins of the vertebrate body plan are major problems in biology. While paleontology and comparative anatomy have revealed the evolutionary trajectories of the organs, recent genetics, genomics and embryology are becoming powerful tools to answer classical questions. The goals of this course are twofold; 1) obtain fundamental knowledge of anatomy, embryology, and the latest genomics and 2) learn how to integrate genetics, genomics and embryology to answer evolutionary questions through active discussion in the classroom. The training to discover and answer scientific questions in animal diversity will be performed at the American Museum of Natural History.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:478,479** ***Special Topics in Genetics (3,3)***
Directed readings and discussion of selected topics of special interest in genetics. Topics will vary according to semester and/or instructor.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:480** ***Topics in Molecular Genetics (3)***
Current research topics in microbial and molecular genetics. Lectures, discussions, and critical analyses of journal articles.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:484** ***Behavioral and Neural Genetics (3)***
Influence of genetics on the nervous system and behavior of various organisms. Overview of field including experimental analysis of behavior, development of the nervous system, and sensory systems. Emphasis on reading and interpreting original research,
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:488** ***Genetic Counseling Rotation (3)***
The goal of this course is to provide students with an understanding of the genetic counseling career. Students will be placed at a local Genetic Counseling clinic to shadow a genetic counselor for one semester. During the semester, the student is expected to spend 8-9 hours a week at the rotation plus meet weekly with course director (attendance is mandatory). Course grade will be based on 1) Case presentation to Genetic Counseling group 2) ten Genetic Counseling case summary logs, and 3) evaluation by the clinical supervisor.
***Prerequisites: Declared Genetics major, cumulative GPA of 2.8 or greater, and accepted into the undergraduate Genetic Counseling Certificate Program (GCCP).***

**01:447:489,490** ***Advanced Independent Study in Genetics (3,3)***
Advanced independent study in Genetics is an opportunity for students to complete a scholarly project under the direct supervision of a faculty mentor. Projects are varied; e.g. library research on a topic of mutual interest to both the student and the faculty member, computer simulations, informative website design, or development of teaching materials. This course may not used for laboratory research.
***Prerequisites: 01:447:384 and permission of department. Open only to students majoring in Genetics***

Life Sciences (SAS)

# Molecular Biology and Biochemistry 694

# MOLECULAR BIOLOGY AND BIOCHEMISTRY 694

Department of Molecular Biology and Biochemistry, School of Arts and Sciences

**Website:** Here

**Chair:** Barth Grant

**Undergraduate Chair:** Samuel Gunderson

**Professors:**

Gyan Bhanot, B.S., Baroda (India); Ph.D., Cornell

Steven J. Brill, B.S., Maryland; Ph.D., SUNY (Stony Brook)

Monica Driscoll, B.A., Rutgers; Ph.D., Harvard

Isaac Edery, B.S., Ph.D., McGill (Canada)

Barth Grant, B.A., Virginia; Ph.D., Princeton

Kenneth D. Irvine, B.A., Williams College; Ph.D., Stanford

Fumio Matsumura, B.A., Tokyo; Ph.D., Nagoya (Japan)

Konstantin V. Severinov, M.Sc., Moscow State; Ph.D., Russian Academy of Sciences

Ruth Steward, B.S., Ph.D., Basel (Switzerland)

Andrew K. Vershon, B.A., Bennington College; Ph.D., Massachusetts Institute of Technology

Eileen P. White, B.S., Rensselaer Polytechnic Institute; Ph.D., SUNY (Stony Brook)

**Associate Professors:**

Stephen Anderson, A.B., Ph.D., Harvard

Sam Bunting, B.A., Oxford; Ph.D., Cambridge

Guoping (Sam) Gu, B.A., Peking (China); Ph.D., California (Santa Cruz)

Samuel I. Gunderson, B.S., Minnesota; Ph.D., University of Wisconsin, Madison

Mikel Zaratiegui, B.S., Ph.D., Navarra (Spain)

**Assistant Professors:**

Annika Barber, B.S., Bryn Athyn College; Ph.D., Thomas Jefferson

Jia Fei, B.S., Yunnan (China); Ph.D., Zurich (Switzerland)

Tina Liu, B.S. Yale; Ph.D. Harvard

Yang Lyu, B.S. Beijing, China; Ph.D. Guangzhou, China

Kevin Monahan, B.S., Haverford; Ph.D., Harvard

**Assistant Teaching Professor:**

Gabe Villegas B.A., Rutgers; Ph.D., Rutgers


- Learning Goals
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Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Molecular Biology and Biochemistry offers a course of study in which traditional and modern biochemistry are integrated with studies in molecular biology. In addition to traditional courses, students are required to carry out undergraduate research work in a Rutgers professor¿s lab who serves as the host and mentor. This course of study prepares students for graduate studies in molecular biology and biochemistry and related fields, entry into professional schools in medicine or other health professions, or employment in industries (e.g., biotechnology, pharmaceuticals) in which molecular biology and biochemistry skills are in demand. The same learning goals are also used for nonmajor students taking molecular biology and biochemistry courses.

*Learning Goals:*

I. Students should demonstrate an understanding of the knowledge that is needed to begin biomedical research and that is required for postgraduate exams and studies.

II. Students should demonstrate the ability to find and evaluate information about specific biological systems or problems.

III. Students should demonstrate the ability to design experiments and critically analyze data.

IV. Students should demonstrate the ability to communicate their research and findings orally through seminar and poster presentations and through written research papers.

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# Entry Requirements of the Major

# Entry Requirements of the Major

The molecular biology and biochemistry (MBB) major is open to students beyond their first year who have a 2.0 cumulative grade-point average and have received grades of C or better in courses taken toward the major, except by special permission of the department undergraduate chair. The MBB major is also open to first year students with AP credits. In all cases, students interested in the MBB major should contact the Undergraduate Director, Sam Gunderson.  A grade of C or better in all courses credited toward the major is required for graduation and each course may be repeated only once to replace D/F grades.

Departmental approval is required to declare the major in molecular biology and biochemistry. Students who want to register for the MBB major must first meet with the Undergraduate Chair Sam Gunderson, Nelson lab, Room A322/A320 (848-445-1016 gunderson@dls.rutgers.edu) to discuss details about the major.

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# Major Requirements

# Major Requirements

A core of courses is required for completion of the major in molecular biology and biochemistry. Students supplement the core with additional required and elective courses in one of three options. Given that molecular biology and biochemistry is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life science courses applied to the major in molecular biology and biochemistry should be taken within 10 years of graduating. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major. Returning students must meet with their adviser to discuss their path to graduation. All students are required to write research reports and present them at a seminar.

***Required Core Courses (58 credits)***

01:119:115-116 General Biology (4,4)*
01:119:117 Biological Research Laboratory (2)*
01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)*
01:160:171 Introduction to Experimentation (1)*
01:160:309 Organic Chemistry Laboratory (2) (recommended)* or 01:160:311 Organic Chemistry Laboratory (2)
01:160:315-316 Principles of Organic Chemistry (4,4) (recommended)* or 01:160:307-308 Organic Chemistry (4,4)
01:447:380 Genetics (4)*
01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4) *(recommended) or 01:640:135-136 Calculus for the Life and Social Sciences I,II (4,4)**
01:694:407 Molecular Biology and Biochemistry (3) or 01:694:395 Biochemistry for the Life Sciences (3)
01:694:315 Introduction to Molecular Biology and Biochemistry Research (3) or 01:694:215 Honors Introduction to Molecular Biology and Biochemistry Research (4) or 01:694:214 Introduction to Molecular Biology Research (3) or 01:694:316 Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)
01:694:408 Molecular Biology and Biochemistry (3)
01:694:383 Molecular Biology and Biochemistry Seminar: Careers in Science (1)
01:694:484 Molecular Biology and Biochemistry Seminar: Research Presentations (1)
01:750:203-204 General Physics (3,3)***

01:750:205-206 General Physics Laboratory (1,1)***

*Life sciences core course
**01:960:401 Basic Statistics for Research (3) or 01:960:211-212 Statistics I,II (3,3) may be substituted for the second semester of calculus.
***01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

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# Course Requirement Options

# Course Requirement Options

In addition to the required core courses, the Department of Molecular Biology and Biochemistry (MBB) offers two course options to students to fulfill the requirements for the major. Course option one comprises taking advanced electives and is intended to expose MBB students to different current topics in molecular biology and biochemistry. Course option two is for students interested in biophysical questions and research and comprises taking Physical Chemistry and Multivariable Calculus. Students completing course option two will also receive a minor in chemistry are encouraged to take the physical chemistry courses as they will fulfill the minor requirements. Course option two is intended to expose MBB students to different current topics in molecular biology and biochemistry.

*Course Option One (13 credits)*

Two 3-credit courses offered by the MBB department from the following list: 01:694:230; 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

One 400-level, 3-credit elective course offered by any department in the Division of Life Sciences or approved by the MBB department. See degree navigator or the MBB department website for a list of approved courses.

*Course Option Two (9 credits)*

01:160:341-342 Physical Chemistry: Biochemical Systems (3,3) or 01:160:327-328 Physical Chemistry (3,3) (requires 01:640:251 as a prerequisite). Other combinations of Physical Chemistry are possible so see degree navigator for further details.

01:640:251 Multivariable Calculus (4)

One 3-credit course offered by the MBB department from the following list: 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

*Electives*

Because the list of approved electives is changing, students should discuss their elective options directly with their departmental faculty advisers and with the MBB Undergraduate Director, Sam Gunderson. A list of currently approved electives can be found on the MBB department website. In addition to the undergraduate courses listed, advanced students are encouraged to choose electives from the School of Graduate Studies.

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# Research Options

# Research Options

The Department of Molecular Biology and Biochemistry (MBB) offers two laboratory research options (laboratory option one and laboratory option two), as well as a nonlaboratory research option (nonlaboratory option). In all cases, students must take one of the Introduction to Molecular Biology and Biochemistry Research courses (01:694:214, 01:694:215, 01:694:315, or 01:694:316) and 01:694:383, 484 Seminars in Molecular Biology and Biochemistry. Course 01:694:215 is only for first-year honors students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:214 is for first-year students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:315 is for either qualified sophomores or junior students in the major. Course 01:694:316 is for either qualified sophomores or junior honors students in the major.

*Laboratory Option One (>12 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6,2-6)

01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (6,6)

A minimum of 12 credits is required in research courses. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Laboratory Option Two (6 to 11 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6) or 01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (4-6,4-6)

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

A minimum accumulation of 6 credits is required in research courses. Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Note that students applying for honors must complete 4 up to 6 credits of honors coursework per semester for two semesters. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Nonlaboratory Option (9 credits)*

01:694:489,490 Literature Research in Molecular Biology and Biochemistry (3,3). This non-lab option is almost never used and will need approval from the Undergraduate Director, Sam Gunderson

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Students taking this option may not apply for departmental honors.

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# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have attained, at the end of the junior year, a cumulative grade-point average of at least 3.4 and a grade-point average of 3.4 or better in courses required for the major. Exceptional students not meeting these criteria but wishing to apply for honors research may petition the Department of Molecular Biology and Biochemistry at the beginning of their senior year. Students accepted into the program are expected to complete two semesters (6 credits per semester) of honors coursework. A written honors thesis and an oral thesis presentation are required. Students enrolled in 01:694:495,496 Honors Laboratory Research or any of the various school honors programs are eligible to receive departmental honors at the time of graduation.

Life Sciences (SAS)

# Courses

# Courses

**01:694:214** ***Introduction to Molecular Biology Research (3)***
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities available to undergraduates at the university.
***Prerequisites: For first-year students only who have placed out of General Biology (01:119:115,116, and 117) with AP credits, and 01:160:161 or 01:160:163. Corequisite: 01:160:162 or 164.***

**01:694:215** ***Honors Introduction to Molecular Biology and Biochemistry Research (4)***
Basic principles and methods of research, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisite: Limited only to first-year SAS Honors Program or Honors College students who have placed out of General Biology (01:119:115,116, and 117) with AP credits. Corequisites: 01:160:161 or 01:160:163 (or AP credits) and 01:640:135 or 01:640:151 (or AP credits).***

**01:694:230** ***Analytical Methods in Biology (3)***
Mathematical methods and tools to analyze and interpret biological and biomedical data, including probability theory; Bayes Theorem; the binomial, Poisson, and normal distributions; limit theorems; error analysis; tests of statistical significance; parameter estimation; curve fitting; sampling techniques; random number generation; and Monte Carlo methods. Analysis of sequencing and microarray data, such as sequence alignment, phylogeny inference, population structure, selection, and human migration.
***Prerequisites: 01:119:115-116 and 01:640:135 or 151.***

**01:694:281,282** *Sophomore Laboratory Research (2-6,2-6). 281 is Fall, 282 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Credits in this course cannot be used toward the required research credits for laboratory option. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:283** *01:694:283 Undergraduate Laboratory Research (2-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
Typically for rising Juniors and Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

***Prerequisite: Students must complete a special permission form and have it signed by their research and MBB faculty mentors before they can register of the course.***

**01:694:301** *Introductory Biochemistry and Molecular Biology (3)*
Chemistry and metabolism of proteins, carbohydrates, lipids, nucleic acids, and other biologically important compounds.
***Prerequisite: 01:160:209 or 307. Not for students majoring in molecular biology and biochemistry. Credit not given for both this course and 01:694:407, 11:115:301, or 11:115:403.***

**01:694:313** *Introductory Biochemistry Laboratory (1)*
Techniques used in research, clinical, and food laboratories, including tests of biological materials, methods of separation, and determination of enzyme activities.
***Lab. 3 hrs. Pre- or corequisite: 01:694:301. Not for students majoring in molecular biology and biochemistry.***

**01:694:315** *Introduction to Molecular Biology and Biochemistry Research (3)*
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities at the university available to undergraduates.
***Pre- or corequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 or 01:160:163-164, 171. Credit not given for both this course and 01:447:315, 01:694:214, 215, or 316. Open only to MBB majors.***

**01:694:316** *Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)*
Basic principles and methods of research in molecular biology, biochemistry, and genetics, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisites: 01:119:116 and (01:160:162 or 01:160:164). For MBB or genetics majors only or those planning on being MBB or genetics majors. Special permission required.***

**01:694:381,382** *Undergraduate Laboratory Research (3-6,3-6). 381 is Fall, 382 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:383** *Molecular Biology and Biochemistry Seminar: Careers in Science (1)*
Discussion of career options in the life sciences, finding a research laboratory, performing literature searches, reading a scientific paper, and creating posters and abstracts. This course should be taken in the beginning of the third year.
*Open to MBB majors only.*

**01:694:384** *Undergraduate Laboratory Research (1-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

*For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.*

**01:694:385** *MBB Research and Writing (3)*

Research project in the laboratory of a faculty member. Seminar on science communication. Written and oral reports of research carried out during the semester required.

*Prerequisites: MBB majors only. Students need a GPA of 2.8 or better to enroll in research.*

**01:694:390** *Introductory Computational Biology (3)*
Disciplines of biochemistry and molecular biology and genomics all include collection and analysis of large data sets. Hands on use in a computer lab will permit students to learn and apply computer languages such as Python and R to analyze large data including for example DNA mutations and structural variations (SVs), RNA-seq and ChIP-seq as part of understanding genes and gene regulation.
*Prerequisite: 01:447:380 or 01:447:384*

**01:694:395** *Biochemistry for Life Sciences (3)*
The course is intended for life science majors and takes a holistic approach to Biochemistry. You will learn the basics of proteins, enzymology, nucleic acids and metabolism and use these as foundations to discuss exemplary metabolic pathways for their importance to homeostasis and, when dysregulated, to disease including observable phenotypes and what current strategies are used to treat these disorders. Coursework will consist of quizzes, homework, exams and one graded paper.

*Prerequisites: 01:160:307 or 01:160:315*

**01:694:407** *Biochemistry (3)*
Protein structure and function, structure of lipids, membranes and carbohydrates, catalysis of biochemical reactions, intermediary metabolism, oxidative phosphorylation, membrane transport, lipid metabolism, signal transduction, photosynthesis, protein secretion, targeting and turnover, nitrogen, amino acid, and nucleotide metabolism.
*Pre- or corequisites: 01:160:307-308 or 315-316. Credit not given for both 01:694:407 and 01:694:301, 11:115:301, or 11:115:403.*

**01:694:408** *Molecular Biology and Biochemistry (3)*
Disciplines of biochemistry and molecular biology as interlocking and mutually complementary fields of study. Lectures on structure of DNA, RNA, recombinant DNA approaches, DNA replication, repair and recombination, mobile genetic elements, transcription, gene regulation, RNA splicing, translation, and viral gene expression.
***Prerequisite: 01:694:407 or 01:694:301 or 01:694:395 or 11:115:403. Credit not given for both 01:694:408 and 01:146:478 or 11:126:481.***

**01:694:411** *Molecular Pathways and Signal Transduction (3)*
Lectures and discussion of current research areas of advanced molecular and structural biology: transcription, posttranscriptional regulation, cell cycle, neurobiology, protein folding, macromolecular recognition, and molecular virology.
***Pre- or corequisites: 01:694:407 and 408, or 01:447:384-385 or 11:115:403-404 or 11:126:481.***

**01:694:412** *Proteomics and Functional Genomics (3)*
Survey of modern techniques of protein biochemistry, bioinformatics, proteomics, and functional genomics, including basic concepts of protein structure and function, protein folding, protein characterization and purification, enzyme kinetics, NMR and X-ray crystallography, mass spectrometry, yeast two hybrid, and various techniques and approaches to functional and structural genomics.
***Prerequisites: [(01:694:301 OR 01:694:407 OR 01:694:395) AND (01:447:380) OR (01:447:384)]***

**01:694:413** *Chromatin and Epigenomics (3)*

Introduction to chromatin dynamics, particularly the structural and biochemical modifications of chromatin that underlie epigenetic states and their effects on gene expression and development.

***Pre- or corequisites: Prerequisite: 01:694:408 or 01:146:478 or 01:447:385.***

**01:694:420,421** *Special Topics in Molecular Biology and Biochemistry (3,3)*
Directed reading and discussion of selected topics of special interest in molecular biology and biochemistry. Topics will vary according to semester and/or instructor.
***Pre- or corequisites: [(01:694:301 or 01:694:407) and (01:447:380 or (01:447:384)] or equivalent.***

**01:694:481,482** *Advanced Undergraduate Laboratory Research (BA, BA). 481 is Fall, 482 is Spring.*
Research project in the laboratory of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484.

**01:694:484** *Molecular Biology and Biochemistry Seminar: Research Presentations (1)*
Oral presentation of student's own research results and the research interests of the laboratory with which the student is associated. Presentation at a required poster session.
***Students should take this course in the spring semester of their senior year. MBB majors only.***

**01:694:489,490** *Literature Research in Molecular Biology and Biochemistry (1-3,1-3)*
Literature research projects on a selected subject under the direction of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484. This course is rarely used, therefore contact the Undergraduate Director if you are considering to take this course.
***Prerequisites: 01:694:214, 215 or 315, 407, 408, and 383.***

**01:694:492** ***Gene Regulation: Clocks to Cancer (3)***
Explanation of MBB as an experimental science and how molecular biologists know what they know. Covers all aspects of gene regulation from transcription to protein modification to explain how 25,000 human genes can make millions of different protein isoforms and mRNA and ncRNA. Mechanisms of molecular clocks and cancer addressed in terms of gene regulation complexity,feedback loops and rate-limiting steps with emphasis on the methods, experimental design,
***Prerequisites:(01:694:407 BIOCHEM) OR (01:447:384 GEN ANALY) OR (11:126:481 MOLE GEN) OR (11:115:403 GEN BIOCHEM) OR (01:694:395 BioChem LS)***

**01:694:495,496** ***Honors Laboratory Research (BA)***
Two-semester-long Honors research project in the laboratory of a faculty member. In the Fall semester, 01:694:495 students are required to attend a seminar each week on writing a thesis and preparing an oral thesis presentation. In the Spring semester, students take 01:694:496 where they complete their Honors thesis and give their oral presentation to their honors committee.

# Geography 450 (SAS)

## GEOGRAPHY 450

Department of Geography, School of Arts and Sciences

**Website:** Here

**Chair:** Kevin St. Martin

**Director of Undergraduate Studies:** Asa K. Rennermalm

**Distinguished Professors:**

Robin M. Leichenko, B.S., Wisconsin; M.A., Colorado; M.A., Ph.D., Pennsylvania State

David A. Robinson, B.Sc., Dickinson; M.S., Ph.D., Columbia

**Professors:**

D. Asher Ghertner, B.A., Colby College; M.A., Ph.D., California (Berkeley)

Kevin St. Martin, B.A., M.S., Massachusetts; Ph.D., Clark

Asa K. Rennermalm, B.S., M.S., Copenhagen (Denmark); Ph.D., Princeton

Laura Schneider, B.S., Universidad Nacional de Colombia; Ph.D., Clark

**Associate Professors:**

Kevon C. Rhiney, B.A., Ph.D., University of the West Indies (Jamaica)

**Assistant Professors:**

Priscilla Ferreira, B.A., University of São Paulo (Brazil); M.A., Ph.D., University of North Carolina at Chapel Hill

Andrea Marston, B.A., Duke; M.A., British Columbia; Ph.D., California (Berkeley)

J.T. Roane, B.A., The University of Virginia; Ph.D., Columbia

Teona Williams, A.B., Bowdoin College, MSc. University of Michigan (Ann Arbor), MPhil.,MA., Ph.D. Yale

**Associate Teaching Professors:**

Nathaniel J. Gabriel, B.A., Prescott College; M.S., Temple; Ph.D., Rutgers

**Assistant Teaching Professors:**

Paul O¿Keefe, B.A., University of Leeds; M.Sc., Universitiy of Northumbria; Ph.D., West Virtinia

Jesse Rodenbiker, B.A., Notre Dame; M.A., University of Oregon; Ph.D., California (Berkeley)

Geographers study the formation and meaning of place, spatial processes and practices, and the relationships between humans and their environments. Rutgers Department of Geography is nationally recognized for addressing critical contemporary issues, such as unprecedented environmental change, the increasingly clear limits of development, and the necessity to account for and redress racial, ethnic, and gender injustice. In addition to comprehensive major and minor degrees in Geography, the department administers Rutgers' Environmental Studies Program. The latter is a collaboration among more than twenty departments across the university, which offers major and minor degrees in Environmental Studies.

Geography 450 (SAS)

# Learning Goals

# Learning Goals

The Geography program has general learning goals for the entire program, and specific goals for each of the three tracts (Global Culture, Economics and Society; Environment; or Geographical Techniques), as listed below.

General Learning goals

1. Use a spatial perspective to critically examine how human and physical components of the world interact
2. Understand how geographic concepts apply to social and environmental justice
3. Acquire frameworks, methods and spatial models to identify and explain key geographical issues with attention to multi-scalar processes and connections between people, places, and environments
4. Understand how a geography degree can support career prospects

Global Culture, Economics, and Society

1. Synthesize and examine critically a range of cultural, economic and societal issues, particularly those connected with globalization, geopolitics and processes driving environmental change

2. Assess structural inequalities throughout the globe (e.g. systemic racism, wage gap, austerity)

Environment

1. Understand and apply the terminology and frames of reference used in physical and social environmental research
2. Identify and explain key physical and social environmental issues (e.g., environmental justice, climate change, and land-surface transformation).

Geographical Techniques

1. Demonstrate the fundamental principles and concepts of geographic technologies (e.g. geographic information systems, remote sensing) used in the acquisition, processing, and analysis of spatial data
2. Locate, access, manipulate, display and communicate spatial data effectively
3. Acquire frameworks and methods for analyzing how the uses of geographical technologies are power-laden practices

Geography 450 (SAS)

# Major Requirements

# Major Requirements

A minimum of 36 credits are required for the geography major.

Requirement 1: Survey courses: a total of 9 credits from (01:450:101,102,103)

Requirement 2: Methods course: a total of 3 credits from (01:450:330)

Requirement 3: Theory course: a total of 3 credits from (01:450:470)

Requirement 4: Tracks - a total of 18 credits, which must include 12 credits from one of three tracks, and 3 credits from each of the other two tracks. The tracks are:

1. *Global Culture, Economics, and Society: (See the complete list on degree navigator)*
2. *Environment: (See the complete list on degree navigator)*
3. *Geographical Techniques:(See the complete list on degree navigator)*

Requirement 5: Elective - a total of 3 credits of any geography course earned at the 200 level or higher.

No more than 3 credits earned at 100- or 200-level courses may be used to satisfy requirement 4.

No more than one course with a grade of D may be used in the geography major.

Depending on the content of the course, the following may be applied to any track at the discretion of the undergraduate director: 01:450:270, 271, 272, 485, 486, 491, 492, 495, and 496.

Geography 450 (SAS)

# Minor Requirements

# Minor Requirements

Six courses (18 credits) are required for the minor in geography. This includes two of the following three courses: 01:450:101, 102, and 103; and four other courses, at least three from one track and one from a remaining track.

The tracks are:

1. Global Culture, Economics, and Society: (See the complete list on degree navigator)
2. Environment: (See the complete list on degree navigator)
3. Geographical Techniques: (See the complete list on degree navigator)

Depending on the content of the course, the following may be applied to any track at the discretion of the undergraduate director: 01:450:270, 271, 272, 485, 486, 491, 492, 495, and 496.
Nine of these 12-track credits must be earned at the 300 or 400 levels.
No more than one course with the grade of D may be used in the geography minor.

Geography 450 (SAS)

# Departmental Honors Program

# Departmental Honors Program

Departmental honors are awarded to geography majors who achieve either (1) a grade-point average (GPA) of 3.50 or higher within the major following the penultimate semester prior to graduation; or (2) a GPA lower than 3.50 within the major following the penultimate semester prior to graduation, but with an approved and completed honors thesis.

Highest honors are awarded to students who achieve a cumulative GPA of 3.50 or higher within the major following the penultimate semester, and an approved honors thesis.

The honors thesis is produced under the supervision of a department faculty member. Choice of faculty supervisor will be made by the student. One additional faculty reader of the thesis is required. Thesis research and writing fulfills the requirements of honors courses 01:450:495 and 496 (one 3-credit honors course per semester). The student will be invited to give a presentation of their work and be prepared to respond to questions and requests for revisions from the faculty supervisor and reader.

Geography 450 (SAS)

# Andrew Hill Clark Prize

# Andrew Hill Clark Prize

The most outstanding graduating senior geography major is eligible to receive the Andrew Hill Clark Prize in Geography.

Geography 450 (SAS)

# Geospatial Information Science Certificate

# Geospatial Information Science Certificate

A certificate in geospatial information science is awarded to students who complete 01:450:320, 321, 322, 355, 356, and one of the following: 01:450:421, 487, or 488 with a grade of B or better for each course.

All students, regardless of major, are eligible to participate in the geospatial information science certificate program. The certificate is awarded only with, or subsequent to, the awarding of a baccalaureate degree in an approved major.

Geography 450 (SAS)

# Certificate in International Geographic Perspectives

# Certificate in International Geographic Perspectives

A minimum of 24 credits is required for the certificate in international geographic perspectives. Core courses totaling 15 credits are required: 01:450:102, 103, 205, 262, and 405. A regional core is also required, with a choice of one selected from: 01:450:332, 334, 335, 336, 338, 341, or 342. The final 6 credits may be taken as electives selected from: 01:450:211, 222, 241, 250, 309, 311, 361, 363, 491, and 492.

Geography 450 (SAS)

# Courses

# Courses

**01:450:101** *Earth Systems (3)*
Systematic introduction to physical processes on earth; including earth-sun relations, weather and climate, the hydrologic cycle, earth materials, and landforms. Emphasis on interrelationships among these phenomena.

**01:450:102** *Transforming the Global Environment (3)*
Introduction to the role of humans as modifiers and transformers of the physical environment. Emphasis on current changes and contemporary public issues.
*Credit not given for both this course and 01:381:101.*

**01:450:103** *Human Geography: Space, Place, and Location (3)*
Introduction to the spatial patterning of human activities and the role of place in human affairs. Population distributions; world cultural patterns; organization of urban and nonurban societies including land use, transportation, and communications. Impacts of global restructuring.

**01:450:205** ***World Cultural Regions (3)***
Geography of the world's major cultural regions: Europe; Russia and the Newly Independent States; the Americas; East Asia, Australasia, and Oceania; South Asia; the Middle East; and Africa.

**01:450:208** ***Maps, Power, and the Digital World (3)***
Examination of maps, mapmaking, and map interpretation, the ways that these processes are political and rooted in dynamics of power, and the social justice potential for mapping in today's digital age.

**01:450:211** ***Environment, Society and Justice (3)***
Critically examines the relationship between humans and the biophysical environment, emphasizing the major theoretical approaches to the study of social, political, economic, and technological aspects of environmental challenges.

**01:4450:212** ***Water Resources (3)***
Examines freshwater resources in the 21st century. Exploration of global water resources from both physical and social science perspectives, including water cycle, water management, and water conflicts.

**01:450:213** ***The Global Climate System (3)***
Explores the climate system from a geographic perspective. Examines the Earth's energy budget, hydrologic cycle, and atmospheric circulation at a variety of spatial and temporal scales. Investigates natural and human-associated aspects of climate variability and change.

**01:450:214** ***Conservation (3)***
Theories and practices of conservation in critical perspective. Moral, political-economic, scientific, and practical dilemmas in meeting conservation/preservation and restoration/remediation goals.

**01:450:222** ***Cultural Geography (3)***
Systematic introduction to cultural geography. Spatial analyses of peoples, languages, religions, folk and popular culture, and the varying impacts of cultures on environments.

**01:450:241** ***The City: Introduction to an Urban Geography (3)***
The role of cities in the world and overview of various aspects of the city, spanning geographical, political, climactic, psychological, and socioeconomic analysis.
***Credit not given for both this course and 01:450:250.***

**01:450:250** ***Cities (4)***
Spatial organization and functioning of cities in different world regions. Emphasis on societal system factors that influence urban development.
***Credit not given for both this course and 01:450:241.***

**01:450:262** ***Geographic Background to Current World Affairs (3)***
Contemporary global public issues from the perspective of changes in geographical relationships. Examination of major environmental, social, political, and economic trends that involve the restructuring of society and space at a variety of scales.

**01:450:270,271** ***Topics in Geography (1.5,1.5)***
Addresses a subject that is most appropriately treated in an abbreviated format. Topics vary from semester to semester. Specific titles available at time of registration.

**01:450:272** ***Topics in Geography (3)***
Topics vary. Specific titles available at time of registration.

**01:450:280** ***Pandemics (4)***
Exploration of pandemics, including the most recent Covid-19 pandemic, through an interdisciplinary lens that incorporates biology, ecology, politics, economics, and culture along with other themes.

**01:450:306** ***Global Ecosystems and Biodiversity (3)***
Explores the spatial patterns of biological diversity. Emphasis on relationships between living organisms (animals, plants, and microbes) and their environment (climate, geology, soils), emphasizing the spatial and temporal patterns in their distributions over Earth. Uses concepts from ecology, evolutionary biology, geology, and physical geography, and employs methodologies from geography such as geographic information systems and spatial analysis.

**01:450:309** ***Economic Geography (3)***
Spatial organization of economic activities; emphasis on economic globalization and urban and regional development.
***Pre- or corequisite: 01:450:103 or permission of instructor.***

**01:450:311** ***Natural Hazards and Disasters (3)***
Human dimensions of selected types of extreme natural events (e.g., windstorms, earthquakes, floods, and droughts) in developed and developing countries.

**01:450:313** ***Climate Change (3)***
Climate variability and change of the past, present, and future. Studies natural and anthropological dimensions of change across continents, ice sheets, and oceans using a systems approach.
***Prerequisite: 01:450:101 or 213 or 11:670:202.***

**01:450:320** ***Spatial Data Analysis (3)***
Introduction to data analysis for geographers, including graphical techniques for data visualization, data interpretation, basic descriptive statistical methods, and a range of inferential statistical techniques for problem solving in geography.

**01:450:321** ***Geographic Information Systems (3)***
Use of computers for management, analysis, and communication of spatial data. Geocoding, transformations, storage, and representation.

**01:450:322** ***Remote Sensing (3)***
Principles and techniques of satellite remote sensing. Application of satellite sensing to the study of Earth's land, oceans, and atmosphere.

**01:450:330** ***Geographical Research Methods (3)***
Approaches to geographical problem solving. Defining geographical problems; seeking, organizing, and presenting spatial data; report writing.
***Prerequisites: 01:450:101, 102, 103 or permission of instructor. Required for Geography majors.***

**01:450:331** ***New Jersey (3)***
Physical, historical, urban, and economic geography of the state.

**01:450:332** ***Eastern Europe and Eurasia (3)***
Examines social, economic, and political dimensions of the region and the resulting geographical patterns.

**01:450:334** ***Western Europe (3)***
Introduction to the Western European culture area. Its evolution; the features of the physical environment and their influence on human occupancy; demographic characteristics and diversity; regional development problems; quests for regional autonomy.

**01:450:335** ***Caribbean Borderlands (3)***
Regional analysis of basic human and physical differences affecting economic, political, and social conditions in the West Indies, Central America, and Mexico.
***Credit not given for both this course and 01:595:336.***

**01:450:336** ***Latin America (3)***
Relative significance of natural and cultural environments in contributing to regional contrasts.

**01:450:338** ***Africa (3)***
Regional associations of peoples and national states; analysis of resource endowment, economic development, and Africa's changing position in the world.
***Credit not given for both this course and 01:016:338.***

**01:450:341** ***South Asia (3)***
Geographic survey of the region of South Asia (India, Nepal, Pakistan, Afghanistan, Bangladesh, and Sri Lanka) in terms of environment, development, society, and politics.

**01:450:342** ***East Asia (3)***
Examination of East Asia's social, political, environmental, and cultural geographies. Examination of regional and international interconnections between people, places, and processes from the past to the present.

**01:450:343** ***Global China (3)***
Examination of how modern China was formed and the country's major political and economic transitions in global contexts. Exploration of contemporary China's political, cultural, environmental, and economic geographies domestically and internationally.

**01:450:351** ***Africa Region and People (3)***
Exploration of regional, cultural and environmental geographies of Africa with particular attention to refugee populations.

**01:450:355** ***Principles of Cartography (4)***
Theories and techniques of geographic data gathering, analysis, and map preparation. Special attention to problems of thematic map design and preparation.
***Lec. 3 hrs., lab by arrangement 3.6 hrs.***

**01:450:356** ***Advanced Cartography (4)***
Study of psychophysical factors in map design, including experimenting with surface representation and topography. Photographic materials and methods applicable to graphic reproduction.
***Lec. 3 hrs., lab by arrangement 3.6 hrs. Prerequisite: 01:450:355 or permission of instructor.***

**01:450:360** ***Cultural and Political Ecology (3)***
Examines the dynamic relationship between political-economic, cultural, and ecological factors and the ways they shape access to, and control over, natural resources.

**01:450:361** ***Gender Geographies (3)***
Links between gender relations and the spatial organization of society. Emphasis on the spatial division of labor, gendered places, women and development, geographies of safety and fear, and gendered political geographies.

**01:450:363** ***Geography of Development (3)***
Geographical patterns of development in third world areas and less developed parts of advanced capitalist countries. Emphasis on agrarian and industrial development and the restructuring of relations among different regions.

**01:450:364** ***Afro-Latinx geographies in the US and in Latin America (3)***
Examines uneven Afro-Latinx geographies in the US and Latin America. Interrogates how racialization and gender intersect spatial, economic, and environmental (in)justices that affect Afro-Latinxs communities across the Americas.
***Credit not given for both this course and 01:595:364.***

**01:450:365** ***Geographies of Race and Ethnicity in the United States (3)***
Examines the role inequalities based on racial and ethnic identities have played in shaping the historical and contemporary spaces of the United States. Emphasis on spatial dimensions of race and ethnicity and how social and spatial patterns are produced through histories of privilege and oppression, inclusion and exclusion, conflict, containment, and mobility.

**01:450:370** ***Climate Change and Society (3)***
Physical aspects and societal implications of climate change. Means of predicting and detecting change. Impacts on physical and human systems. Climate in the political arena; planning for the future.

**01:450:380** ***Medical Geography (3)***
Geographical analysis applied to disease hazards, health status of populations, and health care delivery systems in selected physical and cultural environments.

**01:450:402** ***Field Geography (4)***
Hands-on introduction to Geographic field methods, including mapping landscapes, using various sensors to monitor weather and water properties, and more. Some class time will be spent outdoors.
***Prerequisites: 01:450:101,102,103, 01:381:101, 01:460:100, 01:375:101 or permission of instructor.***

**01:450:403,404** ***Advanced Physical Geography (3,3)***
Problems in the geography of landforms, climate, soils, and vegetation analyzed from the viewpoints of both pure and applied sciences.
***Prerequisite: 01:450:101 or permission of instructor.***

**01:450:405** ***Political Geography (3)***
Basic principles of political geography and the application of these principles to selected areas around the world; causes of political conflicts and methods used in their resolution.

**01:450:409** *Geohumanities (3)*
Scientific, political, and social challenges at the intersection of geography and the humanities. Critical reflections of imaginative and artistic productions. Examination of geography's concern with scale, place, and space with the humanities' focus on critical and speculative engagements with human culture.

**01:450:413** *Climate Seminar(3)*
In-depth exploration of a topic related to climate science from a geographic perspective. The specific topic will be available as a subtitle at the time of registration.
***Prerequisite: 01:450:101, 01:460:101, 01:375:101,11:670:202, or permission by instructor.***

**01:450:414** *Geographical Hydrology (3)*
Land surface water processes in a geographical perspective. Emphasis on how place and space influence stores and fluxes of water.
***Prerequisite: 01:450:101 or equivalent.***

**01:450:417** *Coastal Geomorphology (3)*
Processes of erosion and deposition in coastal environments. Process-response models and problem-solving methods in coastal research.
***Prerequisite: 01:450:101 or 01:460:101 or permission of instructor.***

**01:450:421** *Advanced Geographic Information Systems (3)*
Introduction to major research and application issues in geographic information systems (GIS). Themes include geodesy and georeferencing; uncertainty and error propagation; multicriteria/multiobjective decision-making; introduction to surface analysis and spatial pattern analysis; change/time series analysis; GIS and society.
***Prerequisite: 01:450:321 or 11:372:362.***

**01:450:470** *History and Theory of Geography (3)*
Major historical themes, concepts, and theories of geography related to specific geographical changes in the real world; facilitates critical evaluation of the uses of geographic research.
***Prerequisites: 01:450:101, 102, 103 or permission of instructor. Required for Geography majors.***

**01:450:485,486** *Internship in Geography (BA,BA)*
Application of geography skills in professional employment setting. Individually designed and evaluated experience under supervision of intern adviser.
***Open only to majors and minors. Prerequisite: Permission of department.***

**01:450:487,488** *Cartographic Problems (3,3)*
Study for students interested in special cartographic problems.
***Prerequisite: Permission of department.***

**01:450:491,492** *Geographic Problems (3,3)*
Study for students interested in special geographic problems.
***Prerequisite: Permission of department.***

**01:450:495,496** *Honors Project: Geography (BA,BA)*
Honors research project under supervision of a faculty member. Permission of department needed to take the course
***Prerequisite: Permission of department.***

# Geological Sciences 460 (SAS)

## GEOLOGICAL SCIENCES 460

Department of Earth and Planetary Sciences, School of Arts and Sciences

**Website:** Here

**Chair:** James Wright

**Undergraduate Program Director:** Lauren Adamo

**Distinguished Professors:**

Marie-Pierre Aubry, B.S., Rouen (France); D.Sc., Pierre et Marie Curie (France)

Paul G. Falkowski, B.S., M.A., CUNY (City College); Ph.D., British Columbia

Kenneth G. Miller, A.B., Rutgers; Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution

Yair Rosenthal, B.S., M.S., Hebrew (Israel); Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution

**Professors:**

Ying Fan Reinfelder, B.S., Beijing; M.S., Utah; Ph.D., Utah State

Craig S. Feibel, A.B., Dartmouth ; M.S., Iowa State; Ph.D., Utah

Mark D. Feigenson, B.S., Maryland; M.S., George Washington; M.A., Ph.D., Princeton

Dennis V. Kent, B.S., CUNY (City College); Ph.D., Columbia

Robert E. Kopp, S.B., Chicago, M.S., Ph.D., California Institute of Technology

Gregory S. Mountain, B.A., Brown; Ph.D., Columbia

Roy W. Schlische, B.A., Rutgers; M.A., Ph.D., Columbia

Carl C. Swisher III, B.A., Montana; M.S., Nebraska; Ph.D., California (Berkeley)

James D. Wright, B.S., Louisiana Tech; M.S., South Carolina; Ph.D., Columbia

Nathan Yee, B.S., McGill (Canada); Ph.D., Notre Dame

**Associate Professors:**

Lauren Neitzke Adamo, B.S., M.S., Ph.D., Rutgers

Katherine R. Bermingham, BSc (Hons) Australian National(Australia); PhD Westfälische Wilhelms-Universität Münster (Germany)

Benjamin A. Black, A.B., Harvard; M.F.A., New York; Ph.D., Massachusetts Institute of Technology

Shaunna Morrison, Ph.D. Geosciences - University of Arizona

Robert M. Sherrell, B.A., Oberlin; Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution

**Assistant Professors:**

Starting in January 2025:
Yoshnori Miyazaki, B.Sc., The University of Tokyo (Tokyo, Japan); Ph.D., Yale (New Haven, CT) , Earth and Planetary Sciences

Lujendra Ojha: B.Sc. University of Arizona; PhD Georgia Tech

Crystal Pletka, B.S., Coastal Carolina University; M.S., Florida Atlantic University; Ph.D., Florida International University

**Research Professors:**

James V. Browning, B.A., Ohio Wesleyan; M.S., Southern California; Ph.D., Rutgers

Cathleen, Doherty, B.A., M.S., Montclair State; Ph.D., Columbia

Linda Godfrey, B.S., St. Andrews (Scotland); Ph.D., Cambridge

Richard Mortlock, B.A., Pennsylvania; M.S., Florida State; Ph.D., Rutgers

Brent Turrin, B.A., California (Berkeley); M.S., Stanford; Ph.D., California (Berkeley)

**Faculty Emeriti:**

Gail Ashley B.S., M.S., University of Massachusetts, Ph.D. University of British Columbia (Canada)

Michael Carr

Claude T. Herzberg, B.S., Alberta (Canada); Ph.D., Edinburgh (UK)

Roger Hewins B.Sc., University of Aberdeen, Ph.D., University of Toronto

Dennis Kent B.S., City College of New York, Ph.D., Columbia

Martha O. Withjack, B.A., Rutgers; M.A., Ph.D., Brown

Richard Olsson B.Sc., City College of New York, Ph.D., Columbia

Geological sciences explores Earth's past, present, and future, as well as other planets in our solar system and beyond. Through education and research, we examine Earth and planetary interiors, surface environments, and life through time; these are interdisciplinary fields that draw on fundamental knowledge in physics, chemistry,

biology, and mathematics. Our studies have scientific and societal relevance: global change to the solid Earth and its environment, oceans, climate, and life; natural hazards (earthquakes, volcanic eruptions, tsunamis, floods, and landslides); natural resource exploration and management (hydrocarbons, ore minerals, groundwater); and planetary geology and the search for extraterrestrial life. Several faculty have joint appointments in other departments: anthropology (in the School of Arts and Sciences), environmental sciences, and marine and coastal sciences (the latter two in the School of Environmental and Biological Sciences). The geological sciences major covers the core areas of the Earth and planetary sciences yet still allows opportunity for students to specialize through additional high-level courses in geological sciences, mathematics, and allied sciences. The major can be completed in four semesters once students have taken foundational courses in mathematics and the cognate sciences. Our majors enjoy employment opportunities in geological and environmental consulting, the energy industry, government agencies, and secondary education as well as excellent placement in top graduate programs.

Geological Sciences 460 (SAS)

# Learning Goals

# Learning Goals

**Majors and Minors.** Students will develop scientific critical-thinking, writing, and oral presentation skills and demonstrate mastery of the scientific method. Students will become proficient at collecting and interpreting data in both the field and laboratory. The required core courses will provide the knowledge of the Earth and planetary sciences needed to critically evaluate scientific issues discussed in the media.

**Other Students.**Students taking geological sciences classes for the general science requirement should develop an appreciation of critical thinking and the scientific method, including hypothesis testing. Students should appreciate the importance of earth sciences in understanding of the physical, social, and economic resources and history of our planet. One example: We would expect that any student successfully completing our courses should be able to critically evaluate scientific issues in earth systems discussed in the popular press.

Geological Sciences 460 (SAS)

# Major Requirements

# Major Requirements

The department offers several options for students pursuing a degree in earth and planetary sciences. Students should discuss with the undergraduate program director or any other faculty member in earth and planetary sciences which option is best for them.

The **geological sciences option** is for students who expect to make geology an important component of their career, e.g., in engineering/environmental consulting, oil and gas exploration, mineral exploration and mining, and federal and state government; it also provides rigorous preparation for graduate study.

The **environmental geology option** is for students who wish to work in the environmental sector, which at present is the largest employer of geoscientists in the United States; its focus is on characterizing processes and hazards in the modern shallow subsurface; it also prepares students for graduate study.

The **planetary science option** is for students who wish to pursue a research career, e.g., at universities, research institutions, government facilities such as NASA, and museums. It focuses on the physical and geochemical processes in our solar system spanning the early solar nebula to planetary formation and evolution. The option facilitates interdisciplinary knowledge in mathematics, physics, chemistry, and biology, and is therefore well suited to students transferring from other STEM disciplines as well as those preparing for graduate study.

The **general option** is for students who have an interest in the earth and planetary sciences and plan to pursue a career in science education, communication and journalism, medicine, environmental law and policy, business, etc.

Declaration of the major in earth and planetary sciences requires a grade of C or better in 01:460:101 Introductory Geology, or its equivalent, or special permission of the undergraduate program director. Course schedules for each semester should be approved by the undergraduate program director or other faculty adviser prior to registration.

**460: Geological Sciences Option (B.S.) [62 credits total]**

*Foundation Courses*

- 01:160:161 General Chemistry (4)
- 01:640 CALC1 (4)
- One of the following: 01:640: CALC2 (4) or 01:960:379 Basic Probability Theory (3) or 01:960:401 Basic Statistics for Research (3)
- One of the following: 01:750:203 General Physics (3) (recommended) or 01:750:193 Physics for the Sciences (4) or 01:750:201 Extended General Physics (5)

*Core Courses*

- 01:460:101 Introductory Geology (4) [alternatively 01:460:100 Planet Earth (3) and 01:460:103 Introductory Geology Lab (1)]
- 01:460:300 Introduction to Sedimentary Geology (4)
- 01:460:301 Mineralogy (4)
- 01:460:302 Petrology (4)
- 01:460:303 Paleontology (4)
- 01:460:304 Introduction to Geochemistry (4)
- 01:460:306 Introduction to Geophysics (4)
- 01:460:407 Structural Geology and Geologic Maps (4)
- 01:460:410 Field Geology (3) or equivalent (see field requirement below)
- 01:460:480 Major Events in Earth History (3)

*Elective Courses*

Three 3-credit courses in 01:460 at the 300 level or higher. Note: 01:119:115, 116 General Biology, 01:160:162 General Chemistry, General Physics 2, CALC 3, CALC 4, and 01:355:302 Scientific and Technical Writing (3) are acceptable electives. Other non-460 courses require permission of the undergraduate program director. Undergraduate students may take graduate courses if they have a GPA of 3.0 or higher and/or with the permission of the instructor. Students may choose from the following specializations or create their own group of electives.

- Paleobiology and Paleoceanography: 01:460:305 Evolution and Geologic Time (3); 01:460:394 Geologic Context (3); 01:460:451 Marine Geology (3); 01:460:454 Micropaleontology (3); 01:460:476 History of the Earth System (3); 16:460:526 Paleoceanography (3); 16:460:552 Stable Isotopes in the Environment (3); 16:460:625 Seminar in Sequence Stratigraphy (3)
- Tectonics, Geophysics, and Hydrology: 01:460:414 Hydrologic Processes (3); 01:460:428 Hydrogeology (3); 01:460:429 Tectonics and Regional Structural Geology (3); 01:460:441 Structure and Formation of Terrestrial Planets (3); 01:460:442 Dynamics of Planetary Interiors (3); 16:460:515 Advanced Tectonics (3); 16:460:528 Groundwater Modeling (3); 16:460:557 Seismic Acquisition and Processing (3)
- Geochemistry and Petrology: 01:460:396 Geochronology (3); 01:460:417 Environmental Geochemistry (3); 16:460:509 Meteoritics (3); 16:460:513 Volcanology (3); 16:460:551 Isotope Geochemistry (3); 16:460:617 Seminar in Geochronology (3); 16:460:631 Seminar in Petrology (3)

**460E: Environmental Geology Option (B.S.) [63 credits total]**

*Foundation Courses*

- 01:160:161 General Chemistry (4)
- 01:640 CALC1 (4)
- One of the following: 01:640 CALC2 (4) or 01:960:379 Basic Probability Theory (3) or 01:960:401 Basic Statistics for Research (3)
- One of the following: 01:750:203 General Physics (3) (recommended) or 01:750:193 Physics for the Sciences (4) or 01:750:201 Extended General Physics (5)

*Core Courses*

- 01:460:101 Introductory Geology (4) [alternatively 01:460:100 Planet Earth (3) and 01:460:103 Introductory Geology Lab (1)]
- 01:460:202 Environmental Geology (3)
- 01:460:300 Introduction to Sedimentary Geology (4)
- 01:460:301 Mineralogy (4)
- 01:460:302 Petrology (4)
- 01:460:306 Introduction to Geophysics (4)
- 01:460:407 Structural Geology and Geologic Maps (4)
- 01:460:410 Field Geology (3) or equivalent (see field requirement below)
- 01:460:413 Environmental Geochemistry (3)
- 01:460:428 Hydrogeology (3)

*Elective Courses*

Four 3-credit courses from the following list: 01:355:302 Scientific and Technical Writing (3); 01:450:321 Geographic Information Systems (3); 01:450:322 Remote Sensing (3); 01:460:304 Introduction to Geochemistry (4); 01:460:408 Geomorphology (3); 01:460:418 Geological Modeling (3); 11:375:202 Chemical Principals of Environmental Science (3); 11:375:203 Physical Principles of Environmental Science (3); 11:375:303 Numerical Methods in Environmental Science (3); 11:375:423 Environmental Fate and Transport (3).

**460P: Planetary Science Option (B.S.) [63 credits total]**

*Foundation Courses*

- 01:160:161,162 General Chemistry (4, 4)
- 01:640 CALC1, CALC2 (4, 4)
- One of the following: 01:640 CALC3 (4) or 01:960:401 Basic Statistics for Research (3)
- One of the following: 01:750:193 Physics for the Sciences (4) or 01:750:201 Extended General Physics (5) or 01:750:203 General Physics (3)
- One of the following: 01:750:194 Physics for the Sciences (4) or 01:750:201 Extended General Physics (5) or 01:750:204 General Physics (3)

*Core Courses*

- 01:460:101 Introductory Geology (4) [alternatively 01:460:100 Planet Earth (3) and 01:460:103 Introductory Geology Lab (1)]
- 01:460:116 Building Blocks of the Solar System (3)
- 01:460:222 Planet Mars (3) or 01:460:224 Geology of Moons and Planets (3)
- 01:460:301 Mineralogy (4)
- 01:460:302 Petrology (4)
- 01:460:304 Introduction to Geochemistry (4)
- 01:460:441 Structure and Formation of Terrestrial Planets (3) [or 01:460:442 Dynamics of Planetary Interiors (3)]
- 01:460:480 Major Events in Earth History (3)

*Elective Courses*

Three 3-credit courses from the following list: 01:355:302 Scientific and Technical Writing (3); 01:450:321 Geographic Information Systems (3); 01:450:322 Remote Sensing (3); 01:460:300 Introduction to Sedimentary Geology (4); 01:460:410 Structural Geology and Geologic Maps (4); 01:460:414 Hydrologic Processes (3); 01:460:418 Geological Modeling (3); 01:460:442 Dynamics of Planetary Interiors (3) [or 01:460:441 Structure and Formation of Terrestrial Planets (3)]; 16:460:630 Seminar in Planetary Science (3); 01:640:244 Differential Equations for Engineering and Physics (4) or 01:640:250 Introductory Linear Algebra (3) or 01:640:252 Elementary Differential Equations (3) or 01:640:292 Honors Calculus IV (4); 01:750:341 or 342 Principles of Astrophysics (3)

**460L: General Option (B.A.) [40 credits total]**

*Foundation Courses*

- 01:160:161 General Chemistry (4)
- 01:640 CALC1 (4)

*Core Courses*

- 01:460:101 Introductory Geology (4) [alternatively 01:460:100 Planet Earth (3) and 01:460:103 Introductory Geology Lab (1)]
- 01:460:300 Introduction to Sedimentary Geology (4) (assumes change in name and number)
- 01:460:301 Mineralogy (4)
- 01:460:302 Petrology (4)
- 01:460:303 Paleontology (4)
- 01:460:407 Structural Geology and Geologic Maps (4)
- 01:460:411 Geologic Field Methods (2)

*Elective Courses:*

Two additional 3-credit courses in 01:460, one of which must be at 300-level or higher; other acceptable courses are 01:119:115 General Biology, 01:750:203 General Physics, and those approved by undergraduate program director.

**Field Requirement**

All majors in the geological sciences option and the environmental geology option must take a minimum of 3 credits in field geology. Most students satisfy this requirement by taking an external field camp offered by many geoscience departments at other universities; ask the undergraduate program director for guidance. Many students do the field training during the late spring/summer between junior and senior years.

Geological Sciences 460 (SAS)

# Minor Requirements

# Minor Requirements

The minor in geological sciences requires completion of 01:460:101 Introductory Geology plus five additional geology courses of 3 credits or more, of which at least two must be at the 300 level or higher. Potential minors who take 01:460:100 Planet Earth may still complete a minor by requesting permission to take 01:460:103 Introductory Geology Lab.

Geological Sciences 460 (SAS)

# Departmental Honors Program

# Departmental Honors Program

Students may be admitted to candidacy for honors in geology if they make a written application to the undergraduate program director before May 1 of their junior year. To qualify, a student must have a minimum overall cumulative grade-point average of 3.0 and a minimum 3.4 grade-point average in major courses. In addition, the student must have completed 75 percent of all foundation and core courses.

Honors students must successfully complete at least two additional 3-credit courses in 01:460 (at the 400 level) and/or in the allied sciences, as well as 01:460:495,496 Honors in Geology, and 3 credits of Independent Study in 01:460 in their final semester.

In consultation with a faculty adviser, students choose an honors research project, which they document in a paper or a formal presentation to the department.

Geological Sciences 460 (SAS)

# Courses

# Courses

**01:460:100** ***Planet Earth (3)***
Introductory geology for the nonscience major, designed to give a broad, basic understanding of the planet on which we reside, its age and origin, composition and evolution, interrelationships of Earth's major physical systems, scientific revolutions in Earth science, and the role the physical Earth plays in global politics and economics.
***Credit not given for both this course and 01:460:101.***

**01:460:101** ***Introductory Geology (4)***
Geological concepts, principles, processes, chemistry, and physics of the Earth and the interplay of Earth systems. Course explores the Earth as a whole, its origin, structure, composition, history, and the nature of the processes that resulted in its formation and its present state.
***Course includes a 3-hour laboratory session. Previously listed as 01:460:103. Credit not given for both this course and 01:460:100.***

**01:460:103** ***Introductory Geology Laboratory (1)***
For students requiring fulfillment of the geological sciences lab requirement who have previously taken 01:460:100 Planet Earth, or an equivalent of 01:460:101 Introductory Geology without a lab. Lab times are those scheduled for 01:460:101 labs. Explores mineral and rock identification, geological sample analysis, structural and seismological interpretation, and field observation.
***Prerequisite: Permission of instructor only.***

**01:460:110** ***Sea Change (3)***
History of global and regional sea-level changes through geological time and their impact on the New Jersey coast. Relationships among carbon dioxide, temperature, and sea-level change. Social, ethical, economic, and political concerns are explored.

**01:460:111** *Solving the Climate Crisis (3)*
The basic physics of Earth¿s climate. Past and future climate change. The impacts of climate change on humans. Strategies for limiting the magnitude and consequences of climate change. Climate action at a national, organizational, and personal scale.

**01:460:116** *Building Blocks of the Solar System (3)*
What is the Solar System made of? How did it and the planets form? Why does the Solar System contain life? In the context of learning about the role of chemistry in the evolution of our world, these and other fundamental questions in planetary science will be discussed

**01:460:120** *Introduction to Oceanography (3)*
Ongoing discoveries and developing knowledge including plate tectonics, the properties and motion of the ocean (waves, tides, and currents), ocean resources (food, energy, minerals), and related marine environmental issues that are changing our understanding of the way our planet works and that impact on our lives.
***Credit not given for this course and 01:460:209 or 11:628:120.***

**01:460:201** *Earthquakes and Volcanoes (3)*
Plate tectonics and the origin of earthquakes and volcanoes: causes, mechanisms, consequences, and effect on humans.

**01:460:202** *Environmental Geology (3)*
Analyses of issues and case studies related to cleaning up the environment, finding and using resources, predicting and mitigating natural disasters, and understanding global change.

**01:460:203** *Building and Maintaining a Habitable Planet (3)*
Understanding human-caused environmental changes in the context of Earth's 4.6-billion-year history. Geological and human timescales; planetary habitability; planetary, biological, and civilizational flows of energy and entropy; feedback between life, the carbon cycle, and climate; the evolution of complex life; human alterations of the Earth system; intelligent life in the universe.

**01:460:204** *The Water Planet (3)*
Survey of the science, environmental impact, and resource allocation of water on Earth. Characteristics of water: hydrologic cycle; runoff and erosion; river systems; past and present climates; water quality; political and economic aspects of water.
***Credit not given for both this course and 11:628:204.***

**01:460:206** *Dinosaurs (3)*
Survey of dinosaurian evolution and diversity. Discovery and collection; reconstruction of anatomy, behavior, physiology, and habitats; origin, evolutionary radiation, and extinction.

**01:460:207** *Oil and Gold: The Good, the Bad, and the Ugly (3)*
Introduction to the geologic setting and origin of the Earth's natural resources. Topics include the exploitation of energy resources (oil and gas) and metallic and nonmetallic deposits and its impact on society.

**01:460:212** *Earth and Life through Time (3)*
Relationship between the development of continents and oceans, changes in sedimentary environments, and the evolution of life through time.
***Designed for nonmajors. Credit not given for both this course and 01:460:102.***

**01:460:213** ***A Walk through Time: Evolution of Mammals (3)***
Introduction to current perspectives on the origins and fossil history of mammals. Critical evaluation of the how and why theories of evolution and adaption through a detailed presentation of the who, what, when, and why.

**01:460:222** ***Mars: The Next Frontier (3)***
Mars observations test models of evolution of planet and the potential for life beyond the Earth. The prospect of human habitation on our neighbor Mars. Older ideas and modern models of the planets in the context of over 40 missions to Mars and evidence from known Martian meteorites.

**01:460:224** ***Geology of the Moons and Planets (3)***
Formation and evolution of the solar system and the solid objects in it as constrained by both astronomical evidence of stellar/planetary evolution and by direct observations of meteorites and from missions to planets and other bodies. The concept of the "habitable zone" exoplanets around other stars compared to our local planets.

**01:460:225** ***Astrobiology (3)***
Investigation of the origin, evolution, and distribution of life in our solar system and beyond. Addresses some of the biggest questions in science today such as where life began, whether there is life on other planets, and how scientists search for extraterrestrial life.

**01:460:300** ***Introduction to Sedimentary Geology (4)***
Interpretation of sedimentary rocks; their relation to depositional environment and processes. Analysis of sedimentary sequences in time and space. Principles of correlation.
***Lec. 3 hrs., lab. 3 hrs. Field trips. Prerequisites: 01:460:101 or 01:460:100 and 01:460:103.***

**01:460:301** ***Mineralogy (4)***
Chemistry, crystal structure, optical properties of minerals, and minerals as records of processes that shaped the Earth and extraterrestrial bodies. Laboratory: identification of minerals in hand specimen, thin section, electron microprobe, and scanning electron microscope.
***Lec. 3 hrs., lab. 3 hrs. Field trips. Prerequisites: 01:160:161, 01:460:101 or 01:460:100 and 01:460:103. Credit not given for both this course and 01:460:210.***

**01:460:302** ***Petrology (4)***
Origin of Earth's crust and mantle through the study of igneous, metamorphic, and sedimentary rocks. Laboratory: hand specimens and thin sections of igneous and metamorphic rocks.
***Lec. 3 hrs., lab. 3 hrs. Field trips. Prerequisite: 01:460:301. Credit not given for both this course and 01:460:210.***

**01:460:303** ***Paleontology (4)***
Principles of paleobiology and phylogenetic systematics. Phylogenetic and mathematical analyses of the Earth's fossil record. Laboratory study of invertebrate fossils. Field trips to examine fossil-bearing rock formations.
***Lec. 3 hrs., lab. 3 hrs. Prerequisites: 01:460:101 or 01:460:100 and 01:460:103.***

**01:460:304** ***Introduction to Geochemistry (4)***
Low- and high-temperature geochemistry, element distribution, geochemical structure of the Earth. Laboratory exercises include sample materials, preparation techniques, mass spectrometry, data collection, reduction, and interpretation.
***Lec. 3 hrs., lab. 3 hrs. Prerequisites: 01:460:101 or 01:460:100 and 01:460:103, 01:160:161.***

**01:460:305** *Evolution and Geologic Time (3)*
Major events in the evolution of life on Earth; evolutionary pattern and process through geologic time; relationship of macro- and microevolutionary theory.
*Prerequisites: 01:460:101 or 01:460:100 and 01:460:103.*

**01:460:306** *Introduction to Geophysics (3)*
Principles of subsurface exploration using seismic waves, gravity and magnetic fields, electric currents, and electromagnetic waves. Applications to problems on scales from global to local. Practical training in executing local geophysical surveys (seismic, electric, magnetic).
*Prerequisites: 01:460:101 or 01:460:100 and 01:460:103, 01:750:203.*

**01:460:355,356** *Geology Colloquium (1,1)*
Current research in geological sciences.
*Lec. and discussions 1 hr. For geological sciences majors only.*

**01:460:394** *Geological Context (3)*
Field and laboratory studies of geological context in archaeological sites. Data collection and sampling, sediment analysis, and reporting. Interpretation of depositional and postdepositional features.
*Recommended prerequisite: 01:460:300. Credit not given for both this course and 01:070:394.*

**01:460:396** *Geochronology in Geosciences and Anthropology (3)*
Isotopic, astronomical, and paleomagnetic dating techniques in geology and anthropology.
*Prerequisites: 01:460:101 or 01:460:100 and 01:460:103.*

**01:460:407** *Structural Geology and Geologic Maps (4)*
Geometry and origin of brittle and ductile structures; stress, strain, rheology, and deformation mechanisms; geologic maps and cross sections; introduction to tectonics and regional structural geology.
*Lec. 3 hrs., lab. 3 hrs. Field trips. Prerequisite: 01:460:101 or 01:460:103. Recommended pre- or corequisite: 01:460:300, 01:640:CALC1.*

**01:460:408** *Geomorphology (3)*
Application of Earth system science to understanding the evolution of landforms and landscapes on the Earth's surface.
*Lec. 3 hrs. Prerequisite: 01:460:101 or equivalent.*

**01:460:410** *Field Geology (3)*
Methodology of field investigations: pace and compass; aerial photo and topographic mapping; construction of geological maps and cross sections; interpretations of seismic profiles; preparation of written reports.
*Lec. 1 hr., lab. 6 hrs. Prerequisite: 01:460:407 or permission of instructor. Satisfies field requirement.*

**01:460:411** *Geological Field Methods (2)*
Introduction to geological mapping and related field investigations; surveying methods; construction of geological maps, stratigraphic sections, and cross sections; interpretation of seismic reflection profiles; computer applications; preparation of written reports.
*Pre- or corequisites: 01:460:407 and 300. Course does not satisfy the field requirement.*

**01:460:412** *Geophysical Field Methods (By Arrangement)*
Practical training in designing and executing geophysical surveys for shallow subsurface targets, analysis of geophysical observations, and interpretation of geophysical survey results. Methods employed are seismic, ground penetrating radar and magnetic surveying. Class activities include lectures, field work, independent (guided) data analysis, and report preparation and presentation.
*Prerequisite: 01:460:306 or permission of instructor.*

**01:460:414** *Hydrologic Processes (3)*
Introduction to physical principles of water cycling through the Earth's atmosphere, lithosphere, and biosphere, with emphasis on water storage, flux, and flow pathways among the various reservoirs near the land surface.
*Prerequisites: 01:640:CALC1 and 01:750:203 General Physics (3) or equivalent, or permission of the instructor.*

**01:460:417** *Environmental Geochemistry (3)*
Distribution of elements in the sedimentary environment; behavior of trace metals in sediments and waters.
*Pre- or corequisites: 01:160:162, 01:460:101 or 01:460:100 and 01:460:103.*

**01:460:418** *Geological Modeling (3)*
Computer techniques for collection, processing, interpretation, and presentation of geological and geophysical data. Computer-based modeling exercises in geologic and geophysical exploration and environment assessment.
*Pre- or corequisite: 01:460:300, 301, or 303.*

**01:460:428** *Hydrogeology (3)*
Introduction to physical and chemical principles of fluid flow and mass transport through geologic media, with emphasis on quantitative characterization of groundwater systems.
*Prerequisites: 01:640:CALC1, 01:750:203, and 01:460:101 or 01:460:100 and 01:460:103; or permission of instructor.*

**01:460:429** *Tectonics and Regional Structural Geology (3)*
Theories of tectonics, regional tectonostratigraphic analysis, and development of the Earth's Phanerozoic orogens.
*Prerequisite: 01:460:407.*

**01:460:441** *Structure and Formation of the Terrestrial Planets (3)*
Examination of planetary formation processes and hypotheses of planetary evolution in the solar system drawn from seismological and petrological observations of Earth's well-organized lithological and chemical parts.
*Prerequisites: 01:460:302, 01:460:304, 01:460:306, or permission of instructor. Credit not given for both this course and 16:460:506.*

**01:460:442** *Dynamics of Planetary Interiors (3)*
Applications of continuum mechanics, thermodynamics, and fluid dynamics to the processes within the Earth and other rocky planets of the solar system. Combines fundamental theory with hands-on computer-based data manipulation to connect theoretical expectations of simple models with current knowledge about the planets.
*Prerequisite: 01:460:306.*

**01:460:451** *Marine Geology (3)*
Structure and oceanographic setting, marine sediments, evolution of ocean basins and margins.
*Prerequisite: 01:460:300.*

**01:460:454** *Micropaleontology (3)*
Studies of foraminifera, calcareous nannoplankton, and siliceous microplankton emphasizing stratigraphic, paleoecologic, and paleoceanographic utility.

**01:460:476** *History of the Earth System (3)*
Earth as an evolving physical/biological system, including physical and biogeochemical processes whose interactions have shaped Earth's environment over geologic time.
*Pre- or corequisites: Any three of 01:119:102 or 116, 01:160:162, 01:460:101, 01:750:204, or permission of instructor.*

**01:460:480** *Major Events in Earth History (3)*
History of the solid Earth, oceans, atmosphere, and life over the past >4.5 billion years as narrated by major events in the geological record.
*Prerequisites: All courses for geological sciences majors in their senior year, or by special permission.*

**01:460:493,494** *Independent Studies in Geology (1-3,1-3)*
Topic of study chosen in consultation with a faculty adviser.
*Prerequisites: Minimum 3.0 cumulative and geology grade-point averages. Adviser's approval required for registration. Credits by arrangement.*

**01:460:495-496** *Honors in Geology (3,3)*
Research project chosen in consultation with a faculty adviser.
*Both semesters must be completed to receive credit. See section on departmental honors program for registration requirements.*

# German 470 (SAS)

## GERMAN 470

Department of Germanic, Russian, and East European Languages and Literatures, School of Arts and Sciences

**Website:** Here

**Chair:** Martha Helfer

**Undergraduate Director-German:** Nicholas Rennie

**Director of Language and Cultural Studies:** Alexander Pichugin

**Distinguished Professor:**

Michael G. Levine, B.A., Cornell; M.A., Ph.D., Johns Hopkins

**Professor:**

Martha B. Helfer, B.A., Washington (St. Louis); M.A., Wisconsin (Madison); Ph.D., Stanford

**Associate Professors:**

Nicola Behrmann, M.A., Free University Berlin; Ph.D., New York

Nicholas Rennie, B.A., Princeton; Ph.D., Yale

**Assistant Professors:**

Regina Karl, B.A., M.A., Ludwig-Maximilians (Munich); Ph.D., Yale

Dominik Zechner, M.A., Vienna; M.Phil, Ph.D., New York

**Assistant Teaching Professor:**

Alexander E. Pichugin, M.Ed., Rutgers; M.A., Ph.D., Pennsylvania

**Lecturer:**

Silke Wehner-Franco, Ph.D. Münster (Germany)

**Faculty Emeriti:**

Hildburg Herbst

Maria M. Wagner

Lothar Zeidler

German 470 (SAS)

# Learning Goals

# Learning Goals

Students completing courses in the German program gain proficiency in written and spoken German, general cultural fluency relating to German-speaking Europe and its history, and skill in writing and in the critical analysis of written texts and other cultural artifacts related to the study of German.

Students completing a major or minor in German demonstrate advanced proficiency in the German language, cultural fluency, and analytical skills in a specific area of concentration such as German language and literature, philosophy, history, visual arts, music, or political science.

German 470 (SAS)

# Major Opportunities

# Major Opportunities

The German major provides students with linguistic proficiency and a broad knowledge of the literatures and cultures of German-speaking countries. It enables students to work in a number of different fields such as history, literature, film, political science, European studies, music, art history, philosophy, religion, and Jewish studies, exploring the rich and often vexed history of things German from diverse perspectives.

**Note:** At least 12 of the credits comprising the major must be completed in courses taught by faculty in the Rutgers University-New Brunswick School of Arts and Sciences. Students do not normally receive credit toward the major for taking German-language courses below a level at which they have already received a grade of C or better. Courses with a grade of D are not counted toward the major.

German 470 (SAS)

# Minor Opportunities

# Minor Opportunities

The German minor provides students with linguistic proficiency and an introduction to the literatures and cultures of German-speaking countries. It comprises 18 credits, as approved by the department. At least 9 of these credits must be completed in courses taught by faculty in the Rutgers University-New Brunswick School of Arts and Sciences. Students do not normally receive credit toward the minor for taking German-language courses below a level at which they have already received a grade of C or better. Courses with a grade of D are not counted toward the minor.

German 470 (SAS)

# Major Requirements

# Major Requirements

The major can be completed by combining study of the literatures and cultures of German-speaking countries with other fields such as history, political science, European studies, music, art history, philosophy, religion, and Jewish studies.

The degree comprises 36 credits arranged in the following manner: a set of core courses in German language (at any level), culture, and history; and a thematically linked set of at least 15 credits to be selected from the German studies course list with the written approval of the undergraduate director. For a list of these courses see the German studies course list on the department's undergraduate webpage within the descriptions of the German major and minor.

This list offers only a representative sample. Courses not included in the German studies course list may be considered toward the major at the discretion of the undergraduate director and the participating department.

Majors must complete the equivalent of 01:470:232 Advanced German II; and at least 6 credits, taught in German, in course numbers 01:470:299 and higher. Majors are also encouraged to include 6 credits in history courses with a strong focus on German culture.

MINIMUM REQUIREMENT: 36 credits in German language and culture

- All German majors must complete the equivalent of 01:470:232
- 6 credits, taught in German, in course numbers 01:470:299 and higher

At least 15 additional credits of coursework in which students are engaged in a thematically coherent examination of a period, topic, or set of questions from an interdisciplinary perspective. To ensure that such an examination is properly focused and productively interdisciplinary, these courses should be chosen in consultation with the undergraduate director.

German 470 (SAS)

# Minor Requirements

# Minor Requirements

The minor can be completed by combining study of the literatures and cultures of German-speaking countries with other fields such as history, political science, European studies, music, art history, philosophy, religion, and Jewish studies.

The degree comprises 18 credits. All minors must complete the equivalent of 01:470:232 Advanced German II. At least 9 credits must be received in a thematically linked set of German studies courses at the 300 level or above, either in German or English.

German 470 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To be a candidate for graduation with honors, a German major must have and maintain a grade-point average of 3.4 or better in German and a cumulative grade-point average of 3.0 or better. Conferral of honors is never automatic. Whether a candidate graduates with departmental honors depends on his or her total performance in German as measured by the recommendations of the faculty. Interested students are encouraged to apply at the department toward the end of their junior year or during the first week of classes in their senior year.

**Honors in German Studies Major**

Students may receive honors either by taking 6 credits (3 per semester) of graduate courses with the approval of the undergraduate director or by completing a senior honors thesis. This may be done through the School of Arts and Sciences honors programs (this thesis should be submitted to a German studies faculty member to be read and approved for credit); or by enrolling in 01:470:495,496 (in any of the following credit sequences: 3-3, 6-0, 0-6). Under the supervision of a faculty adviser, honors students will in either case pursue an independent research project that requires the use of German-language source material pertinent to the area of concentration, and may in the process earn up to 6 credits toward the German studies major.

German 470 (SAS)

# Summer Study in Germany

# Summer Study in Germany

Each year, the Department of Germanic, Russian, and East European Languages and Literatures provides advising and significant financial support to students traveling to Germany to study within the summer program of the Free University Berlin. Depending on their course selections and scheduling preferences, students earn between 4 and 7 Rutgers credits in regular or intensive German language classes (offered at all levels) and/or courses in German and European culture. With prior approval of the undergraduate director of German, these credits may be applied toward the German major or minor. The program provides excursions and other extracurricular activities to acquaint participants more fully with the cultural life of Germany and its largest city. Students have the opportunity to stay in dormitories or apartments, or with German host families.

There is no German language prerequisite for this program; beginning German language students are welcome. It is also possible to enroll in two English-language courses in German or European studies.

For the most complete and recently updated information about the program visit the department website.

German 470 (SAS)

# Semester and Year Abroad in Germany Study Options

# Semester and Year Abroad in Germany Study Options

Each year, the Department of Germanic, Russian, and East European Languages and Literatures provides advising and significant financial support to select students traveling to Germany to study within the academic-semester programs of the Free University Berlin. Students may register for study abroad either for the academic year or for a single semester. All majors are strongly encouraged to spend at least one semester abroad at the Free University Berlin or another German university. Up to 18 credits (9 credits per semester maximum) may be credited toward the major, and 9 credits maximum toward the minor, from courses taken during study abroad. Such credits are assigned at the discretion of the undergraduate director of German on the basis of materials (transcripts, "Scheine," syllabi, tests, quizzes, and graded papers) provided by the student after return to the United States. In the case of students enrolling through Rutgers Global with the Free University Berlin¿s FUBEST program, credits are typically assigned in advance, at the discretion of the undergraduate director of German. German majors and minors studying in Germany are advised to remain in close contact with the undergraduate director of German during their studies in Germany to confirm their courses and progress toward the degree. The German studies senior honors thesis option must be taken at Rutgers University-New Brunswick.

German 470 (SAS)

# External Fellowships for Study Abroad

# External Fellowships for Study Abroad

All students who apply for fall, spring, or academic-year study in Germany via the Rutgers Study Abroad office and do so by the spring deadline for fall study in Germany are automatically considered for scholarships that the Max Kade Foundation makes available through the German program at Rutgers. In addition, external scholarships, such as those from Fulbright, DAAD (German Academic Exchange), and Rotary, can be the best way for many graduating seniors to spend a year at a university in German-speaking Europe. Our students who have received these and similar scholarships have found their experience abroad invaluable and have benefited by being able to add these awards to their résumés.

The deadlines for many scholarships come early--some of them before classes begin in September, others in the first weeks of classes: see the Rutgers undergraduate scholarships page for further information about programs and their deadlines. See also the "funding" link here for information about scholarships made available by the Delta Phi Alpha German Honors Society, as well as a downloadable application form. More scholarship information can be found through the Phi Sigma Iota (foreign language honors society) website here.

Note also that some of the schools at Rutgers University provide scholarships of their own, and that some of these monies, in particular for study abroad, often go unspent because students fail to apply. Students should contact their school deans' offices for more information. School of Arts and Sciences students can find information here.

Keep in mind that most applications for external scholarships require transcripts, a carefully written personal statement, recommendation letters, and additional materials. Putting a strong application together is not necessarily difficult, but it takes some time and thought. Students should contact faculty early on for advice and recommendation letters.

German 470 (SAS)

# Certificate of Proficiency in German

# Certificate of Proficiency in German

The department awards a certificate of proficiency in German based on demonstrated ability to comprehend, speak, read, and write German as attested by a grade of B or better in 6 credits of work taken in courses conducted in German at or above the 300 level.

Note: The German certificate is awarded only with, or subsequent to, the awarding of the baccalaureate degree in an approved major.

German 470 (SAS)

# Goethe Institute's Zertifikat Deutsch als Fremdsprache

# Goethe Institute's Zertifikat Deutsch als Fremdsprache

The Goethe Institute (the international cultural agency of the Federal Republic of Germany) administers examinations for the internationally recognized Zertifikat Deutsch als Fremdsprache each year. For more information, go to their website or contact them at:

Goethe Institut New York
30 Irving Place
New York, NY 10003, USA
Phone: 212-439-8700
Fax: 212-439-8705

German 470 (SAS)

# Courses in English

# Courses in English

**01:470:225** ***Fairy Tales Then and Now (3)***
Analysis of structure, meaning, and function of fairy tales and their enduring influence on literature and popular culture.
***Credit not given for both this course and 01:195:246.***

**01:470:227** ***Tales of Horror (3)***
Examination of historical and political context, and psychoanalytical underpinnings, of horror tales in literature and film of the Western tradition from Brothers Grimm to Alfred Hitchcock. Focus on some of the most spellbinding creatures from this tradition: Frankenstein and Dracula, vampires and zombies, Doppelgängers, ghosts, artificial humans, and other figures that continue to haunt the cultural imagination.
***Credit not given for both this course and 01:195:227.***

**01:470:244,246** ***Topics in German Culture - in English (1.5, 1.5)***
Examination of topics in German culture. May be repeated for credit, depending on topic.

**01:470:247** ***Psy Fi: Literature and Psychoanalysis (3)***
Key psychoanalytic concepts explored through readings of literature, film, case studies, and literary theory.
***Credit not given for both this course and 01:195:247, 01:195:312, or 01:470:356.***

**01:470:253** ***Tales of Horror (1.5)***
Tales of horror in literature and film from Brothers Grimm to Alfred Hitchcock. Consideration of historical, political, and psychoanalytical dimensions.

**01:470:254** ***Nietzsche and Popular Culture (1.5)***
Exploration of how to define popular culture examined through analysis of Nietzsche's "Overman" and its gradual translation into the American "Superman" hero. Consideration of works from Nietzsche to Kafka, Hermann Hesse, Bertolt Brecht, Bob Dylan, Stanley Kubrick, and the Wachowski Brothers (*The Matrix*).
***Credit not given for both this course and 01:470:258 or 01:195:258.***

**01:470:255** ***The Faust Legend through the Ages (3)***
Relevance of the Faust theme to Western civilization from biblical days to the present, with emphasis on Goethe's *Faust*.

**01:470:258** ***From Nietzsche to Superman (3)***
Examination of transformation of Nietzsche's Übermensch (overman) into the American Superman heroes of our contemporary culture. Analysis of impact of this motif on gender studies, animal studies, and contemporary media technologies: Hitler's racist Aryan superman and its dismantling in modern art; female versions of Superman such as Wonder Woman or the "material girl" in pop culture; attention also to the figures of the "outlaw," the "idiot," and the cyborg.
***Credit not given for both this course and 01:195:258 or 01:470:254.***

**01:470:261,262** ***Major German Writers (3,3)***
Selected masterpieces of German literature from the Middle Ages to the present.

**01:470:275** ***Introduction to German Studies (3)***
Introduction to major cultural movements and pivotal historical moments in the German tradition examined through literature, painting, drama, philosophy, music, and film.

**01:470:276** ***Realism and Revolution (3)***
Introduction to 19th-century German literature and its response to and critical reflection of the French Revolution.
***Credit not given for both this course and 01:195:276.***

**01:470:277** ***Radical Modernism and Anti-Art (3)***
Introduction to the major movements and protagonists of early 20th century European avant-garde--Expressionism, Futurism, Dada, Surrealism--and the impact of these movements on Pop Art and Punk Rock of the 1960s and 1970s. Includes examples from visual arts (Kirchner, Kandinsky, Duchamp, Ernst), literature (Wedekind, Ball, Marinetti, Apollinaire), and cinema (Murnau, Richter, Buñuel, Warhol).
***Credit not given for both this course and 01:082:276, 01:195:277, or 01:470:358.***

**01:470:280** ***The Culture of Yiddish: An Introduction (3)***
An overview of Yiddish, the traditional vernacular language of Ashkenazic Jews, and its culture, from its medieval origins to the present.
***Credit not given for both this course and 01:563:245.***

**01:470:285** ***Enchanted Worlds (3)***
Exploration of how fantasy, the fantastic, and the supernatural function as a site of cultural and aesthetic critique in German literature and thought from the Enlightenment to the early twentieth century. Readings include immensely creative and influential masterpieces of world literature. Emphasis placed on developing critical reading and writing skills.
***Taught in English.***

**01:470:303** *Topics in Critical Issues in German Studies (3)*
Introduction to literary and artistic traditions of German-speaking Europe as they both relate to the social, technological, religious, political and linguistic histories of these regions, and reflect changing values and understandings of what it means to be human. Topics may vary from semester to semester.
*Taught in English.*

**01:470:304** *German and Comparative Literature (3)*
Examination of the literary and artistic traditions of German-speaking Europe as they relate to the social, technological, religious, political and linguistic histories of both these regions, and those of other cultures with which these traditions have, historically, been in dialogue.
*Credit not given for this course and 01:195:314.*

**01:470:309** *Justice and Violence (3)*
Justice, violence, and the law are entangled in complex ways. While we may think that following the law will always ensure a just outcome, justice inevitably exceeds the boundaries of legal stipulations. In fact, it is quite uncertain whether and how it is possible to make a just decision, to act or speak justly. While the law is never fully able to represent justice, it is also fundamentally reliant on violence. But how is legal violence different from the unrestrained violence of lawlessness?

Taught in English. Credit not given for both this course and 01:195:373 or 01:904:309.

**01:470:327** *Writing Travel: Movement, Migration, Mobility (3)*
Explores the link between narration and mobility; provides overview of the history of travel and the changes in writing travel from the 18th century until today; engages various literary forms and other media (film, art, and music) as well as cartographic tools offered by digital humanities.
*Prerequisite: 01:470:232, or simultaneous enrollment in 01:470:231 or 232.*

**01:470:349** *Contemporary German and European Cinema (3)*
New German cinema as a contemporary mode of artistic expression. Viewing and analysis of films by such outstanding directors as Fassbinder, Herzog, Schloendorff, and Wenders. Emphasis on the "literary" aspects of the German cinema.
*One section taught in German. Credit not given for this course and 01:175:349 or 01:360:349.*

**01:470:353** *The Nazi Period in Film (3)*
Exploration of important role of cinema during Nazi era. Study of historical situation in Germany between 1933 and 1945, and of representative films produced in Germany under the Nazi regime. Focus on the staging of power, representations of race, and the promotion of escapism in these films, as well as on retrospective representation of the period in contemporary cinema.

**01:470:354** *Kafka and World Literature (3)*
Introduction to Kafka's work and its impact on world literature. Topics include: literary modernism and European modernity; Jewish languages, culture, identity, and music in the early 20th century and beyond; minor and postcolonial literature; rethinking the relationship among humans, animals, hybrids, and monsters; and new directions in art, literature, film, and music.
*Credit not given for both this course and 01:195:382 or 01:563:355.*

**01:470:355** *German Thought in the 20th Century (3)*
Exploration of the vexing history of German philosophy and thought in the 20th century with a focus on History, Language, and Technology. Taught in English.

Credit not given for this course and 01:730:316.

**01:470:360** *Classics of German Cinema: From Haunted Screen to Hyperreality (3)*
Introduction to canonical films of the Weimar, Nazi, postwar, and postwall period. Focusing on class, gender, nation, and conflict through close analysis, the course seeks to sensitize students to the cultural context of these films and the changing sociopolitical and historical climates in which they arose. Special attention to the issue of film style, and to question of what constitutes the film canon in particular in the case of recent works.
*Credit not given for both this course and 01:175:360.*

**01:470:364** *Big Bang: The Literature of Chaos and Order (3)*
Representations of dramatic upheavals in the physical universe as analogies for crisis and revolution in history, politics, psychology, science, and the arts. In literature and philosophy from the Renaissance to the present.
*Credit not given for both this course and 01:195:364.*

**01:470:365,366** *Literature and Social Change from Nietzsche to Brecht (3,3)*
Interaction between German literature and society from the unification (1871) and industrialization of Germany to the end of World War II.
*Credit not given for both this course and 01:175:365 or 01:013:365.*

**01:470:367** *Self and Society in the Postwar German Novel and Short Story (3)*
Major prose writers of Austria, Germany, and Switzerland since the end of World War II.

**01:470:368** *Self and Society in the Postwar German Drama (3)*
Major playwrights of Austria, Germany, and Switzerland since the end of World War II.

**01:470:369** *Remembering the Holocaust (3)*
Holocaust remembrance in contemporary social and cultural practices in the United States and globally considered as a paradigm for deriving lessons from the past in order to respond to traumatic losses, address present social injustices, and prevent future acts of intolerance.
*Credit not given for both this course and 01:510:370 or 01:563:360.*

**01:470:371** *Marx, Nietzsche, Freud (3)*
Exploration of the work of three German writers who revolutionized modern philosophy, theology, psychology, aesthetics, social and political science, gender studies, historiography, literature, and the arts.
*Credit not given for both this course and 01:195:374 or 01:730:344.*

**01:470:373** *Bertolt Brecht, Dramatist and Marxist (3)*
Study of Brecht's epic (Marxist) theater and its impact on contemporary dramatic theory and theatrical practice; an introduction to Brecht's poetry of engagement.

**01:470:375** *New Subjectivity in Literature and Film (3)*
Literature and film in the context of political, social, and cultural developments since the late 1960s. Topics include the politics of the personal, reconciliation with the Nazi past, the "death of literature," and the rise of German feminism.

**01:470:376** *German Culture through the Arts (3)*
Introduction to the visual arts, music, and dance created in German-speaking countries in the 19th and 20th centuries. Taught at the Zimmerli Art Museum by a team of curators, art historians, guest musicians, and dance scholars, and with visits to museums and performances in Manhattan.
*Open to all students; of special interest to those considering enrolling in the German department's Berlin Summer Program.*

**01:470:380** *German-Jewish Literature and Culture (3)*
Survey of German-Jewish culture, 18th century to present. Literature in political-historical context, with some attention to music, philosophy, and film.
*Special permission required for credit toward major. Credit not given for both this course and 01:563:380.*

**01:470:381** *Cultural Foundations of Germany (3)*
Significant aspects of German civilization from the age of Charlemagne to the unification of Germany in 1870. Focus on the German contribution to music, the arts, the sciences, philosophy, and literature.

**01:470:383** *Germanic Mythology (3)*
Myths and religious practices of the migration period and the age of the Vikings. Sources: the Eddas, Christian and pre-Christian documents and texts, archaeological finds, place names, modern folkloristic beliefs.

**01:470:384** *Gender and Politics in Yiddish Literature and Culture (3)*
Traces the cultural dynamics of Ashkenazic Jews in 16th- to 19th-century Europe through Yiddish religious writing, folktales, fiction, memoirs, and poetry. All readings in translation.
*Prerequisites: 01:563:202, 260, or permission of instructor. Credit not given for both this course and 01:563:384 or 01:988:391.*

**01:470:385** *The Changing Image of Women in German Literature (3)*
Selected works of German literature that convey the experience of women cast into socially prescribed roles.

**01:470:388,390,392** *Topics in German Literature and Civilization (3,3,3)*



# Courses in German

# Courses in German

*Prerequisites*

For courses numbered in the 200 series: any two courses between 01:470:131 and 136, or the permission of the department. For courses numbered in the 300 series: any two of 01:470:231, 232, 241, 242, 293, 294, or the permission of the department.

*Introductory Courses*

Beginners or students with fewer than two years of German in secondary school normally take courses 01:470:101-102, and then 131-132. Students who have had two or more years of German in secondary school and who wish to continue this language are assigned according to their achievement on a placement test. Courses 01:470:101-102 and 105-106 are conducted partly in German. All other courses, with the exception of literature, culture, and film courses in English translation, are conducted entirely in German.

**01:470:101-102** *Elementary German (4,4)*
Basic skills of listening, speaking, reading, and writing; study of grammar and vocabulary building; supplementary work in the language laboratory.
***Prerequisite for 01:470:102: 01:470:101 or 01:470:107 or 01:470:109. Not open for credit to students who have had two or more years of secondary school German.***

**01:470:103** *German for Travel (1)*
Introduction to language and culture of German-speaking countries focusing on language competencies particularly relevant to travel. Students learn to speak in German at a basic level about themselves as travelers, learn information on the German-speaking countries and their cultures, as well as different means of transportation and accommodations one can use when traveling to and in Europe.
***Not open to students who have completed 01:470:102, 01:470:121, or equivalent.***

**01:470:104** *German Conversation (1)*
Introduction to the language and culture of German-speaking countries focusing on the language competencies particularly relevant in everyday situations. Students learn to speak in German at a basic level about themselves, their families, studies, the weather, and leisure activities.
***Not open to students who have completed 01:470:102, 01:470:121, or equivalent.***

**01:470:105,106** *German for Reading Knowledge (3,3)*
Development of reading skills for students who wish to acquire a basic competence in the language for research purposes. Texts chosen from the humanities, the natural sciences, and the social sciences.
***Not open for credit to students who have had two or more years of secondary school German. Does not satisfy prerequisite for 01:470:131 or 132.***

**01:470:109** *Introductory German for Business I (4)*
Introduction to the language used in business settings in German-speaking countries at the Level A1 (Beginner) of the Common European Framework of Reference for Languages (CEFR). Preparation for use of German in business-related contexts; basic understanding of German corporate culture. Practice in reading, writing, listening, and speaking on topics of the German-language business environment. Topics include business meetings and visits; offers, purchasing and leasing; and business travel.

**01:470:110** *Introductory German for Business II (4)*
Continuation of introduction to the language used in business settings in German-speaking countries at the Level A2 (Elementary) of the Common European Framework of Reference for Languages (CEFR). Use of German in business-related contexts and deeper understanding of German corporate culture. Practice in reading, writing, listening, and speaking on topics of the German-language business environment. Topics include statistics, job search, planning, IT, and social interaction with business partners.

**01:470:121** ***German Intensive Review (4)***
Intermediate reinforcement course. Practice in speaking, reading, and writing German; extensive grammar review; cultural topics.
***Not open to students who have taken 01:470:101 or 102.***

**01:470:131-132** ***Intermediate German (3,3)***
Emphasis on conversation and composition, based on everyday situations, aspects of culture, and contemporary German short stories; review of major grammatical points.
***Prerequisite: 01:470:102 or placement test.***

**01:470:211,212** ***German Conversation and Culture (3,3)***
Proficiency-oriented with strong emphasis on speaking skills. Extensive use of audiovisual material and guided conversation practice; texts and discussion topics relating to everyday life, current events, and contemporary issues in the German-speaking community.

**01:470:231-232** ***Advanced German (3,3)***
Reading and discussion of advanced text material based on contemporary German culture. Intensive practice in word formation, sentence structure, and expository writing.
***Prerequisite: 01:470:132 or placement test***

**01:470:241,242** ***Introduction to German Literature (3,3)***
Critical appreciation of German literature through the study of selections of prose fiction, drama, and poetry, and the culture of the periods in which they were written.

**01:470:299** ***Contemporary German Media and Society (1.5)***
Development of active language skills through study of the role of various media (including print, internet, film, and the other arts) in informing contemporary German politics and society. Special attention to cultural differences between Germany and the United States. Texts and presentations chosen to accommodate level of students enrolled. In German. All levels of language above German 121 welcome.
***Prerequisite: 01:470:102 or 122.***

**01:470:301,302** ***Introduction to Literary and Cultural Analysis (3,3)***
Introduction to the basic German terminology of literary and cultural analysis, and preparation for courses in German at the 300 level. Study of literary works and films, as well as newspaper articles, film reviews, and literary analyses.
***Prerequisite: 01:470:232, or simultaneous enrollment in 01:470:231 or 232. May be repeated for credit.***

**01:470:313** ***Business German I (3)***
Development of effective communication models with emphasis on the terminology of economics. Treatment of basic principles governing commercial organizations in German-speaking countries.
***Prerequisite: 01:470:232 or equivalent.***

**01:470:314** ***Business German II (3)***
Continuation of 01:470:313 with emphasis on the terminology of international commerce and the development of specialized language skills for diverse business situations. Contrastive treatment of cultural factors affecting German-American trade relations.
***Prerequisite: 01:470:313 or permission of instructor.***

**01:470:315** ***Advanced Translation Seminar I (3)***
Methodology and techniques of translating German-English and English-German. Texts are drawn from a variety of fields, with special attention to stylistic, syntactic, and semantic divergences between the two languages and the latest developments in computer-generated translations.

**01:470:316** ***Advanced Translation Seminar II (3)***
Methodology and techniques of translating German-English and English-German. Texts are drawn from a variety of fields, with special attention to stylistic, syntactic, and semantic divergences between the two languages and the latest developments in computer-generated translations.

**01:470:321** ***Fundamentals of Literary Analysis (3)***
Introduction to textual categories, literary terminology, and methodological problems through the analysis and interpretation of representative works of literature.

**01:470:323** ***Masters of German Poetry (3)***
Readings from such poets as Walther von der Vogelweide, Gryphius, Klopstock, Goethe, Schiller, the romantics, Heine, George, Hofmannsthal, Rilke, Benn, and Brecht.

**01:470:324** ***German Theater (3)***
Study of German drama through readings from such playwrights as Lessing, Goethe, Schiller, Kleist, Büchner, Wedekind, Brecht, Handke, and Heiner Müller, along with analysis (using video) of current approaches to theater production.

**01:470:325** ***The Short Narrative: 16th Century to Present (3)***
Studies in short genres of German prose such as the anecdote, farce, fable, novella, and short story.

**01:470:326** ***The German Fairy Tale and Folk Tradition (3)***
Studies in the German fairy tale, legend, and folk song; principal characteristics and cultural contexts.

**01:470:329** ***Heroes and Monsters (3)***
Survey from medieval literature to the present of the relationship between heroes and monsters, the latter considered as the incarnation of all that would destroy civilization.
***Prerequisite: 01:470:232.***

**01:470:333** ***German Literature of the Enlightenment, Rococo, and Storm and Stress (3)***
Major authors of the 18th century, including Klopstock, Lessing, Herder, the early Goethe, and Schiller.

**01:470:335** ***Goethe: Life and Works (3)***
Close reading of Goethe's works against the cultural, historical, and political background of his time. Selected poems, plays, and prose.

**01:470:337** ***Schiller: Life and Works (3)***
Close reading of Schiller's works against the cultural, historical, and political background of his time. Selected poems, plays, and prose.

**01:470:341** ***German Civilization I: Fifth through 15th Centuries (3)***
Cultural foundations of the German-speaking areas of central Europe from the fall of Rome to the waning of the Middle Ages. Readings from historical, didactic, and poetic documents, supplemented by slides and recorded music.

**01:470:342** *German Civilization II: 16th through 18th Centuries (3)*
Cultural foundations of the Holy Roman Empire of the German nation from the age of Luther to the Napoleonic era. Readings from historical, didactic, and poetic documents, supplemented by slides and recorded music.

**01:470:343** *German Culture Today (3)*
Contemporary cultural, social, and political life in German-speaking countries with emphasis on the daily experience. Audiovisuals, guest lectures, field trips, and contact with resource persons.

**01:470:347** *German Politics and Society: Germany 1871-1945 (3)*
Overview of significant political, historical, and social trends which shaped modern Germany in its early years from the Franco-Prussian War to the end of World War II.

**01:470:348** *German Politics and Society: Germany 1945 to the Present (3)*
Introduction to major political, historical, and social trends which have shaped German society, both east and west, from the end of the World War II to the present.

**01:470:349** *Contemporary German Cinema (3)*
See description under Courses in English. ***One section taught in German.***

**01:470:386** *Junior Year in Germany (BA)*

**01:470:387,389,391** *Topics in German Literature and Civilization (3,3,3)*

**01:470:393,394** *Independent Study in German (1-3,1-3)*
For students of exceptional promise wishing to pursue an individualized project in German literature, civilization, or language under the guidance of a member of the department.
***Prerequisites: Permission of instructor and undergraduate director.***

**01:470:395,396** *German Teaching Apprenticeship (3,3)*
Development of various projects relevant to language teaching, e.g., preparing new teaching devices, conducting conversational groups, and tutoring.
***Prerequisite: Permission of instructor.***

**01:470:415,416** *Advanced Translation Seminar I,II (3,3)*

**01:470:431** *German Literature of the 19th Century: Romanticism (3)*
Romantic period from Wackenroder to Eichendorff (1790-1850), including Tieck, Novalis, Hoffmann, A.W. and F. Schlegel, Hölderlin, Kleist, and Brentano. Readings of theoretical and poetic texts.

**01:470:435** *German Literature of the 20th Century before 1945 (3)*
Major literary movements and figures from the turn of the century to the end of World War II, including naturalism (Hauptmann); impressionism (Schnitzler); symbolism (Rilke); expressionism (Kaiser, Trakl); neo-factualism (Zuckmayer); the outsiders (Wedekind, Hesse, Kafka); and the anti-Nazi writers in exile (Mann, Brecht).

**01:470:436** *German Literature of the 20th Century after 1945 (3)*
Literary trends and currents from the end of World War II to the present: the "literature of the ruins" (Borchert, Böll); documentary theater (Weiss, Hochhuth); Brecht's epic theater and East Germany; major novelists (Böll, Frisch, Grass, Wolf); and playwrights (Dürrenmatt, Handke).

**01:470:441** ***German Civilization III: The 19th Century (3)***
Cultural foundations of Germany from the abolition of the First Reich by Napoleon in 1806 to the end of the Second Reich in 1918. Readings from historical, didactic, and poetic documents, supplemented by slides and recorded music.

**01:470:444** ***Masters of German Satire (3)***
Satirical features and strategies in literary and visual texts from late medieval carnival plays to postmodern cabaret.

**01:470:450** ***Reading Women's Lives: 20th-Century Narratives (3)***
Twentieth-century women's literature and film; historical retrospective and methodological introduction prepare for treatment of preeminent postwar texts.
***Prerequisite: A 300-level course in German or permission of instructor.***

**01:470:460** ***Voices of a Century: 20th-Century Autobiography and Culture (3)***
Masterpieces of 20th-century autobiography read in a social, political, and philosophical context.
***Prerequisite: A 300-level course in German or permission of instructor.***

**01:470:491,492** ***Senior Seminar in German Literature (3,3)***
Analysis and interpretation of selected works of German literature with emphasis on various literary genres; discussions, oral and written reports.

**01:470:493,494** ***Independent Study in German (3,3)***
For students of exceptional promise wishing to pursue an individualized project in German literature or civilization under the guidance of a member of the department.
***Prerequisites: Permission of instructor and undergraduate director.***

**01:470:495,496** ***Senior Honors in German (3-6,3-6)***
Independent research on a topic selected by the senior and approved by a departmental honors committee; carried out under the guidance of a member of the department.

# Classics (SAS)

## CLASSICS

(Classical Humanities 190, Greek 190b, Greek and Latin 190c, Latin 190d)

Department of Classics, School of Arts and Sciences

**Website:** Here

**Chair:** Serena Connolly

**Undergraduate Director:** Emily Allen-Hornblower

**Distinguished Professor:**

Thomas J. Figueira, B.A., Fordham; Ph.D., Pennsylvania

**Professors:**

T. Corey Brennan, B.A., Pennsylvania; M.A., Oxford; Ph.D., Harvard

Serena Connolly, B.A., Cambridge; M.A., Ph.D., Yale

James McGlew, B.A., M.A., Ph.D., Chicago

Azzan Yadin-Israel, B.A., Hebrew; Ph.D., California (Berkeley) and Graduate Theological Union

**Associate Professors:**

Emily Allen-Hornblower, B.A., Sorbonne, École Normale Supérieure; M.A., Ph.D., Harvard

Timothy Power, B.A., Yale; M.A., Ph.D., Harvard

**Assistant Professors:**

Bice Peruzzi, B.A., Perugia (Italy); M.A., Padova (Italy); M.A., Ph.D., Cincinnati

Jeffrey Ulrich, B.A., Rutgers; M.A., Ph.D., Pennsylvania

**Associate Teaching Professor:**

Kristina Chew, B.A., Princeton; Ph.D., Yale

John Fisher, B.A., Kean College; M.A., Richard Stockton College; Ph.D., Princeton¿

**Assistant Teaching Professors:**

Salam Al Kuntar, B.A., Damascus University; M.A., University of Liverpool; Ph.D., University of Cambridge

The department offers a major in classics with options in classical humanities, Greek, Greek and Latin, and Latin. Selected courses in history, philosophy, and art history also may count for credit toward the classics major. Students with a strong interest in ancient history may pursue the ancient history and classics option within the history major (see the history section of this catalog). Minors are offered in ancient Greek, Latin, and classical humanities. For more information, consult the departmental website.

Classics (SAS)

# Learning Goals

# Learning Goals

See here.

- Classics is a broad discipline, characterized by its interdisciplinary nature. Pursuing classics means acquiring fundamental language skills in ancient classical languages (Greek, Latin, and, to a lesser degree, Sanskrit), along with a wide-ranging knowledge of the ancient world.

- Studying classics involves coming to grips with the ancient Greek and Roman civilizations: their myths and literature; their social, military, political, and cultural history; their philosophy; and aspects of their material culture. At every stage, students are led to reflect on the many connections of classics to the modern world, and how these ancient civilizations contributed to shape it.
- As many other humanities disciplines do, classics combines language study with the exploration of questions central to many social sciences. Classics students are led to ponder the mechanisms of human psychology, social organization, and historical evolution, and given an opportunity to appreciate the ways in which the individual and the community relate to, shape, and affect one another.

Classics (SAS)

# Major Requirements

# Major Requirements

Classics majors choose one of four options. Those who wish to concentrate on one or both ancient languages may choose an option in ancient Greek and Latin, ancient Greek, or Latin. The classical humanities option is for those who wish to pursue a general study of the history, literature, and culture of the classical world. All courses applied to the major must be completed with a grade of C or better.

*Classical Humanities Option (Classical Humanities 190).* A major who pursues the classical humanities option must complete 36 credits in the department. (Credits from approved classical humanities courses in other departments may be counted among these, as well as courses with a 190, 490, or 580 subject code.) The following are required of every classical humanities major: 1) one course in the Greek or Latin language at the 200 level or above; 2) at least six courses at the 300-level or above.

*Greek Option (Greek 190b).* A student majoring in classics with emphasis on Greek must take 35 credits in the department, of which 26 credits must be in the ancient Greek language (including at least six courses at the 300 level or above).

*Greek and Latin Option (Greek and Latin 190c).* A student majoring in classics with emphasis on Greek and Latin must take 35 credits in the department, of which at least 29 credits must be in the ancient Greek and Latin languages. The credits may be distributed between the two languages, but at least 11 credits must be taken in each language. At least six courses must be at the 300 level.

*Latin Option (Latin 190d).* A student majoring in classics with emphasis on Latin must take 35 credits in the department, of which at least 26 credits must be in the Latin language (including at least six courses at the 300 level or above).

Classics (SAS)

# Minor Requirements

# Minor Requirements

Classics minors choose one of three options. Those who wish to concentrate on one of the ancient languages may choose an ancient Greek or Latin minor. The classical humanities minor is for those who wish to pursue a general study of the history, literature, and culture of the classical world. All courses applied to the minor must be completed with a grade of C or better.

*Classical Humanities (190).* A minor in classical humanities requires a minimum of seven courses in the department. (Credits from approved classical humanities courses in other departments may be counted among these, as well as courses with a 190, 490, or 580 subject code.) Of these seven courses, at least three courses must be at the 300 level or above.

*Latin (580).* A minor in Latin requires a minimum of six courses in the Latin language, including three at or above the 300 level.

*Greek (490).* A minor in ancient Greek requires a minimum of six courses in the Latin language, including three at or above the 300 level.

Classics (SAS)

# Teacher Certification

# Teacher Certification

Classics majors interested in earning eligibility for teacher certification (K-12) in New Jersey should contact advisers in the Graduate School of Education and in the Department of Classics in their first year, or as soon as possible thereafter.

Classics (SAS)

# Departmental Honors Program

# Departmental Honors Program

Honors in Classics may be earned by eligible students who wish to write a senior thesis with the help of an adviser. To qualify, students must have a cumulative grade-point average (GPA) of 3.2 or better and a GPA of 3.6 or better in the major at the end of their junior year. At that time, students should complete the required application form, before the deadline of May 2 of their junior year. See the classics website under Honors & Glory for the honors thesis application form.

Note: Students writing theses must enroll in 01:190:495, 496 (8 credits total) in their senior year. Students who are interested in a topic that spans more than one academic discipline should consider the School of Arts and Sciences interdisciplinary honors thesis option: Here.

Honors in Classics may also be earned by classics majors who:

1. Maintain a 3.5 in the major

2a. Have earned 12 credits at the 300 level or above in Greek OR Latin courses

OR

2b. Have earned 6 credits in BOTH Greek and Latin at the level of 300 or above

3. Submit two papers representative of their work in classics (they may be revised versions of class papers), which a panel of two faculty members deem worthy of honors using the rubric that we have developed for senior assessment purposes.

4. Sit for a sight translation exam in the spring of senior year and pass with honors

To be eligible for honors without a thesis, the grades in the Greek and Latin courses must be at an average of 3.5 or above; for high honors, 3.7 or above; for highest honors, 3.9 or above. Highest honors will be reserved for those students who, in addition to meeting the GPA requirement, have performed at the highest level on the sight exam and paper requirement. Students should inform the undergraduate director by the fall of senior year if they would like to be considered for honors in the major.

Classics (SAS)

# Courses in Classical Humanities (190)

# Courses in Classical Humanities (190)

Courses in classical humanities are open to students without a knowledge of the Greek or Latin language.

**01:190:101** ***Word Power (3)***
Systematic study of the basic Greek and Latin derivatives in English. Emphasis is on Greek and Latin elements in current scientific and literary use.

**01:190:102** ***Medical Terminology (1.5)***
Systematic study of scientific terminology based on ancient Greek and Latin elements, with emphasis on the field of medicine.
***May be taken concurrently with 01:190:101.***

**01:190:200** ***Ancient Near East (3)***
Origins and development of the societies of Mesopotamia, Egypt, Asia Minor, and Palestine, through the period of the Persian Empire.
***Credit not given for both this course and 01:563:200, 01:508:200, or 01:685:200.***

**01:190:201** ***Ancient Greece (3)***
Civilization of the eastern Mediterranean world in ancient times, with emphasis on the origins of Western civilization and the Greek contribution to Western culture.
***Credit not given for both this course and 01:510:201.***

**01:190:205** ***Greek Civilization (3)***
Survey of Greek thought and literature. Readings include Homer, the lyric poets, the Athenian dramatists, and selected readings from historians and philosophers. Artistic material may be included.

**01:190:206** ***Roman Civilization (3)***
Surveys Roman thought and literature. Readings include Virgil, Ovid, Livy, Cicero, Tacitus, and Petronius. Artistic material may be included.

**01:190:207** ***Greek and Roman Mythology (3)***
Examination of the nature, meaning, and continued vitality of the principal classical myths through reading, lectures, and slide presentations.

**01:190:208** ***Philosophy of the Greeks (3)***
Introduction to the major philosophical thinkers of the ancient Greek world with special emphasis on Plato and Aristotle.
***Credit not given for both this course and 01:730:208.***

**01:190:209** ***Ancient Rome (3)***
The Roman Republic and the empire, with emphasis on the rise and decline of a Mediterranean world civilization under Roman leadership.
***Credit not given for both this course and 01:510:202.***

**01:190:211** ***Greek and Roman Religion (3)***
Study of pagan gods and goddesses, and cults and practices of the classical Greek world, Roman Republic, and Roman Empire.

**01:190:212** ***Classical World in Film (3)***
Survey of film depictions of the classical world of Greece and Rome, with readings from literary, historical, and critical sources. Topics include "sword and sandals" genre and its history; parallels between America and Greece/Rome; spectacle and empire; and the uses of history in popular historical films.

**01:190:213** ***Science and Technology in Ancient Greece and Rome (3)***
Explores the nature and development of science in ancient Greece and Rome, focusing on medicine, biology, physics, and mathematics.

**01:190:214** ***Sexuality in Ancient Greece and Rome (3)***
Investigates how the ancient Greeks and Romans categorized, depicted, and reacted to different sexual behaviors and identities through the study of visual and literary sources ranging from Homeric Greece to Imperial Rome.

**01:190:215** ***Introduction to Greek and Roman Archaeology (3)***
Introductory survey of the archaeology, architecture, and material culture of the Mediterranean world from the Bronze Age throughout the transformation of the Roman Empire following the reign of Constantine. Consideration given to chronological developments, Greek and Roman artistic production in its social and cultural settings, and Classical Art.
***Credit not given for this course and 01:070:113.***

**01:190:220** ***Greek Food from Antiquity to Today (3)***
Food and foodways of Greek-speaking peoples from ancient times to the present, with special emphasis on problems of continuity and change.
***Credit not given for this course and 01:489:220, 01:510:222, 01:685:220, or 667:220.***

**01:190:251** ***Papal Rome and Its People, 1500-Present: A Select History (3)***
Case-study approach toward select aspects of the social, cultural, intellectual, and political history of the early modern and modern popes, with a particular focus on their relationship to the city of Rome. Highlights the reign of Pope Gregory XIII Boncompagni (1572-1585) and Gregory XV Ludovisi (1621-1623), and their subsequent family history to the present day.
***Credit not given for both this course and 01:556:251.***

**01:190:254** ***The Presocratic Philosophers (3)***
Introductory survey of the Presocratic philosophers. Emphasizes exposure to the teachings of these thinkers through the remaining fragments, while also engaging scholarly writings that introduce and contextualize the sources.
***Credit not given for this course and 01:730:254.***

**01:190:300** ***Greek and Roman Slavery (3)***
Social, economic, legal, and political aspects of slavery in ancient Greece and Rome. The sources and numbers of slaves, forms of servitude, manumission, and slave labor.

**01:190:301** ***Food and Drink in the Ancient World (3)***
This course provides students an opportunity to understand the social history of the ancient Mediterranean world through an exploration of the production, preparation, and consumption of food and drink and (re)presentations of them in word and image.

**01:190:303** ***Hellenistic World (3)***
Expansion and development of Greek culture from Alexander through the successor kingdoms in Greece, Egypt, Syria-Palestine, and Asia Minor.
***Credit not given for both this course and 01:510:303.***

**01:190:305** ***The Crisis of the Roman Republic (3)***
Roman political, social, and cultural history during the crisis of the late republic from 133 BC.

**01:190:306** ***Roman Empire (3)***
Political, social, and intellectual developments of the imperial period until the age of Constantine, with emphasis on the first two centuries AD.
***Credit not given for both this course and 01:510:306.***

**01:190:309** ***Greek and Roman Athletics (3)***
Examines the ideology and cultural context of ancient athletic competition. Topics include the Olympic and other Panhellenic games, Roman chariot racing and gladiator combat, and women athletes.

**01:190:310** *Augustan Rome (3)*
The cultural renaissance under Augustus (44 BC-AD 14): the writings of Virgil, Horace, Livy, Ovid, and the elegiac poets; the building program at Rome; and artistic trends.
*May be jointly taught (in part) with 01:580:310. Students wishing to earn language credit in Latin should enroll in 01:580:310. Credit not given for both this course and 01:580:310.*

**01:190:312** *The Search for the Historical Socrates (3)*
Portraits of Socrates in Plato, Xenophon, Aeschines of Sphettus, and Aristophanes. Birth of the philosophical dialogue and other genres; life and thought of Socrates; and later Socratic movements.
*Prerequisite: One course in ancient Greek history, culture, or philosophy; or permission of instructor. May be jointly taught (in part) with 01:490:312. Students wishing to earn language credit in Greek should enroll in 01:490:312. Credit not given for both this course and 01:490:312.*

**01:190:314** *The Etruscans (3)*
Study of the social history, material culture, and artistic expression of the Etruscans. Survey of urbanism and architecture, trade, funerary practices, painted decoration, sculpture, and minor arts between the 9th and 2nd centuries BC.
*Credit not offered for this course and 01:082:314.*

**01:190:315** *Latin Poets in English (3)*
Selections from the Augustan poets Horace, Virgil, and Propertius. Translations by Dryden, Ezra Pound, and others, with close reference to the Latin original. Theories of translation.
*Prerequisite: One year of Latin or permission of instructor.*

**01:190:317** *Ancient Painting (3)*
Survey of Greek, Etruscan, and Roman painting from the eighth century BC through the Roman Empire. Emphasis on the development of style and on the cultural significance of painted images in different social contexts.
*Credit not given for this course and 01:082:317.*

**01:190:318** *Cleopatra (3)*
Examines the historical Cleopatra and the reception of her image from antiquity to the present in literature, art, and film. Issues considered include female power in a man's world, East versus West, and politics and propaganda.
*Credit not given for both this course and 01:510:312 or 01:988:321.*

**01:190:320** *Women in Antiquity (3)*
Women in the ancient societies of Greece and Rome. Their roles and images in the social, legal, political, domestic, philosophical, and artistic spheres examined using primary sources.
*Credit not given for both this course and 01:510:251.*

**01:190:321** *Classical Rhetoric (3)*
Origins and development of rhetorical theory: persuasive argument, emotional appeal, good style, and delivery.

**01:190:323** *Criminals and Saints: Power in Greek Political Life and Imagination (3)*
Unlimited power, tyranny, democracy. Explores the ancient Greeks' ambivalent conceptions and perceptions of autocratic versus collective power through time.
*Prerequisite: 01:190:205 or permission of instructor.*

**01:190:324** *Race and Ethnicity in the Classical World (3)*
Examination of ancient Greek and Roman understanding of physically different and geographically alien individuals. Consideration of the origins of our culture's beliefs about race, ethnicity, and human difference in classical world's views of strangers, foreigners, and barbarians and how our ideas about race and difference have evolved.

**01:190:325** *Cults, Magic, and Witchcraft (3)*
Magic and witchcraft in the everyday life of antiquity, from pagan to Christian times; how individuals tried to control the unknown. Literary and material sources.

**01:190:328** *Ancient Law in Action (3)*
Explores Greek and Roman constitutions and legal systems in their social contexts. Illustrates procedural elements of ancient criminal and civil law through mock trials.

**01:190:350** *Greek Society (3)*
Social and economic life of the Greeks from the Mycenaean period through the Hellenistic age. Written and material evidence employed.
*Recommended: 01:510:201. Credit not given for both this course and 01:510:350.*

**01:190:352** *Plato (3)*
Philosophy of Plato through close reading of selected dialogues, supplemented by relevant readings on other ancient and contemporary philosophers.
*Credit not given for both this course and 01:490:352 or 01:730:352.*

**01:190:353** *Aristotle (3)*
Philosophy of Aristotle through his selected works, supplemented by relevant readings in Plato and in modern philosophers.
*Prerequisite: One course in ancient Greek history, culture, or philosophy; or permission of instructor. May be jointly taught (in part) with 01:490:353. Students wishing to earn language credit in Greek should enroll in 01:490:353. Credit not given for both this course and 01:490:353.*

**01:190:355** *Ancient Mythology and Society (3)*
Social history and practical utilization of ancient myth (with emphasis on Greek myths), applying historical, religious, sociological, and literary-critical perspectives.

**01:190:356** *Oedipus: A Survey of the Myth from Antiquity to Freud (3)*
Survey of the Oedipus myth in earliest, pre-Sophoclean evidence; in Greek and Roman tragedy; in the Middle Ages and the Renaissance; and in the 19th and 20th centuries (with special emphasis on Oedipus in art and music).

**01:190:358** *Odysseus in Literature, Drama & Film (3)*
Evolving images of Odysseus from ancient literature through medieval poetry and modern novels, poetry, plays, and films. Significance of Odysseus as an enduring literary icon.
*Credit not given for both this course and 01:195:358 or 01:489:358.*

**01:190:370** *Greek Film: Love, Eros & Death (3)*
Masterpieces of modern Greek film, 1914 to present, exploring interplay of love, the erotic, and death.
*Credit not given for this course and 01:489:370. Taught in English.*

**01:190:372** ***Cities of the Classical World (3)***
Study of urban development in antiquity, focusing on Athens and Rome, and synthesizing the evidence of literary, historical, and archaeological sources.
***Credit not given for both this course and 01:512:311.***

**01:190:373** ***Pompeii: The Life and Death of a Roman Town (3)***
Pompeii and Herculaneum, as laboratories for the study of Roman life: the economy and society; public and private architecture, art, and inscriptions; and the birth of archaeology.
***Prerequisite: One course in Roman history or culture, Latin or ancient art, or permission of instructor. Credit not given for both this course and 01:510:310.***

**01:190:375** ***Masterpieces of Greek and Roman Art (3)***
Analyses of selected monuments of architecture, sculpture, and painting from 800 BC to AD 500.

**01:190:377** ***The Hero in Ancient Greece and Rome (3)***
Explores the ancient Greek and Roman hero from literary, religious, mythical, and comparative narrative points of view. Readings drawn mostly from ancient sources.

**01:190:381** ***Greek Drama in Translation (3)***
Readings in English of the major Greek tragedies and comedies; emphasis on the dramatic structure, literary analysis, and the theatrical conventions of the ancient stage.

**01:190:391** ***Roman Drama in Translation (3)***
Readings in English of the comedies of Plautus and Terence and the tragedies of Seneca to emphasize the contributions of Latin authors to the dramatic genre and their influence on European and English drama.

**01:190:393** ***Greek and Roman Satire (3)***
Readings in English of classical satire from its origins in the Greek world through the fourth century AD. Emphasis on the significance of ancient satire for comedy and satire in Western culture.

**01:190:395** ***Transgression in Ancient Greek Society and Culture (3)***
Violence. Obscenity. Gender roles. Punishment. Violations of cultural norm in ancient Greek practical, civic, religious, and intellectual life, through close critical analysis of their myths, literature, laws, and rituals.
***Prerequisite: 01:190:205 or permission of instructor.***

**01:190:397** ***The Ancient Novel in Context (3)***
Readings from Greek and Roman novels of the Imperial period, with attention to their place in the literary and cultural history of the ancient world.

**01:190:421** ***Indo-European Origins of the Classical Languages (3)***
Comparative survey of Latin and Greek grammar, with historical analysis of those features that the two languages share due to their common origin as Indo-European languages. Reference to the major characteristics of Indo-European languages in general.
***Open only to advanced undergraduates in classics and linguistics and to graduate students with some knowledge of Latin and/or Greek.***

**01:190:440** ***Cultural Heritage and Preservation Studies (CHAPS): Museums, Collecting, and Preservation (3)***
Examines the history of museums, modes of collecting, and the preservation of the past, and considers these activities in the context of contemporary political issues.
***Credit not given for this course and 01:082:440.***

**01:190:491,492** ***Independent Study in Classics (3,3)***
Directed reading and research on an assigned topic in classics under the supervision of a member of the department. An extensive essay required, reflecting in-depth research on the assigned topic.
***Open only to juniors and seniors majoring in classics. Permission of the undergraduate director required.***

**01:190:493,494** ***Special Topics Seminar (3,3)***
Advanced study of a problem, topic, or theme in Greek and Roman studies.
***Open only to junior or senior majors in classics or by permission of instructor.***

**01:190:495,496** ***Honors Project (4,4)***
Independent or team projects resulting in a written paper, a performance, or some other appropriate form of public presentation such as drama, poetry, narrative prose, or museum excavation materials.
***Open only to honors students in one of the fields in classics.***

Classics (SAS)

# Classical Humanities Courses in Other Departments

# Classical Humanities Courses in Other Departments

01:013:180 Elementary Sanskrit I (4)

01:013:181 Elementary Sanskrit II (4)

01:082:301 Ancient Architecture (3)

01:082:306 Roman Art (3)

01:082:317 Ancient Painting (3)

01:082:342 Early Greek Art (3)

01:082:343 Later Greek Art (3)

01:510:201 Ancient Greece (3)

01:510:202 Ancient Rome (3)

01:510:205 The History of the Byzantine Empire (3)

01:510:207 Byzantine Civilization (3)

01:510:301 Early Greece (3)

01:510:302 Classical Greece (3)

01:510:303 Hellenistic World (3)

01:510:304 The Rise of the Roman Republic (3)

01:510:305 The Crisis of the Roman Republic (3)

01:510:306 Roman Empire (3)

01:510:307 The Roman World in Late Antiquity (3)

01:510:310 Pompeii: The Life and Death of a Roman Town (3)

01:510:320 Women in Antiquity (3)

01:510:350 Greek Society (3)

01:510:403 Ancient Warfare and Diplomacy (3)

01:730:302 Plato and Aristotle (3)

01:730:352 Plato (3)

01:730:401 Plato (3)

01:730:402 Aristotle (3)

01:730:403 Ancient Philosophy after Aristotle (3)

Classics (SAS)

# Courses in Greek, Ancient (490)

# Courses in Greek, Ancient (490)

**01:490:101** ***Elementary Greek I (4)***
Intensive study of ancient Greek grammar in conjunction with readings in simple Greek prose.

**01:490:102** ***Elementary Greek II (4)***
Continued study of Greek grammar in conjunction with readings.
***Prerequisite: 01:490:101 or permission of instructor.***

**01:490:206,207** ***Intermediate Greek Prose (3,3)***
Study of Greek prose through the reading of a work of Plato, Lysias, Herodotus, or other authors.
***Prerequisite: 01:490:102 or permission of instructor.***

**01:490:208,209** ***Intermediate Greek Poetry (3,3)***
Study of Greek poetry through the reading of a work of Euripides, Sophocles, Homer, or other authors.
***Prerequisite: 01:490:102 or permission of instructor.***

**01:490:211** ***Introduction to New Testament Greek (3)***
Introduction to grammar and syntax of Greek in conjunction with readings from the Gospels, Acts, or Epistles.
***Prerequisite: 01:490:207 or permission of instructor.***

**01:490:304** ***Aristophanes (3)***
Reading of *Clouds* and one other comedy; comparison of the Aristophanic with the Platonic Socrates; study of relation of Old Comedy to Athenian life.
***Prerequisites: 01:490:207 or 208 or permission of instructor.***

**01:490:305** ***Greek Drama (3)***
Readings in the works of fifth-century Greek dramatists with special emphasis on Sophocles.
***Prerequisite: 01:490:207 or 208 or permission of instructor.***

**01:490:306** ***From Athens to Alexandria (3)***
Major works of the literature of Greece from the fourth century BC into the Hellenistic Age.
***Prerequisite: 01:490:207 or 305 or permission of instructor.***

**01:490:308** ***Greek Historical Writings (3)***
Readings of selected narratives in Herodotus and of main speeches, excursuses, and parts of books six and seven of Thucydides. Comparative study of historical method.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:309** ***Lyric Poetry (3)***
Survey of the main poets of the "lyric age" of Greece (Alcman, Sappho, Alcaeus, Archilochus, Solon, Theognis, and Anacreon); reading of an ode of Pindar.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:310** ***Greek Heroic Poetry (3)***
Studies in the poetry and culture of Homeric Greece. Selections from the *Iliad* or *Odyssey*.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:311** ***New Testament Greek (3)***
Selections from the Gospels, Acts, and Epistles, supplemented by a review of grammar and syntax.

**01:490:312** ***Socratic Literature (3)***
Portraits of Socrates in Plato, Xenophon, Aeschines of Sphettus, and Aristophanes, with emphasis on the reading, in Greek, of selections from the writings of these authors.
***Prerequisite: 01:490:207 or 208 or permission of instructor. May be jointly taught (in part) with 01:190:312. Students wishing to earn language credit in Greek should enroll in 01:490:312. Credit not given for both this course and 01:190:312.***

**01:490:315** ***Menander (3)***
Study of *Dyskolos* and *Samia* as examples of New Comedy; their relation to Athenian life at the end of the fourth century.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:335** ***Greek Prose Composition (3)***
Review of syntax, composition in Greek, and translation from English to Greek of continuous passages adapted from classical authors.
***Prerequisite: 01:490:207 or 208.***

**01:490:352** ***Readings in Plato (3)***
Reading of one or more Platonic dialogues (or thematically related selections from several) in the original Greek.
***Prerequisites: 01:490:207, 208, or permission of instructor. May be jointly taught (in part) with 01:190:352; separate meetings for readings in Greek. Credit not given for both this course and 01:190:352 or 01:730:352.***

**01:490:353** ***Readings in Aristotle (3)***
Reading of one or more treatises by Aristotle (or thematically related selections from several) in the original Greek.
***Prerequisites: 01:490:207, 208, or permission of instructor. May be jointly taught (in part) with 01:190:353; separate meetings for readings in Greek. Credit not given for both this course and 01:190:353.***

**01:490:391** ***Readings in Greek Prose (3)***
Readings in selected ancient Greek prose authors or genres.
***Prerequisites: 01:490:305, 306, or permission of instructor.***

**01:490:392** ***Readings in Greek Poetry (3)***
Readings in the works of selected Greek poets or poetic genres.
***Prerequisites: 01:490:305, 306, or permission of instructor.***

**01:490:400** ***Demosthenes (3)***
Reading of one public and one private oration; study of Demosthenes as orator; as source for Athenian law, commerce, and private life; and as statesman.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:402** ***Plato and Aristotle (3)***
Reading of one Platonic dialogue followed by selected portions of an Aristotelian treatise. Attention to prose style and also to common problems and diverging solutions.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

Classics (SAS)

# Courses in Latin (580)

# Courses in Latin (580)

**01:580:101** ***Elementary Latin I (4)***
Beginning course in Latin, introducing the Latin language and its grammar and syntax.

**01:580:102** ***Elementary Latin II (4)***
Continued beginning instruction in Latin, introducing Latin language, grammar, and syntax.
***Prerequisite: 01:580:101 or permission of instructor.***

**01:580:203** ***Intermediate Latin Prose (3)***
Selections from prose authors of the late Republican and/or early empire, e.g., Caesar, Cicero, Livy; development of skill in reading continuous passages of Latin prose.
***Prerequisite: 01:580:102 or permission of instructor.***

**01:580:204** ***Intermediate Latin Poetry (3)***
Representative poems of Catullus, Horace, and Ovid, read and studied with a view to their style, imagery, and topicality. Introduction to Latin metrics.
***Prerequisite: 01:580:102 or permission of instructor.***

**01:580:302** ***Medieval Latin (3)***
Readings in major Latin writings and documents of the Middle Ages.
***Prerequisite: 01:580:203 or 204 or permission of instructor.***

**01:580:303** ***Cicero: Philosophical Writings (3)***
Selected philosophical dialogues and rhetorical treatises of Cicero.
***Prerequisites: 01:580:203, 204.***

**01:580:304** ***Cicero: Orations (3)***
Selected orations of Cicero, with emphasis on the development of Cicero's style and the significance of historical and biographical background.
***Prerequisites: 01:580:203, 204.***

**01:580:310** ***Prose and Poetry in the Age of Augustus (3)***
The cultural renaissance under Augustus (44 BC-AD 14), with emphasis on the reading, in Latin, of selections from the writings of Virgil, Horace, Livy, Ovid, and the elegiac poets.
***Prerequisite: 01:580:203 or 204 or permission of instructor. May be jointly taught (in part) with 01:190:310. Students wishing to earn language credit in Latin should enroll in 01:580:310. Credit not given for both this course and 01:190:310.***

**01:580:321** ***Roman Comedy (3)***
Study of the principal meters, the theater, and the staging of plays through the reading of plays of Plautus and Terence.
***Prerequisites: 01:580:203, 204.***

**01:580:323** ***Lucretius (3)***
Readings from Lucretius' *De Rerum Natura* with analysis of its place within the literary and philosophical traditions of Rome and Greece.
***Prerequisites: 01:580:203, 204.***

**01:580:324** ***Sallust (3)***
Readings from Sallust's *Jugurthine War*, *Histories*, and *Catiline*, with a study of selected problems from the historical periods relevant to those works.
***Prerequisites: 01:580:203, 204.***

**01:580:325** ***The History of Livy (3)***
Readings from Livy's *Ab Urbe Condita* with a study of selected problems in Roman Republican history.
***Prerequisites: 01:580:203, 204.***

**01:580:327** ***Latin Elegy (3)***
Survey of Latin poetry written in elegiac meter, with selections from Catullus, Tibullus, Sulpicia, Propertius, and/or Ovid.
***Prerequisites: 01:580:203, 204.***

**01:580:328** ***Roman Satire (3)***
Selected poems of Horace, Martial, and Juvenal and a study of their interrelationship.
***Prerequisites: 01:580:203, 204.***

**01:580:329** ***Tacitus (3)***
Reading of a minor work of Tacitus and/or selections from the *Annals of Tacitus* with an investigation of their value as sources for Imperial history in the first century AD.
***Prerequisites: 01:580:203, 204.***

**01:580:335** ***Latin Prose Composition (3)***
Review of syntax and prose style; composition in Latin and translation into Latin of continuous passages of prose.
***Prerequisites: 01:580:203, 204.***

**01:580:369,370** ***The Seminar in Latin (3,3)***
Extensive and rapid reading in Latin literature from the early Roman Republic to the empire.
***Primarily for juniors and seniors majoring in classical humanities; open to others with permission of instructor.***

**01:580:401** ***Advanced Study of the Poetry of Ovid (3)***
Readings and interpretation of selected works of Ovid. A study of the poet's contribution to Roman literature and his importance in the Western literary tradition.
***Prerequisites: 01:580:203, 204.***

**01:580:402** ***Advanced Study of Vergil's Aeneid (3)***
Readings of Vergil's *Aeneid* with an analysis of selected problems in its interpretation.
***Prerequisites: 01:580:203, 204.***

**01:580:403** ***Readings in Latin Literature I: Literature of the Republic (3)***
Prose and poetry of Rome from its beginnings in the third century BC to the end of the republic in the first century BC. Extensive selections from epic, drama, lyric, elegy, pastoral, and other poetry and from history, rhetoric, and oratory.
***Prerequisites: 01:580:203, 204.***

**01:580:404** ***Readings in Latin Literature II: Literature of the Empire (3)***
Prose and poetry of imperial Rome. Extensive selections from epic, history, satire, the novel, and other genres, with emphasis on writers of the Augustan and Neronian ages.
***Prerequisites: 01:580:203, 204.***

**01:580:407** ***Advanced Study of the Poetry of Horace (3)***
Intensive reading of Horace's poems with emphasis on the variety of style and content.
***Prerequisites: 01:580:203, 204.***

# Greek, Modern Greek Studies 489 (SAS)

## GREEK, MODERN GREEK STUDIES 489

School of Arts and Sciences

**Website:** Here

**Undergraduate Director:** Timothy Power, Department of Classics



# Learning Goals

# Learning Goals

Minors in modern Greek studies achieve an interdisciplinary understanding of the language, literature, history, society, and culture of Greek-speaking people from the Byzantine period through contemporary times. Minors will achieve basic proficiency in the (modern) Greek language. They will understand modern Greek culture in its many forms and expressions, in terms of its ancient Hellenic legacy, developments in Byzantine times, and the special identity of Greece and Cyprus as crossroads of western Europe, the Balkans, the Eastern Mediterranean, and the Middle East.



# Minor in Modern Greek

# Minor in Modern Greek

Students must complete six courses (18 credits). Three courses (9 credits) must be at the 300 level or above. The following courses are required for and count toward the minor: 01:489:201,202 or the equivalent.

An additional four courses, three at the 300 level or above, may be selected from the following two catalog pages: Courses in Greek and Courses in English.



# Courses in Greek

# Courses in Greek

**01:489:101,102** ***First-Year Modern Greek (4,4)***
Fundamentals of the language with exercises in speaking, reading, and writing.

**01:489:201,202** ***Second-Year Modern Greek (4,4)***
Development of language skills, emphasis on speaking, translation drills, and grammar.
***Prerequisite: 01:489:102 or permission of the discipline adviser.***

**01:489:301,302** ***Third-Year Modern Greek (3,3)***
Introduction to themes in the Hellenic tradition, particularly through readings in modern Greek literature. Development of facility and accuracy in oral expression and listening comprehension.
***Prerequisite: 01:489:202 or permission of instructor.***

**01:489:305,306** ***Introduction to Modern Greek Literature (3,3)***
Introduction to modern Greek literature from medieval times to the present. Selections from works of Kornaros to Ritsos.
***Prerequisite: 01:489:202 or permission of the discipline adviser.***

**01:489:493,494** ***Independent Study in Modern Greek (BA,BA)***
***Prerequisite: Permission of the discipline adviser.***

Greek, Modern Greek Studies 489 (SAS)

# Courses in English

# Courses in English

**01:489:205** ***History of the Byzantine Empire (3)***
Survey of political, military, religious, and socioeconomic development of the eastern Roman Empire, centered at Constantinople, from late third century to Ottoman conquest in 1453.
***Credit not given for both this course and 01:510:205 or 01:685:205.***

**01:489:207** ***Byzantine Civilization (3)***
History of Byzantine culture and civilization, including political ideology and statecraft, orthodox Christianity, transmitting classical traditions of science and literature, art and architecture, and laying foundations of modern Greek culture.
***Credit not given for both this course and 01:510:207 or 01:685:207.***

**01:489:217** ***From Byzantium to the Ottomans: 1204-1460 (3)***
Development of Byzantine society and culture from the Latin crisis (1204-1261) through the Ottoman conquest (1460), including the Byzantine impact on West European, Slavic, and Ottoman cultures.
***Credit not given for both this course and 01:510:217 and 01:685:217.***

**01:489:312** ***Greek Christianity (3)***
Eastern church tradition from the second through the eighth centuries; theological controversies and the development of liturgy, monasticism, and mysticism.
***Credit not given for both this course and 01:840:312.***

**01:489:314** ***The Evolution of Christian Orthodoxy 300-787 CE (3)***
History, theology, and social context of the formation of Christian orthodoxy from the First Council of Nicea to the Second Council of Nicea.
***Credit not given for both this course and 01:840:410.***

**01:489:315** ***Byzantine Art (3)***
Art and architecture of the eastern Roman empire, from the third through 15th centuries. Emphasis on sources of Byzantine style and iconography and on the historical context of Byzantine art.
***Prerequisites: 01:470:231 or 232; 01:082:105,106; or permission of instructor. Credit not given for both this course and 01:082:312.***

**01:489:340** ***Major Greek Writers in Translation (3)***
Reading and discussion of great works of modern Greek literature including short stories, poetry, and a novel. Course will include selected parallel films for additional insight and analysis.
***In translation. Credit not given for both this course and 01:195:241.***

**01:489:347** ***The Life and Works of Odysseus Elytis (3)***
Examination of the works of Odysseus Elytis; the writers and artists who influenced his work.
***Credit not given for both this course and 01:195:347.***

**01:489:350** ***Nikos Kazantzakis (3)***
Works of Nikos Kazantzakis (1885-1957) and the Eastern and Western ideas that influenced him: Homer, Henri Bergson, Nietzsche, Freud, and Buddhist philosophy.
***In translation. Credit not given for both this course and 01:195:383.***

**01:489:358** ***Odysseus, the Hero (3)***
Explores the Homeric figure Odysseus in literature from Homer and Vergil, through Dante and modern masterpieces by Nikos Kazantzakis, James Joyce, and Derek Walcott. Additional explorations in poetry as well as selected modern films.
***Credit not given for both this course and 01:195:358. Taught in English.***

**01:489:370** ***Greek Film: Love, Eros, and Death (3)***
Masterpieces of modern Greek film, 1914 to present, exploring the interplay of love, the erotic, and death.
***In English.***

**01:489:376** ***Contemporary Greek Music (3)***
Sociocultural dynamic of modern Greek music, from Byzantine chant to folk, pop-art, laiko fusion, and Greek hip-hop. How these genres shape modern Greek social routines, worldviews, and emotions.
***Modern Greek not required.***

**01:489:381** ***Cyprus: A Global History (3)***
Dynamics of empires, ethnic politics, nationalism, colonialism, and globalization as affecting Cyprus, 16th to 21st centuries, and culminating in the division of the island.
***Credit not given for both this course and 01:510:384 or 01:685:384.***

**01:489:382** ***History of Modern Greece (3)***
Greek experience under Ottoman rule; revolution and independence; development of national state and society from 1830s to present.
***Credit not given for both this course and 01:510:382 or 01:685:382.***

**01:489:385** ***Politics and Culture in Greece and the Balkans (3)***
Patterns of political, social, and cultural developments in forming and developing statecraft in Greece, and comparatively in other key Balkan countries (e.g., Serbia, Bulgaria, Romania, Turkey).

**01:489:386** ***Twentieth-Century Greek Poetry (3)***
Modern Greek poetry from 1900 to 2000.
***Credit not given for both this course and 01:195:386.***

**01:489:390** ***Special Topics: Modern Greek Studies (3)***
Variable content. Special studies emphasizing particular historical ideas and themes, prominent literary figures and forms, as well as important political and social events that have contributed to the shaping of modern Greek society. Designed by individual instructors.
***In Greek or in translation.***

**01:489:402** ***International Service Learning in Greece (3)***
Public service and international service learning projects in Thessaloniki, Greece, organized through the American College of Thessaloniki.
***Summer program.***

**01:489:403** ***International Service Learning in Greece (3)***
Supplementary study and reflection, complementing parallel engagement in public service and international service learning sites in Thessaloniki, Greece, conducted in modern Greek.
***Summer program.***

**01:489:493,494** ***Independent Study in Modern Greek (BA,BA)***
***Prerequisite: Permission of the discipline adviser.***

# Programs of Study (EJB-U)

## PROGRAMS OF STUDY

The Edward J. Bloustein School of Planning and Public Policy offers five major programs of study and nine minors:

- Planning and Public Policy major (762, 762D) -- Bachelor of arts (B.A.) degree
- Health Administration major (501, 501D) -- Bachelor of Science (B.S.) degree
- Public Health major (832, 832D) -- Bachelor of Science (B.S.) degree
- Public Policy major (833, 833D) -- Bachelor of Science (B.S.) degree
- Urban Planning and Design major (971, 971D) -- Bachelor of Science (B.S.) degree
- Minors in:
    - Planning and Public Policy
    - Health Administration

- Public Health
- Public Policy
- Urban Planning & Design
- Public Administration & Management
- Urban Studies
- Medical Ethics & Health Policy
- Disability Studies

All of the majors are available to students who directly transfer into the Bloustein School, as well as to students in the School of Arts and Sciences. Students in the School of Environmental and Biological Sciences are eligible to pursue the public health major.

- Bloustein School direct-admit students are permitted to double major or major/minor across programs except as noted below.
- Students in SAS are allowed to declare a Bloustein School major/minor combination except as noted below.
- Students in SEBS are allowed to declare the Public Health major with a Bloustein School minor.
- Students in a Rutgers-New Brunswick professional school need permission from their dean's office to declare more than one Bloustein School program.
- Students in the Ernest Mario School of Pharmacy may not declare a Bloustein School major.

**Restrictions of major and minor combinations:**

- Planning and Public Policy majors may NOT declare the Urban Studies (975), Public Policy (833), and Urban Planning and Design (971) minors. Also, PPP majors may NOT double major in Public Policy or Urban Planning and Design.
- Public Policy majors may NOT declare the Planning and Public Policy major or minor programs.
- Urban Planning and Design majors may NOT declare the Planning and Public Policy major or minor or the Urban Studies minor.

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Exceptional, well-prepared students who are admitted to the Bloustein School may be invited by the faculty to pursue dual-degree programs in the following areas:

- B.A. or B.S./M.P.H. for public health
- B.A. or B.S./ M.P.P. for public policy
- B.A. or B.S./M.C.R.P. for city and regional planning

- Health Administration Major (501, 501D) and Minor
- Planning and Public Policy Major (762, 762D) and Minor
- Public Health Major (832, 832D) and Minor
- Public Policy Major (833, 833D) and Minor
- Urban Planning and Design Major (971, 971D) and Minor
- Disability Studies (304) Minor
- Medical Ethics and Health Policy Minor
- Public Administration and Management Minor
- Urban Studies Minor

# Health and Society 502 (SAS)

## HEALTH AND SOCIETY 502

School of Arts and Sciences

**Website:** Here

**Program Director:** Jeffrey Dowd

**Program Faculty:**

Catherine Bliss, B.A., California (Santa Cruz); M.A., San Francisco State; Ph.D., New School

Sharon Bzostek, B.A., Rice; M.A., Ph.D., Princeton

Joanna Kempner, B.A., Pennsylvania State; M.A., Ph.D., Pennsylvania

Catherine Lee, B.A., Ph.D., California (Los Angeles)

Lei Lei, B.A., Zhehiang (China); M.Sc., Tilburg (Netherlands); M.A., Central Florida; M.A., Ph.D., SUNY (Albany)

Norah MacKendrick, B.Sc, M.Sc., Alberta; Ph.D., Toronto

Dawne Mouzon, B.A., Rutgers; M.P.H. University of Medicine and Dentistry (New Jersey); M.A., Ph.D., Rutgers

Julie A. Phillips, Ph.D., Pennsylvania

Kristen W. Springer, B.S., California (Santa Cruz); M.P.H., Emory; M.A., Yale; Ph.D., Wisconsin (Madison)



# Learning Goals

# Learning Goals

1. Students will develop an understanding of physical and mental health, health behaviors and practices, and health care institutions in national and global contexts.

2. Students will learn the social and cultural foundations of how health and health care are conceptualized, and differences in the delivery of health care across disparate social and cultural settings.

3. Students will develop the skills necessary to read and evaluate social science research in an intelligent and critical manner.

4. Students will develop some understanding of the policy implications when health issues and social concerns intersect.

# Minor Program

# Minor Program

The interdisciplinary minor in health and society consists of at least six courses, which must include 01:920:101 Introduction to Sociology; 01:920:210 Sociology of Medicine and Health Care; and 01:920:307 Mental Illness or 01:920:335 Health and Inequality. In addition, at least one elective must be taken in the Department of Sociology, and at least two electives from other School of Arts and Sciences (SAS) departments affiliated with the minor (see list below). No more than two courses are allowed to overlap with the major, and no more than two electives may be taken from within the same department (except sociology). All courses must be passed with a grade of C or better to earn credit toward the minor.

**Required Sociology Courses**

01:920:101 Introduction to Sociology (3)

01:920:210 Sociology of Medicine and Health Care (3)

01:920:307 Mental Illness (3)

or 01:920:335 Health and Inequality (3)

**Elective Sociology Courses**

At least one course must be selected from the following:

01:920:115 The Color of Health: How Does Inequality Get Under the Skin (4)

01:920:227 Population and Society (3)

01:920:232 Sociology of Food and Eating (3)

01:920:303 Social Gerontology (3)

01:920:332 Social Inequalities (3)

01:920:335 Health and Inequality (3)

01:920:359 Environmental Sociology (3)

01:920:361 Sociology of Drug Use (3)*

01:920:410 Sociology of Alcohol Problems (3)

01:920:433 Race, Science, and Medicine (3)

01:920:434 Social Science and Public Policy (3)

01:920:438 Sociology of Age (3)

01:920:440 Sexuality and Society (3)

01:920:462 Sociology of Selected Institutions (3)

**Elective Courses from Other SAS Departments**

At least two electives must be selected from the following course offerings. No more than two courses can be taken from each department, to ensure breadth of study.

*Africana Studies*

01:014:347 Health Issues in the African-American Community (3)

*Anthropology*

01:070:307 Medical Anthropology (3)

*Biology*

01:119:150 Biology, Society, and Biomedical Issues (3)

01:119:154 Genetics, Law, and Social Policy (3)

*Economics*

01:220:316 Health Economics (3)

01:220:348 Economics of Social Welfare Programs (3)***

*Genetics*

01:447:354 Social, Legal, and Ethical Implications of the New Genetics (3)***

*History*

01:506:226 Contemporary Challenges in International Health (3)

01:506:322 Black Death to Obesity Epidemic: History of Public Health in the West (3)

01:508:328 History of Health and Healing in Africa (3)

01:512:121 Health and Environment in America (3)

01:512:225 Sexuality in America (3)

01:512:230 History of Medicine in Film (3)

01:512:321 Health Care and Society in America (3)

01:512:322 Drugs: A Social History (3)*

*Kinesiology and Health*

01:377:225 Contemporary Health Issues (3)

*Philosophy*

01:730:105 or 106 Current Moral and Social Issues (3 or 4)**

01:730:107 or 108 Introduction to Ethics (3 or 4)**

01:730:249 Bioethics (3)**

*Political Science*

01:790:320 Politics and Social Policy: Lessons from Europe (3)

*Psychology*

01:830:101 General Psychology (3)

01:830:360 Drugs and Human Behavior (3)*

01:830:333 Adolescent Development (3)

01:830:335 Adult Development and Aging (3)

01:830:340 Psychopathology Psychology (3)

01:830:377 Health Psychology (3)

*Religion*

01:840:112 Death and Afterlife (3)

01:840:221 Ethical Issues, Religious Responses (3)**

*Women's, Gender, and Sexuality Studies*

01:988:240 Gender and Science (3)

01:988:487 Language of Women's Health and Health Policy (3)

*Notes:*

*Students may take no more than two of the following three courses:

01:920:361 Sociology of Drug Use (3)

01:512:322 Drugs: A Social History (3)

01:830:360 Drugs and Human Behavior (3)

**Students may take no more than two of the following four courses:

01:730:105 or 106 Current Moral and Social Issues (3 or 4)

01:730:107 or 108 Introduction to Ethics (3 or 4)

01:730:249 Bioethics (3)

01:840:221 Ethical Issues, Religious Responses (3)

***Denotes one or more prerequisites

# African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

## AFRICAN, MIDDLE EASTERN, AND SOUTH ASIAN LANGUAGES AND LITERATURES 013

Department of African, Middle Eastern, and South Asian Languages and Literatures, School of Arts and Sciences

**Website:** Here

**Chair:** Anjali Nerlekar

**Undergraduate Director:** Benjamin Koerber

**Professors:**

Ousseina Alidou, B.A., Niamey (Niger); M.A., Ph.D., Indiana

Charles G. Häberl, B.A., Brown; M.A., Ph.D., Harvard

Alamin Mazrui, B.S., M.Ed., Rutgers; Ph.D., Stanford

Samah Selim, B.A., Barnard; M.A., Ph.D., Columbia

**Associate Professors:**

E. Efe, B.A., M.A., Istanbul; M.A., Ph.D., Columbia

Benjamin Koerber, B.A., Indiana; M.A., Ph.D., Texas

Anjali Nerlekar, B.A., M.A., M.Phil., Pune (India); Ph.D., Kansas

Meheli Sen, B.A., M.A., Jadavpur (India); Ph.D., Emory

**Assistant Professors:**

Yasmine Khayyat, B.A., A.U. (Beirut); M.A., London; M.A., M.Phil., Ph.D., Columbia

Preetha Mani, B.A., Tufts; M.A., Ph.D., California (Berkeley)

**Teaching Professor:**

Maryam Borjian, B.A., M.A., Tehran; M.A., Hunter; Ed.D., Columbia

**Associate Teaching Professor:**

Hanan Kashou, B.A., M.A., Ph.D., Ohio State

**Assistant Teaching Professor:**

Jamal Ali, B.A., California (Riverside); Ph.D., California (Los Angeles)

Shaheen Parveen, B.A., M.A., M.Ed., Ph.D., Lucknow (India)

**Instructors:**

Anuja Kubra, B.A, Delhi University (India)

Dilek Öztoprak , B.A., Marmara University (Instanbul); M.A., Fatih University (Instanbul)

Feri Paydar B.A., M.A., Shahid Beheshti University (Iran); Ph.D., Tarbiat Modarres University (Iran)

Jehan Mohamed, M.A. Rutgers University

The Department of African, Middle Eastern, and South Asian Languages and Literatures offers a major program (013) with two options: regional concentration and global humanities. The department currently offers six minor programs:

- African Languages (013A)
- Arabic (074)
- Hindi (505)
- Languages and Literatures (013)
- Persian (723)
- Turkish (973)

For more information on these minor programs, please read the descriptions below.



# Learning Objectives for the Major

# Learning Objectives for the Major

**Regional Option (013J)**

As an African, Middle Eastern, and South Asian languages and literatures (AMESALL) major with the regional major option, you will demonstrate:

1. listening, speaking, writing, and reading proficiency in one of the languages taught through AMESALL at a level of advanced-low or higher according to the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL);

2. familiarity with a cross-section of the classical literatures of all three regions; and
3. a broad understanding of the literatures of one of the three regions.

**Global Humanities Option (013G)**

As an AMESALL major with the global humanities option, you will demonstrate:

1. appreciation of major global issues as articulated in Africa, the Middle East, and South Asia and from the perspective of these three regions;
2. understanding of a variety of epistemologies rooted in the cultures of Africa, the Middle East, and South Asia; and
3. proficiency in critical, theoretical, and research-oriented skills in global and comparative cultural studies.



# Major Requirements

# Major Requirements

**Regional Option**

The regional option in the African, Middle Eastern, and South Asian languages and literatures (AMESALL) major requires the successful completion of at least 33 credits, with the first two years of language study/proficiency as a prerequisite.

This option is designed to allow students to explore in depth one of the literatures offered by AMESALL, within a regional context. All majors must take the following two courses to complete this major option:

- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3) and
- 01:013:401 Senior Seminar in Literature and Society (3)

Students enrolling in this option must complete at least 6 credits of language courses at the advanced 300 level or higher.

Students must also take one of the following courses, as appropriate to their region of study:

- 01:013:211 Introduction to the Literatures of Africa (3) or
- 01:013:221 Introduction to the Literatures of the Middle East (3) or
- 01:013:231 Introduction to the Literatures of South Asia (3)

Finally, students must complete 18 credits of additional literature, sociolinguistics, or linguistics courses on the region of their concentration. Of these, 9 credits must be upper-level courses at the 300 level or above. These courses must either be taught in AMESALL, cross-listed with AMESALL, or approved by the department chair.

**Global Humanities Option**

The global humanities option in African, Middle Eastern, and South Asian languages and literatures requires the successful completion of at least 36 credits.

This is an interdisciplinary program of study that provides opportunities to view the world from multiple perspectives, and a framework for understanding and negotiating global realities and challenges in the 21st century.

All majors must take the following three courses to complete this major option:

- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)
- 01:013:205 Cultural Forces in International Politics (3)
- 01:013:401 Senior Seminar in Literature and Society (3)

Students enrolling in this option must also take two courses from each of the following categories:

*Transregional Sociolinguistics Courses*

- 01:013:115 History of the Alphabet (1.5)
- 01:013:203 Language and Society in Africa, the Middle East, and South Asia (3)
- 01:013:204 Introduction to Discourse Analysis (3)
- 01:013:225 Global Arabic
- 01:013:285 Language and Globalization (3)
- 01:013:305 Languages in Peril (3)
- 01:013:409 Introduction to Semitic Languages (3)

*Transregional Culture Courses*

- 01:013:202 Cinemas of Africa and Asia (3)
- 01:013:206 Banned Books (4)
- 01:013:210 World Literature and Social Change (3)
- 01:013:304 Introduction to Translation Studies (3)
- 01:013:307 Introduction to Postcolonial Literature and Theory (3)
- 01:013:365 Bollywood (3)
- 01:013:324 Ottoman Africa (3)
- 01:013:412 Literature and Religion
- 01:013:445 Storytelling in the Muslim World (3)

Majors must also take at least three courses (a total of 9 credits) in any combination of their choice, from the following departmental courses:

- African literature/cinema courses
- Middle Eastern literature/cinema courses
- South Asian literature/cinema courses

In addition, majors will take at least 6 credits, in any combination of their choice, from the following:

- AMESALL's literature/sociolinguistics/cinema/culture courses
- AMESALL's language courses at the intermediate level or above
- Study Abroad program courses
- Approved courses from other units with significant AMESALL content

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Learning Objectives and Requirements for African Languages Minor (013A)

# Learning Objectives and Requirements for African Languages Minor (013A)

**Learning Objectives**

The objective of the African languages minor is to develop listening, speaking, writing, and reading skills in an African language to the intermediate mid level, as based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The minor program in African languages consists of 20-22 credits, which must be completed with a grade of C or better in each course.

Minors must take four courses in one African language (Akan/Twi, Arabic, Swahili, or Yoruba) (14-16 credits). They must also take EITHER:

- Two 300-level courses in the language (6 credits), OR
- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3) and *either* 01:013:312 African Folklore and Myth (3) *or* 01:013:211 Introduction to the Literatures of Africa (3)

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Learning Objectives and Requirements for Arabic Minor (074)

# Learning Objectives and Requirements for Arabic Minor (074)

**Learning Objectives**

The objective of the Arabic minor is to develop listening, speaking, writing, and reading skills in Modern Standard Arabic to the advanced level, as based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The minor program in Arabic consists of 20 credits, which must be completed with a grade of C or better in each course.

The minor in Arabic consists of four courses in Arabic language beyond the elementary level plus two additional courses:

- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)
- 01:013:221 Introduction to the Literatures of the Middle East (3)

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Learning Objectives and Requirements for Hindi Minor (505)

# Learning Objectives and Requirements for Hindi Minor (505)

**Learning Objectives**

The objective of the Hindi minor is to develop listening, speaking, writing, and reading skills in Hindi to the advanced level, as based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The minor program in Hindi consists of 20 credits, which must be completed with a grade of C or better in each course.

The minor in Hindi consists of four courses in Hindi language beyond the elementary level plus two additional courses:

- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)
- 01:013:221 Introduction to the Literatures of the Middle East (3)

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Learning Objectives and Requirements for Languages and Literatures Minor (013)

# Learning Objectives and Requirements for Languages and Literatures Minor (013)

**Learning Objectives**

Students in the languages and literatures minor will demonstrate familiarity with a cross-section of the classical literatures of Africa, the Middle East, and South Asia, and a broad understanding of the modern literatures of one of the three regions. They will also develop listening, speaking, writing, and reading skills in one of the languages of their chosen region of study (Africa/the Middle East/South Asia) at a proficiency level of intermediate-low or higher, based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The languages and literatures minor consists of 18-20 credits, which must be completed with a grade of C or better in each course.

- Two courses beyond the elementary 100 level in one of the languages offered by the department.
- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)
- One of the following three courses, as appropriate to the chosen language of study:
  01:013:211 Introduction to the Literatures of Africa (3) or
  01:013:221 Introduction to the Literatures of the Middle East (3) or
  01:013:231 Introduction to the Literatures of South Asia (3)
- Six elective credits of additional literature, sociolinguistics, or linguistics courses at the 300 level or above, offered through AMESALL, by cross-listing through other departments, or with the approval of the department chair.



# Learning Objectives and Requirements for Persian Minor (013P or 723)

# Learning Objectives and Requirements for Persian Minor (013P or 723)

**Learning Objectives**

The objective of the Persian minor is to develop listening, speaking, writing, and reading skills in Persian language to the intermediate mid level, as based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The minor in Persian consists of 20-22 credits hours, which must be completed with a minimum grade of C.

Minors must take four Persian language courses (14-16 credits). They must also take EITHER:

- Two 300-level Persian language courses (6 credits), OR
- 01:013:201: Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3), and *either* 01:013:203 Language and Society (3), *or* 01:013:221 Introduction to the Literatures of the Middle East (3)

# Learning Objectives and Requirements for Turkish Minor (013T or 973)

# Learning Objectives and Requirements for Turkish Minor (013T or 973)

**Learning Objectives**

The objective of the Turkish minor is to develop listening, speaking, writing, and reading skills in Turkish language to the intermediate mid level, as based on the guidelines of the American Council for the Teaching of Foreign Languages (ACTFL).

**Requirements**

The minor in Turkish consists of 20-22 credits, which must be completed with a minimum grade of C.

Minors must take four Turkish language courses (14-16 credits). They must also take EITHER:

- Two 300 level Turkish language (6 credits), OR
- 01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3), and *either* 01:013:203 Language and Society (3), *or* 01:013:221 Introduction to the Literatures of the Middle East (3)



# Certificate in Translation

# Certificate in Translation

The translation certificate in African, Middle Eastern, and South Asian languages and literatures (AMESALL) consists of 18 credits, completed with a grade of B or better in each course. The requirements for the translation certificate program are:

1. Two courses beyond the intermediate level in any of the languages offered through AMESALL or the equivalent level as determined by placement testing
2. 01:013:203 Language and Society in Africa, the Middle East, and South Asia (3)
3. 01:013:304 Introduction to Translation Studies (3)
4. 01:013:403 Translation Practicum I (3), or equivalent
    a. 403a: Arabic
    b. 403b: Hindi
    c. 403c: Swahili
    d. 403d: Persian
    e. 321: Independent Language Practicum

5. 01:013:404 Translation Practicum II (3), or equivalent
    a. 404a: Arabic
    b. 404b: Hindi
    c. 404c: Swahili
    d. 404d: Persian
    e. 321: Independent Language Practicum

Credits earned in any of the above courses can also be used to fulfill the requirements of the minor or major in African, Middle Eastern, and South Asian languages and literatures. 01:013:203 Language in Society in Africa, the Middle East, and South Asia (3) is regularly offered in the fall semester, and 01:013:304 Introduction to Translation Studies (3) is regularly offered in the spring semester. The language practicum courses are offered according to student interest. If you are interested in pursuing the translation certificate, but a practicum course if not being offered in the language of your choice, please contact one of our full-time faculty members about taking 01:013:321 Independent Study: Language Practicum (3) to fulfill the certificate requirements.

In order to enroll in the translation certificate program, please contact the AMESALL department administrator, Michele Frishberg (mf532@amesall.rutgers.edu), with your name, RUID, and anticipated year of graduation (class). The translation certificate program is also available to nonmatriculating students (i.e., those not enrolled in a degree program).

African, Middle Eastern, and South Asian Languages and Literatures 013 (SAS)

# Courses

# Courses

**01:013:110** ***Introduction to Aramaic (3)***
Introduces students to study of Aramaic, including Aramaic portions of the Bible, by developing reading comprehension and vocabulary.
***Credit not given for both this course and 01:563:145 or 01:685:145.***

**01:013:111** ***The Bible in Aramaic (3)***
Introduction to Aramaic through biblical literature, including Aramaic Bible passages and vernacular translations into various Aramaic dialects, with a focus on Syriac version.
***In English. Credit not given for this course an 01:53:146 or 01:840:123.***

**01:013:120** ***Literary Egypt (3)***
Introduction to the works of Egypt's Nobel Laureate Naguib Mahfouz (1911-2006) dealing with conflict between tradition and modernity, faith and freedom, ambition and social mobility, and existential crisis of individuals in a corrupt and suffocating society.
***Credit not be given for this course and 01:074:120.***

**01:013:130** ***Comics in the Middle East (3)***
Introduction to the study of comics and graphic narratives in the Middle East. Genres and media include the comic strip, graphic novel, satirical cartoon, graffiti, and internet memes. We will also look at parallels between modern sequential art and premodern graphic narratives, such as illuminated manuscripts, and examine connections with

American and Japanese comics. No previous knowledge of Middle Eastern literatures or languages required. All readings are in English.
*Credit not given for both this course and 01:685:130.*

**01:013:140-141** *Elementary Arabic I,II (4,4)*
Introductory course in Modern Standard Arabic (MSA) for beginner students. Course emphasizes development of oral and written proficiency.
*Prerequisite for 141: 01:013:140, 01:074:140, or placement test. Credit not given for both this course and 01:013:145, 01:013:148-149, 01:074:140-141, or 01:074:148-149.*

**01:013:143-144** *Arabic Lab I,II (1,1)*
Instructor-guided laboratory practicum for improving oral proficiency practice in aural/oral skills and communication styles. Evaluation of pronunciation and fluency.
*Corequisite: 01:013:140-141. Not open to students with any level of prior knowledge of spoken and/or written Arabic.*

**01:013:145** *Accelerated Arabic (4)*
Introductory Arabic course designed for heritage learners, meaning those who have some proficiency in written or spoken Arabic. Covers all material in 01:013:140-141 Elementary Arabic I and II (4,4).
*Credit not given for both this course and 01:013:140, 01:013:141, 01:013:148, 01:013:149, 01:074:140, 01:074:141, 01:074:145, 01:074:148, or 01:074:149.*

**01:013:148-149** *Elementary Arabic for Arabic Speakers I,II (4,4)*
Introduction to Modern Standard Arabic (MSA) for students who have prior knowledge of Arabic script and spoken dialects, but not enough competencies to speak, read, or write MSA.
*Credit not given for both this course and 01:013:140-141, 01:013:145, or 01:074:140-141.*

**01:013:152-153** *Elementary Modern Hebrew I,II (4,4)*
Speaking, reading, and writing; oral-aural and written exercises.
*Prerequisite: Placement test to determine level of language competence. Not open for credit to students who have had two or more years of secondary school Hebrew. Credit not given for both these courses and 01:563:101-102 or 01:685:101-102.*

**01:013:154-155** *Biblical Hebrew I,II (3,3)*
Introduction to Biblical Hebrew, with a focus on basic grammar and lexicon, leading to reading ability and comprehension of simple narrative prose texts.
*Credit not given for both this course and 01:563:141-142.*

**01:013:156** *Hebrew Review and Continuation (4)*
Development of primary language skills.
*Prerequisites: Previous exposure to Hebrew and placement into Hebrew 121. Credit not given for both this course and 01:563:121. Prerequisite: 01:013:152.*

**01:013:160-161** *Elementary Hindi I,II (4,4)*
Introduction to sound, grammar, and writing system of Hindi; practice and exercises in speaking, reading, and writing. Continuation of Elementary Hindi I; practice and exercises in speaking, reading, and writing.
*Prerequisite for 161: 01:013:160. 01:505:160, or placement. Credit not given for both this course and 01:505:160-161.*

**01:013:162-163** *Elementary Urdu I,II (4,4)*
Introduction to Urdu, focusing on development of elementary-level proficiency in all four language skills.

**01:013:176** ***Elementary Persian I (4)***
Introduction to Persian, focusing on development of elementary-level proficiency in all four language skills.
***Credit not given for both this course and 01:723:176.***

**01:013:177** ***Elementary Persian II (4)***
Builds on skills acquired in Elementary Persian I. Focus on Persian orthography, spelling, grammar, vocabulary, and the four language skills. Emphasis on actively using the language for interpersonal, interpretive, and presentational modes of communication.
***Prerequisite: 01:013:176 or 01:723:176 or placement exam. Credit not given for this course and 01:723:177.***

**01:013:186-187** ***Elementary Swahili I,II (4,4)***
Introduction to Swahili, focusing on development of elementary-level proficiency in all four language skills.

**01:013:188** ***Introduction to Syriac (3)***
Introduction to reading and writing in Classical Syriac (Aramaic), with focus on understanding basic Syrian grammar and writing simple short texts in Syriac.

**01:013:190-191** ***Elementary Turkish I,II (4,4)***
Introduction to Turkish, focusing on development of elementary-level proficiency in all four language skills.
***Credit not given for both this course and 01:973:190-191.***

**01:013:192-193** ***Elementary Twi I,II (4,4)***
Introduction to Twi, focusing on development of elementary-level proficiency in all four language skills.
***Credit not given for both this course and 01:974:192-193.***

**01:013:201** ***Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)***
Survey of classical literary traditions of Africa, the Middle East, and South Asia in comparative context.
***Credit not given for both this course and 01:685:204.***

**01:013:202** ***Cinemas of Africa and Asia (3)***
Survey of the cinemas of Africa, the Middle East, and South Asia.

**01:013:203** ***Language and Society in Africa, the Middle East, and South Asia (3)***
This course is about language in society. It introduces language within its social context with special reference to African, Middle Eastern, and South Asian speech communities. It examines the interaction and inter-sectionality of language and variables such as power, class, ethnicity, gender, and education. It also looks at the range of articulations of politico-linguistic problems and challenges, including language conflicts, linguistic inequalities, and minority language rights.

**01:013:204** ***Introduction to Discourse Analysis (3)***
Introduction to theories, approaches, and methodologies for the study of socially situated language use. Multidisciplinary examination of written and spoken languages/texts to understand the linguistic qualities of language use and the impact of discourse on people's beliefs, attitudes, assumptions, actions, interactions, and social behaviors.

**01:013:205** ***Cultural Forces in International Politics (3)***
Exploration of cultural forces in world politics, with a focus on language and literature as important factors in the shaping of political relations across cultures and nations.

**01:013:206** *Banned Books (4)*
Global history of censorship with a focus on the political and cultural contexts of countries like the USA, Niger, Egypt, and India. How ideas in great books have been suppressed through debates about sedition, blasphemy, obscenity, and sexuality and strategies that people used to undermine that suppression, such as book smuggling, underground markets, exile, and translation.
*Credit not given for this course and 01:195:206.*

**01:013:208** *Jewish-Muslim Relations: History and Culture (3)*
Surveys the cultural history of Jewish-Muslim relations from the seventh century up to our present. Analyzes this important and unique aspect of Jewish and Muslim pasts and the place of the Jews in the cultural history of Islam. Course taught in English.
*Credit not given for both this course and 01:508:208 or 01:563:208.*

**01:013:210** *World Literature and Social Change (3)*
Critical investigation of diverse fiction from a global perspective with a particular ficus on social change in Africa, the Middle East, and South Asia.

**01:013:211** *Introduction to the Literatures of Africa (3)*
Literatures of Africa from their origins to the present.

**01:013:217** *African Immigrant Literature (3)*
A historical survey of the literary works of several writers from various parts of Africa living in Europe and the USA.
*Taught in English.*

**01:013:220** *Introduction to the Qur'an (3)*
Academic study of the Qur'an including the origin of the Qur'an, its role as a cultural and historical phenomenon; various controversies and disputes that have revolved around the Qur'an; different schools of thought regarding interpretation of the Qur'an; and development interpretative schools over time as the needs and understandings of any given society have developed. Taught in English. No prior knowledge of the Arabic or of the Qur'an is required.
*Credit not given for both this course and 01:840:229.*

**01:013:221** *Introduction to the Literatures of the Middle East (3)*
Literatures of the Middle East from their origins to the present.
*Credit not given for both this course and 01:195:221 or 01:685:221.*

**01:013:225** *Global Arabic (3)*
Traces the historical development of Arabic as a global language, the various meaning Arabic has come to acquire in various parts of the world, and the functions it has come to serve in different periods and different global spaces. Arabic's iterations with other languages and their sociolinguistic implications.
*Taught in English. Credit not given for this course and 01:685:225.*

**01:013:226** *Rhythms of Resistance: Global Hip Hop (3)*
Explores how hip hop is used across different cultural, linguistic, and geographical localities as an artistic technology for framing issues of racial, gender, sexual, political, economic, health, and philosophical concern.

**01:013:229** ***War and Literature in the Arab World (3)***
Examines war and literature through a multifaceted approach, exposing diverse experiences and perspectives that shape creative process of writing during times of high conflict and crisis. No previous knowledge of Middle Eastern languages or literatures assumed.

**01:013:231** ***Introduction to the Literatures of South Asia (3)***
Literatures of South Asia from their origins to the present.
***Credit not given for both this course and 01:195:243. All works studied in translation.***

**01:013:232** ***Women Writers of South Asia (3)***
Survey of recent writings by women from a variety of cultural, linguistic, and regional areas of South Asia.
***Credit not given for both this course and 01:195:232 or 01:988:232.***

**01:013:240-241** ***Intermediate Arabic I,II (4,4)***
Continued development of oral and written proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisites: 01:013:141, 01:013:145, 01:074:141, 01:074:145, or placement. Credit not given for both this course and 01:074:240-241.***

**01:013:243** ***Classical Arabic (3)***
Introduction to classical and Qur'anic Arabic.
***Prerequisites: 01:013:141 or 01:074:141 or equivalent.***

**01:013:244** ***Egyptian Arabic I (3)***
Introduction to Egyptian Arabic or masri, most widely spoken of Arabic vernaculars, with focus in speaking, listening, writing, and reading, with an eye to future study in Egypt.
***Credit not given for both this course and 01:074:244.***

**01:013:245** ***Arabic Graphic Narratives (3)***
Introduction to Arabic graphic narratives (comics, graphic novels, newspaper cartoons, graffiti, and internet memes) in global context in translation. No previous knowledge of Middle Eastern languages or literatures assumed.

**01:013:252-253** ***Intermediate Modern Hebrew I,II (4,4)***
Development of language skills; selected readings.
***Prerequisite: 01:013:152, 01:685:102, 01:563:102, or placement. Credit not given for both these courses and 01:563:131-132 or 01:685:131-132.***

**01:013:260-261** ***Intermediate Hindi I,II (4,4)***
Continued development of oral and written proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisite: 01:505:161 or 01:013:161 or placement. Credit not given for both this course and 01:505:260-261.***

**01:013:266** ***Ancient Egypt (1.5)***
Introduction into ancient Egypt. Topics include a historical overview, religion, art, interconnections between ancient Egypt and ancient Israel, and Hieroglyphic Egyptian language and literature.
***Credit not given for both this course and 01:563:266.***

**01:013:276-277** ***Intermediate Persian I,II (4,4)***
Continued development of oral and written proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisite: 01:013:177 or 01:723:177 or placement. Credit not given for both this course and 01:723:276-277.***

**01:013:280-281** ***Intermediate Sanskrit I,II (4,4)***
Reading of intermediate-level Sanskrit technical literature: grammar, logic, and textual exegesis.
***Prerequisite: 01:013:181 or permission of instructor.***

**01:013:285** ***Language and Globalization (3)***
Linguistic and sociolinguistic dimensions of globalization and current debates surrounding language and globalization.

**01:013:286-287** ***Intermediate Swahili I,II (4,4)***
Continued development of oral and written proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisite: 01:013:187.***

**01:013:290-291** ***Intermediate Turkish I,II (4,4)***
Continued development of oral and written proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisite: 01:013:191 or 01:973:191 or placement. Credit not given for both this course and 01:973:290-291.***

**01:013:292-293** ***Intermediate Twi I,II (4,4)***
Continued development of oral and written proficiency. Elementary literacy material. Detailed exploration underlying linguistic structures of the language.
***Prerequisite: 01:013:193 or placement.***

**01:013:294-295** ***Intermediate Yoruba I,II (4,4)***
Continued development of written and oral proficiency. Elementary literary material. Detailed exploration of the underlying linguistic structures of the language.
***Prerequisite: 01:013:134 or 01:013:195.***

**01:013:301** ***Topics in African, Middle Eastern, and South Asian Languages and Literatures (3)***
Variable content. Studies in particular ideas, themes, forms, and historic units in literature, linguistics, or sociolinguistics in one or more regions covered by AMESALL.

**01:013:302** ***Topics in African, Middle Eastern, and South Asian Languages and Literatures (1.5)***
Variable content. Studies in particular ideas, themes, forms, and historic units in literature, linguistics, or sociolinguistics in one or more regions covered by AMESALL.

**01:013:304** ***Introduction to Translation Studies (3)***
Introduction to the main themes and issues in contemporary translation studies.

**01:013:305** ***Languages in Peril: African, Middle Eastern, and South Asian (3)***
Introduction to local languages, their scientific and cultural value, and the threat posed by their extinction, with a focus upon the endangered languages of Africa and Asia.

**01:013:307** ***Introduction to Postcolonial Literatures and Theories (3)***
Study of novels, poetry, essays, and films from regions of the world deemed postcolonial, which may include Africa, Latin America, South and Southeast Asia, and the Caribbean, among others. Discussion of major issues in postcolonial theory and criticism.
***Credit not given for both this course and 01:195:307.***

**01:013:308** ***Minorities in the Middle East (3)***
Examination of various ethno-linguistic and religious minority groups, their origins, their oral and written literatures, their recent history (from 1798 onwards), their current status, and their future prospects, and how these factors influence their experiences of and perspectives on the world.
***Credit not given for both this course and either 01:685:306 or 01:840:306.***

**01:013:311** ***Women Writers of Africa (3)***
Survey of recent writings by women from a variety of cultural, linguistic, and regional areas of Africa.
***Credit not given for both this course and 01:195:363.***

**01:013:312** ***African Folklore and Myth (3)***
Survey of the folklore of Africa and the African diaspora.

**01:013:314** ***Islam and African Literature (3)***
Impact of Islam on African literature, and Islam as a theme of literary expression.
***Credit not given for both this course and 01:840:377.***

**01:013:315** ***Political Thought in African Literatures (3)***
Literatures of Africa as an instrument of political thought and political activism.

**01:013:316** ***African Literature of the South Asian Diaspora (3)***
Imaginative works of writers of the South Asian diaspora in East Africa and Southern Africa.

**01:013:320** ***The Ottoman Middle East: Politics, Culture, Literature (3)***
A study of the sociocultural atmosphere of the Middle East in the late 19th-early 20th century under Ottoman rule.

**01:013:322** ***Middle Eastern Folklore and Myth (3)***
A survey of the folklore of the Middle East, with a focus upon Jewish, Christian, Mandaean, and Muslim folktales from Iraq and the Levant.
***Credit not given for both this course and 01:685:323.***

**01:013:324** ***Ottoman Africa (3)***
Cultural legacy of Ottoman-Turkish rule in Africa during 19th century in context of radical political and cultural shifts, through historical narratives, novels, short stories, essays, articles, and poetry.

**01:013:325** ***Women Writers of the Middle East (3)***
Survey of recent writings by women from a variety of cultural, linguistic, and regional areas of the Middle East.

**01:013:326** ***Orhan Pamuk (3)***
Introduction to Turkish Nobel Prize laureate Orhan Pamuk through novels, essays and articles, interviews and autobiographical narratives, offering practical instruction in literary and cultural criticism.

**01:013:331** *Modern Literatures of South Asia (3)*
Literary works from modern South Asia.
*Credit not given for both this course and 01:195:249. All works studied in translation.*

**01:013:334** *The Modern Indian Woman (3)*
Course focuses on how representations of women have shaped ideas of modern Indian citizenship and belonging in colonial and postcolonial periods.

**01:013:335** *Caribbean Pluralities and Indo-Caribbean Literature (3)*
A study of some of the major canonical works of the Anglophone Caribbean and Indo-Caribbean writers.
*Credit not given for both this course and 01:195:335 or 01:195:338.*

**01:013:337** *Film and Literature in South Asia (3)*
A critical study of a wide range of South Asian films and the literary works they are based on/inspired by.

**01:013:340-341** *Advanced Arabic I,II (3,3)*
Reinforcement of oral and written proficiency developed within a cultural context. Comprehensive understanding of linguistic structures. Readings in literature.
*Prerequisite: 01:013:241 or 01:074:241 or permission of instructor. Credit not given for both this course and 01:074:340-341.*

**01:013:342** *Modern Arabic Literatures (3)*
Survey of representative works of modern Arabic literature in translation, including poetry, the novel, the short story, and plays.
*Credit not given for both this course and 01:195:365.*

**01:013:343** *Arabic Classical Literatures (3)*
Survey of a wide selection of Arabic literary texts in translation, dating from the sixth to the 12th centuries, including poetry and prose in both classical and colloquial Arabic.
*Credit not given for both this course and 01:195:237. All works studied in translation.*

**01:013:346** *Literature and Memory in the Arab World (3)*
The course explores the interconnections between memory and literature through close readings of memoirs, novels, poems, short stories, films, and graphic art.
*Credit not given for both this course and 01:195:337 or 01:685:347.*

**01:013:352-353** *Advanced Modern Hebrew I,II (3,3)*
Intensive training in Hebrew grammar and reinforcement of already acquired higher-level language skills: speaking, listening, comprehension, reading, and writing. Text analysis includes newspaper articles and essays.
*Prerequisite: 01:563:132, 01:685:132, 01:103:253, or placement. Credit not given for both these courses and 01:563:210-211 or 01:685:210-211.*

**01:013:354** *Contemporary Hebrew Literature and Media (3)*
Addresses current issues facing Israeli society as reflected in Israeli literature and press. Texts include poetry, songs, essays, newspaper articles, and films.
*Prerequisite: 01:563:211 or 01:013:353 or placement. Credit not given for both this course and 01:563:371.*

**01:013:355** ***Introduction to Modern Israeli Literature (3)***
Introduces students to major writers of modern Hebrew literature with the goal of developing their own critical reading and writing skills. Readings include modern Hebrew poetry, prose, and plays.
***Credit not given for both this course and 01:563:372.***

**01:013:360-361** ***Advanced Hindi I,II (3,3)***
Reading, textual analysis, and content discussion of selected short essays from Hindi newspapers, fictional works, and ethnographic material. Introduction to Hindi discourse structure.
***Prerequisite: 01:013:261 or 01:505:261. Credit not given for both this course and 01:505:360-361.***

**01:013:365** ***Bollywood (3)***
A broad overview of the Bollywood industry and its cinematic productions over the years.
***Credit not given for both this course and 01:175:365.***

**01:013:372** ***Islamic Mystical Literatures (3)***
Examines literary output of mystics in Islamic world. Main focus will be on mystical teachings, although attention will be also paid to literary genres, including not only poetry of various forms and from diverse regions and periods, but also biography and modern novels, all in English translation.
***Credit not given for both this course and 01:840:372.***

**01:013:376-377** ***Advanced Persian I,II (3,3)***
Reinforcement of oral and written proficiency developed within a cultural context. Comprehensive understanding of linguistic structures. Readings in literature.
***Prerequisite: 01:013:277 or placement. Credit not given for both this course and 01:723:376-377.***

**01:013:386-387** ***Advanced Swahili I,II (3,3)***
Reinforcement of oral and written proficiency developed within a cultural context. Comprehensive understanding of linguistic structures. Readings in literature.
***Prerequisite: 01:013:287 or 01:956:287 or placement.***

**01:013:390-391** ***Advanced Turkish I,II (3,3)***
Reinforcement of oral and written proficiency developed within a cultural context. Comprehensive understanding of linguistic structures. Readings in literature.
***Prerequisite: 01:013:291 or placement. Credit not given for both this course and 01:973:390-391***

**01:013:392-393** ***Advanced Twi I,II (3,3)***
Develop advanced-level proficiency in all four language skills: writing, speaking, listening, and reading Twi (Akan).
***Prerequisite: 01:013:293 or placement.***

**01:013:401** ***Senior Seminar in Literature and Society (3)***
Advanced seminar on critical theories and methods of analysis related to modern and contemporary literatures of Africa, Middle East, and South Asia.
***Prerequisites: 01:013:201. Open only to students with senior standing or by permission of instructor.***

**01:013:402** ***Advanced Topics in African, Middle Eastern, and South Asian Languages and Literatures (3)***
Variable content. Advanced studies in particular ideas, themes, forms, and historic units in literature, linguistics, or sociolinguistics in one or more regions covered by AMESALL.

**01:013:403-404** ***Translation Practicum I,II (3,3)***
Practical course in translation into English.***Prerequisites: 01:013:304.***

**01:013:409** ***Introduction to the Semitic Languages (3)***
Survey of the Semitic languages and their history from a comparative perspective.
***Prerequisite: One year of a Semitic language (such as Hebrew or Arabic) or permission of instructor. Credit not given for both this course and 01:563:409.***

**01:013:410** ***African Immigrant Voices (3)***
An examination of the literary works of African immigrant writers in the United States and Europe.

**01:013:412** ***Literature and Religion (3)***
Addresses relationship between literature and religion through close reading of select literary works and survey of major schools of interpretation within contemporary literary and cultural criticism.

**01:013:430** ***Gender, Nation, and Literature in South Asia (3)***
Course focuses on how representations of women have shaped ideas of modern Indian citizenship and belonging in colonial and postcolonial periods.
***Credit not given for both this course and 01:195:430 or 01:988:431.***

**01:013:432** ***Readings in Modern Hindi Literature (3)***
Introduces students to modern Hindi literature and its various genres. Course conducted entirely in Hindi.
***Prerequisite: 01:013:261 or 01:505:261. Credit not given for both this course and 01:505:432.***

**01:013:433** ***Modern Urdu Literature and Popular Culture (3)***
Introduces students to modern Urdu literature and popular culture in various genres and cultural contexts. Provides overview of diverse manifestations of South Asian culture and history in Urdu literature. Conducted entirely in Urdu.

**01:013:442** ***Readings in Modern Arabic Literature (3)***
Critical readings of selected short stories from the modern Arab world.
***Prerequisite: Advanced Arabic 01:013:341, near-native proficiency in Arabic, or permission of instructor. Credit not given for both this course and 01:074:442.***

**01:013:445** ***Storytelling in the Muslim World (3)***
Exploration of storytelling traditions from culturally diverse communities of the Muslim world, from medieval times to present.

**01:013:452** ***Readings in Modern Hebrew Literature (3)***
Reading and analysis of modern Hebrew poetry and short prose, with an emphasis on major Israeli authors.
***Prerequisite: 01:563:372 or 01:013:355 or placement. Credit not given for both this course and 01:563:471.***

**01:013:453** ***The Hebrew Novel (3)***
Reading and analysis of the modern Hebrew novel, with an emphasis on major Israeli authors.
***Prerequisite: 01:563:372, 01:013:355, or placement. Course taught in Hebrew. Credit not given for both this course and 01:563:472.***

**01:013:454** ***Love and Desire in Hebrew Prose and Poetry (3)***
Explores the themes of love and desire in modern Hebrew prose, poetry, and film. Special attention paid to how the literature and films handle the issues of love, desire, and personal relationships in contemporary Israeli culture.
***Prerequisite: 01:563:372, 01:013:355, or placement. Course taught in Hebrew. Credit not given for both this course and 01:563:484.***

**01:013:455** ***Hebrew Literature and Israeli Society (3)***
Traces the development of modern Israeli literature, from the establishment of the state of Israel in 1948 to the present day. Of special interest will be the manner in which these stories define the quintessential Israeli hero and contend with the question of Israeli identity.
***Prerequisite: 01:563:372, 01:013:355, or placement. Course taught in Hebrew. Credit not given for both this course and 01:563:485.***

# History (SAS)

## HISTORY

(General/Comparative History 506; African, Asian, and Latin American History 508; European History 510; American History 512)

Department of History, School of Arts and Sciences

**Website:** Here

**Chair:** Melissa Feinberg

**Associate Chairs:** Jennifer Jones and Samantha Kelly

**Undergraduate Vice Chair:** James Delbourgo

**Distinguished Professors:**

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Erica Armstrong Dunbar, B.A., Pennsylvania, M.A., Ph.D., Columbia

Jochen Hellbeck, B.A., Free University of Berlin; M.A., Ph.D., Columbia

Seth Koven, B.A., Swarthmore; A.M., Ph.D., Harvard

T.J. Jackson Lears, B.A., Virginia; M.A., North Carolina (Chapel Hill); M.A., Ph.D., Yale

Louis Masur, B.A., SUNY (Buffalo); M.A., Ph.D., Princeton

Richard L. McCormick, B.A., Amherst College; Ph.D., Yale

Gary A. Rendsburg, B.A., North Carolina (Chapel Hill); M.A., Ph.D., New York

Camilla Townsend, B.A., Bryn Mawr College; M.A., Ph.D., Rutgers

**Professors:**

Leslie Alexander, B.A., Stanford; M.A., Ph.D., Cornell

Alastair J. Bellany, B.A., Oxford; M.A., Ph.D., Princeton

Paul G.E. Clemens, B.S., Maryland; Ph.D., Wisconsin

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Belinda Davis, B.A., Wesleyan; M.A., Ph.D., Michigan

Rachel Devlin, B.A., Barnard College; M.A., Ph.D., Yale

Leah DeVun, B.A., Washington; M.A., M.Phil, Ph.D., Columbia

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David Greenberg, B.A., Yale; M.A., M.Phil., Ph.D., Columbia

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Julia Stephens, B.A., Harvard; M.Phil., Cambridge; Ph.D., Harvard

Andrew T. Urban, B.A., Middlebury; M.A., Ph.D., Minnesota

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Nicole Burrowes, B.A., NYU; M.A., Ph.D., CUNY Graduate Center

Elaine LaFay, B.A., Michigan; Ph.D., Pennsylvania

Kristin O'Brassill-Kulfan, B.A., Millersville; M.A., Queen's (UK); Ph.D., Leicester (UK)

**Research Professor:**

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**Associate Teaching Professor:**

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**Assistant Teaching Professors:**

Mark Bray, B.A. Wesleyan; Ph.D., Rutgers

**Faculty Emeriti:**

Michael Adas

Samuel Baily

Carolyn A. Brown

Jack Cargill

John Chambers

Dorothy Sue Cobble

Ann Fabian

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Allen Howard

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Donald Kelley

Steven Lawson

Suzanne Lebsock

James Livingston

Phyllis Mack

Karl Morrison

James Reed

Stephen Reinert

Donald Roden

Bonnie Smith

Gail Triner

Mark Wasserman

Deborah Gray White

Virginia Yans

Yael Zerubavel

The study of history allows students to understand the past as well as the present--how and why our world became the way it is today. The Department of History offers an array of two hundred course offerings and many research opportunities. The courses are designed to (1) provide the student with an understanding of the social, political, and cultural forces that have shaped the course of history and our present world; and (2) teach the student the important skills of critical reading and research, logical analysis, and effective written and oral communication.

Students should begin with introductory-level courses (100 or 200), proceed to the upper-level courses that are at the center of the history major (300), and finally to the advanced courses (400), which usually require significant research.
The history major is designed to expose students to the histories of various civilizations over time and place. However, it also affords specialization in one area, time, or theme (e.g., African history, medieval Europe, or women in history, etc.) to interested students, in consultation with departmental advisers.

For additional information, visit the department's website.

History (SAS)

# Learning Goals

# Learning Goals

**Conceptual Learning Goals.** Students who study history at Rutgers University can expect to develop an understanding of the following concepts:

1) The role of human agency in bringing about change in society and institutions. This includes:

- understanding how individuals are shaped by their own past and by the past of their society and institutions
- the role of diversity and difference in shaping human experience

2) The operation of large-scale forces responsible for causing change over time, such as politics, economics, and religion

**Practical Learning Goals.** Students who study history at Rutgers University can expect to develop the following practical skills:

1. The ability to understand a variety of historical primary sources such as archival documents, diplomatic correspondence, journalistic reports, and private papers

2. The ability to read and understand secondary sources written in academic prose and to understand the substance of debates
3. The ability to analyze information effectively and to use different kinds of historical sources to a historical argument
4. The ability to write persuasively and communicate effectively
5. The ability to work independently and to conduct independent research

History (SAS)

# Major Requirements

# Major Requirements

History majors must complete 12 courses in history (36 credits) with a grade of C or better in each course. A minimum of eight courses for the major must be taken at Rutgers University-New Brunswick. All history majors must fulfill the following requirements:

1. At least five courses at the 300 or 400 level

2. At least eight courses at the 200 through 400 level

3. History Workshop, 01:506:299, taken by the end of the sophomore year; transfer students must take 01:506:299 in their first semester at Rutgers

4. A History Seminar, either 01:506:401 or 402,or Public History Internship (01:506:451), or History Honors Thesis (01: 506:495 and 496) usually taken in the junior year, or senior year

5. Of the 12 history courses, at least two must be in each of the following three areas:

a. Global, African, Asian, Latin American, or Native American history (selected 506 courses and all 508 courses)

b. European history (510)

c. United States history (512)

6. At least one course focusing on the period before 1500 C.E.

7. History majors shall not count more than two overlapping courses between history and any other majors or minors.

*Ancient History and Classics Option*

The ancient history and classics option in the history major requires 15, 3-credit courses (of which at least three must be history department courses and at least three must be classics department courses), apportioned as follows:

1. At least two courses in ancient languages (at least two languages: Latin, Greek, and/or other ancient languages offered at the university, e.g., Sanskrit and Hebrew). One of the courses must be a Greek or Latin course at the 200 level or above. Advanced placement can substitute for either or both of the courses, if at the appropriate level. Suggested intermediate courses are 01:490:207 Classical Greek Prose (3) and 01:580:203 Intermediate Latin Prose (3).

2. Three ancient history or classics survey courses at the 200 level, from among:

01:190:205 Greek Civilization (3)
01:190:206 Roman Civilization (3)
01:508:200 Ancient Near East (3)
01:510:201 Ancient Greece (3)
01:510:202/01:190:209 Ancient Rome (3)
01:510:205 History of the Byzantine Empire (3)
01:510:207 Byzantine Civilization (3)

In consultation with an adviser, appropriate higher-level courses or courses from other departments may be substituted for any of the 200-level courses mentioned above.

3. Six ancient history or classics lecture courses at the 300 level, from among:

01:190:310 Augustan Rome (3)
01:190:320 Women in Antiquity (3)
01:190:322 Greek Political Philosophy (3)
01:190:325 Cults, Magic, and Witchcraft (3)
01:190:350/01:510:350 Greek Society (3)
01:190:355 Ancient Mythology and Society (3)
01:190:372 Cities of the Classical World (3)
01:190:373 Pompeii: The Life and Death of a Roman Town (3)
01:490:306 From Athens to Alexandria (3)
01:490:391 Readings in Greek Prose (historical topic/author) (3)
01:510:301 Early Greece (3)
01:510:302 Classical Greece (3)
01:510:303 Hellenistic World (3)
01:510:304 The Rise of the Roman Republic (3)
01:510:305 The Crisis of the Roman Republic (3)
01:510:306/01:190:306 Roman Empire (3)
01:510:307 The Roman World in Late Antiquity (3)
01:510:308 Creating Culture and History in the Ancient World (3)
01:510:403 Ancient Warfare and Diplomacy (3)
01:580:304 Cicero: Orations (3)
01:580:325 The History of Livy (3)
01:580:329 Tacitus (3)

4. One ancient history or classics course at the 300 or 400 level focusing on research and writing such as:

01:490:391 Readings in Greek Prose (historical readings) (3)
01:506:401,402 History Seminar (ancient topic) (3,3)
01:506:471,472 Research in History (ancient topic) (3,3)
01:510:407 Rome in the Age of Augustus (3)
01:580:369,370 The Seminar in Latin (historical readings) (3,3), college honors, or departmental project (appropriate topic)

5. Three additional courses in history, classics, Latin, or Greek (in any combination, but no more than two of them at the 100 level)

History (SAS)

# Minor Programs and Requirements

# Minor Programs and Requirements

*General History Minor*

The minor in history consists of six 3-credit courses, passed with a grade of C or better, including three courses at the 300 to 400 level. A minimum of four courses for the minor must be taken at Rutgers University. No more than two courses used to complete a major or minor in another department can be used to fulfill the requirements of the history minor.

*Law and History Minor*

The minor in law and history provides an interdisciplinary introduction to the study of law, with a particular focus on the role of history in examining law and legal culture in their social contexts. The minor in law and history consists of six 3-credit courses, passed with a grade of C or better, from the following list. No more than one course used to complete a major or minor in another department can be used to fulfill the requirements of the law and history minor.

01:506:216 Law and History (required introductory course)

Four of the following history courses:
01:506:210 Sex and Power
01:506:220 Piracy: A Global History
01:506:236 Poverty in World History
01:506:255 Science, Nature, and Empire
01:506:260 Wars, Wayfarers, and the Wall: A History of the U.S.-Mexican Border
01:508:110 Political Islam: Present and Past
01:508:367 The Afro-Latin American Experience
01:510:245 The Arts of Power
01:510:261 History of the Holocaust
01:510:268 Fascism
01:510:335 Modern France
01:510:345 English Constitutional History to 1688
01:510:394 Human Rights

01:512:215 American Legal History
01:512:216 Famous Trials
01:512:221 Abortion: The Collision of History, Law, Religion, Medicine, and Human Rights
01:512:229 History of Medical Ethics
01:512:238 History of Homelessness
01:512:250 Natives and Newcomers: Immigration and Migration in U.S. History
01:512:253 Asian American History
01:512:264 Black Lives Matter
01:512:308 History and Asylum Law
01:512:317 Murder in American History
01:512:318 Political Corruption in America
01:512:322 Drugs: A Social History
01:512:342 Policing in Black Communities: From Slavery to Mass Incarceration (3)
01:512:368 History of Civil Rights, 1900-1980
01:512:383 Women's Rights in America, 1800-1930
01:512:385 Women Behaving Badly
01:512:402 American Constitutional History to 1865
01:512:404 American Constitutional History from 1865
One of the following electives from outside of the Department of History:

*Africana Studies*
01:014:353 Black Community Law and Social Change
*Anthropology*
01:070:360 Law, Justice, Rights
*Criminal Justice*
(Special permission numbers are required for the following courses):
01:202:201 Introduction to Criminal Justice (recommended)
01:202:202 Police
01:202:203 Prisons and Prisoners
01:202:204 Crime and Public Policy
01:202:205 Criminal Procedure
*Economics*
01:220:395 Law and Economics
(01:220:102 and 01:220:103 are prerequisites for 01:220:395, and precalculus math is a prerequisite for 01:220:102 and 01:220:103)
*Latino and Caribbean Studies*
01:595:370 Law and the Latino Community
*Middle Eastern Studies*
01:685:457 Islamic Law and Jurisprudence
*Philosophy*
01:730:345 Philosophy and the Law
01:730:358 Philosophy of Law
01:730:341 Ethics through History
01:730:342 Seventeenth- and Eighteenth-Century Social and Political Philosophy
*Political Science*

01:790:340 Law and Society
01:790:373 Legal Philosophy, Rights, and Justice
01:790:401 American Constitutional Law I
01:790:404 Politics of Criminal Justice
01:790:406 Civil Liberties and Civil Rights
01:790:426 Gender, Public Policy, and the Law
*Religion*
01:840:425 Seminar on Law and Religion
*Sociology*
01:920:349 Law and Society
01:920:222 Criminology
01:920:304 Sociology of Deviant Behavior
01:920:361 Sociology of Drug Use
*Women's, Gender, and Sexuality Studies*
01:988:307 Women and the Law

***STEM in Society Minor***

The minor in STEM in society examines science, technology and engineering, environment, medicine, and quantification in their historical contexts from the ancient world to the 21st century. The minor in STEM in society consists of six 3-credit courses, passed with a grade of C or better, from the following list:

01:506:226 Contemporary Challenges in International Health
01:506:227 Health, Culture, and Society
01:506:233 History of the Future
01:506:247 The Seas Around Us: Ocean History in Global Perspective
01:506:249 Climate Politics: A Deep History
01:506:250 Science, Collecting, and Power
01:506:251 History of Science and Society
01:506:252 History of Technology and Society I
01:506:253 History of Technology and Society II
01:506:254 History of Oil
01:506:255 Science, Nature, and Empire
01:506:321 Disease in History
01:506:322 Black Death to Obesity Epidemic: History of Public Health in the West
01:506:324 History of AIDS Pandemic
01:506:325 Living on the Edge: Human Societies in Extreme Environments
01:508:255 Global Environmental History
01:508:328 History of Health and Healing in Africa
01:508:364 Environmental History of Latin America
01:510:248 The Last Climate Crisis: Histories of ¿The Little Ice Age¿ c. 1300-1800
01:512:121 Health and Environment in America
01:512:210 Food in the United States and the World
01:512:221 Abortion: The Collision of History, Law, Religion, Medicine, and Human Rights
01:512:229 History of Medical Ethics
01:512:230 History of Medicine in Film

01:512:235 Accidents and Disasters in the United States and the World
01:512:237 Data: A Social History
01:512:321 Health Care and Society in America
01:512:322 Drugs: A Social History
01:512:323, 324 History of the North American Environment
01:512:328 Science in American Culture
01:512:329 Technology and Nature in American History
01:880:210 The Edison Effect: Technological Innovation in American Culture
01:880:212 Science and Dollars: The Business of Innovation Since the Age of Edison

History (SAS)

# Certificate Programs and Requirements

# Certificate Programs and Requirements

*Law and History Certificate*

The certificate in law and history provides an interdisciplinary introduction to the study of law, with a particular focus on the role of history in examining law and legal culture in their social contexts. The certificate in law and history consists of five 3-credit courses, passed with a grade of C or better, from the following list. No more than one course used to complete a major or minor in another department can be used to fulfill the requirements of the law and history certificate.

01:506:216 Law and History (required introductory course)

Four of the following history courses:

01:506:210 Sex and Power
01:506:220 Piracy: A Global History
01:506:236¿Poverty in World History
01:506:255 Science, Nature, and Empire
01:506:260 Wars, Wayfarers, and the Wall: A History of the U.S.-Mexican Border
01:508:110 Political Islam: Present and Past
01:508:367 The Afro-Latin American Experience
01:510:245 The Arts of Power
01:510:261 History of the Holocaust
01:510:268 Fascism
01:510:335 Modern France
01:510:345 English Constitutional History to 1688
01:510:394 Human Rights
01:512:215 American Legal History
01:512:216 Famous Trials
01:512:221 Abortion: The Collision of History, Law, Religion, Medicine, and Human Rights
01:512:229 History of Medical Ethics
01:512:238 History of Homelessness

01:512:250 Natives and Newcomers: Immigration and Migration in U.S. History
01:512:253 Asian American History
01:512:264 Black Lives Matter
01:512:308 History and Asylum Law
01:512:317 Murder in American History
01:512:318 Political Corruption in America
01:512:322 Drugs: A Social History
01:512:342 Policing in Black Communities: From Slavery to Mass Incarceration (3)
01:512:368 History of Civil Rights, 1900-1980
01:512:383 Women's Rights in America, 1800-1930
01:512:385 Women Behaving Badly
01:512:402 American Constitutional History to 1865
01:512:404 American Constitutional History from 186

One of the following electives from outside of the Department of History:

*Africana Studies*
01:014:353 Black Community Law and Social Change
*Anthropology*
01:070:360 Law, Justice, Rights
*Criminal Justice*
(Special permission numbers are required for the following courses):
01:202:201 Introduction to Criminal Justice (recommended)
01:202:202 Police
01:202:203 Prisons and Prisoners
01:202:204 Crime and Public Policy
01:202:205 Criminal Procedure
*Economics*
01:220:395 Law and Economics
(01:220:102 and 01:220:103 are prerequisites for 01:220:395, and precalculus math is a prerequisite for 01:220:102 and 01:220:103)
*Latino and Caribbean Studies*
01:595:370 Law and the Latino Community
*Middle Eastern Studies*
01:685:457 Islamic Law and Jurisprudence
*Philosophy*
01:730:345 Philosophy and the Law
01:730:358 Philosophy of Law
01:730:341 Ethics through History
01:730:342 Seventeenth- and Eighteenth-Century Social and Political Philosophy
*Political Science*
01:790:340 Law and Society
01:790:373 Legal Philosophy, Rights, and Justice
01:790:401 American Constitutional Law I
01:790:404 Politics of Criminal Justice

01:790:406 Civil Liberties and Civil Rights
01:790:409 Courts and Public Policy
01:790:426 Gender, Public Policy, and the Law
*Religion*
01:840:425 Seminar on Law and Religion
*Sociology*
01:920:349 Law and Society
01:920:222 Criminology
01:920:304 Sociology of Deviant Behavior
01:920:361 Sociology of Drug Use
*Women's, Gender, and Sexuality Studies*
01:988:307 Women and the Law

***Public History Certificate***

Public history explores interpretations of the past produced for the general public in a variety of different settings such as museums, archives, historical preservation, monuments, etc. The certificate in public history consists of the following five courses:

1. History Workshop 01:506:299
2. Public History: Theory, Method, and Practice 01:506:301
3. Introduction to Oral History 01:506:302 or Digital History 01:506:303 or a class on digital humanities (01:506:299 and 01:506:301 should be prerequisites for coursework in oral history or digital history)
4. One elective. See history department's website for approved electives: Here
5. Public History Internship 01:506:451

***STEM in Society Certificate***

The certificate in STEM and society examines science, technology and engineering, environment, medicine, and quantification in their historical contexts from the ancient world to the 21st century. The certificate in STEM and society consists of five 3-credit courses, passed with a grade of C or better, from the following list:

01:506:226 Contemporary Challenges in International Health
01:506:227 Health, Culture, and Society
01:506:233 History of the Future
01:506:247 The Seas Around Us: Ocean History in Global Perspective
01:506:249 Climate Politics: ADeep History01:506:250 Science, Collecting, and Power01:506:251 History of Science and Society
01:506:250 Science, Collecting, and Power
01:506:251 Science and Society
01:506:252 History of Technology and Society I
01:506:253 History of Technology and Society II
01:506:254 History of Oil
01:506:255 Science, Nature, and Empire
01:506:321 Disease in History
01:506:322 Black Death to Obesity Epidemic: History of Public Health in the West
01:506:324 History of AIDS Pandemic

01:506:325 Living on the Edge: Human Societies in Extreme Environments
01:508:255 Global Environmental History
01:508:328 History of Health and Healing in Africa
01:508:364 Environmental History of Latin America
01:510:248 The Last Climate Crisis: Histories of `The Little Ice Age¿ c. 1300-1800
01:512:121 Health and Environment in America
01:512:210 Food in the United States and the World
01:512:221 Abortion: The Collision of History, Law, Religion, Medicine, and Human Rights
01:512:229 History of Medical Ethics
01:512:230 History of Medicine in Film
01:512:235 Accidents and Disasters in the United States and the World
01:512:237 Data: A Social History
01:512:321 Health Care and Society in America
01:512:322 Drugs: A Social History
01:512:323, 324 History of the North American Environment
01:512:328 Science in American Culture
01:512:329 Technology and Nature in American History
01:880:210 The Edison Effect: Technological Innovation in American Culture
01:880:212 Science and Dollars: The Business of Innovation Since the Age of Edison

History (SAS)

# Teacher Certification

# Teacher Certification

History majors interested in entering the five-year program in social studies education should contact advisers in the Department of History and in the Graduate School of Education in their first year or as soon as possible thereafter.

History (SAS)

# Departmental Honors Program

# Departmental Honors Program

The departmental honors program enables students to pursue their individual interests in history and helps prepare them for future research work or graduate study. Qualified students take a two-semester honors thesis seminar (in the spring of the junior year and fall of the senior year) and work with a faculty adviser to conduct original historical research and write a thesis. Interested students should read the program description available on the department website and discuss their plans thoroughly and well in advance with a faculty adviser. Approval of the proposed thesis topic by a faculty member who will serve as thesis adviser is required for acceptance to the program.

For more information, see the department website: Here.

History (SAS)

# General/Comparative History Courses (506)

# General/Comparative History Courses (506)

**01:506:101** ***World History I (3)***
Traces human history from the development of modern humans to the beginning of the first era of globalization with the voyage of Columbus to the Americas.

**01:506:102** ***World History II (3)***
World history since the late 15th century.

**01:506:105** ***Honors Colloquium (3)***
Study of a contemporary social issue from the perspective of the discipline of history. Specific title available at time of registration through the School of Arts and Sciences honors programs.
***By permission of the department. Open to students in school honors.***

**01:506:110** ***Age of European Global Expansion (3)***
Traces the rise of Europe to global dominance beginning with early explorers and empire builders, and focuses on Europe's impact on Africa, Asia, and the Americas.

**01:506:112** ***Patterns in Civilization: Love (3)***
Love and its literary expression in Japan and Europe since the Middle Ages. Comparative analysis of culture and society, political and economic transformations, and religion.

**01:506:113** ***Patterns in Civilization: Death (3)***
Individual and societal responses to death in Japan, Europe, and the United States. Comparative analysis of culture and society, political and economic transformation, and religion.

**01:506:114** ***World Civilizations: Europe, Africa, and America (3)***
Family, economy, government, and religion in major civilizations of West Africa, Europe, and North America. Interaction of these three geographical areas through the slave trade, colonialism, and the movement of ideas and culture.

**01:506:115** ***World War II in World History (3)***
Examines the political, military, economic, social, and cultural dimensions of World War II from the perspectives of its different combatants. Considers the war from the perspective of states, soldiers, and civilians around the world.

**01:506:118** ***Looking at 21st-Century World History (3)***
Interdisciplinary examination of the role of the visual in both our daily lives and in the way we remember the past. Taught through a series of topics ranging from war and violence to gender, work, and play.
***Credit not given for both this course and 01:082:118.***

**01:506:151** ***History and the News (3)***
Analysis of the historical background to events in the current week's news; emphasis on how historical knowledge deepens understanding of contemporary issues.

**01:506:201** ***Twentieth-Century Global History to 1945 (3)***
Emphasis on themes in political-military and social-cultural history worldwide, including imperialism, origins and impact of two world wars, revolutions, fascism, Nazism, and race and gender issues.

**01:506:202** ***Twentieth-Century Global History from 1945 (3)***
Focus on critical themes from Hiroshima to September 11, 2001, including the atomic age, superpower rivalries, decolonization, population growth and development, globalization, environmental degradation, and terrorism.

**01:506:203** ***Histories of the Pacific (3)***
Survey of Pacific island peoples and cultures from early navigators and settlers to the colonial and postcolonial eras of the 19th and 20th centuries.

**01:506:205** ***Paris/Tokyo: 1700-Present (3)***
Comparative study of French and Japanese cultures from 1700 to the present, drawing on literary and visual representations from both traditions.

**01:506:210** ***Sex and Power (3)***
Investigates how gender relations have changed over time and place by considering different moments in world history. Examines how states, religions, families, and other social or political institutions have created and enforced sex and gender norms.

**01:506:211** ***Women in Europe and the Americas until 1800 (3)***
Survey of women's roles in Western society and culture--covering Europe and the New World up to about 1800.
***Credit not given for both this course and 01:988:211***

**01:506:212** ***Women in Europe and the United States since 1800 (3)***
Survey of women's roles in Western society and culture--covering the 19th and 20th centuries.
***Credit not given for both this course and 01:988:212.***

**01:506:215** ***The Modern Girl (3)***
Examines the so-called "modern girl" of the 1920s and 1930s. Representations in fiction, film, and advertisements. Concentrates on the West, with comparative evidence from Asia and Africa.
***Credit not given for both this course and 01:988:260.***

**01:506:216** ***Law and History (3)***
Explores the law through historical and contemporary cases, including disputes about legalization of drugs, religious freedom, and immigration controls, from U.S. and global perspectives.
***Required for the Law and History Minor/Certificate.***

**01:506:218** ***Terrorism (3)***
Global historical survey of the development and importance of terrorism from the eighteenth century to the present.

**01:506:220** ***Piracy: A Global History (3)***
Examines piracy in world history from Ancient Egypt until the 21st century. Considers its social, political, and economic meanings in different societies.

**01:506:221** ***History of Exploration (3)***
Exploring expeditions from Columbus to the moon flights. Experiences of explorers; political, economic, and cultural motives for exploration; effects of exploration on society and on views of the world.

**01:506:224** ***Slavery in World History (3)***
Historical survey of the institution of slavery from antiquity to the present day, with particular attention to the relationship of human bondage to broader progress of social and economic change.

**01:506:225** ***The Black Atlantic World (3)***
Black Atlantic World (Europe, Atlantic Africa, and the Americas) from the 16th century to the present. Historical, cultural, sociopolitical, and intellectual formations, movements, and connections crisscrossing the Atlantic.

**01:506:226** ***Contemporary Challenges in International Health (3)***
Examines the history of Western efforts to promote health and nutrition in the developing world, including Africa, Asia, Latin America, and the former Soviet Republics. Emphasizes the economic, political, and cultural assumptions associated with international health and development.

**01:506:233** ***History of the Future (3)***
Examines the global history of human attempts to predict the future from antiquity to the present, with an emphasis on the 19-21st century. Engages with topics and concepts from disciplines including meteorology, economics, statistics, computer science, behavioral economics, psychology, and literature to look at attempts to anticipate the future, from fortune telling to sports picks to weather forecasting.

**01:506:227** ***Health, Culture, and Society (3)***
Integrates perspectives from sociology, history, public health, medicine, and the humanities to define health, understand the diverse ways scholars study health, and identify factors that influence the prevalence, distribution, and experience of four health conditions: obesity; depression; cancer; and HIV/AIDS. Implications of research for medical practice, ethics, and policies to enhance health worldwide.
***Credit not given for both this course and 01:920:220.***

**01:506:236** ***Poverty in World History (3)***
Explores poverty as people have experienced and understood it in various times, places, and circumstances through world history.

**01:506:241** ***Film and History (3)***
Presentation of films relating to history and culture, combined with readings and discussions of standard history accounts.

**01:506:247** ***The Seas Around Us: Ocean History in Global Perspective (3)***
Explores maritime history in a global context from antiquity to the modern period, with a special focus on Polynesian, Malay, Dutch, and Greek mariners, among others.

**01:506:249** ***Climate Politics: A Deep History (3)***
Studies climate change in the past and present; explores the legitimacy and manipulation of scientific knowledge; analyzes the connections between climate and imperialism in a global context.

**01:506:250** ***Science, Collecting, and Power (3)***
Explores scientific collections from the ancient world to the present in a global context. Examines the relationship between collecting and science, and how science derives its power from making and using collections.
***Credit not given for both this course and 16:082:594.***

**01:506:251** ***History of Science and Society (3)***
Science and its social context from 1500 to the present. Development of ideas; interaction with philosophy, religion, and art; science as a profession.

**01:506:252** ***History of Technology and Society I (3)***
Global perspective on the history of materials, energy, manufacturing, transportation, and communication technologies from earliest times to the Industrial Revolution. Central themes include interplay between technology and the pursuits of material wealth, political power, and military, as well as the relationship between early science and burgeoning technology.

**01:506:253** ***History of Technology and Society II (3)***
History of production, transportation, and communication technologies worldwide from the Industrial Revolution to the present. Integration of science and technology, rise of consumer technologies, and emergence of the United States as a center for technological, economic, military, and political power.
***Special Notation: Does not fulfill global requirement for majors.***

**01:506:254** ***History of Oil (3)***
Political and economic history of oil over the 20th and into the 21st century. Oil's impact on the rise and fall of empires, the fates of nation-states, its role in war, as well as its varied impact on social and cultural life.

**01:506:255** ***Science, Nature, and Empire (3)***
Explores key episodes in the history of science, imperialism, and colonialism in a global context from the 15th to the 21st century.

**01:506:260** ***Wars, Wayfarers, and the Wall: A History of the U.S.-Mexican Border (3)***
The history of the U.S.-Mexican border from the colonial era to the present and its contemporary significance for national well-being and national identities in the United States and Mexico. Emphasis on this history's influence on contemporary debates regarding immigration, national borders, and the United States' relationship with Mexico and Mexicans.

**01:506:271** ***Jewish History I: Ancient and Medieval (3)***
Social, economic, religious, and political experiences of the Jewish people from the Biblical world of the ancient Near East until the Middle Ages.
***Credit not given for both this course and 01:563:201 or 01:685:208.***

**01:506:272** ***Jewish History II: Modern (3)***
Jewish life from the breakdown of traditional society in Europe in the 1700s until the rise of the modern state of Israel in the 20th century.
***Credit not given for both this course and 01:563:202.***

**01:506:291,292** ***Topics in History (3,3)***
Study of special topics in history at the intermediate level.

**01:506:299** ***History Workshop (3)***
Introduction to historical research, analysis, and interpretation. Topical lectures and hands-on workshops.
***Required for all history majors.***

**01:506:301** ***Public History: Theory, Method, and Practice (3)***
Introduction to theory, methods, practice, and politics of public history, exploring production and dissemination of histories in nonacademic settings. Includes workshops conducted by professionals in the field, site visits.

**01:506:302** ***Introduction to Oral History (3)***
Introduction to oral history and its methods. How to design an oral history project and how to integrate technology into that design.

**01:506:303** ***Digital History (3)***
History of the United States through space and geography. Focus on three key topics: colonial North America, the American Civil War, and the racial landscape of the modern US.

**01:506:305** ***Special Topics in Politics, History, and Heritage (3)***
Special topics emphasizing politics, history, and cultural heritage and preservation studies. Special studies in particular theoretical and practical aspects of historic preservation and conservation. Designed by individual instructor.
***Credit not given for both this course and 01:082:441.***

**01:506:313** ***Women and Social Movements to 1945 (3)***
In-depth analysis of different ways women have organized for change. Focus on three or four case studies using cross-cultural perspectives to illustrate various themes of gender and collective action by women.
***Credit not given for both this course and 01:988:371.***

**01:506:314** ***Women and Social Movements since 1945 (3)***
Twentieth-century autonomous women's movements, emphasizing the second wave of feminism from cross-cultural perspectives. Selected case studies to illustrate themes of gender and collective action.
***Credit not given for both this course and 01:988:372.***

**01:506:321** ***Disease in History (3)***
Human disease on a global scale from the Paleolithic period to the present, with emphasis on infectious disease and diet.

**01:506:322** ***Black Death to Obesity Epidemic: History of Public Health in the West (3)***
Surveys attempts to protect the health of human populations from the Black Death in Europe to rising concern about obesity in the United States. Explores shifting patterns of disease and illness, and emergence and growth of public health as a domain of expert knowledge and policy in the United States and Europe.

**01:506:324** ***History of AIDS Pandemic (3)***
Explores the AIDS epidemic from a range of historical vantage points: science, health care, and social and cultural life in a variety of local, national, international, and institutional contexts. Focuses on United States, Haiti, and Africa.

**01:506:325** ***Living on the Edge : Human Societies in Extreme Environments (3)***
Focuses on important changes in human history and their origins in extreme environments. Looks closely at environments such as deserts, mountains, and icescapes, from antiquity to the present day, and in a global context.

**01:506:328** ***Atlantic Cultures 1500-1800 (3)***
Encounters between peoples of Europe, Africa, and the Americas from the 16th through the 18th centuries. Team-taught, interdisciplinary course with an emphasis on the interpretation of texts and visual images from the era.

**01:506:329** ***Jamestown, 1607, and the Atlantic World (3)***
The original permanent English New World settlement at Jamestown in 1607, from the perspective of the larger Atlantic World of which it was a part. Course approaches topic through history and other fields such as archaeology, art history, and literature, and is taught from an interdisciplinary perspective.

**01:506:330** ***African Diaspora Liberation Movements (3)***
Examines liberation movements in Africa and the African diaspora in Europe and the Americas, focusing on common intellectual, political, and social currents. Concentrates on abolitionism, Pan-Africanism, and nationalism, investigating the relationship between elite and mass movements in each case.

**01:506:361** ***History of Socialism and Communism (3)***
History of movements for socialism and communism, their diverse development on the world scene, and impact on modern history.

**01:506:362** ***Capitalism: The History (3)***
Explores the nature of capitalism, the relationship between capitalism and history, questions about the relation between capitalism and ideas or events of the modern age.

**01:506:363** ***Imperialism (3)***
Causes of colonial expansion by European powers, Russia, Japan, and the United States; the nature of colonial empires; and the impact of imperialism on Africa and Asia.

**01:506:364** ***Colonialism to Globalism (3)***
Differences and similarities of the major European encounters with non-Europeans in modern history.

**01:506:373** ***History of Jewish Women (3)***
Jewish women's history; examines the religious, social, intellectual, and cultural environments of Jewish women from the biblical period through the 20th century.
***Credit not given for both this course and 01:563:373 or 01:988:373.***

**01:506:375** ***Jewish Immigrant Experience (3)***
Modern Jewish immigrant experience, focusing on European and Middle Eastern communities resettled in America, Israel, and Europe.
***Credit not given for both this course and 01:563:375 or 01:685:375.***

**01:506:388** ***Touching History: The World of Medieval Manuscripts (3)***
An introduction to medieval manuscripts and to book culture from before the age of printing, with particular attention to the scribal transmission of ancient and classical texts (Bible, Homer, Qur¿an, Beowulf, etc.).

Credit not given for both this course and 01:563:387 or 01:677:387 or 01:840:388

**01:506:390** ***Historiography: The History of History (3)***
Explores the history of writing history and the philosophy of history over time.

**01:506:391,392** ***Historical Studies (3,3)***
Separate sections focusing on different topics at different times and in different areas. Specific titles available at time of registration.

**01:506:393** ***Advanced Topics in the History of Women (3)***
Advanced course on specialized topic in the history of women.

**01:506:401,402** ***History Seminar (3,3)***
Introduction to skills and techniques of historical research, including writing a research paper based on primary sources. Specific topics of sections available at time of registration.

**01:506:424** ***Reading and Writing about Nature (3)***
Exploration of political, philosophical, fictional, and visual texts on relationship between humans and nature in Anglo-North America, late-16th century to present.
***Prerequisite: Permission of instructor.***

**01:506:451** ***Public History Internship (3)***
Professional, supervised work for historical society, site, archives, museum, legislative office, or equivalent; 112 hours required. Faculty coordinator evaluates student's paper/product and agency's assessment.
***Open only to junior and senior history majors.***

**01:506:452** ***General History Internship (3)***
Includes internships in the fields of law, politics, and government. In addition, includes other internships that do not meet the criteria for the Public History Internship Program; 112 hours required. Faculty coordinator evaluates student's paper/product and agency's assessment.
***Open only to junior and senior history majors. Not eligible for major credit without special permission of undergraduate adviser.***

**01:506:471,472** ***Research in History (BA, BA)***
One-semester independent study projects.
***Not open to honors candidates.***

**01:506:473,474** ***Readings in History (BA, BA)***
Independent readings under supervision of a member of the department.

**01:506:495-496** ***Honors Program in History (BA,BA)***
Focus on writing of a major research paper working with an individual professor. A seminar guides students through stages of writing, using short papers as the vehicle for the exploration; includes outlines, rough drafts, etc.
***Both semesters must be completed to receive degree credit.***

# African, Asian, and Latin American History Courses (508)

# African, Asian, and Latin American History Courses (508)

**01:508:100** ***Study Abroad Benin: History Culture and Memory (3)***
This interdisciplinary cross-cultural study abroad program explores the African side of the Atlantic World. Students spend two weeks in Benin based at our sister institution, the Ecole du Patrimoine Africaine in Porto Novo. In partnership with our Beninois colleagues, faculty and students will explore how trans-Atlantic connections have shaped religion, language, and identity; the relationship between tourism and historical memory; and the dynamism of the contemporary art scene.

Credit not given for both this course and 01:016:100.

**01:508:110** ***Political Islam: Present and Past (3)***
Introduction to Islamic political thought and practice. Emphasis on how historical knowledge can help us to understand contemporary debates over the place of Islam in the modern world.
***Credit not given for both this course and 01:685:110 and 01:840:125.***

**01:508:191,192** ***Global Topics (3,3)***
Study of special topics in global history at the introductory level.

**01:508:200** ***Ancient Near East (3)***
Origins and development of the societies of Mesopotamia, Egypt, Asia Minor, and the Levant, through the period of the Persian Empire.
***Credit not given for both this course and 01:190:200, 01:563:200, or 01:685:200.***

**01:508:201** ***Islamic Civilization (3)***
Survey of Islamic societies from seventh-century Arabia to modern times. Religious, political, military, social, economic, and cultural institutions and organizational patterns.
***Credit not given for both this course and 01:014:205 or 01:685:201***

**01:508:203** ***History of Islamophobia (3)***
This course surveys the history of Western anxiety about Islam from its origins to the present, exploring the theological, political, and cultural forces behind it. It examines how Islamophobia has been institutionalized through discrimination, exclusion and violence against Muslims and those perceived as Muslim. The term ¿Islamophobia¿ is analyzed through engaging with multidisciplinary debates that interrogate the term and its limitations, and its complex relation to religious bias and racism.

Credit not given for both this course and 01:685:241 or 01:840:228

**01:508:205** ***History of the Modern Middle East (3)***
Shaping of Middle Eastern politics and society since 1800 out of the Islamic/Ottoman legacies and under the impact of modernity and Western encroachment.
***Credit not given for both this course and 01:563:205 or 01:685:203.***

**01:508:208** ***Jewish-Muslim Relations: History and Culture (3)***
Surveys the cultural history of Jewish-Muslim relations from the seventh century up to our present. Analyzes this important and unique aspect of Jewish and Muslim pasts and the place of the Jews in the cultural history of Islam. Course taught in English. Credit not given for both this course and 01:013:208 or 01:563:208.

**01:508:209** ***Jerusalem Contested: A City's History from Jewish, Christian, and Muslim Perspectives (3)***
Introduces students to the history of Jerusalem. Causes for and evolution of the profound attachment of Judaism, Christianity, and Islam.
***Credit not given for both this course and 01:563:280 or 01:685:280.***

**01:508:211** ***Modern Israeli Culture (3)***
Approaches modern Israel as a case study in creating a new national culture in relation to ancient history and traditions and a longstanding diaspora. Explores the evolution of Israeli culture between 1940s and the 1990s from an interdisciplinary perspective.
***Credit not given for both this course and 01:508:310, 01:563:310, 01:563:281, 01:685:310, or 01:685:281.***

**01:508:212** ***Israeli-Palestinian Conflict (3)***
Overview of the hundred-year-old Arab-Israeli conflict, the controversies it has generated, the attempts to resolve it, and how outsiders to the conflict learn about it and experience it.
***Credit not given for both this course and 01:508:300; 01:563:282; 01:563:300; 01:685:282 or 01:685:300.***

**01:508:220** ***Ancient Africa (3)***
Precolonial African societies and kingdoms: family life, cities, Islam, growth and decline of states, impact of the slave trade, and African culture in the Americas.
***Credit not given for both this course and 01:016:220.***

**01:508:221** ***West Africa (3)***
Politics in past and present states, rise of new social and economic groups, various reactions to the West during precolonial and colonial eras.

**01:508:222** ***Modern Africa (3)***
Nineteenth-, 20th-, and 21st-century Africa: resistance and accommodation to colonialism; impact of Christianity; African workers and new elites; changing roles of women, nationalism, and revolution.
***Credit not given for both this course and 01:016:222.***

**01:508:224** ***Women and Gender in African History (3)***
Issues in the history of gender in Africa: female slavery; women and power formations; women in production and trade; family and community; and gender and protest.
***Credit not given for both this course and 01:016:224 or 01:988:224.***

**01:508:226** ***War and Violence in Africa (3)***
Explores the history of warfare and violence in Africa with a view toward understanding how war has shaped African states, societies, and economies. Topics include different patterns of military organization over time; evolution of weaponry, tactics, and strategy; and increasing prevalence of warfare and militarism in African political and economic systems.

**01:508:230** ***The Making of Modern India and Pakistan (3)***
Introduction to the history of the Indian subcontinent from the advent of the Mughal Empire to the creation of the modern states of India, Pakistan, and Bangladesh.
***Credit not given for both this course and 01:925:230.***

**01:508:231** ***South Asian Civilization: The First Five Millennia (3)***
History and culture of South Asia from protohistoric beginnings in the Indus Valley to the late first millennium CE. Emphasizes processes of sociocultural change such as social organization and ideology, religious institutions and patronage, and the evolution of classical culture.

**01:508:235** ***Business and Society in Historical and Contemporary India (3)***
Introduction to the long history of commerce and society in the Indian subcontinent up to the present. Includes study of the sociology of economic activity and its representation in popular culture.

**01:508:240** ***Classical Asia (3)***
Introduction to the three great civilizations of Asia: India, China, and Japan. Emphasis on traditional family life, art, literature, and the spread of Buddhism.

**01:508:242** ***Modern East Asia (3)***
Development of China and Japan in the 19th and 20th centuries: the response to Western imperialism; the rise of Chinese communism and Japanese fascism.

**01:508:243** ***War and Society in Early Modern East Asia: Hideyoshi Invasions (3)***
Examination of background, unfolding, and consequences of Hideyoshi Invasions of Korea (1592-1598) as a major international war. Considers the war's influence on Korea, Japan, and China and the political, military, socioeconomic, and cultural history of early modern East Asia more broadly. Transcends the boundary of national history to reach a comprehensive understanding of the "international" connectedness of East Asia.

**01:508:244** ***China and the United States (3)***
History of contacts between the two peoples since 1784. Concentrates on period from 1941 to present. Includes all aspects of cultural, economic, and political relations.

**01:508:246** ***History of Chinese Civilization (3)***
Introduction to foundational elements of Chinese civilization and society from a historical perspective. Evolution of main Chinese intellectual, political, social, economic, and religious traditions and institutions from the Neolithic to the present period.

**01:508:247** ***China, 1800 to the Present (3)***
Continuity and change in Chinese society, politics, culture, international relations, and the economy. Industrialization, rural life, nationalism, socialism, the party-state, gender issues, democracy movements.
***Credit not given for both this course and 01:508:342.***

**01:508:250** ***Southeast Asia and the World (3)***
Introduction to Southeast Asia--one of the crossroads of the world--from ancient civilizations until the end of the 20th century. Includes the histories of Brunei, Burma/Myanmar, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Timore Leste, and Vietnam.

**01:508:260** ***Colonial Latin America (3)***
Study of formation of culture and society in Latin America through intermingling and merger of Native Americans, Iberians, and Africans.

**01:508:262** ***War and Politics in Latin America (3)***
Examines the causes and political consequences of war and revolution in Latin America (including the Wars of Independence in the 19th century, Cuban Revolution in the 20th century, and US intervention in the region). Special emphasis on international geo-politics and US-Latin American relations.
***Credit not given for both this course and 01:590:262.***

**01:508:264** ***Latin America and the United States (3)***
Survey of the relations between the United States and Latin American nations from the 1780s to the present.

**01:508:265** ***Afro-Brazilian History (3)***
Overview of the history of the largest African diaspora community in the world from the pre-history of slavery through the present day. Critical analysis of major issues in Afro-Brazilian and African diaspora studies.
***Credit not given for both this course and 01:014:265 or 01:590:265.***

**01:508:271** ***History of the Caribbean to 1898 (3)***
History of the Caribbean from before the Spanish conquest until the consolidation of the US Imperial sphere in 1898. Emphasis on Spanish, English, and French colonialism and the formation of Jamaica, Saint Domingue/Haiti, Puerto Rico, Cuba, and Española/Dominican Republic.
***Credit not given for both this course and 01:595:204.***

**01:508:272** ***History of teh Caribbean since 1898 (3)***
Overview of the history of the Caribbean since the formation of the US sphere of influence in 1898. Emphasis on the Hispanic Caribbean and Haiti with consideration of the English-speaking nations.
***Credit not given for both this course and 01:595:205.***

**01:508:280** ***Early Native American History (3)***
Examines the images and realities of Native American cultures and histories from America before Columbus through the early period of European-Native American interaction.
***(Formerly 01:508:379)***

**01:508:282** ***Modern Native American History (3)***
Examines the images and realities of Native American cultures and histories from the colonial period through the present day.

**01:508:291,292** ***Topics in History (3,3)***
Study of special topics in global history at the intermediate level.

**01:508:303** ***The Classical Age of Islam (3)***
Rise and expansion of Islam and formation of Islamic civilization in the Middle East from 600 to the demise of the Abbasid Caliphate ca. 1250.
***Credit not given for both this course and 01:685:303.***

**01:508:304** ***Ottoman Empire (3)***
Political, socioeconomic, and cultural history of the Ottoman Empire, 1300-1900, from frontier principality, to world empire, to post-Suleymanic crisis and change.
***Credit not given for both this course and 01:685:304.***

**01:508:305** ***Modern Turkey (3)***
Introduction to the political, social, and cultural history of modern Turkey, from its late Ottoman origins to the recent past.

**01:508:306** ***War and Revolution in Iran and Iraq (3)***
Examines key episodes of conflict between Iran and Iraq in the 20th century, including Iran's Islamic revolution, the Iran-Iraq war, and the two U.S. led wars on Iraq. Investigates the longer-term roots of conflict and its social, political, and ideological consequences.

**01:508:307** ***Women and Society in the Islamic Middle East (3)***
History of women and gender relations in the Islamic Middle East: origins of gender inequalities; women's functioning within society; reality versus literary depictions; and recent transformations.
***Credit not given for both this course and 01:988:308 or 01:685:307.***

**01:508:316** ***Israeli Women: Historical and Literary Perspectives (3)***
Impact of socialism, nationalism, ethnicity, religion, and feminism on Israeli women's roles within the family, labor force, army, kibbutz, and politics.
***Credit not given for both this course and 01:563:316 or 01:685:316 or 01:988:316.***

**01:508:318** ***Nationalism in Modern Africa (3)***
Development of African political thought from the 18th century to the modern period with a focus on nationalism. Topics will include African responses to European conquest and colonization; efforts to situate Africa in world history; the emergence of African independence movements; and the influence of race, class, and gender on nationalist thought.

**01:508:320** ***History of Southern Africa (3)***
Precolonial African societies and kingdoms, family life, religion, European colonialism, and African nationalist and revolutionary movements. Emphasis on South Africa, apartheid, and the freedom struggle.

**01:508:321** ***African Cultural History (3)***
History of African music, art, religion, and other cultural practices in social and political context.
***Credit not given for both this course and 01:016:321.***

**01:508:324** ***Africans in the Americas (3)***
Africans in the Americas: Latin America, the Anglophone and Francophone Caribbean, and the United States. Focus on the African background, slavery, and race relations.

**01:508:325** ***Africa from the 15th to the 19th Centuries (3)***
Explores the history of Africa between the 15th and 19th centuries. Focuses on themes such as state formation, economic development, and the imperial conquest.

**01:508:326** ***Islam in African History (3)***
Relation of Islam to the history of long distance trade, the rise of urban centers, shifting identity formations, gender dynamics, and religious conflict.

**01:508:327** ***World War II and Africa (3)***
Focuses on the history of Africa's involvement in World War II and the impact of this involvement on African political and economic history, with special emphasis on the war's role in nationalist movements.

**01:508:328** ***History of Health and Healing in Africa (3)***
Impact of colonial and postcolonial history on patterns of health and health care in sub-Saharan Africa. Focus on African responses to changing new medical technologies and cultures, and emerging patterns of disease.

**01:508:330** ***Early Modern South Asia, 1500-1800 (3)***
The Mughal Empire between the 16th and 19th centuries and the making of modernity in the region.

**01:508:331** ***Women in South Asian History (3)***
Origins and development of modern Indian feminist struggles in their historical contexts between the late-18th and late-20th centuries.
***Not open to first-year students.***

**01:508:332** ***Slavery in South Asian History (3)***
Covers military, monastic, and household forms of slave employment in the economy of the region between the 12th and 19th centuries. Also traces changes in the legal and economic statuses of slaves in the latter half of the period.

**01:508:333** ***Culture and Power in South Asia (3)***
Explores connections between sacred power, "sciences," courts, nation-building and developments in music, dance, drama, and cinema.

**01:508:334** ***Passages to India: South Asia through Travel Narratives (3)***
Introduces students to South Asian and comparative history through reading of travelogues by visitors from other civilizations, seventh century to 20th century.

**01:508:335** ***Modern South Asia (3)***
Modern history of South Asia; focuses on the transition to and through colonialism.

**01:508:336** ***South Asia, 1947 to the Present (3)***
Follows social and political development of South Asia after decolonization, assessing the developmental agendas and international relations of the new regimes.

**01:508:337** ***Pirates, Pilgrims, and Poets: Globalization in Indian Ocean History (3)***
Examines the history of globalization by looking at the Indian Ocean as a space of economic and cultural exchange. Themes include technology and exchange, politics and space, people and mobility, and culture and representation.

**01:508:338** ***Asian Migrations (3)***
Traces the modern history and contemporary cultures of Asian migration, from approximately 1850 to the present. Explores how global historical trends, including overseas exploration, colonialism, capitalism, nation-building, and war, have shaped patterns of Asian migration.

**01:508:340** ***Late Imperial Chinese Culture and Society (3)***
Chinese history from the 16th to the 19th centuries. Focus on power, gender, and ethnicity in a comparative framework of analysis.

**01:508:341** ***Chinese Renaissance, 1000 to 1400 (3)***
History of China from 1000 CE to 1400 CE, exploring the social, cultural, and intellectual changes in the period beginning with the transition from the Tang to Song dynasties.

**01:508:344** ***China's Socialist Revolution (3)***
History of socialism and revolution in China, emphasizing rise of Chinese Communist Party, its victory in 1949, and post-1949 People's Republic of China.

**01:508:346** ***TransAsia: A Transnational History of Gender and Sexuality in Asia (3)***
Transnational history of Asia; how (trans)regional movements in peoples, ideas, commodities, technologies, and capital have shaped and been shaped by gender/sexuality.

**01:508:348** ***Chinese Intellectual History (3)***
Key topics and themes of Chinese intellectual history from antiquity to the modern period.

**01:508:349** ***Modern China through Film and Fiction (3)***
Use of film and fiction to examine selected topics in modern Chinese history: origins and rise of Chinese nationalism; geneses and development of Chinese social revolutions and political movements; trajectories of China's rise and transformation from a declining empire to a global power and evolving modern society.

**01:508:352** ***Japan's Rise to World Power (3)***
Japan's emergence from 1800 to present. The path to industrialization, military expansion, and postwar recovery. Emphasis on changing lifestyles depicted in literature and film.

**01:508:360** ***The History of Brazil (3)***
Social, economic, and political developments of the Colonial Period, the Independence Movement, the Empire, the First Republic, the era of Getulio Vargas, and the Second Republic.

**01:508:362** ***Mexico (3)***
Surveys Mexican history from pre-Columbian times to the present with special emphasis on the 20th century and the Mexican Revolution.

**01:508:364** ***Environmental History of Latin America (3)***
Mutual reshaping of physical environment and human society in Latin America, from pre-Colombian through contemporary times.
***Credit not given for both this course and 01:590:364.***

**01:508:365** ***Revolution in Latin America (3)***
Compares and contrasts the causes and effects of major revolutionary movements in 20th-century Latin America: Mexico, Bolivia, Cuba, and Central America.

**01:508:366** ***Central American Revolutions (3)***
Central America since independence. Topics include revolt and revolution; formation of repressive states and labor-repressive capitalism; emergence of reformist and revolutionary movements.
***Credit not given for both this course and 01:595:391.***

**01:508:367** ***The Afro-Latin American Experience (3)***
Examines profound impact of African diaspora on Latin American societies where persons of African descent represent significant minorities and numerical majorities. Explores how Afro-Latin Americans remember the past and experience the present.
***Credit not given for both this course and 01:590:367 or 01:595:367.***

**01:508:369** ***Gender in Latin American History (3)***
Study of the position of men and women in Latin American society from pre-European times to the present.

**01:508:370** ***The History of Cuba (3)***
Study of Cuba from pre-Columbian times to the present day. Deals with the long battle for freedom during the 19th and 20th centuries.
***Credit not given for both this course and 01:595:390.***

**01:508:371** ***History of Puerto Rico (3)***
Examination from pre-Columbian to present times. Focus on Spanish colonial policy, slavery and land tenure systems, emergence of national identity, U.S. invasion and rapid economic changes, and population control and migration.
***Credit not given for both this course and 01:595:371.***

**01:508:372** ***History of the Dominican Republic (3)***
From French invasion of Hispaniola to present. Role in Spanish Empire, U.S. control in transition to sugar economy, Trujillismo, U.S. invasion in 1965, and impact of migration on society.
***Credit not given for both this course and 01:595:372.***

**01:508:374** ***Slavery in the Caribbean (3)***
Analysis of different institutions of slavery in the Caribbean and the rise of the plantation societies. Investigating the effects on Europe and the Western Hemisphere and its legacy.
***Credit not given for both this course and 01:595:300.***

**01:508:381** ***Ancient Kingdoms: A History of the Aztecs, Incas and Mayas (3)***
This course treats the history of the three most powerful Native American states: the Aztecs, Incas and Mayas. It begins long before contact with Europeans and ends about two generations after the arrival of the newcomers. Students will learn what scholars have been able to uncover, now that we are relying more on sources written by Indigenous people and less on those produced by Europeans.

Credit not given for both this course and 01:590:381.

**01:508:383** ***History of Native American Women (3)***
Explores the lives and experiences of Native American women from 16th-century contact with Europeans through the present-day United States.
***Credit not given for both this course and 01:988:387.***

**01:508:391,392** ***Historical Studies (3,3)***
Separate sections focusing on different topics at different times and in different areas. Specific titles available at time of registration.

**01:508:393** ***Global Diasporas in Caribbean History (3)***
Intraregional migrations of Caribbean since 18th century. Theories and concepts of migration; slavery; Asian indentured workers; European and American presence; labor migration; Panama Canal; export economies; race; citizenship; transnational dynamics.
***Credit not given for both this course and 01:595:393.***

**01:508:410** ***Medieval Turkey, 1071-1481 (3)***
Origins and development of Turkish states in Asia Minor including Seljuk Sultanate of Rum, its successor beyliks, and early Ottoman Empire.
***Credit not given for both this course and 01:685:410.***

**01:508:420** ***African Labor History (3)***
African labor history: precolonial labor mobilization, control, and resistance; working-class formation; the labor process and worker consciousness.
***Credit not given for both this course and 01:014:367.***

**01:508:424** ***African Cities Past and Present (3)***
Social, cultural, economic, and political history of African cities with focus on student-led comparative research.
***Not open to first-year students. Prerequisite recommended: One course on Africa.***

**01:508:429** ***Research in African Historical Studies (3)***
Construction of the African past through extended study of sources for one region or theme. Requires research paper based on primary sources.

**01:508:450** ***Society and Culture in Japan (3)***
Topical approach to traditional Japanese history. Focus on social institutions, the courtly and martial arts, and the endurance of traditional values in postindustrial Japan.

History (SAS)

# European History Courses (510)

# European History Courses (510)

**01:510:101** ***Ancient and Medieval Europe (3)***
Introductory survey of European history from ancient times to the early modern period. Introduction to historical interpretation and historical inquiry.

**01:510:102** ***Europe in the Global Age (3)***
Introductory survey of European history from the early modern period to the present. Introduction to historical interpretation and historical inquiry.

**01:510:191,192** ***Topics in History (3,3)***
Study of special topics in European history at the introductory level.

**01:510:201** ***Ancient Greece (3)***
Civilization of the eastern Mediterranean world in ancient times, with emphasis on the origins of Western civilization and the Greek contribution to Western culture.
***Credit not given for both this course and 01:190:201.***

**01:510:202** ***Ancient Rome (3)***
The Roman Republic and the Empire, with emphasis on the rise and decline of a Mediterranean world civilization under Roman leadership.
***Credit not given for both this course and 01:190:209.***

**01:510:205** ***History of the Byzantine Empire (3)***
Survey of political, military, religious, and socioeconomic development of the eastern Roman Empire, centered at Constantinople, from late third century to Ottoman conquest in 1453.
***Credit not given for both this course and 01:489:205 or 01:685:205.***

**01:510:207** ***Byzantine Civilization (3)***
History of Byzantine culture and civilization, including political ideology and statecraft, orthodox Christianity, transmitting classical traditions of science and literature, art and architecture, and laying foundations of modern Greek culture.
***Credit not given for both this course and 01:489:207 or 01:685:207.***

**01:510:209** ***Emergence of Medieval Europe, 400-1150 (3)***
Europe from the fall of Rome through the Dark Ages and into the feudal age--the era of Charlemagne, the Vikings, and the Crusades.
***Credit not given for both this course and 01:667:281.***

**01:510:211** ***Harvest of the Middle Ages, 1150-1520 (3)***
From feudalism to the Protestant Reformation, with emphasis on social and economic developments. Religious, political, institutional, and cultural changes.
***Credit not given for both this course and 01:667:282.***

**01:510:213** ***The Crusades (3)***
Ideology and expressions of the crusades, 11th to 14th centuries, including crusades against Muslims, heretics, and other papal enemies. Extensive use of film.
***Credit not given for both this course and 01:685:213.***

**01:510:217** ***From Byzantium to the Ottomans: 1204-1460 (3)***
Development of Byzantine society and culture from the Latin crisis (1204-1261) through the Ottoman conquest (1453), including the Byzantine impact on West European, Slavic, and Ottoman cultures.
***Credit not given for both this course and 01:489:217 and 01:685:217.***

**01:510:222** ***Greek Food from Antiquity to Today (3)***
Food and foodways of Greek-speaking peoples from ancient times to the present, with special emphasis on problems of continuity and change.
***Credit not given for this course and 01:489:220, 01:685:220, 01:667:220, or 01:190:220.***

**01:510:224** ***Europe: Gender, Sex, and Society (3)***
Explores the varieties of gendered experience in Europe from the Enlightenment to the 20th century, including the relationship between gender, class, ethnicity, and sexual orientation. Course material will emphasize interdisciplinary and comparative approaches.

**01:510:231** ***A History of the Britannic Isles: From the Beginnings to the 18th Century (3)***
Explores the histories of the Britannic Isles--modern England, Ireland, Scotland, and Wales--from the beginnings until the Act of Union of 1707; emphasis on history of migration, invasion, and cultural exchange.

**01:510:232** ***Fashion & Design in Europe: Between the West and the World (3)***
Focuses on a series of "moments" in European history when aesthetic styles in clothing became a flashpoint for cultural change. Explores the history and culture of clothing and fashion through a range of disciplinary and interdisciplinary perspectives from the European Renaissance to the 20th century.

**01:510:245** ***The Arts of Power: Ritual, Myth, and Propaganda (3)***
Investigates how paintings, movies, poems, and ceremonies have been manipulated to bolster the political authority of rulers, including Louis XIV, Lincoln, Hitler, and Elizabeth II.

**01:510:248** ***The Last Climate Crisis: Histories of the "Little Ice Age", c.1300-1800 (3)***
Analyzes the social, environmental, political, and cultural impact of the centuries-long climatic cooling often known as the ¿Little Ice Age¿ (c.1300-1800). Students consider what the historical study of the last climate crisis can teach us about what awaits us in the current crisis of anthropogenic climate change.

**01:510:253** ***History of Witchcraft and Magic (3)***
Witchcraft in relation to the history of religion; the phenomena of crime, deviance, and demographic change; and the history of women in Europe and America.

**01:510:255** ***Dracula: Facts and Fictions (3)***
History of Dracula in context of early modern Balkan and Ottoman political and military history. Historical and literary legacies of Dracula from the 15th century to the late 19th century.

**01:510:260** ***Remembering the Shtetl (3)***
How Jewish life in eastern European small towns has been documented and recalled from 19th century to present in fiction, art, ethnography, film, and memoir.
***Credit not given for both this course and 01:563:260.***

**01:510:261** ***History of the Holocaust (3)***
Development of anti-Semitism in modern European history culminating in the "Final Solution"; special emphasis on Jewish responses and resistance.
***Credit not given for both this course and 01:563:261.***

**01:510:263** ***Between Nazism and Communism (3)***
Explores the experiences of Poles and Polish Jews under Nazi and Communist rule through history, travel writing, memoir, poetry, and film.
***Credit not given for both this course and 01:563:270.***

**01:510:265** ***Jewish-Christian Relations through the Ages (3)***
Jewish-Christian relations from the first century CE to the start of the 21st century. Focuses both on the history of interactions between Jews and Christians--persecutions, collaborations, conversions, etc.--and the history of theological stances and popular attitudes.
***Credit not given for both this course and 01:563:240.***

**01:510:268** ***Fascism (3)***
Examines connections between alt-right, white power, and neo-Nazi groups today to the historical fascist movements and regimes of the 1930s and 1940s. Historical perspective on what fascism is, what fascists believe, and they want to do. Considers the historical conditions that have produced fascism, the legacies of the fascist movements of the 1930s for our own time, and the relevance of fascism's history to the challenges of the present day.

**01:510:269** ***Antisemitism (3)***
History of negative attitudes toward Jews and Judaism from the ancient and medieval world to modern Europe, the United States, and the Middle East. Explores continuities and turning points in the history of antisemitism as well as the significance of antisemitism as an analytic category. Focus on contemporary discourses and media representations of antisemitism in light of their historical precedents and resonances.
***Credit not given for both this course and 01:563:269.***

**01:510:271** ***Russia and the West (3)***
Formation of traditional Russian society in isolation from the West; the impact of the West on Russia from Peter the Great to the present.

**01:510:277** ***Russia: Between Empire and Nation (3)***
Study of Russia's imperial culture, history, and politics from the 19th to the 21st century as a window onto geopolitical shifts in contemporary Russia's relations to the wider world.
***Credit not given for both this course and 01:195:272 or 01:860:272.***

**01:510:291,292** ***Topics in History (3,3)***
Study of special topics in European history at the intermediate level.

**01:510:300** ***Greek and Roman Slavery (3)***
Social, economic, legal, and political aspects of slavery in Ancient Greece and Rome. The sources and numbers of slaves, forms of servitude, manumission, and slave labor.
***Credit not given for both this course and 01:190:300.***

**01:510:301** ***Early Greece (3)***
History of the Greek world from Minoan Crete through the Persian War. Readings (in translation) range from Homer through Herodotus.

**01:510:302** ***Classical Greece (3)***
Greek history from the Persian War to the Macedonian conquest of Greece. Readings (in translation) from Thucydides, Xenophon, Demosthenes, Plutarch, and others.

**01:510:303** ***Hellenistic World (3)***
Expansion and development of Greek culture from Alexander through the successor kingdoms in Greece, Egypt, Syria-Palestine, and Asia Minor.
***Credit not given for both this course and 01:190:303.***

**01:510:304** ***The Rise of the Roman Republic (3)***
Roman political, social, and cultural history from the beginning of urban settlement through the emergence of the Roman state as the dominant power in the Mediterranean basin to the end of the second century BC.

**01:510:305** ***The Crisis of the Roman Republic (3)***
Roman political, social, and cultural history during the crisis of the late republic from 133 BC, the tribunate of Tiberius Gracchus, through the establishment of the principate by the Emperor Augustus.
***Credit not given for both this course and 01:190:305.***

**01:510:306** ***Roman Empire (3)***
Political, social, and intellectual developments of the imperial period until the age of Constantine, with emphasis on the first two centuries AD.
***(Formerly 01:510:305) Credit not given for both this course and 01:190:306.***

**01:510:307** ***The Roman World in Late Antiquity (3)***
Development of the Roman state and society from the late third through early seventh centuries. The transformation of the late classical world, and the origins of Byzantium and the medieval West.
***(Formerly 01:510:306)***

**01:510:308** ***Creating Culture and History in the Ancient World (3)***
Aspects of cultural, religious, and intellectual developments in the classical world.
***(Formerly 01:510:307)***

**01:510:309** ***A History of Western Morals: Antiquity and Middle Ages (3)***
Examines the formative period of moral ideas in Western civilization in ancient Greek, Roman, and Hebrew societies, then traces the evolution of those ideas through the Middle Ages.

**01:510:310** ***Pompeii: The Life and Death of a Roman Town (3)***
Pompeii and Herculaneum, as laboratories for the study of Roman life: the economy and society; public and private architecture, art, and inscriptions; and the birth of archaeology.
***Prerequisites: One course in Roman history or culture, Latin or ancient art, or permission of instructor. Credit not given for both this course and 01:190:373.***

**01:510:311** ***Cities of the Classical World (3)***
Study of urban development in antiquity, focusing on Athens and Rome, and synthesizing the evidence of literary, historical, and archaeological sources.
***Credit not given for both this course and 01:190:372.***

**01:510:312** ***Cleopatra (3)***
Examines the historical Cleopatra and the reception of her image from antiquity to the present in literature, art, and film. Issues considered include female power in a man's world, east versus west, and politics and propaganda.
***Credit not given for both this course and 01:190:318 or 01:988:321.***

**01:510:313** ***Muslims, Christians, and Jews in Medieval Spain (3)***
History of medieval Spain with a focus on cultural, religious, and political diversity.
***Credit not given for both this course and 01:563:307.***

**01:510:314** ***Jews, Heretics, and the Inquisition (3)***
Survey of the Medieval, Spanish, and Roman inquisitions focusing on these institutions' attitudes toward--and treatment of--heretics, Jews, and conversos. Examines how these inquisitions operated and their legal precedents as well as their relations to the social, political, and religious tensions of their day, in the context of broader historical questions about forms of intolerance and modes of persecution.
***Credit not given for both this course and 01:563:314.***

**01:510:315** ***Reform and Dissent in the Middle Ages (3)***
Christian unity and its implementation, church structure, canon law, monastic reform, conciliar movement, academic and popular heresy, and church-state relations, with emphasis on Italy and Germany. Integrated, interdisciplinary study of the age of the Renaissance in Italy and northern Europe from 1300 to 1550.
***(Formerly 01:510:417)***

**01:510:316** ***Food and Drink in Medieval Europe (3)***
Food history at the crossroads of environmental, economic, agricultural, dietary, social, gender, ethnic, everyday life, religious, and political-diplomatic investigations. Examination of these themes within the millennial trajectory of medieval Europe and the Mediterranean from ca. 450 CE to ca. 1450 CE.

**01:510:317** ***The Renaissance (3)***
Integrated, interdisciplinary study of the age of the Renaissance in Italy and northern Europe from 1300 to 1550.

**01:510:318** ***Era of World War I (3)***
Causes, course, and consequences of World War I in the light of political, social, and military forces.
***(Formerly 01:510:417)***

**01:510:319** ***The Age of Reformation, 1500-1648 (3)***
The Protestant and Catholic reformations and their significance for European society.

**01:510:320** ***Women in Antiquity (3)***
Women in the ancient societies of Greece and Rome. Their roles and images in the social, legal, political, domestic, philosophical, and artistic spheres examined using primary sources.
***(Formerly 01:510:251). Credit not given for both this course and 01:190:320.***

**01:510:321** ***The Age of Enlightenment (3)***
Eighteenth-century European philosophy and philosophers examined within their historical contexts. The role of ideas in movements for social, moral, and political change.

**01:510:325** ***Nineteenth-Century Europe (3)***
Examination of the formative period of modern Europe, including the industrial and democratic revolutions, nationalism, imperialism, and the crises culminating in World War I.

**01:510:327** ***Twentieth-Century Europe (3)***
Major economic and social forces shaping life in 20th-century Europe, and efforts of major social groups to cope with and shape these forces.

**01:510:329** ***World War II in Europe (3)***
Exploration of causes, events, and consequences of WW II in Europe. Focus on political, military, economic, social, and cultural history dimensions.

**01:510:330** ***The Spanish Civil War (3)***
Analysis of the historical factors that led to war in twentieth-century Spain, how major powers influenced the conflict's outcome, and the war's impact on European and global politics.

**01:510:333** ***France, Old Regime, and Revolution (3)***
French history from Louis XIV to the fall of Napoleon. The absolutist state and the impact of revolution, stressing the interplay of political, social, cultural, and economic history.

**01:510:335** ***Modern France (3)***
History of France from the fall of Napoleon to the present, with particular emphasis on the relation of political developments to social, intellectual, and economic change.

**01:510:337** ***Medieval Kings and Queens (3)***
Rulership in theory and practice, from Germanic chieftains to divine-right monarchs, with attention to royal rivals, myths and rituals, marriage, and gender.

**01:510:338** ***England in the Middle Ages (3)***
Political development of England from William the Conqueror to the War of the Roses.

**01:510:340** ***British Atlantic World (3)***
Explores the forms of knowledge and networks of communication that shaped British colonization in the early modern Atlantic. Themes include early contact with Native Americans; commerce, piracy, and slavery; political communications and the American Revolution; and the campaign to abolish the slave trade.

**01:510:343** ***A Century of Revolution: Politics and Culture in England 1588-1720 (3)***
Explores the tumultuous political history of England during the "long seventeenth century," focusing on the long-term origins and consequences of the revolutions of 1640-60 and 1688-89, the impact of religion on politics, and the operations and transformations of monarchical and popular political culture.

**01:510:344** ***The Social History of England, 1580-1780: The First Modern Society? (3)***
Explores the socioeconomic and cultural history of early modern England. Topics include popular culture; religion; sex and gender; urbanization; and the rise of consumerism, industrialism, and capitalism.

**01:510:345** ***English Constitutional History to 1688 (3)***
Developments of English governments to 1688, with emphasis on those institutions and political and legal ideas that form the background for American constitutional development.

**01:510:346** ***The English Revolution, 1640-1660 (3)***
Explores the most tumultuous period in English history. Topics include causes and revolution, the Civil War, regicide and republicanism, radical politics and religion, and Oliver Cromwell.

**01:510:347** ***The British Empire and the British Isles, 1485-1763 (3)***
History of British overseas enterprise from opening phases of Atlantic exploration through the end of the Seven Years' War. Special attention to impact of empire on British Isles.

**01:510:348** *Great Britain, 1685-1815 (3)*
Explores Great Britain's rise to dominant global power. Focuses on internal developments as well as colonial experiences.

**01:510:349** *Modern Britain (3)*
Developments since the 18th century that have shaped the character of contemporary Britain, including parliamentary democracy, industrialization, rise and fall of empire, and cultural change.

**01:510:350** *Greek Society (3)*
Social and economic life of the Greeks from the Mycenaean period through the Hellenistic age. Written and material evidence employed.
***Prerequisite: Recommended: 01:510:201. Credit not given for both this course and 01:190:350.***

**01:510:351** *Medieval Italy, 476-1300 (3)*
The Italian peninsula from the fall of the empire in the west to the age of the communes; social, political, and religious history.

**01:510:354** *History of Italy's People (3)*
Topical approach. Etruscans to present. Emphasis on culture, geography, religion, philosophy, family structures, agricultural systems, urban development, and universities.

**01:510:357** *Medieval Germany (3)*
Survey of German history from the late Roman Empire to the threshold of the Reformation, ca 300 to ca 1500.

**01:510:360** *Society and Culture in Germany 1750-1870 (3)*
Introduction to the classical period of German culture, including study of Kant, Fichte, Lessing, Goethe, and Shiller in historical context.

**01:510:363** *Germany from 1871 to Present (3)*
Analysis of the collapse of imperial Germany, the failure of democracy in the Weimar Republic, Hitler's Third Reich, the Holocaust, and restructuring of Germany since 1945.

**01:510:368** *Jews of Germany and Austria-Hungary, 1780-Present (3)*
Jewish history in modern Central Europe. Focus on Germany, Austria, Hungary, and Czechoslovakia (now the Czech Republic and Slovakia) from the late 1700s until the present day.
***Credit not given for both this course and 01:563:368.***

**01:510:370** *Remembering the Holocaust (3)*
Holocaust remembrance in contemporary social and cultural practices in the United States and globally considered as a paradigm for deriving lessons from the past in order to respond to traumatic losses, address present social injustices, and prevent future acts of intolerance.
***Credit not given for both this course and 01:563:360 and 01:470:369.***

**01:510:372** *Armenian Genocide in Comparative Perspective (3)*
Overview of the Armenian Genocide in comparative perspective, drawing from a wide spectrum of cases of mass violence and genocide, the development of the concept of genocide in International Law, genocide denial, responsibility to protect, reparations, and reconciliation; organization and implementation of the genocide, humanitarian and armed resistance to it, and the aftermath of genocide.

**01:510:373** *State and Society in Imperial Russia (3)*
Autocratic government as a dynamic force in the 18th century and a conservative one in the 19th century in the face of intellectual and socioeconomic development.

**01:510:375** *Revolutionary Russia and the Soviet Union (3)*
Crisis of the old regime; revolution; building socialism in an underdeveloped country; Stalin's terror; expansion and the Cold War; the post-Stalin attempts at reform; and the breakup of the Soviet Union.

**01:510:377** *Russia in War and Peace (3)*
History of Russia from the war against Japan in 1904 to post-Soviet wars in Chechnya. Focus on how international conflicts affected Russian politics, culture, and society: Revolution of 1905, turmoil in First World War, revolutions of 1917, Russian Civil War, "socialism in one country," mythology of Great Patriotic War, xenophobia in Cold War, war in Afghanistan, and collapse of communism.

**01:510:378** *Jews and Revolution (3)*
Jewish experience in modern Russia, with special focus on the involvement of Jews in the Russian Revolution and socialism and nationalism during the Soviet Union, and the challenges to Russian-Jewish relations in the post-Soviet era.
*Credit not given for both this course and 01:563:331.*

**01:510:379** *St. Petersburg (3)*
Intensive study of the historical development of St. Petersburg and its role in Russian and European history. Variable topics; specific topics will be available at time of registration.
*No knowledge of Russian required. Offered only as part of summer program in St. Petersburg.*

**01:510:381** *Eastern Europe, 1800-1948 (3)*
Emergence of national movements and independent states in Poland, Czechoslovakia, Hungary, Yugoslavia, Romania, and Bulgaria. Problem of national minorities in nation-states, and solutions offered by nationalist, fascist, and communist regimes.

**01:510:382** *History of Modern Greece (3)*
Greek experience under Ottoman rule; revolution and independence; development of national state and society 1830s to present.
*Credit not given for both this course and 01:489:382 or 01:685:382.*

**01:510:383** *Eastern Europe, 1945-Present (3)*
Impact of communism and neoliberalism on Eastern Europe. Collapse of the Soviet Bloc, transition to liberal market capitalism, and its social consequences.

**01:510:384** *Cyprus: A Global History (3)*
History of Cyprus from the 16th to the 21st century.
*Credit not given for both this course and 01:489:381 or 01:685:384.*

**01:510:385** *The History of East European Jewry (3)*
Economic, legal, and political conditions of Jewish life from the 16th century to World War II. Forms of Jewish response: autonomism, messianism, Hasidism, emigration, and socialism.
*Credit not given for both this course and 01:563:385.*

**01:510:386** ***Zionism: Meanings and Challenges (3)***
Origins of Zionism in the mid-19th century and its development to the present day. Topics addressed include Zionism¿s political and social contexts, how other ideologies shaped Zionism, critics of Zionism, and the effect of Zionism on Jews¿ relationship to each other and to their surrounding societies.

***Credit not given for both this course and 01:563:343***

**01:510:389** ***Jewish Politics, Jewish Power (3)***
Political relationship of the Jewish community to the Gentile authorities among whom they lived, from Rome in 70 CE to the contemporary period. Continuities and discontinuities of traditional conceptions of Jewish political behavior; rebellion and accommodation to structures of power in varying historical contexts.
***Prerequisite: At least one course in Jewish or European history after 1500. Credit not given for both this course and 01:563:389 and 01:790:384.***

**01:510:390** ***Jewish Memory (3)***
Course explores various forms of Jewish memory shaped in response to major events, including myths, holidays, monuments, pilgrimages, testimonies, museums, literature, and film.
***Credit not given for both this course and 01:563:390.***

**01:510:391,392** ***Historical Studies (3,3)***
Separate sections focusing on different topics at different times and in different areas. Specific titles available at time of registration.

**01:510:393** ***Jewish Historical Fiction (1.5)***
Explores a variety of Jewish historical novels and their relationship to the historical periods they purport to represent, from late antiquity to the modern period. Special emphasis is given to comparing works of history with works of fiction. Topics include: Second Temple sectarianism, medieval Jewish marriage law and customs, mysticism, sabbatianism, and revolution in the Soviet Union.
***Credit not given for both this course and 01:563:336.***

**01:510:394** ***Human Rights (3)***
Examines the history of human rights as a set of ideas and as a motivation for social action. Special emphasis on the role of human rights in Europe, but includes comparisons with rights-based activism in other parts of the world.

**01:510:401** ***The Idea of Europe: 18th Century to the Present (3)***
Exploration of the concepts "Europe" and "Europeans" from 1700 to the present.
***Prerequisite: 01:510:101-102 or permission of instructor. Credit not given for both this course and 01:360:401.***

**01:510:403** ***Ancient Warfare and Diplomacy (3)***
International politics and military history in the Greek and Roman world. Readings include ancient sources (in translation) and modern interpretations.

**01:510:407** ***Rome in the Age of Augustus (3)***
Examination of the career of Augustus and the developments in the Roman world during this period. Treatment of the problems of change and continuity through revival and innovation in political, social, and intellectual spheres, with emphases on growth of imperial system and on the literary works and social legislation.

**01:510:419** ***Europe in the Contemporary World (3)***
Europe from 1930s to present, focusing on European responses to challenges of American power, Soviet revolution, and anticolonial movements.

**01:510:425** ***Intellectual History of Early Modern Europe (3)***
Study of major currents of thought (religious, scientific, political, and social) from the end of the Middle Ages to the 18th century.

**01:510:441** ***The Social History of Medieval England (3)***
Concentrates on the interaction between individual and society in medieval England with special emphasis on the life experiences of the common people.

**01:510:484** ***Russia after Stalin: Literature, History, Theory (3)***
Recent past of Russian culture and politics. Study of how the Stalinist past influenced late Soviet Russian culture, contributed to the collapse of the USSR, and shaped post-Soviet Russia through examination of powerful fiction texts and films that defined the post-Stalin era, from 1950s onward, as well as nonfiction and theoretical texts on Stalinism and its aftermath.
***Taught in English. Credit not given for both this course and 01:86:484 and 01:195:484.***

History (SAS)

# American History Courses (512)

# American History Courses (512)

**01:512:103** ***Making of America: Colonization to Civil War (3)***
Political, economic, and social history of the United States from colonial times to the Civil War.

**01:512:104** ***Making of America: Gilded Age to Global Power (3)***
Political, economic, and social history of the United States from the Civil War to the present.

**01:512:107** ***Gateway to Making of America: Colonization to Civil War (4)***
U.S. history to 1877, with weekly recitation section.
***Registration through school dean.***

**01:512:108** ***Gateway to Making of America: Gilded Age to Global Power (4)***
U.S. history since 1877, with weekly recitation section.
***Registration through school dean.***

**01:512:111** ***Race, Place, and Space in American History (3)***
Explores the interplay of social, historical, and spatial forces in configuring American racial formations and identities--white, black, Indian, and Asia--from the colonial period to the present. Situates race in geographical context and assesses how modern America has been influenced by the historical development of racialized spaces and places.

**01:512:121** ***Health and Environment in America (3)***
Changing manner in which Americans perceived and responded to health-related problems involving both the individual and the physical and social environment from the 17th to the 20th century.

**01:512:191,192** ***American Topics (3,3)***
Study of special topics in American history at the introductory level.

**01:512:205** ***The American Presidency (3)***
Examines the American presidency in historical perspective, including the powers of the office, its place in the American imagination, and the substantive achievement of the most significant presidents.

**01:512:210** ***Food in the United States and the World (3)***
Examines the histories of food production and consumption in the United States and the world from the colonial era to the 21st century, with particular emphasis on the 19th and 20th centuries. Considers how political and economic power relations, social norms, and cultural traditions regarding food production and consumption have changed over time.

**01:512:212** ***Cowboys and Indians on the Western Frontier (3)***
Introduction to the history of the west and tensions between native people and settlers.

**01:512:215** ***American Legal History (3)***
American legal history from the 18th century to the contemporary era. Focus on specific case studies in the history of American law.

**01:512:216** ***Famous Trials (3)***
Examines famous American trials (Sacco and Vanzetti, Scopes, Scottsboro, Hiss) with comparative trials from world history (Galileo, Dreyfus, Oscar Wilde). Includes film portrayals and 21st-century parallels.

**01:512:220** ***Your Family in History (3)***
American history from the perspective of a student's own family or ethnic group. Impact of social, cultural, economic, and religious changes on the family.

**01:512:221** ***Abortion: The Collision of History, Law, Religion, Medicine, and Human Rights in the 20th and 21st Centuries (3)***
Abortion is one of the most socially contested issue of our time. Using a historical and

sociological lens, this course seeks to understand the issues in more contextual and less polemic manner. This course will explore the history of abortion, key legal and public health aspects, the anti-abortion social movement, the realities of abortion provision, abortion in popular culture and public opinion, and abortion in the international arena.

Credit not given for both this course and 01:840:220.

**01:512:225** ***Sexuality in America (3)***
The history of sexuality in American history from early colonization to contemporary America. Explores the factors that shaped people's sexual lives and introduces students to the historical study of sexuality.

**01:512:229** ***History of Medical Ethics (3)***
Overview of medical ethics in 19th and 20th century United States and the historical milestones that led to our current system of research oversight. Traces history of research with human subjects prior to the establishment of bioethics as a field and examines discussion and practice surrounding human subjects research in late 19th and 20th centuries. Topics include Tuskegee Syphilis Experiment, ethical issues in human reproduction, ethics of death and dying, ethics of commodification of medical care.

**01:512:230** ***History of Medicine in Film (3)***
Portrayals of medicine and medical care in American film over the past 80 years. What popular films can tell us about the cultural images of physicians, technology, and medicine in American society.

**01:512:231** ***American Jewish History (3)***
History of the Jews in the New World, beginning in the middle of the 17th century, and then focusing on the United States until the present.
***Credit not given for both this course and 01:563:231.***

**01:512:235** ***Accidents and Disasters in the United States and the World (3)***
Examines the histories of accidents and disasters in the United States and the world from the 17th to the 21st centuries, with particular emphasis on the 19th and 20th centuries.

**01:512:236** ***Edison and His Era (3)***
Work of Thomas Edison as a vehicle for understanding the transformation of the American economy and culture from 1880-1930.

**01:512:237** ***Data: A Social History (3)***
Explores data in American society. How and why data became central to government, business, and daily life in the United States, from the nineteenth century to the present day.

**01:512:238** ***History of Homelessness: Unhoused Populations in US History (3)***
Examines social and legal history of homelessness and unhoused populations in the United States, from the colonial period to the present.

**01:512:240** ***World War I (3)***
Study of the causes, course, and consequences of World War I, with particular emphasis on American culture and foreign policy within Western civilization.

**01:512:242** ***World War II (3)***
Study of the causes, course, and aftermath of World War II, with particular emphasis on the place of American culture and foreign policy within world politics.

**01:512:250** ***Natives and Newcomers: Immigration and Migration in U.S. History (3)***
Immigration and migration in U.S. history from precolonial societies to the present. Critical examination of the dynamics of immigration over several centuries, challenging common fundamental views. Considers immigration from the perspective of natives or "the nation" and from the view of newcomers.

**01:512:253** *Asian American History (3)*
Introduction to the political, economic, and sociocultural aspects of immigrants from Asia and their descendants in the United States from the 16th to the 21st century.
*Credit not given for both this course and 01:050:253.*

**01:512:260** *American Slavery (3)*
Examines the institution of slavery from 1619 through the Civil War. Considers how slavery changed over time and how it was experienced in different regions.

**01:512:262** *African-American History to 1877 (3)*
African-American history from origins in Atlantic Africa to the end of the Civil War. Focal points include the Atlantic African background, the Atlantic slave trade, Antebellum slavery, slave culture, and the Civil War. Explores forces which have converged to create African-American peoples and shape their lives, communities, and cultures in early North America.

**01:512:263** *African-American History, 1877 to Present (3)*
African-American history from defeat of Reconstruction to present. Topics covered include the post-Reconstruction period, Jim Crow, urbanization, and migration, as well as African-Americans' experiences with education, housing, and justice in the U.S. legal system. Examines key social justice movements such as the Civil Rights Movement and Black Power.

**01:512:264** *Black Lives Matter (3)*
Explores the development of the #BlackLivesMatter movement beginning with the colonial era and ending with the contemporary moment.
*Credit not given for this course and 01:014:264.*

**01:512:266** *History of the Black American (3)*
Survey of the history of the black American from the colonial era to the present. Includes such topics as slavery, the Reconstruction era, the Washington-DuBois controversy, the Harlem Renaissance, and the Civil Rights movement.

**01:512:267** *History of Black Travel and Migration (3)*
Examines the various travels taken by African Americans. From the forced migration of African peoples in the transatlantic slave trade to contemporary heritage tours to Africa, this class explores the meaning of travel for African Americans.

**01:512:268** *Plantation to White House (3)*
Exploration of the history of blackness in America, from colonial times to the present, with key questions focusing on slavery, citizenship, gender, and racial identity.

**01:512:278** *Popular Music in American History (3)*
Popular music examined within the broader social and cultural context of America's past. Significant historical changes in musical expression.

**01:512:280** *News Media and Government in American History (3)*
Examines relationship between media and institutions, and the processes through which people and societies make political choices.
*Credit not given for both this course and 04:567:278.*

**01:512:282** ***Sport in History (3)***
Role of sport in ancient and preindustrial societies; modernization of sport following the Industrial Revolution; social functions and aesthetics of sport; women in sport; sport in contemporary society.

**01:512:291,292** ***Topics in History (3,3)***
Study of special topics in American history at the intermediate level.

**01:512:300** ***History of Colonial America (3)***
From the Age of Discovery through the American Revolution, with particular emphasis on political, economic, and social history.

**01:512:301** ***The American Revolution (3)***
Coming of the American Revolution seen in its world setting; various interpretations of the causes: ideological, constitutional, social, economic, political, diplomatic, and military perspectives.

**01:512:302** ***The United States: The Young Republic (3)***
Examination of the principal political, economic, and social forces that were responsible for the development of the new nation.

**01:512:303** ***American Civil War and Reconstruction, 1848-1880 (3)***
Analysis of major forces 1848 to 1880. Emphasis on the more immediate background to the war; how the war began; how it was fought; and why Reconstruction developed and collapsed.

**01:512:304** ***The Forging of Modern America, 1880-1920 (3)***
Political reform movements against the background of industrial development, urbanization, and immigration in the United States from 1880 to 1920.

**01:512:305** ***U.S. History, 1914-1945 (3)***
U.S. history from World War I through World War II, emphasizing major themes in U.S. politics, society, culture, and diplomacy.

**01:512:306** ***U.S. History, 1945 to the Present (3)***
U.S. history emphasizing the cold war, McCarthyism, and the major political, social, and economic trends of the 1960s and 1970s.

**01:512:308** ***History and Asylum Law in the United Stats (3)***
Advanced research seminar and practicum; explores the history of asylum in the United States; shows how historical research can be applied to the practice of asylum law.

**01:512:310** ***New Jersey History (3)***
New Jersey from its proprietorial beginnings to the present. Emphasis on those factors that have been most influential in determining the character of the state today.

**01:512:311** ***History of American Education (3)***
A historical survey of American education from the colonial period to the present. Topics considered will include the following: 1) colonial American education; 2) the origins of common schools; 3) the development of a public school system; and 4) 20th- and 21st-century educational reform.
***Credit not given for both this course and 05:300:364.***

**01:512:313** ***Childhood in America (3)***
Introduction to childhood as a subject of historical inquiry, exploring both childhood as a cultural expression and children as historical subjects over the course of 400 years of American experience in psychological, religious, social, educational, economic, and political terms.

**01:512:314** ***The City in American History (3)***
Urbanization from the colonial city to the 20th-century metropolis; urban population, institutions, problems, and planning; urbanism in American culture.

**01:512:315** ***Famous Trials in Modern America (3)***
Civil liberties and civil rights trials in 20th-century America: Abrams, Sacco and Vanzetti, Scopes, Scottsboro, Rosenbergs, Hiss, *Roe v. Wade*.

**01:512:316** ***Radicalism in America (3)***
Ideas of the outstanding radicals in American history (18th century to the present), the areas of discontent, and an analysis of the response of the American community.

**01:512:317** ***Murder in American History (3)***
Famous murders (and other capital crimes) illustrating major cultural and political trends in American life. May include Salem witchcraft, the Boston Massacre, Sacco and Vanzetti, Lindbergh, Leopold and Loeb, and Emmett Till.

**01:512:318** ***History of Political Corruption and Reform in America (3)***
The long history of political corruption in America, and the reform movements designed to combat corruption. From colonial America to the present.

**01:512:319** ***Nineteenth-Century Architecture and Society in the United States (3)***
Overview of the social and intellectual history of architecture in the United States to 1900. Role of architecture in societal transformations (the development of nationhood, industrialization, and urbanization). Emphasis on the invention of new building types, including universities, government buildings, prisons, hospitals, railroad stations, and the architecture of World's Fairs.
***Credit not given for both this course and 01:082:391.***

**01:512:320** ***American Frontier History (3)***
Mythology, theory, and reality of the frontier in American social, cultural, and environmental development from discovery to the present.

**01:512:321** ***Health Care and Society in America (3)***
History of disease in America from the age of smallpox and scarlet fever to the era of AIDS; and history of health and health care from the colonial era to present.

**01:512:322** ***Drugs: A Social History (3)***
History of drug use in modern America, drugs in the underground and informal economy, drug epidemics, and government response in the United States after World War II.

**01:512:323,324** ***History of the North American Environment (3,3)***
Comparative study of the interplay of culture, society, and environment in Canadian, U.S., and Mexican history.

**01:512:328** ***Science in American Culture (3)***
Place of science in U.S. history. Science and exploration, war, the economy, and social problems; growth of research and educational institutions; popular science and antiscience.

**01:512:329** ***Technology and Nature in American History (3)***
Historical exploration of the shaping of American history by technological and natural forces. From colonial America to the 21st century; from Walden Pond to Yosemite National Park, an exploration of land-use patterns, transportation networks, suburbanization, ideas about wilderness, environmental politics, and other topics.

**01:512:332** ***American Economic Growth since 1860 (3)***
Main currents and major factors in American economic growth, welfare, and decision making, 1860 to the present. Critical evaluation and interpretation of economic issues.

**01:512:335** ***History on Film (3)***
Examination of films that interpret the American past and engage major historical issues.

**01:512:342** ***Policing in Black Communities: From Slavery to Mass Incarceration (3)***
This course examines the history of policing in Black communities from its origins in colonial slavery to the present. It reveals how Black people's desire for freedom from slavery led fearful local, state, and federal authorities to establish a complex web of laws, policies and social practices that monitored and governed Black people's lives, laying a durable foundation for systems of racial and social control that continue to exist in modified forms in contemporary society.

**01:512:347** ***War, Peace, and the Military of the United States to 1877 (3)***
Survey of American attitudes toward and developments in regard to war, peace, and the military from colonial times through the Civil War and the end of Reconstruction.

**01:512:348** ***War, Peace, and the Military of the United States since 1877 (3)***
Survey of American attitudes toward and developments in regard to war, peace, and the military from modernization of the army and navy beginning in the late 19th century through the Spanish-American War, two world wars, the Korean and Vietnam wars, to the present military situation.

**01:512:350** ***From Colonies to Empire: American Foreign Relations to 1898 (3)***
American foreign relations from the colonists' conflicts with Native Americans to the Spanish-American War. Territorial expansion, diplomatic principles, economic expansion, and rise of the "New Empire."

**01:512:351** ***Mexican-American History (3)***
Examination of major themes in Mexican American/Chicano history since the 19th century. Topics include Spanish empire, Anglo-American conquest, racial hierarchies, labor migration, politics, popular culture, gender, sexuality, and social movements.
***Credit not given for both this course and 01:595:351.***

**01:512:352** ***U.S. Foreign Relations since 1898 (3)***
American foreign relations from the Spanish-American War to the end of the cold war: Imperialism, Wilsonian interventionism, World War II, cold war, and détente.

**01:512:354** ***America, Russia, and the Cold War (3)***
Examines the shift from friendship to antipathy between Russia and America in the late 19th century and early 20th century; the roots of Soviet-American ideological rivalry; superpower competition and global conflicts after 1945; détente; the ending of the Cold War; and the question of a "new Cold War" in the 21st century.

**01:512:355** ***America's Rise to Global Power (3)***
Technology as the key source of U.S. identity and projection of power and culture overseas. Focus on the interaction of United States and Asian and African societies.

**01:512:356** ***The Thirty Years' War: America in Vietnam (3)***
Examination of the causes and effects of the war in Vietnam with special emphasis on the United States and its role.

**01:512:359** ***Race, Culture, and Politics: Blacks and Jews in America (3)***
How black and Jewish identities have evolved in relationship to one another through an examination of social and political history, literature, and film.
***Credit not given for both this course and 01:563:359 or 01:014:359 or 01:050:339.***

**01:512:360** ***Latino History (3)***
History of people of Latin American and Hispanic Caribbean descent in the United States over the last two centuries. Experiences of exile, labor migrants, refugees, and colonial subjects. Formation of communities, political and labor struggles, and racial/ethnic identities.
***Special Notation: Not open to first-year students. Credit not given for both this course and 01:595:369.***

**01:512:361** ***History of the South (3)***
Development of southern society from the settlements of Virginia to the present. Aspects of life in the South that distinguish this region from others in the United States.

**01:512:362** ***Black Family in American History (3)***
Defines and interprets the black family at different points in American history. Also explores such contemporary topics as the rise of the "underclass" black family, and the tendency toward "singleness" in black America.

**01:512:363** ***African-American Women's History (3)***
Examines the diversity of African-American women's lives and the development of women, work, and culture from the colonial era through the late 20th century.

**01:512:364** ***History of Blacks in Urban America (3)***
Explores aspects of black urban life from the early years of the nation to the present. Migration. Examination of contemporary black urban America.

**01:512:365** ***African-American History Since 1945 (3)***
Social history, politics, and culture of African-American life in the United States from 1945 to the present.

**01:512:366** ***History of Race and Sex in America (3)***
Examines how race and gender have independently and jointly determined life chances throughout American history.
***Credit not given for both this course and 01:014:366 and 01:988:329.***

**01:512:368** ***History of Civil Rights, 1900-1980 (3)***
Politico-economic, demographic, cultural, and legal forces generating and shaping the struggle for racial justice in the United States from the beginning of the 20th century.

**01:512:370** ***History of American Thought to 1850 (3)***
Principal ideas about humanity, God, nature, and society in American history from Puritan America to 1850.

**01:512:372** ***History of American Thought since 1850 (3)***
Principal ideas about humanity, God, nature, and society in American history from 1850 to present.

**01:512:373** ***African Americans in a Revolutionary World, 1910-1940 (3)***
History of black migration to the urban South and North, Harlem Renaissance and the New Negro movement, the entrance of black people into industrial employment, the establishment of black urban communities, the development of black political activism and artistic production, pan-Africanism and the connection of black activists to global networks of activists and intellectuals in the Caribbean and Europe.

**01:512:374** ***Cultural History of the United States: 20th Century (3)***
Nature of American culture by study of folk, popular, and elite cultural products, verbal and nonverbal, in a world of mass production and consumption.

**01:512:375** ***Gay and Lesbian History in the United States (3)***
Introduction to gay and lesbian history in the United States; explores same-sex desire, queer identities, community formation, and social movements from the colonial period to present. Particular emphasis on queer history's place in the larger context of U.S. political, social, and cultural movements in history.

**01:512:376** ***American Culture in the 1950s (3)***
Survey of major cultural and political developments of the 1950s. Growth of advertising, consumerism, television, popular music, the "Ike Age," and McCarthy; perceptions of race and sex.

**01:512:377** ***The 1960s (3)***
Examines the political culture of the 1960s, centering on conflicts between the forces of order, consensus, and containment, and the social forces of protest, resistance, and liberation.

**01:512:379** ***African-American History, 1877 to Present (3)***
African-American history from defeat of Reconstruction to present.

**01:512:380** ***Women in American History I (3)***
Changing status of women from settlement to Reconstruction, including the study of work, family, religion, sexuality, organizations, and feminism.
***Credit not given for both this course and 01:988:380.***

**01:512:381** ***Women in American History II (3)***
Changing status of women from Reconstruction to the present, including the study of work, family, religion, sexuality, organizations, and feminism.
***Credit not given for both this course and 01:988:390.***

**01:512:383** ***Women's Rights in America, 1800-1930 (3)***
Explores women's rights movements in the United States from 1800-1930 in the context of larger developments in the Atlantic World. Movements studied include abolition of slavery, legal rights, labor organizing, peace, suffrage, and sex radicalism.

**01:512:385** ***Women Behaving Badly (3)***
History of women behaving badly in the late 19th- and early 20th-century United States. Examines histories of women criminals as well as experiences of women who transgressed racial, gendered, and sexual boundaries. Analysis of crime and female sexual deviance as well as efforts to curtail and reform disorderly women. Emphasis on social constructions of morality, delinquency, and womanhood.

**01:512:388** ***Religion, Law, and the American Constitution (3)***
A course that studies Religion in American Constitutional Law, focusing especially on Supreme Court cases related to religion from the 19th century to the present. Interpretation of the establishment and free exercise of religion clauses in the First Amendment has been and remains a vital issue for American democracy and civil rights. This course seeks to provide context and analytical tools for understanding religion's role in American law, and vice versa.

Credit not given for both this course and 01:840:381.

**01:512:391,392** ***Historical Studies (3,3)***
Separate sections focusing on different topics at different times and in different areas. Specific titles available at time of registration.

**01:512:395** ***The Electronic Century: Technology and Popular Culture Description (3)***
Shaping of American social and cultural life in the 20th century by electrical, electronic, communications, and computer technologies.

**01:512:400** ***History of American Politics (3)***
Conduct of politics in the United States, including the origin and development of political parties, characteristic forms of political behavior, and relationship of parties to democratic government.

**01:512:402** ***American Constitutional History to 1865 (3)***
Study of the origins of the American Constitutional system: American Revolution; Constitutional Convention of 1787; Bill of Rights; Marshall and Taney courts; slavery, racism, and the Civil War.

**01:512:404** ***American Constitutional History from 1865 (3)***
Supreme Court's role in interpreting the Constitution from the Civil War and Reconstruction (and passage of the 14th Amendment) to the present. Regulation of the economy and the "right to work"; free speech in war and peace; the New Deal; the due process "revolution"; abortion; affirmative action; and freedom of and from religion.

**01:512:432** ***History of Business in America (3)***
Historical view of the growth and change of business institutions in the United States from the colonial era to the present.

**01:512:434** ***History of Labor Movement (3)***
Impact of industrialization on the workforce of the United States. Economic pressures, technological developments, and ethnic subcultures as related to the social history of the working class.

**01:512:438** *Oral History Fieldwork (3)*
Problems, theories, and methods of conducting field interviews and transcribing, editing, and analyzing oral sources. Students document New Jersey families; ethnic communities; and labor, business, religious, and political groups.

# History/French Joint Major 513 (SAS)

## HISTORY/FRENCH JOINT MAJOR 513

The joint major is an integrated program consisting of 45 credits of interdisciplinary study in the history, literature, culture, and language of France and French-speaking regions. The program is administered jointly by the Departments of History and French, and students should obtain advising and program approval from the undergraduate director in either department.



## Major Requirements

## Major Requirements

The required 45 credits are distributed as follows:

*1. 18 credits in courses offered by the Department of History:*

6 credits in French history (01:510:331, 333, 335, or others by approval)

12 credits in either French history or related subjects, including non-European Francophone cultures. (Related courses in history include 01:510:101, 102, 321, 323, 325, 327, 343, 363, 407, 427, 445; 01:508:322, 422. Other courses may be added with approval of an adviser.)

*2. 24 credits in courses offered by the Department of French:*

9 credits of French language courses. A student may count only one of 01:420:131, 132, 210, and may not count 01:420:100, 101, 102, 105, 121, or 128.

6 credits as follows: 01:420:215 (or 217) and 216 (or 218). (These courses have a prerequisite of 200-level placement or successful completion of 01:420:132.)

9 credits on the 300 and 400 levels, at least 3 of which must be on the 400 level

*3. 3 credits from a senior seminar jointly offered by history and French (taught in English, with supplemental materials in French).*

With appropriate written approval, a student may count toward the major one School of Arts and Sciences honors seminar on an appropriate history/French topic, or one course given outside the history and French departments on a topic directly related to history/French. (For example, 01:082:351 Art in France, or a seminar on Paris/Tokyo-1700 to present.)

Of the required eight upper-level courses, at least four must be taken with Rutgers University-New Brunswick faculty.

History/French Joint Major 513 (SAS)

# Honors Program

# Honors Program

History/French majors with a cumulative grade-point average of 3.0, and a grade-point average of 3.4 in history and French courses, are encouraged to choose and carry out an independent project of advanced study on a topic that interests them for 6 credits, of which 3 count toward the major. Interested juniors may obtain further information from the departments and should consult an adviser.

History/French Joint Major 513 (SAS)

# Secondary Teaching Certificate

# Secondary Teaching Certificate

A secondary teaching certificate is available to students who complete the major and a fifth year in the teaching education department. Consult the Office of Teacher Education, Graduate School of Education, no later than the start of the junior year.

History/French Joint Major 513 (SAS)

# Study Abroad

# Study Abroad

History/French majors are urged to increase their knowledge of French through study abroad. Students who have completed French 01:420:213, 215, and 216 are eligible for study in Rutgers' program in Tours as sophomores or juniors. The French Department offers courses from the 213 to the 400 level through its seven-week summer program in Paris.

History/French Joint Major 513 (SAS)

# Eligibility for Departmental Activities

# Eligibility for Departmental Activities

Program majors are eligible to compete for nomination by the French department as "assistant d'anglais" (subsidized program to teach English in French schools for a year), to live in the French-speaking housing on

the Douglass campus or the French Living and Learning Community on the College Avenue campus, and for membership in the Phi Sigma Iota honorary society. A variety of special programs, opportunities, and events also are available through the history department, which will provide information at its offices.

Information may be found at the Department of History website or at the Department of French website.

# History/Political Science Joint Major 514 (SAS)

## HISTORY/POLITICAL SCIENCE JOINT MAJOR 514

The joint major is an integrated program consisting of 45 credits from the combined disciplines and not less than 21 credits from each. The program is administered by the Department of History and students should obtain advising and program approval from the undergraduate director in history.

**Major Requirements**

1. 15 courses in history and political science (45 credits)

2. 9 out of 15 courses in history and political science at the 300+ level (27 credits)

3. A minimum of 11 courses for the major must be taken at Rutgers University-New Brunswick.

4. Students must take 21 credits of political science, with 12 of those credits being at the 300+ level.

5. One course needs to be taken in each of the following four areas:

a. Global, African, Asian, Latin American, or Native American History (all 508 and select 506 courses)

b. European history (510)

c. United States history (512)

d. A course focusing on the period before 1500 CE

6. A History Seminar, either 01:506:401 or 01:506:402, in their junior or senior year. Students can also complete a Public History Internship (01:506:451) or Honors Program in History Thesis (01:506:496) for this requirement.

7. A History Workshop, 01:506:299, must be taken by the end of their sophomore year; junior-year transfer students must take the History Workshop in their first semester at Rutgers.

8. No more than two courses taken to complete a major or minor in another department can be used to fulfill the requirements of the history/political science joint major.

# Holocaust Studies 564 (SAS)

## HOLOCAUST STUDIES 564

**Website:** Here

**Director:** Jeffrey Shandler, Jewish Studies; Ph.D., Columbia

Judith Gerson, Sociology; Ph.D., Cornell

Paul Hanebrink, History and Jewish Studies; Ph.D., Chicago

Martha Helfer, German; Ph.D., Cornell

Michael Levine, German; Ph.D., Johns Hopkins

Jeffrey Shandler, Jewish Studies; Ph.D., Columbia

Nancy Sinkoff, History and Jewish Studies; Ph.D., Columbia

Arlene Stein, Sociology; Ph.D., California (Berkeley)

Paola Tartakoff, History and Jewish Studies; Ph.D., Columbia

**Holocaust Studies Minor**

This interdisciplinary minor enables students to take courses, offered by multiple departments, related to the history of the Holocaust and its remembrance, in order to acquire an in-depth understanding of the genocide in multiple contexts and its enduring importance as a moral paradigm.

Holocaust Studies 564 (SAS)

# Learning Goals

# Learning Goals

- Students will demonstrate a foundational command of the history of the Holocaust, situated within the context of European history of the first decades of the 20th century, the rise of Nazism and its racial policies, and World War II.
- Students will demonstrate an overview of representations of the Holocaust from a variety of countries and in an array of media, in order to understand how these works of memory are responsive to the context in which they are created and how they are used by various constituents to engage the public in issues of social justice.
- Students will demonstrate the relationship between their study of Holocaust history and remembrance with larger historical trajectories (e.g., modern Germany, modern Jewish history, World War II, Antisemitism), with related cultural practices (e.g., film, literature), with related intellectual issues (e.g., the ideology of fascism, the study of collective memory and of trauma), and/or other genocides.

Holocaust Studies 564 (SAS)

# Minor Requirements

# Minor Requirements

The minor consists of 6 courses.

*Two required courses:*

- 01:510:261 or 01:563:261 History of the Holocaust (3)
- 01:563:360 or 01:510:370:01 Remembering the Holocaust (3)

***Four additional courses in at least two different departments*** (German, History, Jewish Studies) related to the Holocaust as listed on the Elective Courses page. A relevant 3-credit independent study or internship (e.g., at the Museum of Jewish Heritage: A Living Memorial to the Holocaust in New York) can count as one of these four courses, with approval of the faculty adviser. A 6-credit honors thesis can count as two of these courses, with approval of the faculty adviser. An honors seminar on a relevant topic can count as one of these four courses, with approval of the faculty adviser. Only one transfer course may be counted toward the minor, pending approval of the faculty adviser.



# Elective Courses

# Elective Courses

**Elective Courses**

*German*
01:090:255 Atrocity Crimes and Legal Response (Honors Seminar)
01:470:310, 01:195:370, or 01:563:370 Germany Confronts the Holocaust
01:470:350 Nazi Period in Film
01:470:380 or 01:563:380 Topics: Germans and Jews: An Intercultural History
01:470:388 Topics: The Holocaust and Transgenerational Trauma

*History*
01:510:261 or 01:563:261 History of the Holocaust
01:510:329 World War II in Europe
01:510:363 Germany from 1871 to Present
01:510:368 or 01:563:368 Jews of Germany and Austria-Hungary, 1780-Present
01:510:372 Armenian Genocide in Comparative Perspective
01:510:381 Eastern Europe, 1800-1948
01:510:385 Rabbis, Rebels, and Rationalists: The Jews of Eastern Europe
01:510:394 Human Rights
510:268:01 Fascism

*Jewish Studies*
01:510:260 or 01:563:210 Remembering the Shtetl
01:563:269 or 01:510:269 Antisemitism
01:563:270 or 01:510:263 Exile under Nazism and Communism
01:563:365 or 01:195:395 Holocaust Literature in Translation
01:563:366 or 01:195:371 Holocaust Media
01:563:390 or 01:510:390 Jewish Memory

*Sociology*
01:920:393 Sociology of Trauma and Collective Memory
01:920:298 After the Holocaust (Honors Seminar)

# Human Resource Management 533 (SMLR-U)

## HUMAN RESOURCE MANAGEMENT 533

**Dean:** Adrienne Eaton

**Program Director:** Ryan Greenbaum

**Student Counselors:** Shuenn (Grace) Tien and Joy Montuoro

**Website:** Here

The School of Management and Labor Relations' Department of Human Resource Management (HRM) faculty are among the most frequently published and cited human resources (HR) faculty in the United States. Students who pursue studies in HRM will understand the relationship between HR strategy and business success while obtaining valuable skills to apply across many industries.

A course of study in human resource management is one path to understanding business that does not require a business degree. It helps prepare students interested in pursuing a master's degree in human resource management (M.H.R.M.) or the master's in business administration (M.B.A.).

The human resource management undergraduate major and minor are offered by the School of Management and Labor Relations (SMLR). Further details are available in the School of Management and Labor Relations section of this catalog.

Human Resource Management 533 (SMLR-U)

# Major Requirements

# Major Requirements

Students who are in good academic standing are eligible to declare the human resource management (HRM) major through the School of Arts and Sciences at Rutgers University-New Brunswick. The major consists of a total of 45-48 credits, 36 of which are to be taken from within the human resource management curriculum (seven HRM

core courses [37:533] are required; eight for the HRM Honors Program) four HRM elective courses; and 9 credits from a list of related courses from other programs (the list of these courses is provided on the School of Management and Labor Relations [SMLR] website here).

Introduction to Human Resource Management (37:533:301) is a prerequisite for the human resource management bachelor of arts degree program. Students must achieve a grade of C or better in this course before the major is declared.

Grades of C or better must be earned in all courses used to fulfill the requirements of the human resource management major.

Please visit the SMLR website for a full description of the requirements here.

For a full list of courses and details about the human resource management major, see the School of Management and Labor Relations section of this catalog.

Human Resource Management 533 (SMLR-U)

# Minor Requirements

# Minor Requirements

Students who are in good academic standing are eligible to declare the human resource management (HRM) minor through the School of Arts and Sciences at Rutgers University-New Brunswick. The HRM minor consists of 18 credits in human resource management, and must include course 37:533:301 Introduction to Human Resource Management, four courses from the concentration, and one elective course from the potential electives offered by the School of Management and Labor Relations (SMLR). Substitution of courses is not allowed.

Students will be required to complete six courses, offered by SMLR, with a C grade or better.

Please visit the SMLR website for a full description of the requirements here.

For a full list of courses and details about the human resource management minor, see the School of Management and Labor Relations section of this catalog.

Human Resource Management 533 (SMLR-U)

# Courses

# Courses

**37:533:301** ***Introduction to Human Resource Management (3)***
While many of the tasks associated with human resource management are centered in the HR department, all managers have HR responsibilities. This course covers the broad range of topics associated with HR management from the perspective of the HR professional, the manager, and the employee. It serves as the base course in both

the undergraduate HRM major and minor. It will also serve to familiarize students who hope to become managers or team leaders during their careers with some of the issues they will have to deal with, such as staffing, motivating, and developing team members.

**37:533:311** *Talent Acquisition (3)*
This course focuses on the effective management of the flow of talent into and through organizations. It covers human resource planning, recruiting and selection, career transitions, and other workforce movement. An important goal of the class will be to provide opportunities to develop hands-on skills that are relevant to effectively managing talent flow.
***Prerequisite: 37:533:301.***

**37:533:312** *Developing Talent (3)*
This interactive, theoretically anchored, and applied course is aimed at understanding the processes and practices of developing human capital. It covers how organizations train and develop their employees, performance management as an evaluative and developmental tool, and the strategic development of talent framed within the context of talent.
***Prerequisite: 37:533:301.***

**37:533:313** *Compensation & Total Rewards (3)*
Helps students understand the theoretical basis for compensation and other rewards systems and provides a practical understanding of how compensation and rewards systems work. The economic, psychological, and strategic aspects of rewards systems are covered. A series of exercises provide hands-on experience with major compensation and rewards practices.
***Prerequisite: 37:533:301.***

**37:533:315** *Global Human Resource Management (3)*
Explores the importance of international business management in the context of international human resource management, including topics on culture, compensation and benefits, international organizations and their structures, international assignment management, and the legal and regulatory considerations that global organizations face.
***Prerequisite: 37:533:301.***

**37:533:317** *Career Management (3)*
Provides students with the knowledge and skills to help others manage their careers while learning how to manage their own. Topics will include self-assessments, motivation theory, professional skill-development, career ladders, labor market/occupational trends, market research, personal branding, job search techniques, résumé writing, interviewing skills, negotiating, networking, and creating work-life balance.

**37:533:318** *HRM and Benefits (3)*
Employee benefits are complex, expensive, very personal, and many times misunderstood. This course seeks to acquaint students with the type of employee benefits offered in the workplace, the history behind them, and the challenges that benefits present to an organization. Students gain an understanding of benefits strategy, the legal requirements covering benefits, and explore how workforce demographics provide a context for the organization's employee benefits decisions. The course relies on a base knowledge of employment law, tax law, psychology, management, organizational dynamics, and economics.
***Note: This course was previously offered under Special Topic numbers 533:322 and 533:324. Students who take this course may not also utilize 37:575:375 Benefits and Social Insurance toward the HRM major.***

**37:533:321-328** *Special Topics in Human Resource Management (3)*
Topics offered may include:

- Ethics and Corporate Responsibility
- Human Resource Management and Health Administration
- Human Resource Management in the Public Sector
- Economics and Demographics of Labor Markets
- Employee Ownership and Group Incentives
- Conflict Management
- Social Media in HRM

*Prerequisite: 37:533:301.*

**37:533:360** *HRM and Finance (3)*
Successful HR strategies are those that align with and support the firm's business strategy. Successful business strategies are those that create value for the firm and its stakeholders. To be effective in their strategic partner role HR professionals must understand how firms create value and measure value creation. This course will introduce students to the interpretation of financial statements and use of discounted cash flow techniques for planning and evaluating HR and strategic investments. Particular attention will be paid to topics such as selecting the financial measures used to determine incentive pay, paying in stock versus paying in stock options, alternative models for valuing stock options, the financial and HR aspects of pension plans, and the modeling of merger and acquisition opportunities.
*Note: This course is designed for students without prior training in accounting or finance. Prerequisite: 37:533:301.*

**37:533:376** *Corporate Governance (3)*
Explores the relationship between corporate governance and the economic, social, and political impact of corporations. Topics include: history of the corporation and stock ownership; boards of directors; principal-agent/stakeholder theories; executive compensation; profit sharing; employee ownership; stock options; shareholder rights; takeovers and mergers; labor issues; pension funds; international corporate governance; the relationship between governance, corporate performance, and financial collapses; social and environmental sustainability; corporate social responsibility; and the role of public policy and government regulation.
*Prerequisite: 37:533:301.*

**37:533:440** *HRM and Statistics (3)*
Addresses basic statistics, covering frequency distributions through regression analysis. Enables students to compile and analyze data used in developing, implementing, and measuring HR outcomes. It will also enable students to interpret HR and government reports.
*Prerequisite: 37:533:301.*

**37:533:494,495** *Independent Study and Research (BA)*
Individual reading and research project under the guidance of a human resource management faculty member on a topic of interest to the student.
*For HRM majors only. Prerequisites: Completion of five human resource management courses from the list of core requirements including 37:533:301, with a GPA of 3.5 or better. Permission of program director required.*

**37:533:496,497** ***Internship in Human Resource Management (BA)***
Students work as staff members in an approved public or private organization's human resource management department. The opportunity will allow students to apply conceptual knowledge learned in the classroom to actual situations and to acquire new skills
***For HRM majors only. Prerequisites: Completion of five human resource management courses from the list of core requirements including 37:533:301, with a GPA of 3.5 or better. Permission of program director required.***

**37:533:498,499** ***Honors in Human Resource Management (BA)***
An in-depth individual research project under the guidance of a member of the HRM department. Student will produce a thesis-quality research paper.
***Students must be enrolled in the HRM Departmental Honors Curriculum Program (37-533H).***

**37:575:315** ***Employment Law (3) - Labor Studies Offering***
Overview of employment at-will and its limitations; wages and hours; medical/family leave; privacy; drug testing; workers' compensation; and fundamental antidiscrimination law.

**37:575:345** ***Organizational Behavior and Work (3) - Labor Studies Offering***
Covers behavior by individuals and groups in the workplace; group and intergroup dynamics; organizational culture, structure, and change; leadership, employee motivation, job performance, and feedback.
***This course number will be offered under a schoolwide course number in fall 2020.***

**Applicable Labor Studies Courses**

In addition to 37:575:315 and 37:575:345, there are certain courses from the Department of Labor Studies and Employment Relations that are applicable to both the HRM undergraduate minor and major. For the complete list, please consult the HRM undergraduate website here.

**Applicable Courses from Other Disciplines**

The HRM undergraduate major includes a requirement of three courses from psychology, sociology, and economics as well as two courses from a list of quantitative requirements. Applicable courses from these areas of study can be found on the human resource management website here. Course descriptions for these courses can be found under their respective headings in the Programs of Study for Arts and Sciences Students chapter of this catalog.

# Hungarian 535 (SAS)

## HUNGARIAN 535

(See also European Studies 360)

Department of German, Russian, and East European Languages and Literatures, School of Arts and Sciences

**Website:** Here

# Courses in English

# Courses in English

**01:535:259** ***Hungarian Literature and Civilization (3)***
Survey of the history of Hungarian literature and culture, including the fine arts.

**01:535:260** ***Hungarian Culture Today (3)***
Survey of contemporary cultural, social, and political life in Hungary with emphasis on developments after World War II and the Revolution of 1956.

**01:535:360** ***Special Topics in Hungarian Studies (3)***
With permission of program director, course can be taken repeatedly if content is different.
***No knowledge of Hungarian necessary. Content varies each semester.***

**01:535:460** ***Advanced Topics in Hungarian Studies (3)***
With permission of program director, course can be taken repeatedly if content is different.
***No knowledge of Hungarian necessary. Content varies each semester.***

Hungarian 535 (SAS)

# Courses in Hungarian

# Courses in Hungarian

*Introductory Courses*

Beginners, or students with less than two years of Hungarian in secondary school, normally take 01:535:101,102. Students who have had two or more years of Hungarian in secondary school normally take 01:535:201,202. Students from homes in which Hungarian is spoken but who have not had academic training in the language normally take 01:535:121 before taking 01:535:201,202. Native speakers of Hungarian with academic training in the language must receive departmental permission before enrolling in any course.

NOTE: Rutgers currently offers Hungarian language courses only through BTAA course share. For more information, visit here. Please contact the REELL Program Director with questions.

**01:535:101,102** ***Elementary Hungarian (4,4)***
Basic course emphasizing the four basic skills of listening, speaking, reading, and writing

**01:535:121** ***Intensive Elementary Hungarian (4)***
Intensive review of grammar, reading, writing, and vocabulary building, together with development of communicative skills.

**01:535:201,202** ***Intermediate Hungarian (4,4)***
Continued development of language skills in Hungarian.
***Prerequisite: 01:535:102 or 121 or equivalent.***

**01:535:301** *Conversation (3)*
Designed to develop fluency in spoken Hungarian. Emphasis on listening, speaking, and interpretation skills. Development of active language skills through formal instruction and supervised foreign language immersion at the Hungarian Heritage Center.
***Prerequisite: 01:535:202 or equivalent.***

**01:535:303** *Internship in Hungarian (3)*
Development of active language skills through formal instruction and supervised foreign language immersion at the Hungarian Heritage Center.
***Prerequisites: 01:535:301 or equivalent and permission of instructor.***

**01:535:305** *Hungarian Language Laboratory (1)*
Instructor-guided laboratory practicum based on intensive use of media and designed for the improvement of aural/oral skills. Practice involves the use of text-related and other audio and video material, individual and group work, and recording of student speech for evaluation of pronunciation and fluency.
***Pre- or corequisite: 01:535:259 or 301.***

**01:535:321** *Poetry (3)*
Readings in the history of Hungarian literature. Emphasis on selected poets who led to the development of Hungarian literary consciousness.
***Prerequisite: 01:535:202 or equivalent.***

**01:535:355** *Translation (3)*
Translation of advanced-level texts from Hungarian into English. Vocabulary building, linguistic and stylistic problems, contrastive analysis with texts selected from various genres, including the media.
***Prerequisite: 01:535:202 or equivalent.***

**01:535:401** *Advanced Grammar, Stylistics, and Composition (3)*
Intensive study of selected Hungarian grammatical forms and structures. Study and practice in composition. Analysis and imitation of writing styles and forms, vocabulary development, and orthography. Frequent writing exercises.
***Prerequisites: 01:535:301 and permission of instructor.***

**01:535:402** *Advanced Writing Workshop (3)*
Intensive study of selected Hungarian grammatical forms and structures. Study and practice in composition. Analysis and imitation of writing styles and forms, vocabulary development, and orthography. Frequent writing exercises.
***Prerequisites: 01:535:401 and permission of instructor.***

**01:535:403** *Advanced Internship in Hungarian (3)*
Supervised training in a Hungarian business firm, social service agency, or nonprofit organization. Weekly discussion of situations and practices arising from internship experience.
***Prerequisites: 400-level Hungarian course with a grade of B or better or equivalent and permission of instructor.***

**01:535:490** *Seminar (3)*
Specific problems of Hungarian literature and language. Content varies each semester. Paper required.
***Prerequisite: Permission of instructor.***

**01:535:493,494** ***Independent Study (3,3)***
Independent reading under supervision of a member of the department.
***Prerequisites: Permission of department and instructor.***

Individualized Major 555 (SAS)

# School of Arts and Sciences

# School of Arts and Sciences

Normally, individualized majors are only approved when they propose a course of study that would be impossible to do within the current structure of majors, minors, and electives required of School of Arts and Sciences (SAS) students. Within the existing structure of majors, students are free to specialize while fulfilling the general requirements for an existing, approved SAS major. Appropriate courses in a minor and electives can provide the sought-after multidisciplinary supplementation to the particular focus of the standard major.

Students who wish to design their own individualized majors in the arts and sciences may make an application in writing to the SAS Vice Dean for Undergraduate Education. Application forms for the individualized major can be obtained by special request from the Office of Advising and Academic Services of the School of Arts and Sciences.

The individualized major should be designed in consultation with a major faculty adviser from SAS and two additional academic sponsors from at least two different departments, at least one of which must be another SAS department. Applications must include a statement of purpose and learning goals, a proposed program of courses, and the signatures of the three faculty sponsors. An individualized major must consist of at least 36 credits (twelve 3 credit courses): ordinarily, at least two-thirds of these credits (8 credits) must be taken in SAS courses; three-quarters (9 credits) must be at the 300 level or above; and at least one course should be taken as an independent study or capstone project in the senior year under the direction of the SAS faculty adviser, for the purpose of integrating the work comprising the major.

Students returning after multiple semesters away may pursue a 54 credit structured, individualized major. They may write to the SAS Vice Dean for Undergraduate Education for more information about this return to learn credit-intensive option.

Satisfactory completion of this major leads to a Bachelor of Arts degree and will appear on the student's transcript simply as individualized major.

# Information Technology and Informatics (SC&I-U)

## INFORMATION TECHNOLOGY AND INFORMATICS

The information technology and informatics (ITI) major is a 39-credit program offered by the Department of Library and Information Science. This major emphasizes the evaluation, implementation, use, and management of information technologies for a wide range of organizations and corporations, as well as the social and organizational aspects of information and communication technologies. The major unites theories drawn from the humanities and social sciences with practical computer-based competencies. This combination prepares students to work in

a diverse and highly competitive marketplace that demands individuals who understand the social, economic, and organizational impacts of technology locally and globally. The course of study combines rigorous thinking, problem-solving, and technology skills in a program that is based on sound research and current technology applications.

Upon successful completion of the major, students will be able to demonstrate these learning goals of the ITI program:

- *[CREATE]* Develop new technological solutions to real-world problems through innovative, collaborative, and computation approaches.
- *[COMMUNICATE]* Communicate to professional stakeholders utilizing evolving technological platforms.
- *[CRITICAL THINKING]* Analyze the ever-changing interactions of people and technology, regarding pertinent social, cultural, philosophical, ethical, legal, and economic issues.
- [COORDINATE] Evaluate, implement, use, and manage information technologies for a wide range of organizations and corporations.

**Career Opportunities**

New Jersey's growth industries--technology, pharmaceuticals, logistics, and finance--are driven by innovative applications of information technology. Graduates of the major in information technology and informatics seek positions in sectors such as government, health care, education, consulting, and finance where technology skills and an understanding of organizational and social informatics make them valuable employees. Examples of where ITI graduates have launched their careers include:

- Information technology analysis
- IT consulting and project management
- Technology policy analysis
- User experience analysis and design
- Web design and development
- Information assurance and cybersecurity
- Networking and systems administration and support

**Admission to the Major**

Admission to the information technology and informatics major is highly competitive; meeting the minimum requirements does not guarantee acceptance. Minimum requirements for admission include

- completion of at least 15 credits at Rutgers, or 15 transfer credits, with a grade-point average of 2.0 or better;
- a grade of C or better in the required prerequisite course 04:189:103 Information Technology and Informatics (or an equivalent transfer course);
- a grade of C or better in Expository Writing or an equivalent course or placement; and
- completion of the application including a personal statement.

The admissions committee considers the following criteria when reviewing student essays: (a) evidence of your interest in the major; (b) your future plans and their relationship to the major; (c) your strength as a writer; and (d) any other qualities that make you a strong candidate for admission to the ITI major. Applications are available on the school's website here. Students may be admitted for the fall, spring, and summer semesters; check the website for the application deadlines each semester. Students are strongly encouraged to consult the school's website for up-to-date information regarding admissions procedures.

**Major Requirements**

Students must earn a grade of C or better in 04:547 courses in order for those courses to count toward the major.

*Prerequisite survey course required before admission to the major (3 credits):*

04:189:103 Introduction to Information Technology and Informatics (3)

*SC&I interdisciplinary requirement (3 credits):*

Either
04:189:101 Introduction to Communication and Information Processes (3)
or
04:189:102 Introduction to Media (3)

*Core courses (12 credits):*

04:547:200 Social Informatics (3)
04:547:201 Information Technology Fundamentals (3)
04:547:202 Object-Oriented Programming (3)
04:547:210 Management of Technological Organizations (3)

*Elective courses (21 credits):*

ITI students must select seven elective courses from the course listing for the ITI major.

*Optional pathways:*

Several optional areas of focus are available within the information technology and informatics program, including cybersecurity and information assurance, data management and information visualization, and web design. These guided pathways allow students to develop more in-depth knowledge and skills in focused areas. Please check the website for current offerings and course options.

**Internships and Other Educational Opportunities**

The ITI program encourages students to complete a 3-credit internship, which includes both work experience and an academic component. The program offers an independent study option to students who want to investigate a particular topic more fully under the supervision of a faculty member. High achieving students who qualify may apply to participate in a senior thesis. Students interested in the senior thesis must first take Application Research for Information Technology (04:547:300) and then conduct a research project, taking the Senior Thesis Course (04:547:465).

**Course Transfers**

A maximum of 6 transfer credits may be counted toward the information technology and informatics major. Only courses with a grade of C or better will be accepted for transfer.

Courses that students have taken at other New Jersey colleges, which are articulated through the NJ Transfer system and recorded on a student's transcript with an ITI course number, will be counted toward the major. However, such courses do count as transfer courses to the major and therefore a maximum of 6 credits may be applied to the major.

Students who wish to have a course they have taken elsewhere at Rutgers or externally at another university considered as one of their required or elective courses in the ITI major must submit a request for transfer equivalency in writing to the SC&I Office of Student Services. To submit such a request, the letter of petition must include a copy of the full syllabus of the course, a copy of the student's transcript showing the grade achieved, a note which ITI course it is requested to replace, and the reasons for consideration. The courses are evaluated in terms of their very close match of content and skills to the ITI course, the level of the course, and the grade achieved, which should typically be a B or better. Students will be notified in writing of the outcome of the petition.

**Dual-Bachelor's/Master's Degree Program for ITI Majors**

This degree pathway allows students to earn a bachelor's degree with an ITI major and a master of information (M.I.) degree in five years of continuous, full-time study, or longer if completed part-time. Students who have completed at least 90 credits in their undergraduate program can be considered for admission into the dual-degree pathway to the M.I. degree.

ITI majors who are admitted into the dual-degree pathway take two graduate courses in each of the fall and spring semesters of their senior year. Those courses are selected based on student goals and M.I. program requirements. These four courses (12 credits) count both as an undergraduate (ITI electives) and fulfill graduate (M.I.) requirements as long as the student earns a grade of B or better. Upon successful completion of coursework in the senior year, dual-degree students will graduate from the undergraduate program and transition into the graduate program as a M.I. student.

Details about the application process and degree requirements are on the school's website.

# Interdisciplinary Studies, SAS 556 (SAS)

Interdisciplinary Studies, SAS 556 (SAS)

## School of Arts and Sciences

## School of Arts and Sciences

For more information about interdisciplinary studies courses, contact the Office of Undergraduate Education in the School of Arts and Sciences.

Interdisciplinary Studies, SAS 556 (SAS)

# Courses

# Courses

**01:556:101** ***Studies in Biomedical Sciences (3)***
Lectures and laboratory in microbiology including basic morphology, physiology, and genetics of bacteria and viruses, with an introduction to human pathogens. Experience in a clinical department and participation in biomedical research and seminars.
***Lec. 2 hrs., lab. 3 hrs. Open only to students in the biomedical careers program. Prerequisites: One year of college, including one semester of college biology or chemistry, and one semester of college math. Enrollment by permission only. Offered only during the summer semester.***

**01:556:103,104,105,106,107,108,109,111** ***Studies in Humanities (3,3,4,3,1.5,2,2,1)***
Instruction in six modules within four major humanities disciplines: art history, American history, literature, and philosophy. Topics vary.
***Prerequisites: For students in Rutgers Early College Humanities Program; by permission. Graded pass (C or higher)/No Credit.***

**01:556:115,116,117,118** ***Upward Bound Interdisciplinary Studies (1,1,1,1)***
Topics vary.
***Prerequisite: Special permission of program. Graded Pass (C or higher)/No Credit.***

**01:556:120** ***Human Biology and Health (1)***
Cultivation of STEM identity and empowerment of women through fostering understanding of the human body and enabling self-awareness. The role of various organ systems, nutrition, and genetics will be considered in the perspective of human health.

For students in the Douglass Bunting-Cobb Sciences LLC

**01:556:130** ***Introduction to Scientific Research (3)***
How research projects are developed and what skills are needed to undertake research projects. Lectures, discussions, and small-group activities. Serves as a prerequisite for the research-oriented internship of Project SUPER.
***Pre- or corequisites: 01:640:112 or 115; one course in the natural sciences. Enrollment limited to students in Project SUPER.***

**01:556:140** ***The Greenhouse Effect (3)***
Physical and chemical bases of the greenhouse effect and its global impact: biological, climatic, economic, and political. Reducing the emission of greenhouse gases; nuclear energy and other alternative energy sources.
***Lec. 2 hrs., lab. 1.5 hrs. For nonscience majors; not for major credit in science and engineering. Credit not given for both this course and 01:160:140 or 01:450:140 or 01:750:140.***

**01:556:201** ***Studies in Biomedical Sciences (3)***
Introductory biochemistry emphasizing major classes of biomolecules, intermediary metabolism, and gene expression. Selected laboratory projects in bacterial physiology and molecular biology. Instruction in organic chemistry also available where needed. Research/clinical seminars required.

*Lec. 2 hrs., lab. 3 hrs. Open only to students in the biomedical careers program. Prerequisites: Two years of college; two semesters of college chemistry; and two semesters in one of the following areas: college biology, organic chemistry, or physics. Enrollment by permission only. Offered only during summer semester.*

**01:556:202** *NERA II (3)*
Introductory biochemistry emphasizing major classes of biomolecules, intermediary metabolism, and gene expression.
*Prerequisites: Two years of college; two semesters of college chemistry; and two semesters in one of the following areas: college biology, organic chemistry, or physics. Open only to students in the NERA program. Enrollment by permission only. Offered only during summer semester.*

**01:556:221,222** *Aresty Research Assistant Program (1.5,1.5)*
Research with a professor; training on the social and professional aspects of research.
*Prerequisite: Special permission of Aresty program required. Graded Pass/No Credit.*

**01:556:240** *STEM Professional Development with Industry Perspectives (1)*
This course provides professional development and mentoring of STEM students via a collaboration of Douglass Women in Science and Engineering and industry partners. Through workshops, seminars, site visits, and 1-1 mentoring, this course cultivates career readiness, confidence building, and self-advocacy with perspectives from industry partners who support the advancement of women in professional workspaces.

**01:556:251** *Papal Rome and Its People, 1500-Present: A Select History (3)*
Case-study approach toward select aspects of the social, cultural, intellectual, and political history of the early modern and modern popes, with a particular focus on their relationship to the city of Rome. Highlights the reigns of Popes Gregory XIII Boncompagni (1572-1585) and Gregory XV Ludovisi (1621-1623), and their subsequent family history to the present day.

**01:556:291** *Foreign Language Workshop (1)*
Accompanies undergraduate courses in nonlanguage disciplines. Particular language elements taught dependent on the associated course.
*Corequisite: Designated nonlanguage course. For students majoring in nonlanguage disciplines. Graded Pass/No Credit.*

**01:556:301** *Independent Study in Biomedical Sciences (3)*
Lectures and student seminars in experimental genetics; MCAT preparation; required participation in research/clinical seminars; independent research projects with biomedical scientists culminating in formal student presentations at a public symposium.
*Lec. 1 hr., lab. 6 hrs. Open only to students in the biomedical careers program. Prerequisites: Three years of college; two semesters of college chemistry; two semesters of college biology; one semester of college calculus; and four semesters of advanced courses in science, math, statistics, or computer science. Enrollment by permission only. Offered only during summer semester.*

**01:556:302** *NERA III (3)*
Participation in research/clinical seminars; independent research projects with biomedical scientists culminating in formal student presentations at a public symposium.
*Lec. 1 hr., lab. 6 hrs. Prerequisites: Three years of college; two semesters of chemistry and biology; one semester of college calculus; and four semesters of advanced courses in science. Open only to students in the NERA program. Enrollment by permission only. Offered only during summer semester.*

**01:556:303** *Accelerated Research Methods (L/EARN) (3)*
Basic steps of the research process, from the conceptualization of a research question through hypothesis testing. Skills necessary for data analysis. Methodological issues that guide how researchers design projects, collect data, and interpret results.
*Restricted to Project L/EARN summer program participants.*

**01:556:325,326** *Special Topics (3,3)*
Exploration of problems and issues relating to a particular theme.

**01:556:328** *Special Topics (BA)*
Exploration of problems and issues relating to a particular theme.

**01:556:403** *Applied Data Analysis in Health Research (L/EARN) (3)*
Statistical analyses, including univariate, bivariate, and multivariate. Application to an analysis of secondary data on a health or health policy topic.
*Registration by special permission of Project L/EARN director. Prerequisite: For Project L/EARN program participants and other students who have completed a course in statistics through multiple regression and are familiar with a statistical package.*

**01:556:406,407** *Research in Computational Biology and Molecular Biophysics (1-4,1-4)*
Experimental or computational research on an original problem under the direction of a member of the Rutgers Center for Quantitative Biology faculty. Written report required.
*Prerequisites: Declared major in biomathematics, chemistry, computer science, engineering (any of the nine engineering majors), mathematics, physics, statistics, or a minor in one of these fields with a major in biochemistry, biological sciences, biotechnology, cell biology and neuroscience, genetics, microbiology, or molecular biology and biochemistry. Permission of the Rutgers Center for Quantitative Biology undergraduate director; cumulative grade-point average of 2.8 or better. Open only to students who have completed at least 60 credits.*

**01:556:426** *Special Topics (BA)*
Exploration of problems and issues relating to a particular theme.

**01:556:427** *Special Topics (1.5)*
Exploration of problems and issues relating to a particular theme.

**01:556:480** *Interdisciplinary Quantitative Biology Boot Camp (1)*
Introductory exposure to language, culture, and experimental/theoretical underpinnings of molecular biology, macromolecular biochemistry/biophysics, structural biology, computational biology, systems biology, and bioinformatics.
*Prerequisite: Permission of program director.*

**01:556:481** *Interdisciplinary Boot Camp in Quantitative Biology (0)*
Introduces students to the value of integrating quantitative biology education with that afforded by other disciplines of study including mathematics, physics, computer science, statistics, engineering, medicine, and the life sciences.
*Prerequisite: Permission of program director.*

**01:556:482** ***Interdisciplinary Boot Camp in Quantitative Biology (2)***
Introduces students to the value of integrating quantitative biology education with that afforded by other disciplines of study including mathematics, physics, computer science, statistics, engineering, medicine, and the life sciences.
***Prerequisite: Permission of program director.***

**01:556:491,492** ***Independent Study (BA,BA)***
Individual research supervised by a faculty member.

**01:556:493,494** ***Independent Study (3,3)***
***Prerequisite: By permission, SAS dean's office.***

**01:556:497-498** ***SAS Honors Seminar (1.5,1.5)***
Interdisciplinary honors seminar offered by a distinguished faculty member.
***Prerequisite: By permission, SAS dean's office.***

**01:556:499** ***SAS Dean's Honors Seminar (3)***
Interdisciplinary honors seminar offered by a distinguished faculty member.
***Prerequisite: By permission, SAS dean's office.***

# International and Global Studies 558 (SAS)

## INTERNATIONAL AND GLOBAL STUDIES 558

Department of Geography, School of Arts and Sciences

**Website:** Here

**Chair:** Kevin St. Martin

**Director of Undergraduate Studies:** Asa K. Rennermalm

The minor in international and global studies is an interdisciplinary minor offered under the auspices of the Department of Geography in the School of Arts and Sciences, but is open to all Rutgers University students. The minor promotes an interdisciplinary understanding of global processes and relationships between places, while fostering specialization in a particular world region and its language(s). The purpose of the minor is to prepare our students to meet the challenges of the 21st century, including appreciating human difference from multiple disciplinary perspectives and grappling with questions of social justice.

# Learning Goals

# Learning Goals

This program has three learning goals:

1. *Global Literacy*--Gain an understanding of the degree to which forms of human difference shape a person's experiences of and perspectives on the world.
2. *Regional Understanding*--Apply this understanding to a specific world region and situate this region in broader human and societal processes.
3. *Language Training*--Complete language training through the intermediate level as both a mode of communication and vehicle for cultural understanding.



# Minor Requirements

# Minor Requirements

The minor requires 18 credits (six 3-credit courses) in the distribution below, and an approved language proficiency. Detailed course list may be found on Degree Navigator.

***Requirement 1:*** General Core: A total of 6 credits (See detailed course list on Degree Navigator.)

***Requirement 2:*** Track Core: A total of 6 credits (Students select Track 1, Track 2, or Track 3; see detailed course list for each track on Degree Navigator.)

*Track 1: International Politics, Economics, and Business.* Will enable students to address issues relating to the management of global political and economic relationships and systems.

*Track 2: Global Cultures and Social Systems.* Will enable students to better understand forms of human difference and their relation to social justice in diverse cultural settings.

*Track 3: Environment and Development.* Will enable students to address pressing global issues of the 21st century, including environmental change, and human health and well-being.

***Requirement 3a:*** Regional Specialization: A total of 6 credits (Students select one of the six regions below; see detailed course list on Degree Navigator.)

East Asia and the Pacific
Europe and Central Asia
Latin America and the Caribbean
Middle East and North Africa
South Asia
Sub-Saharan Africa

***Requirement 3b:*** Language Proficiency: Intermediate college-level proficiency in a language approved for the selected region (Requirement 3a: see list of what languages are preapproved for each region on Degree Navigator.)

***Requirement 4:*** Upper-level courses: A total of 9 credits in the minor must be earned at the 300 level or above. This requirement overlaps with requirements 1, 2, and 3a.

Students must receive a grade of C or better in each course that counts toward the minor in international and global studies.

International and Global Studies 558 (SAS)

## Courses

## Courses

**01:558:101** ***Global Awareness: An Introduction to International and Global Studies (3)***
Introduces the field of international and global studies using analytical tools from a variety of social science and humanities traditions.

# Italian 560 (SAS)

## ITALIAN 560

Department of Italian, School of Arts and Sciences

**Website:** Here

**Chair:** Alessandro Vettori

**Undergraduate Director:** Andrea Baldi

**Language Program Director**: Carmela Scala

**Professors:**

Andrea Baldi, Dottore in Lettere, Firenze (Italy); Ph.D., California (Los Angeles)

Alessandro Vettori, Dottore in Lettere, Firenze (Italy); Ph.D., Yale

Laura Sanguineti White, Dottore in Lettere, Trieste (Italy); Ph.D., California (Los Angeles)

**Associate Professors:**

Paola Gambarota, Dottore in Lingue, Napoli (Italy); Ph.D., Pavia (Italy); Ph.D., Yale

**Associate Teaching Professor:**

Carmela Scala, B.A., Brooklyn College; M.A., Hunter College; Ph.D., Graduate Center of New York (CUNY)

Italian 560 (SAS)

# Italian Undergraduate Program

# Italian Undergraduate Program

The Department of Italian is committed to the research and teaching of Italian language, literature, and culture from all periods--from Dante to opera, theater, and contemporary film. With seven full-time faculty members, the department is home to award-winning researchers, a thriving graduate program (M.A., M.A.T., and Ph.D.), and an incredibly rich undergraduate program, where students choose from a range of courses on Italian literature, culture, and gastronomy; world-class cities like Venice, Naples, and Rome; business Italian for careers in food, and fashion; the history of Italian opera; the mafia movie genre in the United States and Italy; Italian women writers; medieval and modern Italian poetry; and race, migration, and Italian (post)colonialism, among others.

The undergraduate program prepares students for a globalized world by providing them cultural immersion and fluency in a language other than English, and solid training in the humanities through a focus on textual analysis, critical thinking and writing, and intercultural interpretation.

The Major in Italian is comprised of two sets of courses: the first is designed to provide students linguistic proficiency; the second offers students a solid foundation in Italian cultural production across the centuries¿from Dante to opera, theater, and contemporary film.

Italian 560 (SAS)

# Goals, Objectives, and Expected Outcomes

# Goals, Objectives, and Expected Outcomes

The Department of Italian is committed to providing the university community with an authentic experience of Italian language, literature, and culture, and to providing intercultural and interdisciplinary knowledge as well as fundamental analytical tools. The language is taught with an emphasis on four skills: comprehension, speaking, reading, and writing. Literature and culture are taught with an emphasis on critical analysis, intercultural skills, and interdisciplinary approaches. Equipped with linguistic skills and refined insights into a different culture, students acquire the ability to interact in changing local and global environments and to participate in them with deeper understanding and greater effectiveness.

**Departmental Learning Goals and Expected Outcomes**

**Goal I. General Linguistic Proficiency**

Students achieve the linguistic and intercultural competence necessary to communicate in Italian. Our instructors teach Italian with an emphasis on cultural immersion and interpersonal modes of communication. Students will be able to read and write texts in formal, literary, and academic registers.

**Goal II. Cultural Proficiency**

Students achieve the skills necessary to research and critically analyze Italian culture (literature, film, art, design, fashion, etc.). In addition to culture courses taught in Italian, courses taught in English provide the same skills to students without prior knowledge of Italian and Italian American culture.

**Goal III. Professional Preparation**

Students learn about research and writing methods in Italian literature and culture, which equips them with the necessary skills to enter graduate programs in the humanities or professional graduate schools, including law schools and schools of international affairs or diplomacy, as well as careers in education, international business (finance, import/export, wine, food, and fashion), journalism, and public relations.

Italian 560 (SAS)

# Major Requirements

# Major Requirements

**The major consists of 11 courses, beginning with 01:560:101.**

**Language Proficiency**

A series of 6 courses in language at any level.

Students must complete: **Advanced Conversation 321 or 322.**

NB: 105/6 Italian for Reading Knowledge does NOT count toward the Major/Minor.

* Students who place into 121 Intensive Italian or above are required to take **additional** courses at the 200-400 level in Italian in order to fulfill the **6-course language requirement**.

**Cultural Competence**
5 courses from the Italian Studies Course list (ALL 200-400 level literature, film, and culture classes in the Department of Italian, plus some courses taught in other departments--Classics, Art History, etc.).

Students MUST complete at least:

**THREE courses at the 300-400 level in Italian**

NB: 1.5 Credit "Mini-Courses" do NOT count toward the Major/Minor.

Up to 4 Italian transferred courses will count towards your major or minor.

Students must earn a minimum grade of C to count the course toward the Major.

The student's program must be approved by the Undergraduate Director.

Italian 560 (SAS)

# Minor Requirements

# Minor Requirements

The minor requires six courses, beginning with 01:560:101.

4 courses in Italian language.

Students must complete 01:560:132. If placed into 121 intensive Italian or above, students must take 321 or 322 advanced conversation.

The remaining 2 courses must be chosen from the Italian Studies Course List. (ALL 200-400 level literature, film, and culture classes in the Department of Italian, plus some courses taught in other departments--Classics, Art History, etc.).

NB: 1.5 Credit "Mini-Courses" do NOT count toward the Minor.

NB: 105/6 Italian for Reading Knowledge does NOT count toward the Minor.

Up to 4 Italian transferred courses will count towards your major or minor.

Students must earn a minimum grade of C to count the course toward the Minor.

The student's program must be approved by the Undergraduate Director.

Italian 560 (SAS)

# Introductory Courses

# Introductory Courses

Students who already have studied Italian and wish to continue that language are assigned according to the results on their placement test. Except for the courses listed under Courses in English, all courses are conducted in Italian.

Italian 560 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify for the Department of Italian's Honors Program, a student must have, at the end of her or his junior year, a cumulative grade-point average (GPA) of at least 3.0, and a GPA of 3.5 or higher in the Italian major.

In order to receive Departmental Honors, eligible students write an honors thesis. The honors thesis takes two semesters to complete, and counts for 6 credits toward the major. Students enroll in 495 during the fall semester, and 496 during the spring semester.

During the first semester, students conduct independent research and prepare a bibliography on their chosen topic, in consultation with their faculty adviser. During the second semester, students write and submit the thesis, in consultation with their faculty adviser. The honors thesis will be evaluated by a committee that includes two additional faculty members of the Italian Department.

Students interested in pursuing the honors thesis should take the following steps:

- Contact the undergraduate director, who will verify the student's eligibility (i.e., that the student has the requisite GPA).
- Write a brief (400-word) paragraph research proposal, describing her or his project.
- Consult the research profiles of faculty members on the department website, and select an appropriate faculty adviser.
- Contact the appropriate faculty member with her or his research proposal, requesting that the faculty member advise the honors thesis.

Italian 560 (SAS)

# Study Abroad Programs in Italy

# Study Abroad Programs in Italy

**SUMMER PROGRAM**

**RU in Rome - Rutgers University**

Each summer the Department of Italian offers RU in Rome--a four-week language, culture, and internship program in Rome, Italy, gives students the opportunity to earn 6 to 8 credits. It also provides excursions and other extracurricular activities to acquaint students more fully with everyday life in Italy today. Offerings include introductory to advanced Italian language classes, food studies and culture classes taught in English, which feature trips around Rome and beyond and a credit-bearing internship for those selected to participate. Inquiries should be addressed to the Department of Italian here.

**SEMESTER PROGRAMS**

**Florence**

The International Studies Institute (ISI) offers a variety of courses in Italian language, food studies & sustainability, art history, studio arts, architecture, history, international business, and Italian studies. All students are required to enroll in one course in the Italian language -- the Institute offers Italian at all levels from beginner to advance. Students may then choose freely from the wide variety of elective courses available. In order to have an idea of what classes are available, you should visit the ISI Florence website.

**Rome**

John Cabot University (JCU), an American-style liberal arts university, welcomes approximately 600 study abroad students a year as well as some 350 full degree-seeking Italian and international students. Academic year, summer, fall, spring.
Visit Global-Study Abroad website for more information.

**Perugia**

Umbra Institute has a robust catalog of academic offerings, including Food and Sustainability, Music and Fine Arts, STEM, and Multicultural Psychology, to name a few. All students are required to enroll in one course in the Italian language -- the Institute offers Italian at all levels from beginner to advanced. Students may then choose freely from the wide variety of elective courses available. Students should visit the Global-Study Abroad - Italy website for more information.

Students with intermediate level Italian skills will be excited by Umbra's innovative iCourses. These literature, media, and sociology seminars are taught in English, but with hour-long sections taught exclusively in Italian. Visit the Global-Study Abroad website for additional information.

Italian 560 (SAS)

# Italian Studies Option

# Italian Studies Option

Italian 560 (SAS)

# Courses in English

# Courses in English

**01:560:231,232** ***Italian Culture (3,3)***
First semester: Italian contributions to Western art, literature, music, and thought from the late Middle Ages to the High Renaissance. Second semester: Milestones in Italian history and culture from the High Renaissance to the present.

**01:560:235** ***Doing Business in Italy: Food, Wine, Fashion, and Beyond (3)***
Cultivates cultural competencies with regard to the particularities of the Italian food, wine, fashion industries, and business in general from economic, cultural, and social perspectives.

**01:560:240** ***Italian Cooking Lab (3)***
Laboratorio di cucina. Fifth-semester Italian language and culture. Students learn food-related vocabulary, practice Italian conversation, and experience the art of cooking true Italian food during our cooking sessions.
***Prerequisite: 01:560:132, Special Permission, or Placement equivalent.***

**01:560:241,242** ***Masterpieces of Italian Literature (3,3)***
Readings and discussion of representative works from Dante to Machiavelli in the first semester and from Galileo to contemporary writers in the second.

**01:560:248** ***A Cultural Tour of Italy (1.5)***
Culture of Italy, focusing on some of its most fascinating cities (Naples, Rome, Urbino, Florence, and Venice), seen from a variety of perspectives and a wide spectrum of media (literary texts, photographs, visual artworks, documentaries, and films).
***Does not count toward the major or minor in Italian or Italian studies.***

**01:560:253** ***Major Works of the Italian Renaissance (3)***
Historical overview of Italian Renaissance civilization in Florence and other major centers; significant works of representative writers, composers, and artists.

**01:560:254** ***Modern Italian Literary Masterpieces (3)***
Comparative study of selected narrative, lyrical, and dramatic works of modern Italy.

**01:560:255** ***The Italian Short Story (3)***
Exemplary masterpieces of Italian short-story writing from the early collections to the classics of the Renaissance and the modern and contemporary masters of the art.

**01:560:256** ***Introducing Italy, City by City (3)***
A sequence of courses, each concentrating on one Italian city. Initial semester, Naples, to be followed by other semester courses taught by different members of the department.

**01:560:258** ***Italian Icons (1.5)***
Introduction to Italian culture, seen through some of Italy's most prominent thinkers, artistic movements, and fields. Taught in English.
***Does not count toward the major or minor in Italian or Italian studies.***

**01:560:260** ***From Literary Text to Film: An Introduction (3)***
Introduction to cinematic adaptation of literary texts within the Italian context, through analysis of pivotal narratives and their cinematic counterparts. No knowledge of Italian is required.
***Credit not given for both this course and 01:560:347, 348, 349, 350.***

**01:560:268** ***Walking in the City (3)***
Representations of walking in modern European culture. Readings include Baudelaire, Calvino, Serao, Mansfield, Marinetti, Ortese, and Woolf. Screenings include Rossellini, De Sica, and Sorrentino.

**01:560:270** ***Gol! Italian Sports Culture (3)***
Overview of the history of the development of Italian sports from ancient Rome to today.

**01:560:280** ***The Environment in Italian Narratives (3)***
Introduction to the development of ecological concerns in influential Italian narratives, following a chronological thread. With a focus on the interactions between humans, other animals, and their environments, topics may include urbanization, pollution, ecological disasters, and sustainability, and texts may include poetry, prose, dialogues, documentaries, and feature films. Taught in English.

**01:560:290** ***The Renaissance at the Movies and in Popular Culture (3)***
An exploration of the cultural dynamics of Renaissance Italy and the resonance of Renaissance culture in the popular imagination in the last half century. Study of canonical Renaissance works and films, graphic novels, advertising, and the performing arts.

**01:560:304** ***Translation Workshop: Practice and Theory***
This course will introduce students to the craft of literary translation as well as the theoretical foundations of translation studies.H

**01:560:315** ***Dante and Medieval Culture (3)***
Dante's work in historical perspective: the theological antecedents, memory of the classical writers, and new profane literary experience.
***Credit not given for both this course and 01:195:315.***

**01:560:316** ***Fascism and Italian Culture (3)***
Twentieth-century literary and visual representations of Italian Fascism, the Resistance, and the Holocaust. Topics may include: fascism and everyday life; myths of technology and empire-building; the poetry of dissidents; testimony of Jewish writers; and narratives of resistance fighters, men, and women.

**01:560:320** ***Mafia Movies: Approaches to Genre in Italian and American Film (3)***
Representations of the Mafia in Italian and American films from the early 20th century to today. Introduction to film genres.

**01:560:331,332** ***Dante in Translation (3,3)***
Critical study of Dante in translation: the *Divine Comedy* and other works in their medieval context.

**01:560:335, 336** ***Italian Opera (3,3)***
Italian opera and its cultural milieu from its origin to the present. Libretti and related literature, recordings, and possible attendance at performances.

**01:560:339, 340** ***The Italian-American Experience (3,3)***
Literature of the struggle for survival, adaptation, and success of Italians in the United States; their search for identity; and their impact on the development of American life and culture. Counts toward the major.

**01:560:345** ***Classics of Italian Cinema (3)***
Development of cinema in Italy; its rebirth after World War II; and the achievements of the major directors: Visconti, Rossellini, De Sica, Fellini, Antonioni, and others.

**01:560:346** ***Contemporary Italian Cinema (3)***
A historical introduction to the past 25 years of Italian cinema, situating the films in the historical and cultural contexts that have shaped the past several decades of Italian social life. Films by Bertolucci, Benigni, Amelio, Crialese, Tornatore.

**01:560:349, 350** ***Italian Cinema and Literature (3,3)***
Development of Italian cinema from neorealism to today (Visconti, Fellini, Wertmuller, and others) and the literature that inspired it and was influenced by it.
***May not be used in satisfaction of major requirements. Credit not given for both these courses and 01:560:347,348. Credit not given for this course and 01:560:260.***

**01:560:355** ***Love and Sex Italian Style (3)***
An investigation of love in Italian literary texts from the Middle Ages to the present, through a combination of novels, poems, short stories, treatises, essays, and films.

**01:560:356** ***Women in Italian Literature and Society (3)***
Women in the cultural and social milieu of both historical and present-day Italy as portrayed in works of literature and art as well as by today's mass media.

**01:560:358** ***Love and Power in the Italian Renaissance (3)***
Interdisciplinary investigation of early modern Italian culture, seen through the perspective of power structures. ***Credit not given for both this course and 01:195:389.***

**01:560:362** ***Women's Lives and Literature (3)***
Women's writing in the Italian context, from the end of the 19th century to the present. Analysis and discussion of literary works testifying to women's struggle for social and economic freedom and access to knowledge.

**01:560:364** ***Villains, Heroines, Rebels, and Scapegoats (3)***
Representations of subjugation, violence, and cruelty--seen against their positive counterforces, resilience and heroism--in Italian culture of the late 19th and 20th centuries. Analysis of short stories, novels, and films.

**01:560:391** ***Italian Food Culture (3)***
The history of Italian cuisine seen through literary texts and cultural traditions. Authors include: Dante, Boccaccio, Pulci, Sanudo, Marino, Goldoni, Manzoni, Pirandello, Calvino, and more. Taught in English.

**01:560:398** ***Internship in Italian (3)***
Academic internship in an Italian company, agency, or organization. Internship requires supplemental reading, writing, exams, and reflection, and culminates with an oral interview, a public presentation, and a professional portfolio analyzing the student's experience.

**01:560:399** ***CESEP (1)***
One-credit community service placement in Italian culture.

**01:560:443** ***Contemporary Man's Search for Identity, Dignity, and Justice: The Drama of Pirandello and Betti (3)***

Discussion of several of the authors' most mature and brilliant plays illustrating contemporary man's feeling of confusion, alienation, and outrage, and his eternally unsatisfied search for identity and dignity.

**01:560:446** ***Contemporary Italian Literature in Translation (3,3)***
Study of selected writers illustrating the main currents of 20th century Italian literature: Pirandello, Montale, Merini, Moravia, Calvino, Pavese, Ortese, Scego, and others.

Italian 560 (SAS)

# Courses in Italian

# Courses in Italian

*Prerequisite*

Italian 01:560:132 or permission of the department is a prerequisite for all courses in this section at the 300 level or above.

Please visit our website for the most updated version of our Course List.

**01:560:101,102** ***Elementary Italian (4,4)***
Speaking, reading, and writing; oral-aural and written exercises.
***Not open for credit to students who have had two or more years of secondary school Italian.***

**01:560:110** ***Intensive Elementary Italian (8)***
Fundamentals of the Italian language normally covered in two semester-long courses, 01:560:101 and 01:560:102, offered as a single intensive course.
***Not open for credit to students who have had two or more years of secondary school Italian 01:560:101,102.***

**01:560:105,106** ***Italian for Reading Knowledge (3,3)***
Development of reading skills. Texts chosen from the humanities and social sciences.
***Does not satisfy prerequisite for 01:560:131.***

**01:560:107, 108** ***Elementary Italian Laboratory (1,1)***
Instructor-guided laboratory practicum based on intensive use of media and designed for the improvement of aural/oral skills:
***Corequisites: 01:560:101 (for 107); 01:560:102 (for 108)***

**01:560:121** ***Italian Review (4)***
Intensive review and practice of Italian grammar, reading, and writing.
***Prerequisite: Placement test in Italian. Not open to students who have taken 01:560:101,102.***

**01:560:123,124** ***Conversation (3,3)***
For students enrolled in Intermediate Italian and others who wish to develop fluency in speaking.
***Not open to students who have taken 300-level courses.***

**01:560:131,132** ***Intermediate Italian (4,4)***
Development of fluency and accuracy in speech and composition; current reading materials.
***Prerequisite: 01:560:102 or equivalent.***

**01:560:136** ***Intensive Intermediate Italian (8)***
Development of fluency and accuracy in speech and composition through current reading materials, in one semester.
***Prerequisite: 01:560:102 or equivalent. Not open for credit to students who have taken 01:560:131,132.***

**01:560:250** ***Writing Workshop in Italian (3)***
Study and practice in composition to improve skills for written Italian. Analysis and imitation of writing styles and forms; vocabulary development; syntax; frequent written exercises.
***Pre- or corequisite: 01:560:132 or permission of department.***

**01:560:251** ***Italian Composition and Stylistics (3)***
Study and practice in composition to perfect skills for written Italian. Analysis and imitation of writing styles and forms; vocabulary development; syntax; frequent written exercises.
***Pre- or corequisite: 01:560:250 or permission of department.***

**01:560:261,262** ***Masterpieces of Italian Literature (3,3)***
Introduction to Italian literature: from Dante to Machiavelli in the first semester and from Galileo to the moderns in the second.
***Prerequisite: 01:560:132.***

**01:560:302** ***Italian Today Through Literature (3)***
Explores typical aspects of current Italian life through the analysis of texts taken from contemporary Italian literature, also examined through songs and films.
***Prerequisite: 01:560:132.***

**01:560:305** ***Introduction to Literature (3)***
Introduction to canonical works of medieval and early modern Italian literature, from the beginnings to the 16th century. Refinement of speaking and writing ability.

**01:560:306** ***Introduction to Literature II (3)***
Introduction to canonical works of Italian literature from the Baroque period to the 21st century. Refinement of speaking and writing ability.

**01:560:317,318** ***Italian Culture Today (1.5,1.5)***
Contemporary cultural, social, and political life in Italy with emphasis on daily experience. Field trips.

**01:560:321** ***Advanced Conversation through Current Events (3)***
Development of conversational ability through discussion of significant historical, social, and cultural movements in Italy.

**01:560:322** ***Advanced Conversation through Cinema (3)***
Development of conversational ability through discussion of contemporary films.

**01:560:341,342** ***Italian Literature of the 19th Century (3,3)***
Neoclassicism, romanticism, and verismo. Readings from Foscolo, Manzoni, Leopardi, Carducci, Pascoli, Verga, D'Annunzio, and others.

**01:560:347, 348** ***Italian Cinema and Literature (3)***
Comparative study of selected films and their literary sources and counterparts.
***Credit not given for this course and 01:560:260.***

**01:560:351,352** ***Italian Literature of the 20th Century (3,3)***
First semester: modern narrative; second semester: modern theater. Readings include Pirandello, Saba, Ungaretti, Montale, Quasimodo, Silone, Pavese, Moravia, Vittorini, and others.

**01:560:353** ***Modern and Postmodern Italian Travel Literature (3)***
Italian travel writing from early 20th-century playwright and novelist Luigi Pirandello to postmodern authors Italo Calvino and Antonio Tabucchi.
***Prerequisite: 01:560:305 or 306.***

**01:560:354** ***Italian Culture through Music (3)***
An overview of some of the major trends and movements in Italian history and culture, seen through Italian music.
***Prerequisite: 01:560:305 or 306.***

**01:560:360** ***Practical Commercial Italian (3)***
Study of Italian commercial organizations in Italy. Practice in business correspondence. Comparison of financial and commercial terms in English and Italian.
***Pre- or corequisite: Any 300-level course in Italian.***

**01:560:369** ***Walking in the Modern and Postmodern Italian City (3)***
The representation of walking in modern and postmodern Italian cities, examining literary and visual texts dating from the end of the 19th century to today.
***Prerequisite: 01:560:250.***

**01:560:371** ***Italian Theater (3)***
A survey of Italian theatrical masterpieces combined with the creative component of writing, editing, and performing a play in Italian by the class.
***Prerequisite: 01:560:250 or 251.***

**01:560:377** ***Ri-Scrittura: Rewriting of Biblical Texts in Contemporary Italian Literature (3)***
Addresses a wide variety of genres (novels, plays, screenplays, and poems) and themes. Authors may include Bacchelli, Berto, Coccioli, De Luca, Fabbri, Guidacci, Merini, Pasolini, Pazzi, and Pomilio. Reading of each text accompanied by the study of the appropriate biblical text.
***Prerequisite: 01:560:305 or 306.***

**01:560:381,382** ***The Civilization of Italy (3,3)***
Interdisciplinary approach to Italy's culture, medieval to contemporary; readings and multimedia lectures highlighting masterpieces of literature, drama, music, and art.
***Prerequisite: 01:560:250 or 251.***

**01:959:383,384** ***Study Abroad in Italy (BA,BA)***

**01:560:393,394** ***Independent Study in Italian (3,3)***
Independent study and guided research on a topic selected by the student and approved by a faculty member. Individual conferences.

**01:560:401,402** ***Italian Literature of the 13th and 14th Centuries (3,3)***
Intensive study of the most important representatives of the Sicilian and Tuscan schools, with particular attention to the Dolce Stil Novo and the works of Dante.

**01:560:405** ***The Three Crowns of Florence: Dante, Petrarch, and Boccaccio (3)***
A course on the three main authors of the 14th century. Readings from the *Divine Comedy*, Petrarch's *Lyrics*, and the *Decameron*.
***Prerequisite: 01:560:250 or 251.***

**01:560:409,410** ***Italian Women Writers in the 19th and 20th Centuries (3,3)***
Explores the foremost issues concerning women's writing in the Italian context. Analysis of the historically specific sense of difference in women's literature.

**01:560:415,416** ***Dante (3,3)***
Critical study of Dante's *Divine Comedy* and other works in their medieval context.

**01:560:421,422** ***Italian Literature of the Renaissance (3,3)***
Italian writers most relevant to the development of the humanistic viewpoint and representative of the creative achievements of the Renaissance: Petrarca, Boccaccio, Poliziano, Machiavelli, Ariosto, Michelangelo, and others.

**01:560:431,432** ***Italian Literature of the 17th and 18th Centuries (3,3)***
Readings from the works of Campanella, Marino, Galileo, Goldoni, Alfieri, Parini, and others.

**01:560:491,492** ***Topics in Italian Literature (3,3)***
Directed independent study of a topic selected in consultation with the instructor.

**01:560:493** ***Senior Seminar in Italian (3)***
In-depth examination of a topic, a genre, or a movement within the history of Italian literature and/or film. Focus on development of analytic, interpretive, and research skills. Topic announced by the department.
***Prerequisite: 01:560:305 or 306. Open to senior majors in Italian or by permission of the instructor.***

**01:560:495,496** ***Honors in Italian (3,3)***
Special readings and honors paper prepared under the direction of the departmental honors committee.

# Japanese 565 (SAS)

## JAPANESE 565

Department of Asian Languages and Cultures, School of Arts and Sciences

**Website:** Here

**Chair:** Wendy Swartz

**Director of Undergraduate Studies:** Satoru Saito

**Distinguished Professor:**

Senko K. Maynard, B.A., Tokyo University of Foreign Studies; M.A., Illinois (Chicago); Ph.D., Northwestern

**Professor:**

Paul Schalow, B.A., Hampshire College; M.A., Ph.D., Harvard

**Associate Professor:**

Satoru Saito, B.A., Virginia; M.A., Ph.D., Columbia

**Associate Teaching Professor:**

Haruko Wakabayashi, B.A., Sophia (Japan); Ph.D., Princeton

**Assistant Teaching Professor:**

Jiro Harasaki, M.A., Columbia

**Teaching Instructor:**

Michiru Ichihara Lowe, B.A., Nanzan; M.A., Columbia

Japanese 565 (SAS)

# Major Program Learning Goals and Requirements

# Major Program Learning Goals and Requirements

**Learning Goals**

Majors in Japanese will acquire in-depth knowledge of the Japanese language as well as the literature and culture of Japan. Majors will be able to demonstrate oral, reading, and written proficiency in the language and develop critical skills in analyzing and interpreting literary, historical, and cultural texts. Students will acquire the literary, cultural, and linguistic competency necessary for continuing onto postgraduate study or employment requiring such cultural knowledge and/or linguistic skill. Students will learn the cultural heritage of Japan within the larger context of East Asia through a wide and coherent curriculum, which includes courses in the following humanities and social science disciplines: literature, visual culture, history, religion, language. and linguistics.

**Requirements**

The major in Japanese requires 36 credits distributed as follows:

1. Six courses in Japanese language above the 100 level.
2. Four courses in Japanese literature, history, and/or culture (under subject code 565).
3. One course chosen from East Asian Civilizations: Traditional Era (01:098:241) OR East Asian Civilizations: Modern Era (01:098:242) OR Global East Asia (01:098:250).
4. Capstone Seminar on East Asian Societies (01:098:444).

Japanese 565 (SAS)

# Minor Program Learning Goals and Requirements

# Minor Program Learning Goals and Requirements

**Learning Goals**

Minors will be introduced to the cultural heritage of Japan through courses on literature, history, visual culture, language, and linguistics. Minors will be able to communicate effectively (listening, speaking, and writing) in Japanese and will learn critical skills in analyzing and interpreting literary and cultural materials appropriate to the student's area of specialization. Students will achieve advanced linguistic competency and be able to demonstrate practical skills in using Japanese for translation and interpretation. Students will be able to relate relevant issues to other areas in the humanities.

**Requirements**

A minor in Japanese consists of four courses in Japanese above the 100 level plus two additional elective courses (of 3 credits or more) in the area of concentration (subject code 565). The elective courses may be language courses or culture courses.

Japanese 565 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have a cumulative grade-point average of 3.0 or better and a grade-point average of 3.4 or better in the major at the end of the junior year. At that time, the student should formally apply to the chair for admission to the honors program. In addition to completing all requirements of the Japanese major, candidates are required to register for 01:565:497-498 Honors in Japanese, write an honors paper under the guidance of an assigned faculty member, and take a comprehensive examination at the end of their senior year.

Japanese 565 (SAS)

# Japanese Culture Courses (Taught in English)

# Japanese Culture Courses (Taught in English)

**01:565:210** ***Introduction to Japanese Culture (3)***
Introduction to Japanese culture, past and present. Explores some of the major themes in Japanese culture across areas of art, religion, literature, and film. Themes include Shinto and Buddhism, warrior culture, monsters and the supernatural, and war and disaster.

**01:565:215** ***A-Bomb Literature and Film in Japan (3)***
Reading and discussion of fiction, poetry, and film by and about survivors of the 1945 U.S. atomic bombings of Hiroshima and Nagasaki, Japan, with emphasis on problems of memory, representation, and redemption in a literature of trauma.

**01:565:241** ***Japanese Literature in Translation (3)***
Selected poetry and fiction from 700 to 1885. Major concerns of the Japanese literary tradition and ideas and images of man, love, nature, and time that have continued to influence Japanese culture.
***Taught in English.***

**01:565:242** ***Modern Japanese Literature in Translation (3)***
Japanese literature from 1885 to the present. The influence of Western cultural ideals on modern Japanese literature. Emphasis on the novel as a literary form. Readings from Kawabata, Sõseki, Mishima, Akutagawa, and Tanizaki.

**01:565:250** ***Language and Society in Japan (3)***
How language and society interact in contemporary Japan. Sociolinguistic methods applied to various issues: honorific/humble forms, language and gender, and conversation strategies.

**01:565:317** ***Love, Honor, and Suicide in Japanese Literature (3)***
Suicide as a theme in Japanese literature from the eighth century to the present, with comparisons to the theme of suicide in Western literature. Selected texts from Western literature read to gain a comparative perspective. Films shown as well.
***Credit not given for both this course and 01:195:332.***

**01:565:320** ***The Samurai Tradition in Japanese Literature and Film (3)***
The samurai warrior as a focus of cultural and political expression in Japanese literature and cinema. Supplementary readings of secondary sources on samurai culture and thought.

**01:565:333** ***Anime: Introduction to Japanese Animation (3)***
Anime as an object of cultural, historical, and media analysis. Development of Japanese animation from post-1945 to the present, with special focus on examples from the 1980s onward. Utilizes a variety of approaches to anime, including media theory, reception theory, issues of globalization, and cross-cultural adaptation.

**01:565:350** ***Japanese Film (3)***
Japanese film in its cultural and historic contexts and as a Japanese art form. Viewing and analysis of films by Kurosawa, Mizoguchi, Ozu, and others.

**01:565:360** ***Japanese Women Writers (3)***
Fiction and poetry by Japanese women from the ninth century to the present. Focus on women's early role in inventing and shaping literary genres, and the reemergence of a feminine tradition in the 20th century.

**01:565:370** ***Community and Difference in Japanese Literature and Film (3)***
Charting and analyzing 20th-century filmic and literary portrayals of what is "foreign" and "Japanese." Racialism, ethnicity, sexuality, and gender in the Japanese arts.

**01:565:380** ***Contemporary Japanese Literature and Film (3)***
Examines the fictional representations (short stories, novels, films) of contemporary Japan from the 1980s to the present.

**01:565:395** ***Issues in Japanese Literature (3)***
Variable content, focusing on important issues, texts, and genres in the Japanese literary tradition. May be taken more than once. Content will differ each semester.

**01:565:425** ***Rutgers Meets Japan: Revisiting Early U.S.-Japan Encounters (3)***
Examination of the crucial moment of early U.S.-Japan relationship and cultural exchange during the late nineteenth century through Extensive reading of primary, secondary, and visual sources.

**01:565:460** ***Seminar in Japanese Film (3)***
Major directors, development of Japanese film genres, Japanese film studies in English-language scholarship, and relationship between film and national identity.
***Prerequisite: 01:565:350 or permission of instructor.***

**01:565:471** ***Yukio Mishima: His Fictions and Global Literary Legacy (3)***
Explores the many facets of one of Japan¿s most formidable 20th-century writers, Yukio Mishima (1925-1970)¿his fictions and global literary legacy.
***Taught in English. Credit not given for both this course and 01:195:471.***

**01:565:475** ***The Tale of Genji as World Literature (3)***
The *Tale of Genji* in the context of world literature as court romance, psychological novel, and feminist text. Extensive readings from critical literature in English and discussion of issues of translation.
***Credit not given for both this course and 01:195:475.***

**01:565:480** ***Seminar on Modern Japanese Literature (3)***
Critical literary developments of modern Japan, from the late 19th century to the postwar period, with a close reading of literary texts. Particular attention paid to understanding various analytical frameworks, from historical to theoretical.

**01:565:483** ***From Text to Image in Japanese Art (3)***
Explores the profound influence of classical literature on the arts of Japan, especially painting. Analysis of the historical and literary meaning of the literary works; investigation of the fusion of text and image.
***Credit not given for both this course and 01:082:483.***

**01:565:495,496** ***Independent Study (3,3)***
Independent reading under supervision of a member of the department.
***Prerequisites: Permission of instructor and department.***

**01:565:497,498** ***Honors in Japanese (6,6)***
***Both semesters must be completed to receive credit.***

- Departmental Honors Program

Japanese 565 (SAS)

# Japanese Language Courses

# Japanese Language Courses

**01:565:101,102** ***Elementary Japanese (4,4)***
Introduction to grammar and writing systems; practice in speaking, reading, and writing.
***Prerequisite: 01:565:101 or equivalent for 01:565:102.***

**01:565:103** ***Introduction to Japanese Writing (3)***
History, types, and styles of Japanese writing systems: hiragana, katakana, and kanji. Pen and brush (calligraphy) practices. Some basic creative writing.

**01:565:104** ***Speaking Elementary Japanese (3)***
Elementary speaking and communicating skills based on limited vocabulary and grammar. Conversational phrases and idiomatic expressions associated with various social situations and interpersonal relationships.
***Prerequisite: 01:565:101.***

**01:565:201,202** ***Intermediate Japanese (4,4)***
Study of grammar, development of fluency in speaking; practice in reading and composition.
***Prerequisite: 01:565:102 or equivalent for 01:565:201; 01:565:201 or equivalent for 01:565:202.***

**01:565:213,214** *Japanese Conversation and Culture (3,3)*
Develops speaking skills; guided conversation practice, vocabulary building, and oral reports. Texts and discussion topics relating to Japanese everyday life, language, culture, and society.
***Prerequisite: 01:565:102 or permission of instructor.***

**01:565:301,302** *Advanced Japanese (3,3)*
Refinement of reading, writing, speaking, and listening skills. Advanced grammar and extensive vocabulary. Reading written text from various genres.
***Prerequisite: 01:565:202 or equivalent for 01:565:301; 01:565:301 or equivalent for 01:565:302.***

**01:565:303,304** *Advanced Japanese for Business (3,3)*
Principles of interpersonal communication in Japanese business and international negotiation. Specialized vocabulary, social skills, and business correspondence. Reading and discussion of business, culture, and society.
***Prerequisite: 01:565:202 or permission of department.***

**01:565:313,314** *Advanced Japanese Conversation and Contemporary Issues (3,3)*
Development of conversational skills and strategies. Class discussion, oral presentation, and debate based on cultural/social materials.
***Prerequisite: 01:565:202 or permission of instructor.***

**01:565:325** *Advanced Japanese Grammar and Rhetoric (3)*
Analysis and study of complex sentence structures, rhetorical strategies and principles, and paragraph and text structures of a variety of genres. Reading assignments to appreciate different styles of written Japanese: essays, narrative, newspaper text, etc.
***Prerequisite: 01:565:301 or permission of instructor.***

**01:565:361,362** *Japanese Popular Culture (3,3)*
Critical approaches to Japanese popular culture and advanced discussion in Japanese of a broad range of popular genres, including manga, anime, film, commercials, and music.
***Prerequisite: 01:565:302 or permission of instructor.***

**01:565:401,402** *Advanced Readings in Japanese (3,3)*
Selected readings from modern Japanese. Materials from literature, humanities, and social sciences. Discussion and some writing exercises.
***Prerequisite: 01:565:302 or permission of instructor.***

**01:565:411** *Readings in Classical Japanese: Bungo (3)*
Introduction to classical literary Japanese. Study of verbal and adjectival suffixes and particles through sample sentences. Selected readings in classical prose. Some translation exercises.
***Prerequisite: 01:565:301 or permission of instructor.***

**01:565:451,452** *Translating Japanese Popular Media (3,3)*
Theory and practical techniques of translation from Japanese to English, with particular focus on monthly news and literary magazines, film, anime, manga, and song.
***Prerequisite: 01:565:302 or equivalent.***

**01:565:470** ***Seminar in Japanese Language and Literature (3)***
Readings and research on topics in Japanese language and literature.
***Prerequisite: 01:565:402 or permission of instructor.***

**01:565:495,496** ***Independent Study (3,3)***
Independent reading under supervision of a member of the department.
***Prerequisites: Permission of instructor and department.***

**01:565:497,498** ***Honors in Japanese (6,6)***
***Both semesters must be completed to receive credit.***

# Jewish Studies 563 (SAS)

## JEWISH STUDIES 563

Department of Jewish Studies, School of Arts and Sciences

**Website:** Here

**Chair:** Paola Tartakoff

**Undergraduate Director:** Michal Raucher

**Core Faculty:**

Michal Raucher, Jewish Studies, PhD, Northwestern

Gary A. Rendsburg, Jewish Studies and History; Ph.D., New York

Jeffrey Shandler, Jewish Studies, Ph.D., Columbia

Nancy Sinkoff, Jewish Studies and History; Ph.D., Columbia

Paola Tartakoff, Jewish Studies and History; Ph.D., Columbia

Azzan Yadin-Israel, Jewish Studies; Ph.D., California (Berkeley)

**Affiliated Faculty:**

Debra Ballentine, Religion; Ph.D., Brown

Ethel Brooks, Women's, Gender, and Sexuality Studies; Ph.D., New York

Rebecca Cypess, Mason Gross School of the Arts-Music; Ph.D., Yale

Maurice Elias, Psychology; Ph.D., Connecticut

Leslie E. Fishbein, American Studies; Ph.D., Harvard

Judith Gerson, Sociology; Ph.D., Cornell

David Greenberg, Journalism; Ph.D., Columbia

Charles Haberl, AMESALL; Ph.D., Harvard

Paul Hanebrink, History; Ph.D., Chicago

Martha Helfer, German; Ph.D., Cornell

Michael Levine, German; Ph.D., Johns Hopkins

Emma Wasserman, Religion; Ph.D., Yale

The Department offers an interdisciplinary approach to the academic study of all aspects of the Jewish experience. Courses offered by the Department, which are open to all students, address the historical, social, cultural, religious and political life of the Jewish people from ancient times to the present. Drawing on faculty from eight departments, as well as on visiting fellows sponsored by the Bildner Center, the Jewish Studies curriculum offers over sixty interdisciplinary courses. Students pursuing a B.A. degree may major or minor in Jewish Studies. Students may also minor in Hebrew language . The Department of Jewish Studies and the Bildner Center work together to promote Jewish Studies at Rutgers.

Jewish studies offers courses that originate in the department and cross-listed courses that originate in other departments, both of which may be counted toward the Jewish studies major or minor. Credit is not given for both a Jewish studies course (01:563) and its corresponding cross-listed course.

For further information about the Department of Jewish Studies, contact the office, which is housed at the Allen and Joan Bildner Center for the Study of Jewish Life, Rutgers, The State University of New Jersey, 12 College Avenue, New Brunswick, NJ 08901-1282 (telephone: 848-932-2033), or send an email to info@jewishstudies.rutgers.edu. Information is also posted on the department's website.

Jewish Studies 563 (SAS)

# Learning Goals

# Learning Goals

*Majors* will be able to conceptualize the development of Jewish culture and history over time (from the era of the Bible until the present) and across space (comparing the variety of Jewish cultures in a given historical moment); recognize and analyze a variety of Jewish Studies primary sources, both pre-modern and modern; apply second sources and methodologies (historical, literary, philological, anthropological, philosophical, and sociological) used to study Jewish life; demonstrate research skills (bibliographic, analytic, research, and writing) and competence in textual analysis through guided researching and writing of a research paper over the course of a semester.

*Minors* will be able to demonstrate a broad view of Jewish history and more in-depth knowledge of a sample of the spectrum of Jewish studies.

Jewish Studies 563 (SAS)

# Major Requirements

# Major Requirements

Majors must complete 12 courses (at least 36 credits), either offered by the Department of Jewish Studies or cross-listed by the department, with a grade of C or better in each course:

*Required courses:*

- 01:563:201 Jewish History I: Ancient and Medieval (3)
- 01:563:202 Jewish History II: Modern (3)
- 01:563:464 Research and Writing in Jewish Studies (3)

*Students are advised to take the first two courses as early as possible in their studies, preferably before their junior year. Jewish History I is offered every Fall and Spring semester. Jewish History II is offered only in the Spring semester. The seminar is not regularly offered. In the Fall of your Junior year, plan a meeting with the Undergraduate Director, Prof. Michal Raucher, to discuss meeting this requirement.*

*Elective courses:* Nine elective courses (at least 3 credits each).

Jewish Studies 563 (SAS)

# Minor Requirements

# Minor Requirements

**Requirements for the Jewish Studies Minor**

Minors must complete six courses (at least 18 credits), offered by the Department of Jewish Studies or cross-listed by the department, with a grade of C or better in each course, as follows.

*Required courses:*

- 01:563:201 Jewish History: Ancient and Medieval (3)
- 01:563:202 Jewish History: Modern (3)

*Students are advised to take the first two courses as early as possible in their studies, preferably before their junior year. Jewish History I is offered every Fall and Spring semester. Jewish History II is offered only in the Spring semester.*

*Elective courses:* Four courses (at least 3 credits each), of which no more than two can be in elementary or intermediate language
*Learning Goals:* Minors will be able to demonstrate a broad view of the Jewish past and more in-depth knowledge of a sample of the spectrum of Jewish studies.

**Requirements for the Minor in Language and Culture of Ancient Israel**

The minor in language and culture of ancient Israel consists of six courses (18 credits total) from the courses listed below. A student may not major in Jewish studies and minor in the language and culture of ancient Israel at the same time. The following courses count toward the minor:

- 01:563:141 Biblical Hebrew I (3)
- 01:563:142 Biblical Hebrew II (3)
- 01:563:145 Introduction to Aramaic (3)
- 01:563:201 Jewish History: Ancient and Medieval (3)
- 01:563:241 Introduction to Rabbinic Literature (3)
- 01:563:322 Women in the Bible (3)
- 01:563:340 The Dead Sea Scrolls (3)
- 01:563:409 Introduction to Semitic Languages (3)
- 01:563:431 Hebrew Bible (3)
- 01:563:433 Readings in Biblical Hebrew Prose (3)
- 01:563:434 Readings in Biblical Hebrew Poetry (3)

**Requirements for Interdisciplinary Minor in Holocaust Studies (564)**

Rutgers now offers an **interdisciplinary minor in Holocaust Studies**, with courses offered by the German, History, Jewish Studies, and Sociology departments. The minor consists of six courses, as follows:
Required courses:

History of the Holocaust (01:510:261 / 01:563:261)¿[Core Curriculum Course]

Remembering the Holocaust (01:563:360/01:510:370:01) [Core Curriculum Course]
Elective courses: Four additional courses in at least two different departments; currently including German, History, Jewish Studies, and Sociology related to the Holocaust. Courses can include:

- A relevant three-credit independent study or internship (e.g., at the Museum of Jewish Heritage: A Living Memorial to the Holocaust in New York), with the approval of the faculty coordinator
- An honors seminar on a relevant topic
- A six-credit honors thesis on a relevant topic, with approval of the faculty coordinator
- One relevant transfer course may be counted toward the minor, pending approval of the faculty coordinator

Jewish Studies 563 (SAS)

# Departmental Honors Program

# Departmental Honors Program

**Students majoring in Jewish Studies have two options for earning Honors in the department.**

**Option A: Honors with a Thesis**

The Department of Jewish Studies offers qualified Jewish Studies majors the opportunity to earn honors by pursuing a research project in depth for their entire senior year under the supervision of a faculty advisor.

To be considered, students must meet the following requirements:

1. Have a cumulative grade point average of 3.0 or higher, and 3.4 or higher in the Jewish Studies major.
2. Meet with the department's Undergraduate Director during the second semester of their junior year to discuss the process and determine eligibility.
3. Meet with potential primary advisors and select one in consultation with the Undergraduate Director and faculty.
4. Submit their project proposal to the Undergraduate Director and their primary advisor by the end of their junior year.
5. Enroll in the Jewish Studies Seminar (563:464) in the fall of their senior year and Jewish Studies Honors (563:497) in the spring of their senior year.
6. Complete a multi-chapter thesis during their senior year. The thesis should be a substantial written work based on a defined thesis question developed into a sustained argument. The work must incorporate substantial original research, be supported by evidence and critical reasoning, and must show familiarity with a subject field.
7. Sit for an oral defense in the final semester of their senior year.
8. A panel of faculty members (including the student's advisor) will determine whether the thesis merits honors according to the rubric developed for this assessment.

**Option B: Honors without a Thesis**

At the discretion of the department, honors in Jewish Studies may also be earned by Jewish Studies majors on the basis of extraordinary research, study, or internships associated with the department. In this case, during the penultimate semester of their senior year, a student may apply to be considered for honors by contacting the undergraduate director. Alternatively, a Jewish Studies faculty member may nominate a Jewish Studies major for honors during the penultimate semester of their senior year.¿

To be eligible for JS honors without a thesis, a student must meet the following criteria:

1. Have a cumulative grade point average of 3.0 or higher, and 3.4 or higher in the Jewish Studies major.
2. Have conducted independent research, study, or for-credit internships associated with the department.
3. Submit for consideration a portfolio of at least 2 semester-long papers, projects, or the equivalent. Materials should be submitted at the beginning of their final semester.
4. A committee of faculty members (including at least one who advised the student on this work) will determine whether this student's work is worthy of department honors.

Jewish Studies 563 (SAS)

# Student Awards

# Student Awards

The Department of Jewish Studies provides awards to students in three categories:

**Research in Jewish Studies Awards** are available to students (both undergraduate and graduate) who plan to conduct research related to the field of Jewish Studies in fulfillment of an honors project, senior thesis, capstone project, summer research project, graduate thesis, doctoral dissertation, etc.

**Study in Israel/Abroad Awards** provide financial support to full-time Rutgers students (both undergraduate and graduate) to study at any of the six accredited Israeli universities: Hebrew University, Tel-Aviv University, Bar-Ilan University, Ben-Gurion University, University of Haifa, and the Technion, or to enroll in a program of Jewish Studies at universities in other countries. Awards will only fund programs that are open to all students. Proof of acceptance to the program is required at time of application.

**Excellence in Jewish Studies Awards (ONLY SPRING 2025)** recognize achievements by Rutgers students in the field of Jewish Studies. To be eligible for an award, students must have taken at least two courses in Jewish Studies. Selection is based upon a sustained record of achievement in Jewish Studies. Prior recipients may reapply.

Please visit the Department of Jewish Studies website to learn about eligibility for student awards.

Jewish Studies 563 (SAS)

# Courses in English

# Courses in English

**01:563:100** ***Introduction to the Middle East (3)***
Introduction to the languages and cultures of the Middle East and facilities of cross-cultural communication and understanding between the people of the West and Middle East.
***Credit not given for both this course and 01:685:100.***

**01:563:201** ***Jewish History: Ancient and Medieval (3)***
Examines the social, economic, religious, and political experiences of the Jewish people, from the Biblical world of the ancient Near East until the Middle Ages.
***Credit not given for both this course and 01:506:271 or 01:685:208.***

**01:563:202** ***Jewish History: Modern (3)***
Examines Jewish life from the breakdown of traditional society in Europe in the 1700s until the rise of the modern state of Israel in the 20th century.
***Credit not given for both this course and 01:506:272.***

**01:563:205** ***History of the Modern Middle East (3)***
Shaping of Middle Eastern politics and society since 1800 out of the Islamic/Ottoman legacies and under the impact of modernity and Western encroachment.
***Credit not given for both this course and 01:508:205 or 01:685:203.***

**01:563:206** ***Introduction to the Bible II: Prophets and Poetry (3)***
Literature of the Bible, focusing on the Prophets, the historical backdrop of the prophetic message as revealed mainly through the books of Kings, and other relevant poetic material (Psalms, Job, etc.).
***Credit not given for both this course and 01:840:206.***

**01:563:208** ***Jewish-Muslim Relations: History and Culture (3)***
Surveys the cultural history of Jewish-Muslim relations from the seventh century up to our present. Analyzes this important and unique aspect of Jewish and Muslim pasts and the place of the Jews in the cultural history of Islam. Course taught in English. Credit not given for both this course and 01:013:208 or 01:508:208.

**01:563:220** ***Introduction to the Bible I: Torah and Prose (3)***
Literature of the Bible, focusing on the Torah and the historical material in Joshua through Samuel. Emphasis placed on literary, historical, and theological matters. Special use made of archaeological discoveries. The Bible studied against the backdrop of ancient Near Eastern literature, history, religion, mythology, and law.

**01:563:222** ***Introduction to Ancient Judaism (3)***
Historical development of Judaism in ancient times from its origins in ca. 1200 BCE through the Roman period ca. 300 CE. Emphasis on the beliefs and practices of ancient Judaism during biblical and postbiblical periods, as reflected in the literature of the times (such as the Bible, Dead Sea Scrolls, and Mishna) and in the archaeological record.
***Credit not given for both this course and 01:840:242.***

**01:563:223** ***New Testament (3)***
Interpretation of basic Christian scriptures in translation; influence of Jesus and Paul on the early Christian community.
***Credit not given for both this course and 01:840:202.***

**01:563:224** ***Breaking the Glass Ceiling: Women Religious Leaders (3)***
Interdisciplinary approach to analyzing women's religious leadership in Judaism, Christianity, and Islam. Ethnographic case studies of religious communities. Topics include: strategies that preclude women from leadership; informal and formal leadership for women; differences across traditions; feminism; Internet and religious authority. Readings, films, discussions, interviews with female religious leaders.

Credit not given for both this course and 01:070:284 or 01:988:221.

**01:563:225** ***Jewish Music (3)***
Introduction to biblical cantillation, medieval Jewish music, liturgical and Hasidic melodies, Yiddish folk songs, and the music of modern Israel.

**01:563:226** ***History of Jewish Art (3)***
A survey of Jewish visual culture from ancient synagogue architecture to works of contemporary art.
***Credit not given for both this course and 01:082:255.***

**01:563:228** ***Jews and Medicine (3)***
Explores the engagement of Jews with medicine, public health, and bioethics. Examines ways that Jews have imagined health, illness, and the body, as well as the way that non-Jews have imagined the Jewish body and health.

**01:563:230** ***Modern Jewish Culture: Key Texts and Their Afterlives (3)***
Examines four key texts, written between 1894 and 1944, that have become fixtures not only of modern Jewish culture, but also of world culture primarily through adaptations in stage, film, broadcasting, music, and visual art.
***Credit not given for both this course and 01:195:230.***

**01:563:231** ***American Jewish History (3)***
History of the Jews in the New World, beginning in the middle of the 17th century, and then focusing on the United States until the present.
***Credit not given for both this course and 01:512:231.***

**01:563:240** ***Jewish-Christian Relations through the Ages (3)***
Jewish-Christian relations from the first century of the Common Era through to the start of the 21st century. The course focuses both on the history of interactions between Jews and Christians--persecutions, collaborations, conversions, etc.--and also on the history of theological stances and popular attitudes.
***Credit not given for both this course and 01:510:265.***

**01:563:241** ***Introduction to Rabbinic Literature (3)***
Introduces students to the Rabbinic period and rabbinic texts, including the Mishnah, the Talmud, and midrashic literature.
***Credit not given for both this course and 01:840:241. No prior knowledge required; all readings in English.***

**01:563:243,244** ***Modern Jewish Literature (3,3)***
Works of great Jewish writers from Russia, Germany, France, Italy, the United States, and Israel, from late 19th century to the present, in translation.

**01:563:245** ***The Culture of Yiddish: An Introduction (3)***
An overview of Yiddish, the traditional vernacular language of Ashkenazic Jews, and its culture, from its medieval origins to the present.
***Credit not given for both this course and 01:470:280. All readings in English.***

**01:563:246** ***Jewish Humor (3)***
Analyzes the development of Jewish humor during the 19th and 20th centuries, with a focus on America, Eastern Europe, and Israel. Relation of humor to historical developments, including acculturation and the maintenance of cultural distinctiveness.

**01:563:250** ***Spirituality and Mysticism in Judaism (3)***
The course offers a historical survey of Jewish mystical traditions from the Bible and early rabbinic traditions through later medieval works, including the core book of Jewish kabbalah, the Zohar. The course emphasizes Jewish mystical discussions of the relationship between God and man, the spiritual dimension of everyday practices, and kabbalistic understanding of God
***Credit not given for both this course and 01:840:250.***

**01:563:254** ***Hasidic Tales (3)***
Legends and stories; a study of the ideals and values of the Ba'al Shem Tov and other Hasidic masters from the 18th century to the present.

**01:563:260** ***Remembering the Shtetl (3)***
How Jewish life in eastern European small towns has been documented and recalled from the 19th century to the present in fiction, art, ethnography, film, and memoir.
***Credit not given for both this course and 01:510:260.***

**01:563:261** ***History of the Holocaust (3)***
Development of anti-Semitism in modern European history, culminating in the "Final Solution"; special emphasis on Jewish response and resistance.
***Credit not given for both this course and 01:510:261.***

**01:563:265** ***Women in the Bible (1.5)***
The course focuses on the role of women in biblical stories and addresses the question of the role of women in ancient Israelite society.

**01:563:266** ***Ancient Egypt (1.5)***
Introduction into ancient Egypt. Topics include a historical overview, religion, art, interconnections between ancient Egypt and ancient Israel, and Hieroglyphic Egyptian language and literature.
***Credit not given for both this course and 01:013:266.***

**01:563:269** ***Antisemitism (3)***
History of negative attitudes toward Jews and Judaism from the ancient and medieval world to modern Europe, the United States, and the Middle East. Explores continuities and turning points in the history of "antisemitism" as well as the significance of "antisemitism" as an analytic category. Focus on contemporary discourses and media representations of "antisemitism" in light of their historical precedents and resonances.
***Credit not given for both this course and 01:510:269.***

**01:563:270** ***Between Nazism and Communism (3)***
Explores the experiences of Poles and Polish Jews under Nazi and Communist rule through history, travel writing, memoir, poetry, and film.
***Credit not given for both this course and 01:510:263.***

**01:563:280** ***Jerusalem Contested: A City's History from Jewish, Christian, and Muslim Perspectives (3)***
Introduces students to the history of Jerusalem and explores the causes and evolution of the city's importance in Judaism, Christianity, and Islam.
***Credit not given for both this course and 01:508:209 or 01:685:280.***

**01:563:281** ***Modern Israeli Culture (3)***
Approaches modern Israel as a case study in creating a new national culture in relation to ancient history and traditions and a longstanding diaspora. Explores the evolution of Israeli culture between 1940s and 1990s from an interdisciplinary perspective.
***Credit not given for both this course and 01:508:211, 310 or 01:563:310 or 01:658:281, 310.***

**01:563:282** ***Israeli-Palestinian Conflict (3)***
Overview of the hundred-year old Israeli-Palestinian conflict, the controversies it has generated, the attempts to resolve it, and how we as outsiders to the conflict learn about it and experience it. Credit not given for both this course and 01:508:212 or 01:685:282

**01:563:293** ***Topics in Jewish Studies (3)***
Selected themes in Jewish studies at the introductory level. Topics announced when course offered.

**01:563:304** ***Jewish Cinema and Fiction (3)***
Comparative study of Jewish themes in Yiddish, Israeli, American, and European films (with English subtitles) and their literary sources; discussions and readings in English.

**01:563:306** ***American Jews and the Media (3)***
Examines the roles that film, sound recordings, radio, television, video, and computers play in American Jewish life since the turn of the 20th century.
***Credit not given for both this course and 01:050:336.***

**01:563:307** ***Muslims, Christians, and Jews in Medieval Spain (3)***
History of medieval Spain with a focus on cultural, religious, and political diversity.
***Credit not given for both this course and 01:510:313.***

**01:563:311** ***Classical Jewish Philosophy (3)***
Major trends and figures in medieval Jewish thought; Jewish Platonism (Solomon ibn Gabirol); Jewish Aristotelianism (Maimonides); the critique of philosophy (Hallevi); and Jewish philosophy in the Renaissance.
***Credit not given for both this course and 01:730:311.***

**01:563:312** ***Modern Jewish Philosophy (3)***
Thinkers and systems in modern Jewish philosophy, including interpretations of Jewish tradition; Jewish Kantianism (Cohen, Buber); Jewish existentialism and postmodernism (Rosenzweig, Levinas); the Holocaust; and Jewish feminism.
***Credit not given for both this course and 01:730:312.***

**01:563:314** ***Jews, Heretics, and the Inquisition (3)***
A survey of the medieval, Spanish, and Roman inquisitions, focusing on these institutions' attitudes toward, and treatment of, heretics, Jews, and conversos. Students will study how these inquisitions operated and examine their legal precedents as well as their relations to the social, political, and religious tensions of their day, in the context of broader historical questions about forms of intolerance and modes of persecution.
***Credit not given for both this course and 01:510:314.***

**01:563:315** ***Topics in Rabbinic Literature (3)***
Examines selections of original materials from the Talmud, codes, and responsa literature concerning several topics.

**01:563:316** ***Israeli Women: Historical and Literary Perspectives (3)***
Impact of socialism, nationalism, ethnicity, religion, and feminism on Israeli women's roles within the family, labor force, army, kibbutz, and politics.
***Credit not given for both this course and 01:508:316 or 01:988:316 or 01:685:316.***

**01:563:319** ***Women in Jewish Law (3)***
Women's voices in Jewish legal sources from Late Antiquity and the Middle Ages.

**01:563:321** ***Studies in Literature and Spirituality (3)***
Religious themes in literature, with attention to matters of rhetoric, style, and structure.

**01:563:322** ***Women in the Bible (3)***
Literary readings of biblical stories about women, with special emphasis on their roles, representation, and literary types. All texts in English translation.
***Credit not given for both this course and 01:840:361 or 01:988:314.***

**01:563:323** ***Women in the Bible--Hebrew Seminar (1)***
Optional 1-credit add-on for students enrolled in Women in the Bible who wish to further their understanding of the texts by reading them in the original Hebrew.
***Prerequisite: Intermediate Hebrew or higher. Corequisite: 01:563:322.***

**01:563:324** ***Ancient Near Eastern Religions (3)***
Religious patterns in Mesopotamia, Anatolia, Canaan, Israel, and Egypt from texts in translation; their impact on cultural developments of the Near East.
***Credit not given for both this course and 01:840:301.***

**01:563:325** ***Hebrew Prophets (3)***
Development and diffusion of Israelite prophetic thought from early associations with divination in Near Eastern culture through the Exile and later decline.
***Prerequisites: 01:840:201,202 or permission of instructor; not open to first-year students.***

**01:563:330** ***Space and Identity: Jewish Perspectives (3)***
Drawing on modern Jewish culture as a case study, course focuses on the "spatial turn" in the study of human societies as it sets out to explore the interrelation between space and identity. Examines such concepts as homeland and exile, diasporas and hybrid identities, symbolic landscapes, private and public spaces, gendered spaces, the sanctification of space, communal enclaves and cultural spaces, transplanted and reenacted spaces, and tourism as pilgrimage.

**01:563:332** ***The American Jewish Experience in Literature (3)***
Patterns of alienation and assimilation of an American ethnic group as portrayed in its literature. Attention to early narratives as well as the works of contemporary writers such as Roth, Potok, Bellow, Malamud, and Singer.
***Credit not given for both this course and 01:050:332.***

**01:563:335** ***Jewish-American Women: Contested Lives (3)***
Explores the Jewish-American female identity in autobiography and memoir, social history, literature, and film. Examines interplay of religious belief, secularism, social mobility, and acculturating influences within American experience.
***Credit not given for both this course and 01:050:335 or 01:988:334.***

**01:563:336** ***Jewish Historical Fiction (3)***
Explores a variety of Jewish historical novels and their relationship to the historical periods they purport to represent, from late antiquity to the modern period. Special emphasis is given to comparing works of history with works of fiction. Topics include: Second Temple sectarianism; Medieval Jewish marriage law and customs; mysticism; Sabbatianism; and revolution in the Soviet Union.
***Credit not given for both this course and 01:510:393.***

**01:563:338** ***The Jewish Graphic Novel (3)***
Examination of Jewish graphic novels since the emergence of this genre during the latter half of the 20th century. Focus on the role of graphic novels in Jewish popular culture and as a medium for Jewish storytelling.

**01:563:340** ***The Dead Sea Scrolls (3)***
Introduction to the history and scholarship surrounding the Dead Sea Scrolls.
***Credit not given for both this course and 01:840:340.***

**01:563:341** ***Jesus the Jew (3)***
Explores the historic figure of Jesus within the context of first-century Palestinian Judaism. Topics include Jesus and the Law, Jesus and the Temple, the problem of religious authority and types of religious leaders, the Sermon on the Mount, and the "Parting of the Ways."
***Credit not given for both this course and 01:840:310.***

**01:563:342** ***Jewish Nationalism (3)***
Examines the varieties of Jewish nationalisms that arose in Europe at the end of the 19th century. Considers causes of Jewish national thinking in the broader political and intellectual context within which the Jews lived.

**01:563:343** ***Zionism Meanings and Challenges (3)***
Origins of Zionism in the mid-19th century and its development to the present day. Topics addressed include Zionism's political and social contexts, how other ideologies shaped Zionism, critics of Zionism, and the effect of Zionism on Jews' relationship to each other and to their surrounding societies.
***Credit not given for both this course and 01:510:386.***

**01:563:344** ***Sephardic History and Culture (3)***
Explores the history, religion, and culture of Sephardic Jews from the 15th century to the present.

**01:563:346** ***Contemporary Jewish Life (3)***
Study of contemporary Jewish life, especially in America--in communities, institutions, rituals, personal histories, etc.--through the approach of fieldwork and ethnographic writing.
***Credit not given for both this course and 01:050:337.***

**01:563:348** ***Tradition and Innovation in American Jewish Ritual (3)***
Focuses on the tension between tradition and innovation that characterizes American Jewish life cycles by considering theories of ritual and ethnographic practice. Examines some of the ways American Jews have engaged various rituals including birth, marriage, bar/bat mitzvah, and death and mourning rituals.

**01:563:351** ***Contemporary Politics in the Middle East (3)***
Contemporary politics of the Middle East through scholarly literature and documentary-type films dealing with socioeconomic and cultural influences on politics.
***Credit not given for both this course and 01:685:351 or 01:790:351.***

**01:563:352** ***Israeli Politics (3)***
Basic understanding of the historical background of the establishment of the state of Israel; major characteristics of the political culture and institutions and how they have responded to the dynamic sociocultural and political changes that have shaped the society.
***Credit not given for both this course and 01:790:352 or 01:685:352.***

**01:563:355** *Kafka and World Literature (3)*
Introduction to Kafka's work and its impact on world literature. Topics include: literary modernism and European modernity; Jewish languages, culture, identity, and music in the early 20th century and beyond; minor and postcolonial literature; rethinking the relationship among humans, animals, hybrids, and monsters; and new directions in art, literature, film, and music. Taught in English.
***Credit not given for both this course and 01:195:382 or 01:470:354.***

**01:563:359** *Race, Culture, and Politics: Blacks and Jews in America (3)*
How black and Jewish identities have evolved in relationship to one another through an examination of social and political history, literature, and film.
***Credit not given for both this course and 01:512:359 or 01:014:359 or 01:050:359.***

**01:563:360** *Remembering the Holocaust (3)*
Holocaust remembrance in contemporary social and cultural practices in the United States and globally considered as a paradigm for deriving lessons from the past in order to respond to traumatic losses, address present social injustices, and prevent future acts of intolerance.
***Credit not given for this course and 01:510:370 or 01:470:369.***

**01:563:364** *Genocide, the Holocaust, and Legacies of Violence (3)*
How the Holocaust has shaped and reshaped understandings of genocide and witnessing through an ethnographic and historiographic lens. Examines the complexities of survival as they relate to truth and memory.

**01:563:365** *Holocaust Literature in Translation (3)*
Interpretation of works dealing with the Holocaust by leading Hebrew, Yiddish, and European writers. Appropriate films used.
***All readings in English.***

**01:563:366** *Holocaust Media (3)*
Examines the wide array of uses of media to represent the Holocaust, from World War II to the present. Examples range from wartime radio broadcasts and newsreels to documentaries, television dramas, videotaping of Holocaust testimonies, photography, as well as the use of media in museum displays and tourist practices.
***Credit not given for both this course and 01:195:371.***

**01:563:367** *American Jewish Writers of the 20th Century (3)*
Cultural, literary, attitudinal aspects of American Jewish fiction: Abe Cahan, Henry Roth, Daniel Fuchs, Saul Bellow, Bernard Malamud, and others.

**01:563:368** *Jews of Germany and Austria-Hungary, 1780-Present (3)*
Jewish history in modern Central Europe. Focus on Germany, Austria, Hungary, and Czechoslovakia (now the Czech Republic and Slovakia) from the late 1700s until the present day.
***Credit not given for both this course and 01:510:368.***

**01:563:370** *Germany Confronts the Holocaust (3)*
Analyzes the shifting role of the Holocaust in postwar German public life--in art, literature, museums, and other memorials; film; television; and political discourse. Some attention will also be given to Austria and Switzerland; contrasts will be drawn to the place of the Holocaust in postwar and contemporary America.
***Credit not given for both this course and 01:470:310 or 01:195:370.***

**01:563:373** ***History of Jewish Women (3)***
Jewish women's history; examines the religious, social, intellectual, and cultural environments of Jewish women from the biblical period through the 20th century.
***Credit not given for both this course and 01:506:373 or 01:988:373.***

**01:563:375** ***Jewish Immigrant Experience (3)***
Modern Jewish immigrant experience, focusing on European and Middle Eastern communities resettled in America, Israel, and Europe.
***Credit not given for both this course and 01:506:375 or 01:070:375.***

**01:563:380** ***German-Jewish Literature and Culture (3)***
Survey of German-Jewish culture, 18th century to present. Literature in political-historical context, with some attention to music, philosophy, and film.
***Credit not given for both this course and 01:470:380 or 01:195:380.***

**01:563:381,382** ***Topics in Jewish Studies (1.5,1.5)***
Topics vary. Topics announced when course is offered.
***Seven-week courses; may be taken consecutively or separately.***

**01:563:383** ***Modern Jewish Art (3)***
The Jewish experience in modern art.
***Credit not given for both this course and 01:082:380.***

**01:563:384** ***Gender and Politics in Yiddish Literature and Culture (3)***
Traces the cultural dynamics of Ashkenazic Jews in 16th- to 19th-century Europe through Yiddish religious writing, folktales, fiction, memoirs, and poetry.
***Prerequisites: 01:563:202, 260, or permission of instructor. Credit not given for both this course and 01:470:384 and 01:988:391. All readings in English.***

**01:563:385** ***Rabbis, Rebels, and Rationalists: The Jews of Eastern Europe (3)***
Economic, legal, and political conditions of Jewish life from the 16th century to World War II. Forms of Jewish response: autonomism, messianism, Hasidism, emigration, and socialism.
***Credit not given for both this course and 01:510:385.***

**01:563:386** ***Modern Yiddish Literature and Culture (3)***
Yiddish prose, poetry, folklore, theater, and film in Europe and America from the late 19th century to the present.
***All readings in English translation.***

**01:563:387** ***Touching History: The World of Medieval Manuscripts (3)***
An introduction to medieval manuscripts and to book culture from before the age of printing, with particular attention to the scribal transmission of ancient and classical texts (Bible, Homer, Qur'an, Beowulf, etc.).

Credit not given for both this course and 01:506:388 or 01:677:387 or 01:840:388

**01:563:389** ***Jewish Politics, Jewish Power (3)***
Political relationship of the Jewish community to the Gentile authorities among whom they lived, from Rome in 70 CE to the contemporary period. Continuities and discontinuities of traditional conceptions of Jewish political

behavior and rebellion, and accommodation to structures of power in varying historical contexts.
*Prerequisite: At least one course in Jewish or European history after 1500. Credit not given for both this course and 01:510:389 or 01:790:384.*

**01:563:390** *Jewish Memory (3)*
Explores various forms of Jewish memory shaped in response to major events, including myths, holidays, monuments, pilgrimages, testimonies, museums, literature, and film.
*Credit not given for both this course and 01:510:390.*

**01:563:393** *Israeli Film (3)*
Explores major social, cultural, and political issues central to contemporary Israeli society and its development, and their representation in Israeli cinema.
*Credit not given for both this course and 01:195:393.*

**01:563:394,395,396,397** *Topics in Jewish Studies (3,3,3,3)*
Selected themes in Jewish studies. Topics announced when course offered.

**01:563:399** *Research and Writing in Jewish Studies (3)*
Explores a major theme in Jewish studies and allows students to pursue their own scholarship, culminating in a major research paper.
*Credit not given for both this course and 01:506:464.*

**01:563:404** *Spinoza (3)*
Spinoza's theological political treatise: prophecy, miracles, and faith and reason. Spinoza's ethics: God and his attributes, the human mind, and human bondage and freedom.
*Prerequisites: Two courses in philosophy. Recommended: 01:730:205 or 307. Credit not given for both this course and 01:730:404.*

**01:563:408** *Sociology of American Jewish Religious Movements (3)*
Denominational patterns of America's Jews; religious patterns including Hasidism, fundamentalism-secularization, women's roles, intermarriage, and intra- and interreligious patterns.
*Credit not given for both this course and 01:920:408.*

**01:563:409** *Introduction to the Semitic Languages (3)*
Survey of the Semitic languages and their history from a comparative perspective.
*Prerequisite: One year of a Semitic language (such as Hebrew or Arabic) or permission of instructor. Credit not given for both this course and 01:013:409.*

**01:563:451** *Critical Perspectives on the Middle East (3)*
Promotes critical thinking about the Middle East by analyzing how stereotypes and Western political thinking hinder intercultural understanding, and encourages students to think more dynamically about the relationship between the United States and the developing world.
*Prerequisite: 01:790:102 or 01:790:103 or 01:790:351 or permission of instructor. Credit not given for both this course and 01:685:451 or 01:790:451.*

**01:563:460** *Jewish Studies Internship (3)*
Supervised work at a historical society, archive, museum, communal agency, etc.; 112 hours required. Students also required to prepare a research project related to the internship, under the supervision of an assigned faculty

member. Students may do more than one internship, as long as no two are at the same institution. Only one internship can count toward the Jewish studies major or minor.
*Open to all Rutgers undergraduates.*

**01:563:461** *Supplementary Independent Study (1)*
Add-on for undergraduates who undertake extra work in relation to a course, for example, regularly meeting with a professor to read texts in their original language.
*Prerequisite: Special permission of department.*

**01:563:464** *Jewish Studies Seminar (3)*
Explores a major theme in Jewish studies and allows students to pursue their own scholarship, culminating in a major research paper.
*Prerequisite: 01:563:201 or 202 or permission of instructor. Credit not given for both this course and 01:506:464.*

**01:563:480** *Modern Middle Eastern Literature in Translation (3)*
Modern literature in the Arabic, Hebrew, Persian, and Turkish traditions; with a focus on poetry, the short story, and the novel.
*Credit not given for both this course and 01:195:490 or 01:685:490.*

**01:563:482,483** *Advanced Topics in Jewish Studies (1.5,1.5)*
Highly specialized advanced courses open to both undergraduate and graduate students. Specific titles available at registration.
*Seven-week courses; may be taken consecutively or separately.*

**01:563:490** *Studies in Jewish History (3)*
In-depth study of selected issues and problems in Jewish history and culture.

**01:563:491,492** *Independent Study and Research (3,3)*
Individual reading research project under the guidance of a Jewish studies faculty member on a topic of interest to the student. Final written report required.

**01:563:495** *Special Topics in Literature (3)*
Selected themes in Hebrew, Yiddish, or other Jewish literature. Topics announced when course offered.

**01:563:496,497** *Senior Honors (3,3)*
Independent research project under supervision of a faculty member, culminating in an honors thesis that must be approved by the program.
*Prerequisite: Permission of department director.*

# Courses in Modern Hebrew

# Courses in Modern Hebrew

**01:563:101** ***Elementary Modern Hebrew (4)***
Speaking, reading, and writing; oral-aural and written exercises.
***Prerequisite: Placement test to determine level of language competence. Not open for credit to students who have had two or more years of secondary school Hebrew. Credit not given for both this course and 01:013:152 and 01:685:101.***

**01:563:121** ***Hebrew Review and Continuation (4)***
Development of primary language skills.
***Prerequisites: Previous exposure to Hebrew and placement into Hebrew 121. Credit not given for both this course and 01:013:156.***

**01:563:131,132** ***Intermediate Modern Hebrew (4,4)***
Development of language skills; selected readings.
***Prerequisite: 01:563:102 or placement test. Credit not given for both courses and 01:013:252,253 and 01:685:131,132.***

**01:563:210,211** ***Advanced Modern Hebrew (3,3)***
Intensive training in Hebrew grammar and reinforcement of already acquired higher-level language skills: speaking, listening, comprehension, reading, and writing. Text analysis includes newspaper articles and essays.
***Prerequisite: 01:563:132 or placement test. Credit not given for both courses and 01:013:352,353 and 01:685:210,211.***

**01:563:371** ***Readings in Modern Hebrew 1 (3)***
Addresses current issues facing Israeli society as reflected in Israeli literature and press. Texts include poetry, songs, essays, newspaper articles, and films.
***Prerequisite: 01:563:211 or 01:013:353 or placement test. Credit not given for both this course and 01:013:354.***

**01:563:372** ***Readings in Modern Hebrew 2 (3)***
Introduces students to major writers of modern Hebrew literature with the goal of developing their own critical reading and writing skills. Readings include modern Hebrew poetry, prose, and plays.
***Prerequisite: 01:563:211 or 01:013:353 or placement test. Credit not given for both this course and 01:013:355.***

**01:563:471** ***Readings in Modern Hebrew Literature (3)***
Reading and analysis of modern Hebrew poetry and short prose, with an emphasis on major Israeli authors.
***Prerequisite: 01:563:372 or 01:013:355 or placement test. Credit not given for both this course and 01:013:452.***

**01:563:472** ***The Hebrew Novel (3)***
Reading and analysis of the modern Hebrew novel, with an emphasis on major Israeli authors.
***Prerequisite: 01:563:372 or 01:013:355 or placement test. Credit not given for both this course and 01:013:453.***

**01:563:484** ***Love and Desire in Hebrew Prose and Poetry (3)***
Explores the themes of love and desire in modern Hebrew prose, poetry, and film. Special attention paid to how the literature and films handle the issues of love, desire, and personal relationships in contemporary Israeli culture.
***Prerequisite: 01:563:372 or 01:013:355 or placement. Credit not given for both this course and 01:013:453.***

**01:563:485** ***Hebrew Literature and Israeli Society (3)***
Traces the development of modern Israeli literature, from the establishment of the state of Israel in 1948 to the present day. Of special interest will be the manner in which these stories define the quintessential Israeli hero and contend with the question of Israeli identity.
***Prerequisite: 01:563:372 or 01:013:355 or placement. Credit not given for both this course and 01:013:455.***

Jewish Studies 563 (SAS)

# Courses in Biblical Hebrew

# Courses in Biblical Hebrew

**01:563:141** ***Biblical Hebrew I (3)***
An introduction to Biblical Hebrew, with a focus on basic grammar and basic lexicon, leading to a reading and understanding of simple narrative prose texts.
***Credit not given for both this course and 01:013:154.***

**01:563:142** ***Biblical Hebrew II (3)***
A continuation of Biblical Hebrew I, leading to more advanced grammar and lexicon, with further understanding of narrative prose texts and an introduction to poetic texts.
***Prerequisite: 01:563:141 or 01:013:154 or permission of the instructor. Credit not given for both this course and 01:013:155.***

**01:563:146** ***The Bible in Aramaic (3)***
Introduction to Aramaic through biblical literature, including Aramaic Bible passages and vernacular translations into various Aramaic dialects, with a focus on Syriac version.

In English. Credit not given for this course and 01:013:111 or 01:840:123.

**01:563:431** ***Hebrew Bible (in Hebrew) (3)***
Study of selected portions of the Pentateuch; comparing the original Hebrew with English translations and utilizing classical and modern commentaries.
***Prerequisite: 01:563:216 or placement test or permission of instructor.***

**01:563:433** ***Readings in Biblical Hebrew Prose (3)***
Advanced course in reading selected prose texts in the Hebrew Bible, with a special focus on material from Genesis, Exodus, Numbers, Joshua, Judges, and Samuel. Emphasis on the literary devices utilized by the ancient Israelite prose writers, but also other issues such as grammatical and historical concerns.
***Prerequisite: 01:563:211 or permission of instructor.***

**01:563:434** ***Readings in Biblical Hebrew Poetry (3)***
Advanced course in reading selected poems in the Hebrew Bible, with a special focus on material from Psalms, Proverbs, and the prophets. Emphasis on the literary devices utilized by the ancient Israelite poets, most importantly parallelism, but also other issues such as grammatical and historical concerns.
***Prerequisite: 01:563:211 or permission of the instructor.***

**01:563:437** ***Rabbinic Literature (in Hebrew/Aramaic) (3)***
Study of selected portions of the Mishnah, Midrash, and Talmud; comparing Hebrew/Aramaic and English texts and utilizing classical and modern commentaries.
***Prerequisite: 01:563:216 or placement test.***

Jewish Studies 563 (SAS)

# Courses in Yiddish

# Courses in Yiddish

**01:563:103,104** ***Elementary Modern Yiddish (4,4)***
Speaking, reading, and writing; oral-aural and written exercises.
***Not open for credit to students who have had two or more years of secondary school Yiddish or equivalent.***

**01:563:133,134** ***Intermediate Modern Yiddish (4,4)***
Practice in oral and written composition and selected readings in Yiddish prose and poetry.
***Prerequisite: 01:563:104 or placement test.***

Jewish Studies 563 (SAS)

# Course in Aramaic

# Course in Aramaic

**01:563:145** ***Introduction to Aramaic (3)***
Introduction to the grammar of Aramaic. Focuses on the Aramaic portions of the books of Ezra and Daniel, combined with a survey of Aramaic dialects in antiquity and the present day.
***Prerequisite: 01:563:101 or 01:685:101 or equivalent. Credit not given for both this course and 01:013:145 or 01:685:145.***

# Journalism and Media Studies 567 (SC&I-U)

## JOURNALISM AND MEDIA STUDIES 567

Please check the listing of JMS courses on the SC&I website for the most up-to-date information about courses.

**04:567:200** ***Writing for Media (3)***
Fundamentals of writing across media platforms. By the end of the course, students will be able to write in many journalistic and media-based styles using basic and accepted techniques accepted by each discipline. This course will serve as a foundation for understanding and using different styles of writing, research, and content development. (Required course)

**04:567:201** *Media Ethics and Law (3)*
Legal issues and ethical problems confronting journalists. (Required course)
*Open only to journalism and media studies majors.*

**04:567:205** *Digital News Writing and Reporting (3)*
Fundamentals of gathering information and journalistic writing. By the end of the course, students will learn basic journalistic news writing and reporting techniques, including writing in journalistic style, fact-gathering, conducting observation, freedom of information, and ethics. (Foundational course)
*Prerequisites: 04:567:200. Open only to journalism and media studies majors.*

**04:567:206** *Broadcast News Writing and Reporting (3)*
News writing for radio, with review of television news writing approaches for comparison. (Foundational course)
*Prerequisites: 04:567:200. Open only to journalism and media studies majors.*

**04:567:207** *Design and Digital Editing (3)*
Fundamentals of copyediting and layout. (Foundational course)
*Prerequisites: 04:567:200. Open only to journalism and media studies majors.*

**04:567:210** *Media Management and Strategy (3)*
Focuses on the key economic and strategic concepts, challenges, and opportunities that are central to the management of contemporary media organizations. The course is grounded in the growing academic and professional literatures examining the unique nature of media products and services and the unique and rapidly changing marketplace dynamics in which media organizations operate. Given the ongoing convergence of media industries and technologies, this course focuses on concepts, analytical tools, and issues that have relevance across the full range of media industry sectors. (Foundational Course)
*Prerequisites: 04:567:200. Open only to journalism and media studies major.*

**04:567:211** *Exploring New Media (3)*
This course examines the nature and impact of emerging media technology. Students study four primary ways new technology influences media, including 1) how media professionals do their work; 2) the nature of media content; 3) the relationships between and among media and relevant publics; and 4) the structure, culture, and management of media organizations and systems. Five areas of media technology are studied, including 1) acquisition tools; 2) storage technologies; 3) processing devices; 4) distribution technologies; and 5) display, access, or presentation tools. (Foundational course)
*Prerequisites: 04:567:200. Open only to journalism and media studies majors.*

**04:567:212** *Digital Media Production (3)*
Digital media production is the study of media creation and display through online and interactive experiences. This includes audio and video steaming in online contexts, but it also covers other types of new media that are hybrids of the two. Using various multimedia systems and formats, you will explore the foundations of development, content creation and distribution across multiple platforms. Focusing on multi-platform digital media, you will have the opportunity to write, produce and edit your own digital media content for online distribution.
*Prerequisites: 04:567:200. Open only to journalism and media studies majors.*

**04:567:215** *Gender, Race, and Class in the Media (3)*
Content, treatment, and effects of women and minority group coverage in television, newspapers, magazines, popular music, and film. (Foundational course)

**04:567:216** ***Digital Media and Society (3)***
Historical and contemporary social, cultural, political, and economic issues related to digital media in society. (Foundational course)

**04:567:217** ***Foundations of Media Analysis (3)***
Survey of critical approaches to the analysis of media and its impact on society. (Foundational course)

**04:567:250** ***Children and Media (3)***
This course examines children's relationship to media in its historic, economic, political, and social contexts. It begins by reviewing theories of child development as they inform children's relationship with and understanding of media. Next, it considers the political and economic forces that shape the landscape of children's media. Against this backdrop, the course examines research on the effects of media on children's physical, cognitive, social, and emotional development. Class time consists of lectures, screenings, and visits from professionals working in the field. Students in this course produce a proposal or prototype for an educational children's media property as their final project. (Concept and Analysis Course)

**04:567:274** ***Consumer Media Culture (3)***
Provides a critical understanding of advertising's role in modern society. Examines the history of advertising, the commercial and social aspects of the messages conveyed by ads, and the advertising industry's influence on social relations and institutions, such as journalism. The basic orientation of the course is to study consumer media culture (advertising, public relations, and branded space) as a form unique to modern society. (Concept and Analysis course)

**04:567:275** ***Social Media and Participatory Culture (3)***
This course takes a critical approach to understanding new media environments, especially with regard to what has been called at various moments "social media," "participatory culture," "digital media," "convergence," "Web 2.0," "social web," and "interactive media," among other things. Rather than focus on these emerging media practices as purely technological phenomena, the course situates them in broader social, political, and historical contexts. We will examine key dimensions of cultural life that make up our selves, including friendship, intimacy, labor, celebrity, power, gender, control, race, sexuality, activism, and privacy. (Concept and Analysis course)

**04:567:276** ***Musical Cultures and Industries (3)***
This course looks at the invisible power of music over lives, exploring how music can influence how people feel, what they think, and how they think. Exploration of music's social power, delving into its rich history at the center of politics, religion, and a multibillion dollar global industry. Consideration of music's relationship to technology and how changes in the media landscape are altering the role music plays in human life. (Concept and Analysis course)

**04:567:278** ***News Media and Government in America (3)***
Examines the relationship between media and institutions and the processes through which people and societies make political choices. (Concept and Analysis course)

**04:567:314** ***Photojournalism (3)***
Fundamentals of still photography in print and audiovisual mass media with a primary focus on print journalism. (Practice and Innovation course) Must have a 35mm camera.
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:317** ***Writing the Mediterranean (3)***
Students will draw inspiration from great Mediterranean journeys, and learn to write compelling journey stories of their own. They will travel with Homer, Mark Twain, Ernest Hemingway, Martha Gellhorn, George Orwell, and other notable authors through one of the world's grandest regions, as they explore its legacy of war and exodus, cooking and eating, and romance and revenge. This course includes a spring break reporting trip to a Mediterranean country, such as Spain, Italy, or Turkey.
***Prerequisites: 04:567:200. Open to majors and MCM digital media track students only, except by special permission.***

**04:567:318** ***Fashion Journalism (3)***
Fashion Journalism is a course for advanced students in the journalism and media studies major who have an interest in writing about fashion, a key industry in New York City. The course provides students with an overview of writing about fashion, the different types of fashion journalism, and the numerous formats for fashion journalism. Students will also look at how fashion journalism has changed and how digital has transformed coverage. Throughout the semester, students will use readings, televised fashion coverage as well as online documentaries and collection showings to learn about the fashion journalism industry and to practice reporting techniques. Assignments will incorporate a multimedia focus with students working to produce a full range of fashion journalism that reflects the variety of journalism commonly produced in the industry. (Practice and Innovation Course)
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:319** ***Podcasting and Audio Documentary (3)***
By the end of the course, students learn the basics of the production, writing, and journalistic process required to use audio as a nonfiction storytelling language. Students will participate in the completion of at least one podcast episode. (Practice and Innovation Course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:326** ***Multimedia Reporting (3)***
Advanced reporting, writing, and research using new media technology. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206. Open only to journalism and media studies majors.***

**04:567:327** ***Public Information and Public Relations (3)***
Techniques of public information with focus placed on government, public affairs, and public interest issues. (Practice and Innovation course)
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:328** ***The Hyperlocal Newsroom (3)***
This class will give students hands-on experience with traditional and digital journalism, including work in both written and multimedia formats, through the creation and management of a news-based website covering Rutgers and the city of New Brunswick. Students will report; write and edit stories; create video, audio, and graphics; take photos; and learn about the various uses of social media within the journalism field. Students will collaborate on a news-based website that will synthesize learned skills, journalistic practices, and knowledge of information and technology. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206, or 04:567:212. Open only to journalism and media studies majors.***

**04:567:329** ***International Reporting (3)***
This course prepares students to write about life in other countries and to cover international issues from the United States. Students analyze award-winning global journalism and learn about and practice techniques foreign correspondents use. (Practice and Innovation course)
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:331** ***Digital Media Lab (3)***
Students use experimental new media tools to transform news reporting, media storytelling, and other media processes. Augmented reality, e-reader technology, 360-degree cameras, immersive media, the Mobile Journalist Workstation, 3D imaging and audio, 3D printing, interactive video, video as input, geotagged content, animation and news, and other emerging new media tools are applied to journalism and media to create and test new story formats that in an analog world would be impossible, but in a digital, networked world can engage individuals across time and space; and provide much-needed context and customization, and in-depth, context-sensitive news and mediated entertainment.
***Open only to journalism and media studies majors.***

**04:567:333** ***Media and Popular Culture (3)***
Examines the relationship between media and popular culture and their impact on society. This course introduces students to the shifting trends, ideas, and competing forces that will lay the foundation for the cultural battleground of the future. (Concept and Analysis course)

**04:567:335** ***Mass Communication and the American Image (3)***
Mass communication and America's traditional self-imagery. Critical analysis of the ways in which the American experience is now, and has been, interpreted by the mass media; the relationship of myth to reality. (Concept and Analysis course)

**04:567:340** ***Science and Health Journalism (3)***
To introduce students to the specialized fields of science, health, and technology writing. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206. Open only to journalism and media studies majors.***

**04:567:345** ***Media Publishing and Design (3)***
Computer-based writing, design, and pagination for newsletters, websites, magazines, and newspapers. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:207 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:347** ***Information Design for Web Journalists (3)***
Creation, design, and development of webpages as primary sites for distributing news content and to supplement other technologies for news transmission. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:207 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:350** *Development of Media (3)*
This course examines what media are and what they do; how specific media technologies affect democratic discourse; how media shape narratives of class, race, ethnicity, and gender; the long-running conflict between information and propaganda, and how media conglomerates came to wield such enormous power in modern society. (Concept and Analysis course)

**04:567:365** *Mediating the Middle East (3)*
Media in the US have tended to present the Middle East in a negative light casting Muslim majority countries as static, violent, undemocratic, and sexist. This course will critically analyze racial and religious stereotypes and caricatures by foregrounding the rich and complex history of interaction between the West and the Near East. While the course begins in the 7th century, the emphasis will be on popular discourse in the United States over the last half century. We will study films, news media reports, television shows, video games, and a range of other outlets through which our understanding of the Middle East is mediated. Note: Students who completed Islam, Media, and the Western Imagination (04:567:365) in prior years cannot enroll in this course for credit.

**04:567:370** *Journalism in American Film (3)*
The course is designed to expose students to many of the best known and classic American films about journalism, and to examine how American (U.S.) film has depicted the practice and societal impact of journalism. The course aims to deeply immerse students in a broad range of challenging and critical questions about journalistic practice in the United States, as represented in American film. Among the goals of the course is to have students consider whether popular, filmic depictions of American journalists are accurate and have bases in fact. Similarly, students consider whether the image, or the reality of journalistic practice, keeps changing in the United States, or whether, perhaps, there has been very little if any change in either, or at all, over the 75 years of film the course covers. And if there is change, or there is no change in reality or film, how might we understand the forces behind change or stability (Concept and Analysis course)
***Prerequisites: Open only to junior and senior journalism and media studies majors.***

**04:567:373** *Editing for Multimedia (3)*
In this course, students will learn the workflows associated with editing audio, video, graphics, and text. A strong emphasis is placed on demonstration and hands-on experience in this course. Students will become familiar with developing editing scripts, managing content, importing media, editing, and encoding for distribution across multiple platforms. Instructors will also discuss editing concepts which provide a thorough understanding of technique and theory used by professional editors. Exploring these concepts will provide a better understanding of how messages and stories are told through editing. Editing media will be provided for all exercises and projects.
***Prerequisites: 04:567:200 and one foundation course; Open only to journalism and media studies majors.***

**04:567:374** *Media Field Production (3)*
This course introduces students to the working principles of Electronic Field Production (EFP). Special attention is given to on-location creative and technical aspects of media production. Valuable EFP knowledge and skills will be gained through production exercises, projects, and readings. Students will learn the constraints and benefits of shooting on-location while producing, directing, and operating production equipment.
***Prerequisites: 04:567:200 and one foundation course; Open only to journalism and media studies majors.***

**04:567:375** ***Television Reporting (3)***
Fundamentals of television reporting and electronic news gathering with students assigned to various projects. (Practice and Innovation course)
***Prerequisites: 04:567:206. Open only to journalism and media studies majors.***

**04:567:376** ***Advanced Television Reporting (3)***
Advanced television reporting and electronic news gathering with students assigned to various projects. (Practice and Innovation course)
***Prerequisite: 04:567:375. Open only to journalism and media studies majors.***

**04:567:379** ***Media and Politics (3)***
Examines who controls the media and how the media differentially serve the public and power holders. Attention to both news and entertainment media. (Concept and Analysis course)
***Prerequisite: Open only to junior or senior majors in journalism and media studies.***

**04:567:380** ***Media and Social Change (3)***
This course looks at how past and present social movements (e.g., environmental, civil rights, labor movements) challenge dominant social, economic, and political structures and how they have been portrayed in the mass media. It also examines how social activists use media technologies to organize themselves and communicate their messages to wide audiences in order to achieve social change. (Concept and Analysis course)

**04:567:384** ***Media and the Struggle for Democracy in Central America (3)***
This course takes students to Guatemala for 10 days to study the role of media in historic and contemporary struggles for democracy. The class meets with Guatemalan journalists, human rights activists, Indigenous associations, women's collectives, and other community groups. Students visit news agencies, community radio and TV stations, and the office of the country's first and only feminist magazine. Using Guatemala as a case study, students will learn about the regional effects of colonization, US military intervention, and neoliberal economic policies in the Central American region, as well as the key role of media in local struggles for political autonomy, human rights, and democracy.
***Prerequisites: 04:567:215 or 04:567:380***

**04:567:385** ***Irish Media, Politics and Cultural Survival (3)***
This embedded course takes students to Ireland for 8 days to study the role of Irish (Gaelic) journalism and media in historic and current struggles for political autonomy and cultural identity. There are six 3-hour class meetings before we travel. In the heart of Galway's Irish-Gaelic speaking region, students will spend a few days in the lovely rural village of Carraroe, where Gaelic is the main language spoken (although everyone is bilingual in English). They will also spend two days in the cultural hub of historic Galway City, and two days in the county's bustling capital, Dublin. Through readings, films, lectures, and site visits, students will learn the history of British colonialism in Ireland and the role of Irish-Gaelic journalism in the country's struggles for political independence from England. They will meet Irish civil rights activists who fought in the 1960s and 70s for the right to have Irish/Gaelic radio and TV stations in Ireland and will visit Gaelic radio, TV, print, and online news outlets to speak with journalists and other media makers. Focused on the political and cultural importance of native language media for minoritized and formerly colonized populations, students will see examples of Irish-language journalism and cultural programming such as documentaries, websites, children's cartoons, sports, music videos, and soap operas (subtitled in English), and gain familiarity with contemporary debates about whether the Irish government should continue funding Irish language media. Connections will be emphasized between struggles for Gaelic media in Ireland and struggles by

minoritized and indigenous populations in other parts of the world for the right to have media in their native languages.
***Prerequisites: 04:567:380 or 04:567:215. Majors only***

**04:567:388,389** ***Independent Study in Journalism and Media Studies I,II (3,3)***
Independent study in journalism and media studies topics under faculty supervision. (Elective course)
***Prerequisites: Approval by department chair and supervising instructor of a written project proposal. 04:567:200; 75 or more overall credits, five (5) courses in major, one foundation. Open only to junior or senior majors in journalism and media studies. Minimum 2.50 GPA overall, and 2.75 in the major, and permission of instructor.***

**04:567:393** ***3-Credit Internship in Journalism and Media Studies (3)***
Supervised field experience at professional media outlets. Before registering, students must meet with the internship coordinator to determine eligibility and receive approval of the placement. Students must work at their site a minimum of 15 hours per week during the semester. Off-site (virtual) positions will not be accepted. Students will complete weekly journals and attend several in-class meetings during the semester. Students will be allowed to take both the 3-credit internship and the 6-credit internship, but are not allowed to take both of them in the same semester. Also note that students are limited to a maximum of 9 out-of-classroom credits in the major; the courses that fall under this heading are: Internship, Practicum, and Independent Study.
***Prerequisites: 04:567:200; 75 or more overall credits, five (5) courses in major, one foundation. Open only to junior or senior majors in journalism and media studies. Minimum 2.50 GPA overall, and 2.75 in the major, and permission of instructor.***

**04:567:394** ***6-Credit Internship in Journalism and Media Studies (6)***
Supervised field experience at professional media outlets. Before registering, students must meet with the internship coordinator to determine eligibility and receive approval of the placement. Students must work at their site a minimum of 24 hours per week during the semester. Off-site (virtual) positions will not be accepted. Students will complete weekly journals and attend several in-class meetings during the semester. Students will be allowed to take both the 3-credit internship and the 6-credit internship, but are not allowed to take both of them in the same semester. Also note that students are limited to a maximum of 9 out-of-classroom credits in the major; the courses that fall under this heading are: Internship, Practicum, and Independent Study.
***Prerequisites: 04:567:200; 75 or more overall credits, five (5) courses in major, one foundation. Open only to junior or senior majors in journalism and media studies. Minimum 2.50 GPA overall, and 2.75 in the major, and permission of instructor.***

**04:567:405** ***Writing about Social Issues (3)***
Students will cover the game-changing stories of our time, from the widening gap between the rich and the poor; to battles over immigration; to the climate change wars that may determine our very survival. They'll analyze groundbreaking journalism, and have an opportunity to write and shoot commanding stories of their own. (Practice and Innovation course)
***Prerequisites: 04:567:215 or 04:567:380; 04:567:205 or 04:567:206 or 04:567:328 or 04:567:329 or 04:567:445. Open only to journalism and media studies majors.***

**04:567:410** ***Magazine Writing (3)***
Magazine writing for publication, including consumer, trade, and business magazines. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567.206. Open only to journalism and media studies majors or by permission of the instructor.***

**04:567:413** *Literary Journalism*
This course analyzes great examples of nonfiction writing from the last century to appreciate what makes for enduring non-fiction writing-- journalism that rises to the level of literature.

**04:567:415** *Media and Climate Change (3)*
This course will consider the intersections of science, media, and society. With a focus on both theory and practice, it explores the media's role in understanding and communicating about the most critical science and environmental issues of our day. (Concept and Analysis course)
***Prerequisite: Open only to junior or senior journalism and media studies majors.***

**04:567:420** *Global News (3)*
Investigates, analyzes, and discusses global production, distribution, and consumption of news. Issues include global news flows, journalistic cultures and practices, and international news coverage. (Concept and Analysis course)
***Prerequisite: Open only to junior or senior journalism and media studies majors or by permission of the instructor.***

**04:567:423** *Communication Law (3)*
Examines laws and regulations governing U.S. mass media. (Concept and Analysis course)
***Prerequisite: Open only to juniors or seniors or by permission of the instructor.***

**04:567:425** *Copyright, Media, and Culture (3)*
In this course we will discuss one of the most powerful social, cultural, economic, and political institutions of our day: intellectual property (IP). How did we arrive at the notion that creative works and ideas can be owned, bought, and sold like tangible commodities? What impact does this concept have on the way we view the world? How does it help us achieve our social goals, and how does it present obstacles to reaching those goals? And, in the age of digitized information and networked communication, how can we understand the role of IP in light of the rapidly changing developments in the way culture is produced and consumed? In our efforts to better understand these issues, we will read both primary and secondary materials, covering subjects ranging from the birth of copyright to the latest developments in the global "copyfight" over information in the digital age; view relevant and interesting documentary films; and enjoy guest lectures from a variety of knowledgeable speakers. (Concept and Analysis course)
***Prerequisite: Only open to journalism and media studies juniors or seniors.***

**04:567:430** *Sports Writing and Reporting (3)*
Fundamentals of sports writing, reporting, and commentary for print and online media. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206. Open only to journalism and media studies majors.***

**04:567:432** *Multimedia Sports Reporting (3)*
This course will explore the many facets of multimedia sports reporting, from conventional newspaper websites to robust sports sites and the use of social networking services to transmit sports news.
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:434** *Critical Issues in Sports Media (3)*
Examines the critical issues in sports and sports media, including race, gender, class, politics, culture, economics, and the role of sport in society.
***Prerequisite: Open only to journalism and media studies majors.***

**04:567:438** *Media and Data (3)*
Who decides what we watch, read, and listen to in the digital media age? Increasingly the answer is not a person at all, but an algorithm that studies our online behavior and tries to predict what we'll click, like, and share next. This course will look at how media industries--such as TV, film, music, book publishing, and journalism--are using Big Data to compete in a fierce battle for audiences' attention. How are data and algorithms shaping the movies we watch on Netflix, the songs we hear on Spotify, the books we read on Kindle, and the news we consume on Facebook and Twitter? What are the potential benefits and drawbacks of this transformation? (Concept and Analysis course)
***Prerequisites: 04:567:215 or 04:567:216 or 04:567:217. Open only to journalism and media studies majors.***

**04:567:445** *Media, Movement, and Community Engagement (3)*
This course will enable students to participate in the development of a journalism and media production project. They will also learn how to harness technology and study its implementation and impact on social change. (Concept and Analysis and/or Practice and Innovation course; student may only use this course to satisfy one requirement.)
***Prerequisite: 04:567:215 or 04:567:380.***

**04:567:450** *Promotional Media (3)*
What is a promotional culture? Bringing together elements of media studies, visual culture, critical branding/ marketing studies, and consumer culture, this course is designed to provide advanced undergraduate students with analytical tools to understand the extent to which promotional language, communication, and habits suffuse our everyday lives.
***Prerequisites: 04:567:274. Only open to journalism and media studies juniors or seniors.***

**04:567:451** *Topics in Journalism and Emerging Media I (3)*
Specialized topics related to the practice of journalism are offered on a regular basis. (Practice and Innovation Course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:207 or by permission. Open only to journalism and media studies majors.***

**04:567:452** *Topics in Journalism and Emerging Media II (3)*
Specialized topics related to the practice of journalism are offered on a regular basis. (Practice and Innovation Course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:207 or by permission. Open only to journalism and media studies majors.***

**04:567:453** *Topics in Journalism Emerging Media III (3)*
Specialized topics related to the practice of journalism are offered on a regular basis. (Practice and Innovation Course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:207 or by permission. Open only to journalism and media studies majors.***

**04:567:454** *Practicum in Journalism and Media Studies (3)*
Specific directed project work conducted under faculty supervision. (Practice and Innovation Course)
***Prerequisites: Permission of the instructor required. Open only to sophomore, junior, and senior majors in journalism and media studies.***

**04:567:457** ***Journalism of the Civil Rights Movement (3)***
Students read and study the journalism of the U.S. civil rights movement (1954-1968) to understand its historical role.

**04:567:458** ***Media, Government, and Politics (3)***
Examines interactions between media and political institutions, actors and processes, in light of theories of journalism, communication, and political practice. (Concept and Analysis course)
***Prerequisite: Open only to junior and senior journalism and media studies majors.***

**04:567:459** ***Media, Democracy, and the Public (3)***
The course explores how the news media have figured in constituting a public sphere in American history. Readings juxtapose classics of political philosophy with historical or sociological works describing democracy in practice in the United States. (Concept and Analysis course)
***Prerequisite: Open only to junior and senior journalism and media studies majors.***

**04:567:460** ***News, Entertainment, and Politics (3)***
Examines the influence of entertainment media on political news, opinion, knowledge, and behavior. (Concept and Analysis course)
***Prerequisite: Open only to junior and senior journalism and media studies majors.***

**04:567:465** ***Documentary Filmmaking and Storytelling (3)***
Long-form video journalism storytelling developed over a significant period of time teaching students critical thinking, research, writing skills, and various production techniques. (Practice and Innovation course)
***Prerequisites: 04:567:206 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:470** ***Critical Analysis of News (3)***
Surveys and critiques of social science research on news, journalists, and the news media. (Concept and Analysis course)
***Prerequisite: Open only to junior and senior journalism and media studies majors.***

**04:567:471** ***Topics in Media and Society I (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. (Concept and Analysis course)
***Prerequisites: 04:567:200 and 04:567:215 or 04:567:216 or 04:567:217. Open only to journalism and media studies majors.***

**04:567:472** ***Topics in Media and Society II (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. (Concept and Analysis course)
***Prerequisites: 04:567:200 and 04:567:215 or 04:567:216 or 04:567:217. Open only to journalism and media studies majors.***

**04:567:473** ***Topis in Media and Society III (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. (Concept and Analysis course)
***Prerequisites: 04:567:200 and 04:567:215 or 04:567:216 or 04:567:217. Open only to journalism and media studies majors.***

**04:567:474** ***Topics in Media and Society IV (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. (Concept and Analysis course)
***Prerequisites: 04:567:200 and 04:567:215 or 04:567:216 or 04:567:217. Open only to journalism and media studies majors.***

**04:567:475** ***International Media (3)***
Analyze debates about media and cultural globalization, and theories about international media. (Concept and Analysis course)
***Prerequisites: Open only to junior and senior journalism and media studies majors.***

**04:567:476** ***Topics in Creative Media Practice I (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. Note: Please check with the journalism and media studies coordinator of undergraduate studies or the School of Communication and Information Office of Student Services each semester to find out if the course is conceptual or skills.
***Prerequisites: 04:567:200 and 04:567:210 or 04:567:211 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:477** ***Topics in Creative Media Practice II (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. Note: Please check with the journalism and media studies coordinator of undergraduate studies or the School of Communication and Information Office of Student Services each semester to find out if the course is conceptual or skills.
***Prerequisites: 04:567:200 and 04:567:210 or 04:567:211 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:478** ***Topics in Creative Media Practice III (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. Note: Please check with the journalism and media studies coordinator of undergraduate studies or the School of Communication and Information Office of Student Services each semester to find out if the course is conceptual or skills.
***Prerequisites: 04:567:200 and 04:567:210 or 04:567:211 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:479** ***Topics in Creative Media Practice IV (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. Note: Please check with the journalism and media studies coordinator of undergraduate studies or the School of Communication and Information Office of Student Services each semester to find out if the course is conceptual or skills.
***Prerequisites: 04:567:200 and 04:567:210 or 04:567:211 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:484** ***Workshop in Journalism and Media Practice I (1.5)***
Specialized topics directed at enhancing or introducing journalism and/or media-related skill sets. These are intense seven-week workshops teaching students specific skills applicable to the field. The specialized focus can be an accelerated introduction to basics or an advanced training in particular skills learned in previous offerings.
***Prerequisites: 04:567:205, 04:567:206, or 04:567:212. Open only to journalism and media studies majors.***

**04:567:485** ***Workshop in Journalism and Media Practice II (1.5)***
Specialized topics directed at enhancing or introducing journalism and/or media-related skill sets. These are intense seven-week workshops teaching students specific skills applicable to the field. The specialized focus can be an accelerated introduction to basics or an advanced training in particular skills learned in previous offerings. (Practice and Innovation course)
***Prerequisites: 04:567:205, 04:567:206, or 04:567:212. Open only to journalism and media studies majors.***

**04:567:488** ***Independent Study in Media Studies (3)***
Independent study in media studies topics under faculty supervision. (Elective course)
***Prerequisites: 75 or more overall credits, five (5) courses in major, one foundation, 567:200, 2.75 major GPA, 2.5 overall GPA, and permission of instructor. Open only to junior and senior journalism and media studies majors.***

**04:567:489** ***Independent Study in Journalism (3)***
Independent study in journalism topics under faculty supervision. (Elective course)
***Prerequisite: 75 or more overall credits, five (5) courses in major, one foundation, 567:200, 2.75 major GPA, 2.5 overall GPA, and permission of the instructor. Open only to junior and senior journalism and media studies majors.***

**04:567:490** ***Senior Thesis/Project (3)***
Honors thesis or project under faculty supervision. (Elective course)
***Prerequisites: 04:567:488 or 04:567:489. Permission of instructor. Must meet certain GPA requirements. Open only to senior journalism and media studies majors.***

**04:567:495** ***Investigative and In-Depth Reporting (3)***
In-depth reporting project using public records and other investigative journalism techniques. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206. Open only to journalism and media studies majors.***

**04:567:499** ***Capstone in Gender and Media (3)***
In this capstone to the gender and media minor, students will develop, discuss, produce, and critique a project related to gender, media, and technology. Students will articulate and present the project in written and oral formats and will have the option to also (1) create an in-depth multimedia component to the project; 2) complete an internship; or 3) complete a service-learning experience. Note: Students in the minor, especially those who are not otherwise SC&I majors, may choose to enroll in the capstone through the program in women's and gender studies, course number 01:988:499.
***Prerequisite: Minimum of 12 credits in the gender and media minor must be completed before enrolling in the capstone.***

# Study Abroad 959 (SAS)

## STUDY ABROAD 959

Rutgers offers over 180 study abroad and service-learning abroad programs in more than 50 countries around the world. Students can study overseas for a full year, a single semester, or a Summer or Winter Session. The majority of study abroad programs are offered in English and are open to students of any major.

Interested students should contact the Center for Global Education, Rutgers, The State University of New Jersey, 102 College Avenue, New Brunswick, NJ 08901-8543, or visit the website.

Students wishing to study abroad with programs other than those hosted by Rutgers may contact other American colleges or may seek admission directly from a foreign university. Students making these arrangements should speak with their academic dean about the acceptability of the program and the transfer of credit.



## Courses

## Courses

**01:959:191,192,193,194** ***Study Abroad - Honors (1)***
Field experience course, either embedded in an existing honors course or a free-standing honors experience. ***Graded Pass/No Credit.***

**01:959:200** ***Study Abroad - Nursing (BA)***

**01:959:210** ***Study Abroad - SEBS (BA)***

**01:959:220** ***Study Abroad in Journalism and Media Studies (BA)***
Students will explore issues such as war, corruption, family, food, the arts, and the influence of the sea.

**01:959:300** ***Study Abroad in Guatemala (BA)***

**01:959:301,302** ***Study Abroad in Argentina (BA,BA)***
Study for a year or a semester in Buenos Aires at the CIEE Study Center at the Facultad Latinoamericana de Ciencias Sociales (FLACSO).

**01:959:304,305** ***Study Abroad in Australia (BA,BA)***
Study for a year or a semester at the University of Melbourne, the University of Queensland, or Macquarie University.

**01:959:307,308** ***Study Abroad in Barbados (BA,BA)***
Study for a year or a semester at the University of West Indies at Cave Hill.

**01:959:310,311,312** ***Study Abroad in Belgium (BA,BA,BA)***
Study for a year, semester, or Summer Session in Brussels at Vesalius College.

**01:959:315** ***Study Abroad in Bolivia (BA)***
Study for a Summer Session in Cochabamba and environs in the Rutgers Latin American Studies Program/ Department of Anthropology's International Service Learning Program.

**01:959:316,317** ***Study Abroad in Brazil (BA,BA)***
Study for a year or a semester in either Saõ Paulo at the University of Saõ Paulo (USP), or the USP Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ), or in Rio de Janeiro at the Universidade Estadual do Norte Fluminense Darcy Ribeiro.

**01:959:320,321** ***Study Abroad in the Cayman Islands (BA,BA)***
Study for either a Winter or Summer Session on Little Cayman Island at the Central Caribbean Marine Institute.

**01:959:322,323** ***Study Abroad in Chile (BA,BA)***
Study for a year or a semester in Santiago at the CIEE Study Center at the Pontificia Universidad Católica de Chile and the Universidad de Chile.

**01:959:325,326,327** ***Study Abroad in China (BA,BA,BA)***
Study for a year or a semester at Jilin University, or for a Summer Session in Jilin in the Rutgers Asian Languages and Cultures Department's intensive Chinese program, or the School of Social Work's summer program in Beijing.

**01:959:328,329,330** ***Study Abroad in Costa Rica (BA,BA,BA)***
Study for a year or a semester in San José at the Universidad de Costa Rica.

**01:959:331,332** ***Study Abroad in the Dominican Republic (BA,BA)***
Study for a year or a semester in Santiago at the CIEE Study Center at the Facultad Latinoamericana de Ciencias Sociales (FLACSO-Dominican Republic).

**01:959:334,335** ***Study Abroad in Egypt (BA,BA)***
Study for a year or a semester in Dokki, near Cairo, at the AMIDEAST Semester/Academic Year in Cairo Program.

**01:959:337,338,339** ***Study Abroad in France (BA,BA,BA)***
Study for a year or a semester either in Tours, at the Université François Rabelais; Paris variously at fourteen locations (Paris I, III, IV, VI, VII, VIII, X, XI, XII, XIII; Université d'Évry Val-d'Essonne; Institut Catholique de Paris; Université Paris-Est Marne-la-Vallée; and Université de Versailles St. Quentin-en-Yvellines); or at Sciences Politique, or for a Summer Session either in Paris, in the Rutgers Art History Department's Summer Institute in Art History; or Cluny in the Rutgers School of Environmental and Biological Sciences Department of Biochemistry and Microbiology's Science of Wine and Cheese course.

**01:959:340,341,342** ***Study Abroad in Germany (BA,BA,BA)***
Study for a year or a semester either in Constance at the Universität Konstanz, or Berlin at the Freie Universität (direct enroll or FU-BEST), or Munich in the Technische Universität München, or Östrich-Winkel at the European Business School (EBS); or for a Summer Session in EBS's intensive summer seminar, or Rutgers landscape architecture program in Berlin and Munich.

**01:959:343,344,345** ***Study Abroad in Ghana (BA,BA,BA)***
Study for a year or a semester in Accra at the University of Ghana, or for a Summer Session in the Rutgers Center for African Studies/Department of Women's, Gender, and Sexuality Studies International Service Learning in Ghana program.

**01:959:346,347,348** ***Study Abroad in Greece (BA,BA,BA)***
Study for a year or a semester in Athens at College Year in Athens (CYA), or in Thessaloniki at the American College of Thessaloniki (ACT), or for a Summer Session in Athens in CYA's various programs, or in Thessaloniki at Aristotle University's intensive modern Greek program, or throughout Greece in the Rutgers Department of Classics' Summer Semester in Greece Program, or in Athens in the Rutgers Department of Art History's Cultural Heritage Preservation Program.

**01:959:349,350** ***Study Abroad in Hungary (BA,BA)***
Study for a year or a semester in Budapest at the University of California's Central European Studies Center.

**01:959:352,353** ***Study Abroad in India (BA,BA)***
Study for a year or a semester in Delhi either at St. Stephen's College or Ramjas College.

**01:959:355,356** ***Study Abroad in Ireland (BA,BA)***
Study for a year or a semester either at University College Dublin, University College Cork, or the Limerick Institute of Technology.

**01:959:358,359** ***Study Abroad in Israel (BA,BA)***
Study for a year or a semester at the University of Haifa, in Beer Sheva at Ben-Gurion University, or at the Hebrew University of Jerusalem.

**01:959:361,362,363** ***Study Abroad in Italy (BA,BA,BA)***
Study for a year or a semester in Rome at John Cabot University (JCU), or in Ferrara through CIEE's programs in language and culture and liberal arts; or for a Summer Session in Rome in JCU's various programs, or the Rutgers Summer Art History program in Rome.

**01:959:364,365,366** ***Study Abroad in Japan (BA,BA,BA)***
Study for a year or a semester either in Kyoto at Ritsumeikan University, Beppo at Ritsumeikan Asia Pacific University, or International Christian University in Tokyo; or for a Summer Session in Kyoto in the Rutgers Department of Political Science's course on Japanese international relations.

**01:959:367,368** ***Study Abroad in Jordan (BA,BA)***
Study for a year or a semester at the AMIDEAST Semester/Academic Year in Amman Program.

**01:959:371** ***Study Abroad in Kenya (BA)***
Study for a Summer Session throughout Kenya in the Rutgers Department of Anthropology's program on primatology (Laikippia Plateau region).

**01:959:372** ***Study Abroad in Kenya (BA)***
Study for a Summer Session throughout Kenya in the Rutgers Department of Anthropology's program on palaeoanthropolgy (Koobi Fora).

**01:959:373,374,375** ***Study Abroad in Mexico (BA,BA,BA)***
Study for a year or a semester in Merida at the Universidad Autónoma de Yucatán, or for a Winter Session throughout the Yucatan in the Rutgers School of Environmental and Biological Sciences (SEBS) Department of Landscape Architecture's course on Cities and Monuments of the Yucatan, or for a Summer Session at Oaxaca in the Rutgers Latin American Studies Program/SEBS Department of Human Ecology International Service Learning Program.

**01:959:378** ***Study Abroad in Morocco (BA)***
Study for a Summer Session in Rabat at the AMIDEAST intensive modern Arabic program.

**01:959:379,380** ***Study Abroad in the Netherlands (BA,BA)***
Study for a year or a semester at the University of Leiden.

**01:959:382,383** ***Study Abroad in New Zealand (BA,BA)***
Study for a year or a semester at the University of Auckland.

**01:959:385,386** ***Study Abroad in Norway (BA,BA)***
Study for a year or a semester at the University of Oslo.

**01:959:388,389** ***Study Abroad in Peru (BA,BA)***
Study for a year or a semester in Cusco and environs in the ProWorld International Service Learning Semester Program.

**01:959:396** ***Study Abroad in Romania (BA)***
Study for a Summer Session in Cluj and environs in the Rutgers School of Social Work's International Service Learning Program.

**01:959:397** ***Study Abroad in Uruguay (BA)***

**01:959:398,399** ***Study Abroad in Russia (BA,BA)***
Study for the spring semester at the European University at St. Petersburg, or for a Summer Session in the Rutgers Russian language and literature program's intensive Russian courses.

**01:959:400,401** ***Study Abroad in South Africa (BA,BA)***
Study for a year or a semester in Pietermaritzburg at the University of Kwazulu Natal, or through CIEE's programs in arts and sciences or service learning in Cape Town at the University of Cape Town, or at the University of Stellenbosch.

**01:959:402** ***Study Abroad CIEE Open Campus LA (BA)***

**01:959:403,404,405** ***Study Abroad in South Korea (BA,BA,BA)***
Study for a year, a semester, or a Summer Session in one of various programs in Seoul at Ewha Woman's University.

**01:959:406,407,408** ***Study Abroad in Spain (BA,BA,BA)***
Study for a year or a semester in Valencia at the Universitat de València.

**01:959:409,410** ***Study Abroad in Thailand (BA,BA)***
Study for a year or a semester in Bangkok and environs in the ProWorld International Service Learning Semester Program.

**01:959:412,413** ***Study Abroad in Turkey (BA,BA)***
Study for a year or a semester in Istanbul at Koç University or Ankara at Bilkent University.

**01:959:415,416,417** ***Study Abroad in the United Kingdom (BA,BA,BA)***
Study for a year or a semester variously in 10 locations (Bristol University, Cardiff University, City University London, University College London, University of East Anglia, University of Exeter, University of Manchester, University of Reading, University of Sussex, and University of York), or for a Summer Session in Sussex either at the University of Sussex in various courses or in the Rutgers creative writing program.

**01:959:418,419** ***Study Abroad on Euroscholars Program (BA,BA)***
Study for a year or a semester on a research project in one of 12 major European universities.

**01:959:421,422,423** ***Field Experience (BA,BA,BA)***
Various service learning projects supplementing enrollment in semester/year-length study abroad programs.

**01:959:424,425,426** ***Supplemental Language Study (BA,BA,BA)***
Elementary language instruction supplementing Rutgers faculty-led summer programs.

**01:959:427** ***Study Abroad in Austria (BA)***
Study for a summer at Graz University of Technology and the University of Graz, Austria.

**01:959:428,429** ***Study Abroad in Austria (BA, BA)***
Study for a semester or year at Graz University of Technology and the University of Graz, Austria.

**01:959:431** ***Study Abroad in the Czech Republic (BA)***
Study for a summer on the Council for International Educational Exchange's Program in Central European Studies in Prague.

**01:959:432,433** ***Study Abroad in the Czech Republic (BA,BA)***
Study for a semester or year on the Council for International Educational Exchange's Program in Central European Studies in Prague.

**01:959:434,435** ***Study Abroad in Hong Kong (BA,BA)***
Study for a semester or year at the Hong Kong University of Science and Technology.

**01:959:437,438** ***Study Abroad in Portugal (BA,BA)***
Study for a semester or year on the Council for International Educational Exchange's Language and Culture Program at the School of Social Sciences and Humanities, Universidade Nova de Lisboa.

**01:959:440,441** ***Study Abroad in Sweden (BA,BA)***
Study for a semester or year at the Royal Institute of Technology in Stockholm.

**01:959:442** ***Study Abroad in Poland (BA)***
Study cultural heritage and preservation studies in Krakow, Poland, and Prague, Czech Republic.

**01:959:446** ***Study Abroad in Taiwan (BA)***
Study for a semester or a year at the College of Management, National Taiwan University, Taiwan.

**01:959:447** ***Study Abroad in Taiwan (BA)***
Study for a semester or a year at the College of Management, National Taiwan University, Taiwan.

**01:959:448** ***Study Abroad in Bonaire (BA)***
Study chemistry and marine biology in Bonaire during the summer.

**01:959:449** ***Study Abroad in South Africa (BA)***
Study for a Summer Session in South Africa.

**01:959:450** ***Study Abroad in Cuba (BA)***
Study comparative health care systems in Cuba in the summer.

**01:959:451** ***Study Abroad in Indonesia (BA)***
Study primates, ecology, and conservation in Indonesia in the summer.

**01:959:454** ***Study Abroad in Senegal (BA)***
Study in Senegal in the summer.

**01:959:457** ***Study Abroad at the UN (BA)***
Study the UN and visit UN headquarters in the summer.

**01:959:460** ***Study Abroad in Iceland (BA)***
Study renewable energy in Iceland in the summer.

**01:959:463** ***Study Abroad in Oman (BA)***
Study for a semester or a year with AMIDEAST in Muscat, Oman.

**01:959:466** ***Study Abroad in Belize (BA)***
Study animal science in Belize in the summer.

# Korean 574 (SAS)

## KOREAN 574

Department of Asian Languages and Cultures, School of Arts and Sciences

**Website:** Here

**Chair:** Wendy Swartz

**Director of Undergraduate Studies:** Satoru SaitoW

**Professor:**

Young-mee Yu Cho, B.A., Seoul National (South Korea); Ph.D., Stanford

Suzy Kim, B.A., California (Los Angeles); Ph.D., Chicago

**Assistant Professor:**

Jae Won Edward Chung, B.A., Swarthmore; M.F.A., M.A., Ph.D., Columbia

**Assistant Teaching Professors:**

Hee Chung Chun, B.A.,M.A., Ewha Womans (South Korea); Ph.D. candidate (Rutgers)

Jaehyun Jo, B.A., M.A., Yonsei; Ph.D., California (Los Angeles)

**Teaching Instructor:**

Kyoung-eun Jang Moon, B.A., Seoul National (South Korea); M.A,, Rutgers

Korean 574 (SAS)

# Major Program Learning Goals and Requirements

# Major Program Learning Goals and Requirements

**Learning Goals**

Majors in Korean will acquire in-depth knowledge of the Korean language as well as the literature and culture of Korea. Majors will be able to demonstrate oral, reading, and written proficiency in the language and develop critical skills in analyzing and interpreting literary, historical, and cultural texts. Students will acquire the literary, cultural, and linguistic competency necessary for continuing on to postgraduate study or employment requiring such cultural knowledge and/or linguistic skill. Students will learn the cultural heritage of Korea within the larger context of East Asia through a wide and coherent curriculum, which includes courses in the following humanities and social science disciplines: literature, visual culture, history, religion, language, and linguistics.

**Requirements**

The major in Korean requires 36 credits distributed as follows:

1. Six courses in Korean language above the 100-level.

2. Four courses in Korean literature, history, and/or culture (under subject code 574).

3. One course chosen from East Asian Civilizations: Traditional Era (098:241) OR East Asian Civilizations: Modern Era (098:242) OR Global East Asia (098:250).

4. Capstone Seminar on East Asian Societies (098:444).

Korean 574 (SAS)

# Minor Program Learning Goals and Requirements

# Minor Program Learning Goals and Requirements

**Learning Goals**

Minors will be introduced to the cultural heritage of Korea through courses on literature, history, civilization, language, and linguistics. Minors will be able to communicate effectively (listening, speaking, and writing) in Korean and will learn critical skills in analyzing and interpreting historical and cultural materials appropriate to the

student's area of specialization. Students will achieve advanced linguistic competency and be able to demonstrate practical skills in using Korean for translation and interpretation. Students will be able to relate relevant issues to other areas in the humanities.

**Requirements**

A minor in Korean consists of four courses in Korean above the 100 level plus two additional elective courses (of 3 credits or more) in the area of concentration (subject code 574). The elective courses may be language courses or culture courses.

Korean 574 (SAS)

# Certificate of Academic Korean for Heritage Speakers

# Certificate of Academic Korean for Heritage Speakers

**Korean Heritage Speakers certificate program**

The Certificate of Academic Korean for Heritage Speakers (AKHS) provides students who are heritage speakers of Korean across diverse schools at Rutgers University the opportunity to further their academic competence in Korean. As a separate program designed for non-majors/ minors in Korean, it will train students in developing academic and professional oral registers and literacy in Korean, skills that can be applied to future employment in connection with other majors or professional fields such as Business, Health, Journalism, Law, Social Work, or the Language Industries.

The Certificate of Academic Korean for Heritage Speakers (AKHS) requires:

1. The Heritage-Korean placement test

2. Completion of 12 credits distributed as follows:

- Electives: 3 courses [see the brochure below]
- Capstone course: 01:574:365 Topics in the Korean Language & Linguistics (3)

3. A 3.0 or better grade-point average for the entire sequence is required.

Korean 574 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have a cumulative grade-point average of 3.0 or better and a grade-point average of 3.4 or better in the major at the end of the junior year. At that time, the student should formally apply to the chair for admission to the honors program. In addition to completing all requirements of the Korean major, candidates are required to register for 01:574:497-498 Honors in Korean, write an honors paper under the guidance of an assigned faculty member, and take a comprehensive examination at the end of their senior year.

Korean 574 (SAS)

# Korean Culture Courses

# Korean Culture Courses

**01:574:110, 111** ***The History of the Korean Script and Calligraphy I, II (2,2)***
Overview of the history of Hangul writing practices as well as an introduction to the principles, techniques, and art of Korean calligraphy that are distinct from Chinese calligraphy.

No prior knowledge of Korean language is required.

**01:574:120** ***Korean Folk Traditions (2)***
Introduction to the history and practice of Korean folk-art traditions. Development of an understanding of the popular themes of folk painting (minhwa) and its aesthetics.

No prior knowledge of Korean language is required.

**01:574:210** ***Introduction to Korean Culture (3)***
Survey of Korean culture and society in a historical context. Exploration into the connection between language and culture. Examination of modern Korean novels and their social and historical relevances.

All readings and classes are in English.

**01:574:220** ***Introduction to Korean Literature in Translation (3)***
Introduction to canonical works in Korean literature and practice of literary analysis. Exploration of historical backgrounds and cultural contexts of major works of various genres.
***All readings and classes are in English.***

**01:574:221** ***Topics in Korean Literature in Translation (3)***
Focus on a set of themes and issues as a way to read and analyze Korean literature and texts from various genres and as a way to explore Korea's historical background and cultural context. Topics vary by instructor and semester offered.
***All readings and classes are in English.***

**01:574:230** ***Introduction to Korean Cinema and Cinematic Language (3)***
Cinematic development in postcolonial Korea. Topics include the depictions of traditional and contemporary Korea in films, reflecting political, social, and cultural changes.

All readings and classes are in English.

**01:574:250** ***Korean Language in Culture and Society (3)***
Survey of the Korean language in relation to its culture and society. Examination of language use (diglossia, language and gender, metaphors, and the writing system).
***No prior knowledge of Korean language is required.***

**01:574:281** ***Korean Studies Internship (1.5)***
Provides study-abroad students an opportunity to navigate businesses, cultural centers, community organizations, and non-profit sectors in South Korea over the summer.

**01:574:293** ***Korean Studies Guided Research (1.5)***
Allows students to reflect on their summer study abroad experience in Seoul while conducting a rigorous investigation of Korea's past and present.

**01:574:310** ***Gender and Social Change in Korea (3)***
Explores the shifting category of femininity and masculinity, women's roles and their experiences of social change in Korea from the late 19th century to contemporary times.

**01:574:350** ***North Korea in the Socialist and Postsocialist Worlds (3)***
Examination of social, political, economic, and cultural developments in North Korea before and after the social revolution (1945-1950) that radically transformed it by situating it within the context of regional and global developments.

**01:574:360** ***Korean Popular Culture (3)***
This course examines the history of popular music, dance, and performance through the period of Japanese occupation, the Cold War era, and the recent postmillennial decades, while considering their ideological, economic, and socio-political functions, their modes of reception, redeployment, and medium-specific meaning-making operations.

**01:574:365** ***Advanced Topics in Korean Languages and Linguistics (3)***
Investigation of topics in the Korean language such as phonology, syntax, pragmatics, language change, and dialect variations.

**01:574:380** ***Taste of Korea: Culinary Politics in Contemporary South Korea (3)***
An interdisciplinary introduction to Korean food politics: examines the geo-politics, cultural significance, historical background, and global circulation of Korean culinary culture within the East Asian context and beyond.

**01:574:382** ***Imagining Disaster: Korea and the Apocalyptic Modern (3)***
Traces the apocalyptic imagination in Korea from the 1930s to the 2010s. Approaches familiar topics of modern Korean history (such as Japanese colonial occupation, the unending Korean War, postwar industrial development, virtualization of consumer culture) through the apocalyptic lens, and considers how representations of calamity can function as powerful allegories for re-mapping our past, present, and future.

**01:574:390** ***Topics in Korean Studies (3)***
Study of special topics in Korean studies at the advanced level.

**01:574:392** ***Topics in Korean Studies (3)***
Study of special topics in Korean studies at the advanced level; Topics change per semester.

**01:574:420** ***Traditional Korean Poetry: Sijo (3)***
Examination of the most enduring poetic form in traditional Korea, sijo, a three-line verse form written to be performed in a musical setting. Exploration of its unique structural and thematic properties within the larger context of East Asian poetic tradition, and historical developments as well as contemporary transformations.

All readings and classes are in English.

**01:574:470** ***Seminar on Modern Korean History (3)***
Designed to introduce advanced undergraduate and graduate students to emerging scholarship and major debates in modern Korean history (since 1876). Topics vary by instructor and semester offered.

**01:574:495,496** ***Independent Study in Korean (3,3)***
Independent reading under supervision of a member of the department.
***Prerequisites: Permission of instructor and department.***

**01:574:497,498** ***Honors in Korean (6,6)***
Individualized honors projects for students who have fulfilled all requirements for the minor in Korean or major in East Asian languages and area studies. Both semesters must be completed to receive credit.

Korean 574 (SAS)

# Korean Language Courses

# Korean Language Courses

**01:574:101,102** ***Elementary Korean (4,4)***
Introduction to the sound, grammar, and writing system of modern Korean; practice and exercises in speaking, reading, and writing. Designed for true beginners with no prior knowledge of Korean.
***Prerequisite: 01:574:101 or 01:574:105 or equivalent for 01:574:102.***

**01:574:103** ***Beginning Korean Reading and Writing for Heritage Students (3)***
Development of foundation in Korean grammar and vocabulary. Practice in reading, writing, and oral skills.
***Prerequisite: Placement. Credit not given for both this course and 01:574:101 or 01:574:102.***

**01:574:105,106** ***Online Elementary Korean (4,4)***
Acquisition of basic linguistic and cultural background of the Korean language. Intensive online course that is equivalent to Korean 101 and 102, respectively (01:574:101 and 102).
***Credit not given for both 01:574:101 and 01:574:105. Credit not given for both 01:574:102 and 01:574:106. Prerequisite: 01:574:101 or 01:574:105 or equivalent for 01:574:106.***

**01:574:107, 108** ***Introductory Korean I, II (2,2)***
A sequence of two courses introducing the Korean language. Development of basic skills in speaking, listening, reading and writing in Korean. 01:574:107 is equivalent to the first half of Elementary Korean 1 (01:574:101; 01:574:105); 01:574:108 is equivalent to the second half of Elementary Korean 1 (01:574:101; 01:574:105).
***Prerequisite: 01:574:107 or equivalent for 01:574:108.***

**01:574:201,202** ***Intermediate Korean (4,4)***
Development of oral proficiency, practice in reading comprehension, composition, study of grammar, and vocabulary building.
***Prerequisite: 01:574:102 or 01:574:106 or equivalent for 01:574:201; 01:574:201 or equivalent for 01:574:202.***

**01:574:203** ***Intermediate Korean Reading and Writing for Heritage Students (3)***
Continued study of Korean grammar and vocabulary. Practice in reading, writing, and oral skills.
***Prerequisite: 01:574:103 or equivalent. Credit not given for both this course and 01:574:201 or 01:574:202.***

**01:574:301,302** ***Advanced Korean (3,3)***
Study of advanced vocabulary and grammar through reading texts in various styles. Practice in composition and refinement of oral proficiency.
***Prerequisite: 01:574:202 or 01:574:203 or equivalent for 01:574:301; 01:574:301 or equivalent for 01:574:302.***

**01:574:303, 304** ***Advanced Korean for Business I, II (3, 3)***
Reading and discussion of business, culture, and society; specialized vocabulary, social skills, and practice in business correspondence.
***Prerequisite: 01:574:202 or 01:574:203 or equivalent.***

**01:574:320** ***Korean Translation: Introduction to Practical Translation and Translation Theories (3)***
Practical translation of high-demand materials (medical and legal forms, government and court documents, news articles and headlines, manuals and instructions, and short writings from diverse disciplines), as well as fundamentals of translation theory and its application.
***Prerequisite: 01:574:202 or 01:574:203 or equivalent.***

**01:574:401,402** ***Advanced Readings in Korean (3,3)***
Selected readings from modern Korean materials, including fiction, essays, newspapers, and journal articles. Discussion and some writing exercises.
***Prerequisite: 01:574:302 or equivalent.***

**01:574:410,411** ***Readings in Korean Literature (3,3)***
Selections from representative literary works from premodern to the contemporary period. Exploration of major poetry, drama, and fictional narratives in the context of historical and cultural changes.
***Prerequisite: 01:574:302 or equivalent.***

**01:574:450** ***Korea in Translations: Modern Literature and Film (3)***
Translations as a generative process. Korean literary fiction and poetry of the 20th century and their versions in English translations. Film as another mode of translation with its own language and grammar.
***Prerequisite: 01:574:202 or 01:574:203 or equivalent.***

**01:574:471** ***Korea in Translations: Contemporary Media (3)***
Expository and journalistic writings with attention to contemporary language of the mass media. Broadcast news, documentary films, as well as newspaper and magazine articles, studied and translated into English.
***Prerequisite: 01:574:202 or 01:574:203, or equivalent.***

**01:574:480** ***Korean Interpreting (3)***
Hands-on introduction to practical skills with social, cultural, and ethical components. Role-play with both written and spoken texts, textbook exercises, discussion, and peer evaluation. Required for Certificate in Korean Translation.
***Prerequisite: 01:574:202 or 01:574:203, or equivalent.***

**01:574:481** ***Korean Interpreting Internship (1.5)***
Real-time interpreting assignments in public services settings. Required for Certificate in Korean Translation.
***Permission of instructor and department.***

**01:574:495,496** ***Independent Study in Korean (3,3)***
Independent reading under supervision of a member of the department.
***Prerequisites: Permission of instructor and department.***

**01:574:497,498** ***Honors in Korean (6,6)***
Individualized honors projects for students who have fulfilled all requirements for the minor in Korean or major in East Asian languages and area studies.
***Both semesters must be completed to receive credit.***

# Labor Studies and Employment Relations 575 (SMLR-U)

## LABOR STUDIES AND EMPLOYMENT RELATIONS 575

**Dean:** Adrienne Eaton

**Director:** Professor Paula B. Voos

**Website:** Here

The School of Management and Labor Relations' Department of Labor Studies and Employment Relations (LSER) creates and disseminates knowledge about issues related to work, workers, and the employment relationship.

The undergraduate labor studies and employment relations program aims to provide students with an opportunity to learn more about the nature of work, the management of work, the problems of working people, and what workers have done, both individually and collectively, to address those problems.

Its introductory courses offer anyone interested in the world of work (or likely to have a job) the opportunities to develop a realistic view of the dominant institutions, practices, and values of the workforce and to think about how work can be improved.

Intermediate courses enable students to acquire a range of specific competencies useful to employment, labor relations, and human resource specialists. They also allow students to participate in a series of cultural and disciplinary dialogues providing alternative perspectives on work and the wider society.

Advanced courses provide students majoring in labor studies and employment relations with an opportunity to consolidate what they have learned about the nature of work through more in-depth study of a particular topic or topics through either independent work or the senior seminar.

- The bachelor of arts (B.A.) degree in labor studies and employment relations is offered jointly with the School of Management and Labor Relations and Rutgers School of Arts and Sciences.
- The bachelor of science (B.S.) degree in labor and employment relations is granted by the School of Management and Labor Relations.

Both types of majors are eligible to apply for a five-year bachelor of arts/master of labor and employment relations degree program.

See the School of Management and Labor Relations section of this catalog for additional information about the B.A. program in labor studies and employment relations.

Labor Studies and Employment Relations 575 (SMLR-U)

# Bachelor of Arts Degree

# Bachelor of Arts Degree

- Admission Requirements to the Bachelor of Arts in Labor Studies and Employment Relations

Labor Studies and Employment Relations 575 (SMLR-U)

# Admission Requirements to the Bachelor of Arts in Labor Studies and Employment Relations

# Admission Requirements to the Bachelor of Arts in Labor Studies and Employment Relations

Students in this degree program must be admitted to the major as well as Rutgers School of Arts and Sciences. There is no deadline for admission to the major, but students should apply as soon as possible. Students may take individual courses, or complete a minor offered by the school, without being admitted.

Admission involves completing the application, writing a one-page application letter explaining why the applicant wishes to pursue a labor studies and employment relations major, having earned a 2.0 grade-point average or better in college work taken to date, and having demonstrated an adequate academic record in the introduction to labor studies course or the work, society and the quality of life course.

Please contact Amaila (Amy) Marchitto, student adviser, at amarchitto@smlr.rutgers.edu.

Labor Studies and Employment Relations 575 (SMLR-U)

# Bachelor of Science Degree

# Bachelor of Science Degree

- Academic Policies and Admission Requirements for the Bachelor of Science in Labor and Employment Relations
- Online Bachelor of Science Program

Labor Studies and Employment Relations 575 (SMLR-U)

# Academic Policies and Admission Requirements for the Bachelor of Science in Labor and Employment Relations

# Academic Policies and Admission Requirements for the Bachelor of Science in Labor and Employment Relations

This program is designed to accommodate the needs of transfer and nontraditional students. For admissions procedures please visit here.

The academic and other regulations established by the faculty and administration of the School of Management and Labor Relations and the Board of Governors of the university are subject to amendment at any time. Questions related to general student rules that fall under the jurisdiction of the School of Management and Labor Relations may be directed to the appropriate program. It is the responsibility of the student to remain in communication with the director of the program for which he or she is matriculated.

Labor Studies and Employment Relations 575 (SMLR-U)

# Online Bachelor of Science Program

# Online Bachelor of Science Program

The School of Management and Labor Relations' online program for the bachelor of science (B.S.) degree in labor and employment relations (LER) is perfectly suited for highly motivated, independent students who are seeking the convenience of distance learning. A typical online learner is self-directed, self-motivated, and organized in his or her approach to studying. This program is ideal for adult learners.

All 36 credits needed for the B.S. degree in LER can be completed exclusively online or through a combination of online and live courses. In order to complete the degree solely online, students must be sure they have completed Rutgers' general education requirements since some requirements may not be available from Rutgers online, particularly 01:355:101 Expository Writing. An associate's degree will typically suffice.

Students must ensure that they have the appropriate computer requirements needed to fulfill their work. Academic requirements individual courses in LER are identical for both the online and in-person versions. Online learners will not be segregated into a separate cohort.

Please note that not all online courses are the same. Classes and experiences will vary, as it does with in-person class sessions. Students' course responsibilities using this learning venue require the same, if not more, commitment than traditional courses. In turn, students will learn as much or more than what they would learn in a traditional class.

For more information on the online program for the B.S. degree in LER, visit the school's website.

Labor Studies and Employment Relations 575 (SMLR-U)

# Major Requirements of the B.S. and B.A. Degrees

# Major Requirements of the B.S. and B.A. Degrees

**Bachelor of Science (B.S.) in Labor and Employment Relations**

The major consists of 36 credits in labor studies and employment relations. Students must attain a grade of C or better for a class to count toward the major. In place of 6 of these credits, students may substitute related courses from other social science programs. Departmental approval is required for courses from other universities; a list of Rutgers University-New Brunswick courses is available from the department.

A complete list of requirements is available in the School of Management and Labor Relations section of this catalog or by contacting the department.

*The following five courses are required in the B.S. program:*

- 37:575:100 Introduction to Labor Studies or 37:575:110 Work, Society, and the Quality of Life
- 37:575:315 Employment Law
- 37:575:401 Research Methods in Labor Studies, 37:575:402 Research Corporations and Industries, 37:575:403 Problem-Solving Tools at Work, 37:575:404 Creating and Administering Surveys, or an alternative research methods/statistics from other programs;
- 37:575:395 Perspectives on Labor Studies
- 37:575:490, 496, or 497 an internship; this course will be waived for students with work experience and they will take another major elective in its place.

*General education requirements for the B.S. degree*:

The School of Management and Labor Relations is fully compliant with the Lampitt Law requiring that all individuals who have earned an associate in arts (A.A.) or an associate in science (A.S.) degree from a New Jersey county college will have fulfilled its general education requirements. For others, the requirements are:

- Writing and Communication: 6 credits. Expository Writing (01:355:101) plus a second class that involves writing with revision. See Degree Navigator for a list of approved second-level writing courses.
- Quantitative Reasoning: 6 credits. One course in mathematics or applied quantitative reasoning plus the major requirement of a 3-credit course in research methods/statistics. See Degree Navigator for lists of courses in each.
- Natural Science and Technology: 6 credits
- Arts and Humanities: 3 credits
- History: 3 credits
- Diversity: 3 credits
- Social Science: 3 credits (automatically filled by courses in the major)

**Bachelor of Arts (B.A.) in Labor Studies and Employment Relations**

The major consists of 36 credits in labor studies and employment relations. Students must maintain a grade of C or better. In place of 6 of these credits students may substitute related courses from other programs. (A list of these courses is available from the department).

The following three courses are required in the B.A. program: either 37:575:100 Introduction to Labor Studies and Employment Relations or 37:575:110 Work and Society; 37:575:395 Perspectives on Labor Studies; and at least one advanced capstone course or internship, chosen from 37:575:401, 402,403, 404, 450, 490, 494, 495, 496, 497, 498, or 499.

*Concentrations in the major are available but not required. These include:*

- Law and the Workplace
- Diversity in the Workplace
- Work Organization and Management
- Labor Unions and Social Movements
- Work, Globalization, and Migration

A list of courses required for each concentration is available from the department.

Labor Studies and Employment Relations 575 (SMLR-U)

# Minor Requirements

# Minor Requirements

The general minor in labor studies and employment relations consists of six courses offered by the department, for a total of at least 18 credits. Students must take either Introduction to Labor Studies and Employment Relations (37:575:100) or Work, Society, and the Quality of Life (37:575:110). Students must have a C or better in a course for it to count toward the minor. Minor options are available that parallel each of the concentrations in the major. Each involves taking Introduction, four courses from the concentration, and one elective course from the remaining courses offered by the department; details are available from the department website.

Labor Studies and Employment Relations 575 (SMLR-U)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have completed 18 credits in labor studies and employment relations. The student also must have attained a cumulative grade-point average of 3.0 or better and a grade-point average of 3.4 or better in the major. After earning 90 credits, the student should formally apply to the director. Candidates who are accepted are required to complete a research project under the direction of a faculty member, culminating in a written honors paper, and are examined orally on their project by a faculty honors committee.

Additional information can be found on the department's website.

# Courses

# Courses

**7:575:100** ***Introduction to Labor Studies and Employment Relations (3)***
Work, workers, and organizations that represent employees; class, race, gender, and work; legal, labor market, and human resource issues.
***Students must complete either 100 or 110 for the major or minor. Students may not count both toward the major.***

**37:575:110** ***Work, Society, and the Quality of Life (3)***
Work, social class, diversity, and economic opportunity in the context of globalization; civic engagement and collective action to promote opportunity and social justice for all people.
***Students must complete either 100 or 110 for the major or minor. Students may not count both toward the major.***

**37:575:191,192,193** ***Short Topics on Work (1 each)***
Brief examination of selected issues with regard to work at a level suitable for first-year college students, as well as those at a higher level of academic preparation. Topics to be announced.

**373:575:201** ***U.S. Labor and Work before the End of Reconstruction (3)***
History of work, economic organization, and labor in the United States. Free and slave labor. Early labor unions and movements in the American context.

**37:575:202** ***History of Labor and Work in the U.S. 1880-1945 (3)***
Changes in work, its organization, and the public policy context. History, philosophy, structure, activities, and impact of U.S. labor unions.

**37:575:203** ***Work and Labor History from 1940 to the Present in the U.S. (3)***
Developments in work, labor organizations, and related social movements. Relationship of labor movements to the changing economic, social, and public policy context, including increasing globalization.

**37:575:207** ***New Jersey Labor History (3)***
Workers movements in New Jersey, both local and statewide; their relationship to U.S. labor and working-class history from the earliest period to today.

**37:575:215** ***Youth and Work (3)***
Youth in the U.S. labor market; working students, internships, and unpaid work; job-hopping; and other contemporary concerns. Policies and practices to improve outcomes.

**37:575:220** ***Law for Business and Nonprofit Organizations (3)***
Overview of legal essentials for organizations; contracts; torts; organizational forms; property rights; cyber-law; bankruptcy; agency; criminal law; basics of employment/labor law.

**37:575:230** ***People, Work, and Organizations (3)***
Contemporary organizational transformations forming the context for how people are managed at work; decline of bureaucracy and predictable internal careers; growth of flexible, knowledge-based systems.

**37:575:250** ***Finance for Personal and Professional Success (3)***
Overview of core financial concepts and techniques useful both at work and in personal life; interest, credit, insurance, investments, present value, and net worth.

**37:575:265** ***Introduction to Disability Studies: History, Rights, Justice, and Inclusion (3)***
Introduces perspectives on disability and its relationship to politics, employment, law, media, arts, sports, and built environments, focusing on creating social and economic change.
***Previously listed under 37:575:365 Disability, Work, and Society***

**37:575:294** ***Avoiding Sexual Harassment (1)***
Legal, organizational, and social dimensions of sexual harassment in the workplace; power, gender roles, homophobia, and failed romance; effective prevention or response.

**37:575:295** ***Workplace Violence (1)***
Causes, consequences, and prevention of physical violence in the American workplace. Organizational policies that preserve the rights and well-being of all employees.

**37:575:297** ***Religion in the Workplace (1)***
Contemporary workplace issues stemming from employee religious diversity. Employee rights, accommodation and inclusion; dominant group privilege, prejudice, discrimination; and organizational responses to religious diversity.

**37:575:298** ***Social Media in the Workplace (1)***
Issues for organizations and employees stemming from the increased use of social media by individuals. Hiring discrimination, professional image, collective action, ethics, and other concerns.

**37:575:300** ***Writing in Labor Studies and Employment Relations (3)***
Construction of a well-written argument in labor studies and employment relations; application of sound writing principles to contemporary labor policy issues; intensive practice.

**37:575:301** ***Labor and Democracy (3)***
Labor as a worldwide social and political movement; comparative and historical consideration of how labor can achieve influence in market economies and a better standard of living.

**37:575:302** ***Comparative Social and Employment Policy (3)***
Overview of such policy in wealthy democracies; the relationship between state and market; varieties of capitalism and welfare states; social safety nets; family policy; labor movements' role.

**37:575:303** ***Black Workers in American Society (3)***
Examination of the historical relationships between African-American workers and the American labor movement; analysis of problems facing Black workers in the workplace.

**37:575:304** ***Comparative Employment Relations in Wealthy Nations (3)***
Employment relations systems in wealthy nations; corporate governance; social welfare; global and national labor standards; union-management relations; work organization; labor politics.

**37:575:307** ***Latino Workers in the U.S. (3)***
Role of Latino workers in U.S. society and the U.S. economy; impact of the new migration on the U.S. labor market and social policy.

**37:575:308** ***Dynamics of Work and Work Organizations (3)***
Examination of the social dynamics of economic institutions and their corresponding work relations; corporate organization and union structure; selected problems of technological change; human relations in industry and the changing bases of managerial authority.

**37:575:309** ***Working Women in American Society (3)***
Focus on the contemporary experience of working women, including an exploration of current legal strategies and social policies created to address their concerns.

**37:575:310** ***Labor Relations in Professional Sports (3)***
Labor relations systems in professional sports in the United States; unique institutional aspects and common features of union-management and employee relations.

**37:575:311** ***Organizational Design and Structure (3)***
New and old methods of organizing work and organizations ranging from hierarchical bureaucracy to contemporary models emphasizing teamwork and/or flatter or networked structures.

**37:575:312** ***Conflict and Conflict Resolution in the Workplace (3)***
How people resolve work-related grievances: bargaining, grievance procedures, mediation, arbitration, demonstrations, strikes, and industrial violence. Examines union and nonunion workplaces.

**37:575:313** ***New Technology and Work (3)***
Impact of new technology on work, workers, and society. Emerging technologies like digital platforms, algorithmic hiring, artificial intelligence, and practices like gig jobs.

**37:575:314** ***Collective Bargaining (3)***
Comprehensive study of the development of collective bargaining; the nature and scope of contracts; the changing character of collective bargaining processes through negotiation, legislation, the courts, and arbitration; the substantive issues in bargaining, including the implications for public policy.

**37:575:315** ***Employment Law (3)***
Overview of employment at-will and its limitations; wages and hours; medical/family leave; privacy; drug testing; workers compensation; and fundamental antidiscrimination law.
***Required course for the B.S. in labor and employment relations program (not a required course for the B.A. program).***

**37:575:316** ***Employment Discrimination Law (3)***
Legal, regulatory, and public policy approaches to employment discrimination of all types; Title VII, ADA, ADEA, relevant N.J. laws, and related court decisions.

**37:575:317** ***Contingent and Nonstandard Work (3)***
Issues arising from employment relationships that have nonstandard aspects; temporary, leased, or part-time employees; independent contractors and owner-operators.

**37:575:319** ***Leadership and Governance of Labor Unions (3)***
Leadership of all types of labor organizations. Internal management; union politics; relationships with other organizations; use of media; and other key leadership issues.
***Prerequisite: 37:575:100 or 110, or permission of the instructor.***

**37:575:320** ***Immigration and Public Policy (3)***
Immigration and immigrant workers in American society and related public policy debates; history; immigrants in unions and community organizations.

**37:575:321** ***Immigration Law and Employment Rights (3)***
Contemporary immigration law in the United States; employer compliance issues; employee rights; immigrant employee representation; and related policy debates.

**37:575:322** ***American Labor Unions in Politics (3)***
Role of the labor movement in the political process from the New Deal to the present, including an analysis of its ideology, its legislative agenda, its political action, and its impact on public policy.

**37:575:325** ***Economics of the Employment Relationship (3)***
Fundamentals of labor economics. Economic dimensions of public policies and human resource administration.

**37:575:326** ***Negotiation Concepts and Techniques (3)***
Negotiation strategy and tactics; interests and interest-based bargaining, rights, power, leverage, concessions, commitment; application of theory in various work-life contexts; negotiation skill development.

**37:575:330** ***Working Women and the Law (3)***
Survey of law affecting women as employees: antidiscrimination, OSHA, and other laws. How law relates to advancement opportunities for women, the glass ceiling, and employer behavior.

**37:575:335** ***Women and Labor Movements: A Global Perspective (3)***
How labor movements around the world are addressing such issues as pay equity, equal opportunity, sexual and racial harassment, work-life balance, and women's leadership.

**37:575:336** ***Employment Relations in Emerging Economies (3)***
Changing employment relations systems in nations that are rapidly industrializing; focus on labor movements; labor-management relations; labor standards and public policy.

**37:575:337** ***Workers and Multinationals in Global Perspective (3)***
Impact of multinationals and global value chains on workers in developing nations. Issue of labor standards; corporate social responsibility; international labor organizations; and regulatory approaches.

**37:575:338** ***Occupational Safety and Health (3)***
Federal and state regulatory laws and enforcement; the basic issues involved in safety and health at the workplace; and worker, union, and employer response to the issues.

**37:575:340** ***American Labor Law (3)***
Examination of the present legal arrangements governing the conduct of labor relations in the United States; historical development and impact of common law, legislative statutes, and court decisions on the growth of the labor movement.

**37:624:345** ***Organizational Behavior and Work (3)***
Behavior by individuals and groups in the workplace; group and intergroup dynamics; organizational culture, structure, and change; leadership, employee motivation, job performance, and feedback.
***Previously listed under 37:575:345***

**37:624:348** ***Leadership in the Workplace (3)***
Leadership in work organizations, including unions, nonprofit, and businesses. Key leadership issues in small groups and large organizations; diversity concerns; leadership development.
***Previously listed under 37:575:318 Leadership in Work Organizations***

**37:575:350** ***Public Sector Collective Bargaining (3)***
Study of employer-employee relations in the public sector; federal executive orders and state and municipal legislation regulating public employers and employee organizations; procedures for bargaining unit certification, representation, and recognition; dispute resolution techniques.

**373:575:355** ***Current Labor Problems (3)***
A selected number of labor and employment issues that have particular relevance in contemporary society.

**37:575:357** ***Social Movements, Social Change, and Work (3)***
The theory and practice of social movements and social change, particularly those related to work; the prospects for current and future mobilization.

**37:575:359** ***Organizing for Social Change (3)***
Theory and practice of community organizing for social change for labor and community groups; membership building; leadership development; strategy development; community power analysis; campaign planning.

**37:575:360** ***Union Organizing (3)***
Introduction to and critical analysis of union-organizing strategies and tactics.

**37:575:361** ***Labor and Corporate Restructuring (3)***
Study of how management efforts to decentralize organizational structures and reduce employment levels affect industrial relations, work and workers, skill levels and training needs, and productivity and the macro-economy.

**37:575:362** ***The Work-Education Connection (3)***
What do workers need to know to be prepared for the jobs being generated by the global economy? How do the American secondary and higher education systems prepare workers for changing jobs?

**37:575:363** ***Labor and the Global Economy (3)***
Changes in the global economy and their effects on the living standards and bargaining power of American workers and their unions. Alternative strategies for dealing with globalization.

**37:624:364** ***Diversity in the Workplace (3)***
Focuses on how the increasing demographic diversity of American workplaces affects social relations, cultural dynamics, and organizational effectiveness.
***Previously listed under 37:575:364***

**37:575:366** ***Asian-American Workers in a Global Context (3)***
Social structures affecting Asian-American workers; contemporary and historical immigration policies; stereotypes and other problems; racialized employment; inequality and achievement; differences by nation origin.

**37:575:367** ***Emotional Intelligence in the Workplace (3)***
Nature of emotional intelligence and its effects on employee performance and organizational success; research on development of emotional intelligence; self-awareness and self-development.

**37:575:368** ***Professional Development Strategies (3)***
Best practices in professional development; organizational strategies for addressing employee retention, work/life balance, wellness, communication, and other matters related to employee development.

**37:575:375** ***Benefits and Social Insurance (3)***
Overview of benefits with a focus on social insurance systems, health insurance, and pensions. Relevant issues for employers, employees, unions, and public policy.

**37:624:376** ***Corporate Governance, Power, and Control (3)***Corporate governance and the impact of corporations on society; boards of directors; executive compensation; principal-agent/stakeholder theories; issues for labor and the public.
***Previously listed under 37:575:376***

**37:575:377** ***Democratic Workplaces (3)***Democracy within the firm, employee ownership, and co-ops; approaches to economic democracy; political and economic theory; case studies; and related career tracks.

**37:575:378** ***Solving Labor Problems through Social Entrepreneurship (3)***
Concepts and skills for starting nonprofit organizations or businesses addressing problems of employees and their families; innovative business models; venture plans; critical and supportive perspectives.

**37:575:385** ***Finance for Organizational Leadership (3)***
Quantitative financial and accounting techniques in organizations used for cost analysis and performance decisions. The class is for nonfinancial leaders in profit and nonprofit organizations.

**37:575:391,392,393,394** ***Issues in Work (1 each)***
Brief examination of selected issues in labor and employment relations. Topics to be announced.

**37:575:395** ***Perspectives on Labor Studies (3)***
In-depth study of the classic works on the nature of labor, the relationship of work to other social functions, and the relationship between workers and management.
***Open only to majors who have completed at least 15 credits of labor studies coursework.***

**37:575:396,397** ***Concerns at Work (2 each)***
Examination of contemporary issues related to work; topics to be announced.

**37:575:401** ***Research Methods in Labor Studies (3)***
Overview of both quantitative and qualitative research methods commonly used in the study of labor problems.

**37:575:402** ***Research Corporations and Industries (3)***
Overview of methods used to investigate the competitive situation/prognosis of an industry's employers, profitability, sales, employment, wages, and unionization; strategic corporate research.

**37:575:403** ***Problem-Solving Tools at Work (3)***
Applied analytical and statistical tools for solving problems at work, surveying employees, and maintaining quality. Projects are individual/group and spreadsheet-intensive.

**37:575:404** ***Creating and Administering Surveys (3)***
Issues for online, mail, telephone, and in-person surveys given their intended use. Samples: item construction; scaling; measurement validity and reliability; improving response rates; ethical research.

**37:575:407** ***Workers' Movements in New Jersey (3)***Examination of workers' movements at state and local levels in New Jersey, using library resources, interviews, participant observations, and movement archives. Research results document the development of the New Jersey labor movement.

**37:575:450** ***Senior Seminar in Labor Studies (3)***
In-depth study of a labor studies topic. Intensive reading and discussion designed to integrate student experiences in the labor studies major. Topics vary.
***Open only to labor studies majors with senior standing, except by special permission.***

**37:575:490** ***Internship in Labor Education (BA)***
Students work under the supervision of individual faculty members and other experienced labor educators to develop and/or teach courses and workshops.
***Prerequisite: Permission of instructor.***

**37:575:480,481,491,492,493** ***Topics in Labor Studies (3 each)***
In-depth examination of particular topics concerning work organization, worker problems, or worker organizations.

**37:575:494,495** ***Independent Study and Research (BA,BA)***
An individual reading and research project under the guidance of a labor studies faculty member on a topic of interest to the student.
***Prerequisite: Departmental permission.***

**37:575:496,497** ***Internship in Labor Studies (BA,BA)***
Students work as staff members in a union or labor-related organization (public or private), in an industrial relations unit in private industry, or as employees in a position that permits observation of, and participation in, a labor union at the grassroots level. Allows students to apply conceptual knowledge learned in the classroom to actual situations and to acquire new skills and knowledge.
***Prerequisite: Departmental permission.***

**37:575:498,499** ***Honors in Labor Studies (BA,BA)***
An individual research and reading project under the guidance of a member of the department.
***Prerequisite: Departmental permission.***

# Landscape Architecture 550 (SEBS)

## LANDSCAPE ARCHITECTURE 550

**Degree:** B.S.L.A.

**Director:** Holly Grace Nelson (Holly.Nelson@rutgers.edu)

Program Webpage: Here

**Managing Department Webpage:** Here

Landscape Architecture is the planning and design of outdoor environments at the residential, city, and regional scale. The program engages students in art, science, theory, and practice with a commitment to equitable, sustainable, and resilient solutions that contribute to human and environmental health and well-being.

Our nationally accredited program prepares students for Landscape Architecture licensure through a creative, analytic, and interdisciplinary approach to stewardship of the environment. Set in the School of Environmental and Biological Sciences, the program examines the ideas shaping the interaction of people and landscape and integrates scientific knowledge creatively in the designed environment. Interdisciplinary courses with environmental planning students provide a mutual foundation for both majors, promote collaboration between programs, and sets the groundwork for professional practice where landscape architects are part of or lead interdisciplinary teams of planners, engineers, ecologists, and social scientists.

The program also has a Minor in Landscape Design for students interested in
exploring design solutions to the environmental issues of our time--climate change, demographic shifts, increasing income inequality, food scarcity, and the spread of global pandemics to make our world more sustainable, viable, just, healthy, inclusive, and beautiful.

Landscape Architecture 550 (SEBS)

# Learning Goals

# Learning Goals

**Our Program's Learning Goals**

Explore . . . the potential of space and spatial relationships to create socially vibrant and culturally inclusive design solutions.

Analyze . . . and thoughtfully incorporate natural features and systems to create enduring and ecologically sensitive design solutions.

Understand . . . social, cultural, and behavioral factors in the historical development of designed and everyday landscapes to equitably shape our public realm.

Master . . . technical and industry standards to effectively and sustainability foster safe accessible environments using the materials, methods, and technologies of site design and engineering.

Apply . . . design principles at large as well as small scales.

Demonstrate . . . knowledge of the professional practice skills required for the Landscape Architecture Accreditation licensure exam and manifest sensitivity to issues of power.

Communicate . . . creatively with the public, communities, and policymakers in graphic, written, and verbal formats to advance social justice

Landscape Architecture 550 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of the landscape architecture major requirements, courses, and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis [SCL]*

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent* [WC] *and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

## Graduation Requirements: Major in Landscape Architecture (550)

*No more than one course* with a grade equal to D may be used from (landscape architecture courses) in any requirements or conditions.

*Year 1*

11:460:100* Planet Earth or 01:450:101 Earth Systems

01:640:115* Pre-Calculus or 11:640:111 and 11:640:112 or 11:640:135 or 11:640:139 or 11:640:151

11:573:231 Fundamentals of Environmental Planning

11:550:237* Landscape Drawing and Drafting

11:550:133* Architectural Design

Core requirements (contemporary challenges, writing, economics, social analysis). (See here for core classes met by major requirements.)

*Year 2*

| | |
|---|---|
| 11:550:231 | 11:550:232 |
| 11:550:241* | 11:573:232 |
| 11:550:233 | 11:573:233 |
| 11:119:103* | 11:550:341 |
| | 11:550:345, 11:550:347 |

*Year 3*

| | |
|---|---|
| 11:550:331 | *11:550:332* |
| 11:550:250* | 11:550:340 |
| 11:216:332 | 11:550:301* or Theory Elective (see DN List) |
| or 11:216:101 | |
| 11:550:350 | Plant/Ecology Elective (see DN List) |

*Year 4*

| | |
|---|---|
| 11:550:431 | 11:550:432 or 11:550:333 or 11:550:443 |
| 11:550:441 | 11:550:435 |
| Electives | 11:550:499 |

*Meets core requirement

# Classics (SAS)

## CLASSICS

(Classical Humanities 190, Greek 190b, Greek and Latin 190c, Latin 190d)

Department of Classics, School of Arts and Sciences

**Website:** Here

**Chair:** Serena Connolly

**Undergraduate Director:** Emily Allen-Hornblower

**Distinguished Professor:**

Thomas J. Figueira, B.A., Fordham; Ph.D., Pennsylvania

**Professors:**

T. Corey Brennan, B.A., Pennsylvania; M.A., Oxford; Ph.D., Harvard

Serena Connolly, B.A., Cambridge; M.A., Ph.D., Yale

James McGlew, B.A., M.A., Ph.D., Chicago

Azzan Yadin-Israel, B.A., Hebrew; Ph.D., California (Berkeley) and Graduate Theological Union

**Associate Professors:**

Emily Allen-Hornblower, B.A., Sorbonne, École Normale Supérieure; M.A., Ph.D., Harvard

Timothy Power, B.A., Yale; M.A., Ph.D., Harvard

**Assistant Professors:**

Bice Peruzzi, B.A., Perugia (Italy); M.A., Padova (Italy); M.A., Ph.D., Cincinnati

Jeffrey Ulrich, B.A., Rutgers; M.A., Ph.D., Pennsylvania

**Associate Teaching Professor:**

Kristina Chew, B.A., Princeton; Ph.D., Yale

John Fisher, B.A., Kean College; M.A., Richard Stockton College; Ph.D., Princeton¿

**Assistant Teaching Professors:**

Salam Al Kuntar, B.A., Damascus University; M.A., University of Liverpool; Ph.D., University of Cambridge

The department offers a major in classics with options in classical humanities, Greek, Greek and Latin, and Latin. Selected courses in history, philosophy, and art history also may count for credit toward the classics major. Students with a strong interest in ancient history may pursue the ancient history and classics option within the history major (see the history section of this catalog). Minors are offered in ancient Greek, Latin, and classical humanities. For more information, consult the departmental website.

# Learning Goals

# Learning Goals

See here.

- Classics is a broad discipline, characterized by its interdisciplinary nature. Pursuing classics means acquiring fundamental language skills in ancient classical languages (Greek, Latin, and, to a lesser degree, Sanskrit), along with a wide-ranging knowledge of the ancient world.
- Studying classics involves coming to grips with the ancient Greek and Roman civilizations: their myths and literature; their social, military, political, and cultural history; their philosophy; and aspects of their material culture. At every stage, students are led to reflect on the many connections of classics to the modern world, and how these ancient civilizations contributed to shape it.
- As many other humanities disciplines do, classics combines language study with the exploration of questions central to many social sciences. Classics students are led to ponder the mechanisms of human psychology, social organization, and historical evolution, and given an opportunity to appreciate the ways in which the individual and the community relate to, shape, and affect one another.

Classics (SAS)

# Major Requirements

# Major Requirements

Classics majors choose one of four options. Those who wish to concentrate on one or both ancient languages may choose an option in ancient Greek and Latin, ancient Greek, or Latin. The classical humanities option is for those who wish to pursue a general study of the history, literature, and culture of the classical world. All courses applied to the major must be completed with a grade of C or better.

*Classical Humanities Option (Classical Humanities 190).* A major who pursues the classical humanities option must complete 36 credits in the department. (Credits from approved classical humanities courses in other departments may be counted among these, as well as courses with a 190, 490, or 580 subject code.) The following are required of every classical humanities major: 1) one course in the Greek or Latin language at the 200 level or above; 2) at least six courses at the 300-level or above.

*Greek Option (Greek 190b).* A student majoring in classics with emphasis on Greek must take 35 credits in the department, of which 26 credits must be in the ancient Greek language (including at least six courses at the 300 level or above).

*Greek and Latin Option (Greek and Latin 190c).* A student majoring in classics with emphasis on Greek and Latin must take 35 credits in the department, of which at least 29 credits must be in the ancient Greek and Latin languages. The credits may be distributed between the two languages, but at least 11 credits must be taken in each language. At least six courses must be at the 300 level.

*Latin Option (Latin 190d).* A student majoring in classics with emphasis on Latin must take 35 credits in the department, of which at least 26 credits must be in the Latin language (including at least six courses at the 300 level or above).

Classics (SAS)

# Minor Requirements

# Minor Requirements

Classics minors choose one of three options. Those who wish to concentrate on one of the ancient languages may choose an ancient Greek or Latin minor. The classical humanities minor is for those who wish to pursue a general study of the history, literature, and culture of the classical world. All courses applied to the minor must be completed with a grade of C or better.

*Classical Humanities (190).* A minor in classical humanities requires a minimum of seven courses in the department. (Credits from approved classical humanities courses in other departments may be counted among these, as well as courses with a 190, 490, or 580 subject code.) Of these seven courses, at least three courses must be at the 300 level or above.

*Latin (580).* A minor in Latin requires a minimum of six courses in the Latin language, including three at or above the 300 level.

*Greek (490).* A minor in ancient Greek requires a minimum of six courses in the Latin language, including three at or above the 300 level.

Classics (SAS)

# Teacher Certification

# Teacher Certification

Classics majors interested in earning eligibility for teacher certification (K-12) in New Jersey should contact advisers in the Graduate School of Education and in the Department of Classics in their first year, or as soon as possible thereafter.

Classics (SAS)

# Departmental Honors Program

# Departmental Honors Program

Honors in Classics may be earned by eligible students who wish to write a senior thesis with the help of an adviser. To qualify, students must have a cumulative grade-point average (GPA) of 3.2 or better and a GPA of 3.6 or better

in the major at the end of their junior year. At that time, students should complete the required application form, before the deadline of May 2 of their junior year. See the classics website under Honors & Glory for the honors thesis application form.

Note: Students writing theses must enroll in 01:190:495, 496 (8 credits total) in their senior year. Students who are interested in a topic that spans more than one academic discipline should consider the School of Arts and Sciences interdisciplinary honors thesis option: Here.

Honors in Classics may also be earned by classics majors who:

1. Maintain a 3.5 in the major

2a. Have earned 12 credits at the 300 level or above in Greek OR Latin courses

OR

2b. Have earned 6 credits in BOTH Greek and Latin at the level of 300 or above

3. Submit two papers representative of their work in classics (they may be revised versions of class papers), which a panel of two faculty members deem worthy of honors using the rubric that we have developed for senior assessment purposes.

4. Sit for a sight translation exam in the spring of senior year and pass with honors

To be eligible for honors without a thesis, the grades in the Greek and Latin courses must be at an average of 3.5 or above; for high honors, 3.7 or above; for highest honors, 3.9 or above. Highest honors will be reserved for those students who, in addition to meeting the GPA requirement, have performed at the highest level on the sight exam and paper requirement. Students should inform the undergraduate director by the fall of senior year if they would like to be considered for honors in the major.

Classics (SAS)

# Courses in Classical Humanities (190)

# Courses in Classical Humanities (190)

Courses in classical humanities are open to students without a knowledge of the Greek or Latin language.

**01:190:101** ***Word Power (3)***
Systematic study of the basic Greek and Latin derivatives in English. Emphasis is on Greek and Latin elements in current scientific and literary use.

**01:190:102** ***Medical Terminology (1.5)***
Systematic study of scientific terminology based on ancient Greek and Latin elements, with emphasis on the field of medicine.
***May be taken concurrently with 01:190:101.***

**01:190:200** ***Ancient Near East (3)***
Origins and development of the societies of Mesopotamia, Egypt, Asia Minor, and Palestine, through the period of the Persian Empire.
***Credit not given for both this course and 01:563:200, 01:508:200, or 01:685:200.***

**01:190:201** ***Ancient Greece (3)***
Civilization of the eastern Mediterranean world in ancient times, with emphasis on the origins of Western civilization and the Greek contribution to Western culture.
***Credit not given for both this course and 01:510:201.***

**01:190:205** ***Greek Civilization (3)***
Survey of Greek thought and literature. Readings include Homer, the lyric poets, the Athenian dramatists, and selected readings from historians and philosophers. Artistic material may be included.

**01:190:206** ***Roman Civilization (3)***
Surveys Roman thought and literature. Readings include Virgil, Ovid, Livy, Cicero, Tacitus, and Petronius. Artistic material may be included.

**01:190:207** ***Greek and Roman Mythology (3)***
Examination of the nature, meaning, and continued vitality of the principal classical myths through reading, lectures, and slide presentations.

**01:190:208** ***Philosophy of the Greeks (3)***
Introduction to the major philosophical thinkers of the ancient Greek world with special emphasis on Plato and Aristotle.
***Credit not given for both this course and 01:730:208.***

**01:190:209** ***Ancient Rome (3)***
The Roman Republic and the empire, with emphasis on the rise and decline of a Mediterranean world civilization under Roman leadership.
***Credit not given for both this course and 01:510:202.***

**01:190:211** ***Greek and Roman Religion (3)***
Study of pagan gods and goddesses, and cults and practices of the classical Greek world, Roman Republic, and Roman Empire.

**01:190:212** ***Classical World in Film (3)***
Survey of film depictions of the classical world of Greece and Rome, with readings from literary, historical, and critical sources. Topics include "sword and sandals" genre and its history; parallels between America and Greece/Rome; spectacle and empire; and the uses of history in popular historical films.

**01:190:213** ***Science and Technology in Ancient Greece and Rome (3)***
Explores the nature and development of science in ancient Greece and Rome, focusing on medicine, biology, physics, and mathematics.

**01:190:214** ***Sexuality in Ancient Greece and Rome (3)***
Investigates how the ancient Greeks and Romans categorized, depicted, and reacted to different sexual behaviors and identities through the study of visual and literary sources ranging from Homeric Greece to Imperial Rome.

**01:190:215** ***Introduction to Greek and Roman Archaeology (3)***
Introductory survey of the archaeology, architecture, and material culture of the Mediterranean world from the Bronze Age throughout the transformation of the Roman Empire following the reign of Constantine. Consideration given to chronological developments, Greek and Roman artistic production in its social and cultural settings, and Classical Art.
***Credit not given for this course and 01:070:113.***

**01:190:220** ***Greek Food from Antiquity to Today (3)***
Food and foodways of Greek-speaking peoples from ancient times to the present, with special emphasis on problems of continuity and change.
***Credit not given for this course and 01:489:220, 01:510:222, 01:685:220, or 667:220.***

**01:190:251** ***Papal Rome and Its People, 1500-Present: A Select History (3)***
Case-study approach toward select aspects of the social, cultural, intellectual, and political history of the early modern and modern popes, with a particular focus on their relationship to the city of Rome. Highlights the reign of Pope Gregory XIII Boncompagni (1572-1585) and Gregory XV Ludovisi (1621-1623), and their subsequent family history to the present day.
***Credit not given for both this course and 01:556:251.***

**01:190:254** ***The Presocratic Philosophers (3)***
Introductory survey of the Presocratic philosophers. Emphasizes exposure to the teachings of these thinkers through the remaining fragments, while also engaging scholarly writings that introduce and contextualize the sources.
***Credit not given for this course and 01:730:254.***

**01:190:300** ***Greek and Roman Slavery (3)***
Social, economic, legal, and political aspects of slavery in ancient Greece and Rome. The sources and numbers of slaves, forms of servitude, manumission, and slave labor.

**01:190:301** ***Food and Drink in the Ancient World (3)***
This course provides students an opportunity to understand the social history of the ancient Mediterranean world through an exploration of the production, preparation, and consumption of food and drink and (re)presentations of them in word and image.

**01:190:303** ***Hellenistic World (3)***
Expansion and development of Greek culture from Alexander through the successor kingdoms in Greece, Egypt, Syria-Palestine, and Asia Minor.
***Credit not given for both this course and 01:510:303.***

**01:190:305** ***The Crisis of the Roman Republic (3)***
Roman political, social, and cultural history during the crisis of the late republic from 133 BC.

**01:190:306** ***Roman Empire (3)***
Political, social, and intellectual developments of the imperial period until the age of Constantine, with emphasis on the first two centuries AD.
***Credit not given for both this course and 01:510:306.***

**01:190:309** *Greek and Roman Athletics (3)*
Examines the ideology and cultural context of ancient athletic competition. Topics include the Olympic and other Panhellenic games, Roman chariot racing and gladiator combat, and women athletes.

**01:190:310** *Augustan Rome (3)*
The cultural renaissance under Augustus (44 BC-AD 14): the writings of Virgil, Horace, Livy, Ovid, and the elegiac poets; the building program at Rome; and artistic trends.
*May be jointly taught (in part) with 01:580:310. Students wishing to earn language credit in Latin should enroll in 01:580:310. Credit not given for both this course and 01:580:310.*

**01:190:312** *The Search for the Historical Socrates (3)*
Portraits of Socrates in Plato, Xenophon, Aeschines of Sphettus, and Aristophanes. Birth of the philosophical dialogue and other genres; life and thought of Socrates; and later Socratic movements.
*Prerequisite: One course in ancient Greek history, culture, or philosophy; or permission of instructor. May be jointly taught (in part) with 01:490:312. Students wishing to earn language credit in Greek should enroll in 01:490:312. Credit not given for both this course and 01:490:312.*

**01:190:314** *The Etruscans (3)*
Study of the social history, material culture, and artistic expression of the Etruscans. Survey of urbanism and architecture, trade, funerary practices, painted decoration, sculpture, and minor arts between the 9th and 2nd centuries BC.
*Credit not offered for this course and 01:082:314.*

**01:190:315** *Latin Poets in English (3)*
Selections from the Augustan poets Horace, Virgil, and Propertius. Translations by Dryden, Ezra Pound, and others, with close reference to the Latin original. Theories of translation.
*Prerequisite: One year of Latin or permission of instructor.*

**01:190:317** *Ancient Painting (3)*
Survey of Greek, Etruscan, and Roman painting from the eighth century BC through the Roman Empire. Emphasis on the development of style and on the cultural significance of painted images in different social contexts.
*Credit not given for this course and 01:082:317.*

**01:190:318** *Cleopatra (3)*
Examines the historical Cleopatra and the reception of her image from antiquity to the present in literature, art, and film. Issues considered include female power in a man's world, East versus West, and politics and propaganda.
*Credit not given for both this course and 01:510:312 or 01:988:321.*

**01:190:320** *Women in Antiquity (3)*
Women in the ancient societies of Greece and Rome. Their roles and images in the social, legal, political, domestic, philosophical, and artistic spheres examined using primary sources.
*Credit not given for both this course and 01:510:251.*

**01:190:321** *Classical Rhetoric (3)*
Origins and development of rhetorical theory: persuasive argument, emotional appeal, good style, and delivery.

**01:190:323** ***Criminals and Saints: Power in Greek Political Life and Imagination (3)***
Unlimited power, tyranny, democracy. Explores the ancient Greeks' ambivalent conceptions and perceptions of autocratic versus collective power through time.
***Prerequisite: 01:190:205 or permission of instructor.***

**01:190:324** ***Race and Ethnicity in the Classical World (3)***
Examination of ancient Greek and Roman understanding of physically different and geographically alien individuals. Consideration of the origins of our culture's beliefs about race, ethnicity, and human difference in classical world's views of strangers, foreigners, and barbarians and how our ideas about race and difference have evolved.

**01:190:325** ***Cults, Magic, and Witchcraft (3)***
Magic and witchcraft in the everyday life of antiquity, from pagan to Christian times; how individuals tried to control the unknown. Literary and material sources.

**01:190:328** ***Ancient Law in Action (3)***
Explores Greek and Roman constitutions and legal systems in their social contexts. Illustrates procedural elements of ancient criminal and civil law through mock trials.

**01:190:350** ***Greek Society (3)***
Social and economic life of the Greeks from the Mycenaean period through the Hellenistic age. Written and material evidence employed.
***Recommended: 01:510:201. Credit not given for both this course and 01:510:350.***

**01:190:352** ***Plato (3)***
Philosophy of Plato through close reading of selected dialogues, supplemented by relevant readings on other ancient and contemporary philosophers.
***Credit not given for both this course and 01:490:352 or 01:730:352.***

**01:190:353** ***Aristotle (3)***
Philosophy of Aristotle through his selected works, supplemented by relevant readings in Plato and in modern philosophers.
***Prerequisite: One course in ancient Greek history, culture, or philosophy; or permission of instructor. May be jointly taught (in part) with 01:490:353. Students wishing to earn language credit in Greek should enroll in 01:490:353. Credit not given for both this course and 01:490:353.***

**01:190:355** ***Ancient Mythology and Society (3)***
Social history and practical utilization of ancient myth (with emphasis on Greek myths), applying historical, religious, sociological, and literary-critical perspectives.

**01:190:356** ***Oedipus: A Survey of the Myth from Antiquity to Freud (3)***
Survey of the Oedipus myth in earliest, pre-Sophoclean evidence; in Greek and Roman tragedy; in the Middle Ages and the Renaissance; and in the 19th and 20th centuries (with special emphasis on Oedipus in art and music).

**01:190:358** ***Odysseus in Literature, Drama & Film (3)***
Evolving images of Odysseus from ancient literature through medieval poetry and modern novels, poetry, plays, and films. Significance of Odysseus as an enduring literary icon.
***Credit not given for both this course and 01:195:358 or 01:489:358.***

**01:190:370** ***Greek Film: Love, Eros & Death (3)***
Masterpieces of modern Greek film, 1914 to present, exploring interplay of love, the erotic, and death.
***Credit not given for this course and 01:489:370. Taught in English.***

**01:190:372** ***Cities of the Classical World (3)***
Study of urban development in antiquity, focusing on Athens and Rome, and synthesizing the evidence of literary, historical, and archaeological sources.
***Credit not given for both this course and 01:512:311.***

**01:190:373** ***Pompeii: The Life and Death of a Roman Town (3)***
Pompeii and Herculaneum, as laboratories for the study of Roman life: the economy and society; public and private architecture, art, and inscriptions; and the birth of archaeology.
***Prerequisite: One course in Roman history or culture, Latin or ancient art, or permission of instructor. Credit not given for both this course and 01:510:310.***

**01:190:375** ***Masterpieces of Greek and Roman Art (3)***
Analyses of selected monuments of architecture, sculpture, and painting from 800 BC to AD 500.

**01:190:377** ***The Hero in Ancient Greece and Rome (3)***
Explores the ancient Greek and Roman hero from literary, religious, mythical, and comparative narrative points of view. Readings drawn mostly from ancient sources.

**01:190:381** ***Greek Drama in Translation (3)***
Readings in English of the major Greek tragedies and comedies; emphasis on the dramatic structure, literary analysis, and the theatrical conventions of the ancient stage.

**01:190:391** ***Roman Drama in Translation (3)***
Readings in English of the comedies of Plautus and Terence and the tragedies of Seneca to emphasize the contributions of Latin authors to the dramatic genre and their influence on European and English drama.

**01:190:393** ***Greek and Roman Satire (3)***
Readings in English of classical satire from its origins in the Greek world through the fourth century AD. Emphasis on the significance of ancient satire for comedy and satire in Western culture.

**01:190:395** ***Transgression in Ancient Greek Society and Culture (3)***
Violence. Obscenity. Gender roles. Punishment. Violations of cultural norm in ancient Greek practical, civic, religious, and intellectual life, through close critical analysis of their myths, literature, laws, and rituals.
***Prerequisite: 01:190:205 or permission of instructor.***

**01:190:397** ***The Ancient Novel in Context (3)***
Readings from Greek and Roman novels of the Imperial period, with attention to their place in the literary and cultural history of the ancient world.

**01:190:421** ***Indo-European Origins of the Classical Languages (3)***
Comparative survey of Latin and Greek grammar, with historical analysis of those features that the two languages share due to their common origin as Indo-European languages. Reference to the major characteristics of Indo-

European languages in general.
*Open only to advanced undergraduates in classics and linguistics and to graduate students with some knowledge of Latin and/or Greek.*

**01:190:440** *Cultural Heritage and Preservation Studies (CHAPS): Museums, Collecting, and Preservation (3)*
Examines the history of museums, modes of collecting, and the preservation of the past, and considers these activities in the context of contemporary political issues.
*Credit not given for this course and 01:082:440.*

**01:190:491,492** *Independent Study in Classics (3,3)*
Directed reading and research on an assigned topic in classics under the supervision of a member of the department. An extensive essay required, reflecting in-depth research on the assigned topic.
*Open only to juniors and seniors majoring in classics. Permission of the undergraduate director required.*

**01:190:493,494** *Special Topics Seminar (3,3)*
Advanced study of a problem, topic, or theme in Greek and Roman studies.
*Open only to junior or senior majors in classics or by permission of instructor.*

**01:190:495,496** *Honors Project (4,4)*
Independent or team projects resulting in a written paper, a performance, or some other appropriate form of public presentation such as drama, poetry, narrative prose, or museum excavation materials.
*Open only to honors students in one of the fields in classics.*

Classics (SAS)

# Classical Humanities Courses in Other Departments

# Classical Humanities Courses in Other Departments

01:013:180 Elementary Sanskrit I (4)

01:013:181 Elementary Sanskrit II (4)

01:082:301 Ancient Architecture (3)

01:082:306 Roman Art (3)

01:082:317 Ancient Painting (3)

01:082:342 Early Greek Art (3)

01:082:343 Later Greek Art (3)

01:510:201 Ancient Greece (3)

01:510:202 Ancient Rome (3)

01:510:205 The History of the Byzantine Empire (3)

01:510:207 Byzantine Civilization (3)

01:510:301 Early Greece (3)

01:510:302 Classical Greece (3)

01:510:303 Hellenistic World (3)

01:510:304 The Rise of the Roman Republic (3)

01:510:305 The Crisis of the Roman Republic (3)

01:510:306 Roman Empire (3)

01:510:307 The Roman World in Late Antiquity (3)

01:510:310 Pompeii: The Life and Death of a Roman Town (3)

01:510:320 Women in Antiquity (3)

01:510:350 Greek Society (3)

01:510:403 Ancient Warfare and Diplomacy (3)

01:730:302 Plato and Aristotle (3)

01:730:352 Plato (3)

01:730:401 Plato (3)

01:730:402 Aristotle (3)

01:730:403 Ancient Philosophy after Aristotle (3)

Classics (SAS)

# Courses in Greek, Ancient (490)

# Courses in Greek, Ancient (490)

**01:490:101** ***Elementary Greek I (4)***
Intensive study of ancient Greek grammar in conjunction with readings in simple Greek prose.

**01:490:102** ***Elementary Greek II (4)***
Continued study of Greek grammar in conjunction with readings.
***Prerequisite: 01:490:101 or permission of instructor.***

**01:490:206,207** ***Intermediate Greek Prose (3,3)***
Study of Greek prose through the reading of a work of Plato, Lysias, Herodotus, or other authors.
***Prerequisite: 01:490:102 or permission of instructor.***

**01:490:208,209** ***Intermediate Greek Poetry (3,3)***
Study of Greek poetry through the reading of a work of Euripides, Sophocles, Homer, or other authors.
***Prerequisite: 01:490:102 or permission of instructor.***

**01:490:211** ***Introduction to New Testament Greek (3)***
Introduction to grammar and syntax of Greek in conjunction with readings from the Gospels, Acts, or Epistles.
***Prerequisite: 01:490:207 or permission of instructor.***

**01:490:304** ***Aristophanes (3)***
Reading of *Clouds* and one other comedy; comparison of the Aristophanic with the Platonic Socrates; study of relation of Old Comedy to Athenian life.
***Prerequisites: 01:490:207 or 208 or permission of instructor.***

**01:490:305** ***Greek Drama (3)***
Readings in the works of fifth-century Greek dramatists with special emphasis on Sophocles.
***Prerequisite: 01:490:207 or 208 or permission of instructor.***

**01:490:306** ***From Athens to Alexandria (3)***
Major works of the literature of Greece from the fourth century BC into the Hellenistic Age.
***Prerequisite: 01:490:207 or 305 or permission of instructor.***

**01:490:308** ***Greek Historical Writings (3)***
Readings of selected narratives in Herodotus and of main speeches, excursuses, and parts of books six and seven of Thucydides. Comparative study of historical method.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:309** ***Lyric Poetry (3)***
Survey of the main poets of the "lyric age" of Greece (Alcman, Sappho, Alcaeus, Archilochus, Solon, Theognis, and Anacreon); reading of an ode of Pindar.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:310** ***Greek Heroic Poetry (3)***
Studies in the poetry and culture of Homeric Greece. Selections from the *Iliad* or *Odyssey*.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:311** ***New Testament Greek (3)***
Selections from the Gospels, Acts, and Epistles, supplemented by a review of grammar and syntax.

**01:490:312** ***Socratic Literature (3)***
Portraits of Socrates in Plato, Xenophon, Aeschines of Sphettus, and Aristophanes, with emphasis on the reading, in Greek, of selections from the writings of these authors.
***Prerequisite: 01:490:207 or 208 or permission of instructor. May be jointly taught (in part) with 01:190:312. Students wishing to earn language credit in Greek should enroll in 01:490:312. Credit not given for both this course and 01:190:312.***

**01:490:315** ***Menander (3)***
Study of *Dyskolos* and *Samia* as examples of New Comedy; their relation to Athenian life at the end of the fourth century.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:335** ***Greek Prose Composition (3)***
Review of syntax, composition in Greek, and translation from English to Greek of continuous passages adapted from classical authors.
***Prerequisite: 01:490:207 or 208.***

**01:490:352** ***Readings in Plato (3)***
Reading of one or more Platonic dialogues (or thematically related selections from several) in the original Greek.
***Prerequisites: 01:490:207, 208, or permission of instructor. May be jointly taught (in part) with 01:190:352; separate meetings for readings in Greek. Credit not given for both this course and 01:190:352 or 01:730:352.***

**01:490:353** ***Readings in Aristotle (3)***
Reading of one or more treatises by Aristotle (or thematically related selections from several) in the original Greek.
***Prerequisites: 01:490:207, 208, or permission of instructor. May be jointly taught (in part) with 01:190:353; separate meetings for readings in Greek. Credit not given for both this course and 01:190:353.***

**01:490:391** ***Readings in Greek Prose (3)***
Readings in selected ancient Greek prose authors or genres.
***Prerequisites: 01:490:305, 306, or permission of instructor.***

**01:490:392** ***Readings in Greek Poetry (3)***
Readings in the works of selected Greek poets or poetic genres.
***Prerequisites: 01:490:305, 306, or permission of instructor.***

**01:490:400** ***Demosthenes (3)***
Reading of one public and one private oration; study of Demosthenes as orator; as source for Athenian law, commerce, and private life; and as statesman.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

**01:490:402** ***Plato and Aristotle (3)***
Reading of one Platonic dialogue followed by selected portions of an Aristotelian treatise. Attention to prose style and also to common problems and diverging solutions.
***Prerequisites: 01:490:207, 208, or permission of instructor.***

Classics (SAS)

# Courses in Latin (580)

# Courses in Latin (580)

**01:580:101** ***Elementary Latin I (4)***
Beginning course in Latin, introducing the Latin language and its grammar and syntax.

**01:580:102** ***Elementary Latin II (4)***
Continued beginning instruction in Latin, introducing Latin language, grammar, and syntax.
***Prerequisite: 01:580:101 or permission of instructor.***

**01:580:203** ***Intermediate Latin Prose (3)***
Selections from prose authors of the late Republican and/or early empire, e.g., Caesar, Cicero, Livy; development of skill in reading continuous passages of Latin prose.
***Prerequisite: 01:580:102 or permission of instructor.***

**01:580:204** ***Intermediate Latin Poetry (3)***
Representative poems of Catullus, Horace, and Ovid, read and studied with a view to their style, imagery, and topicality. Introduction to Latin metrics.
***Prerequisite: 01:580:102 or permission of instructor.***

**01:580:302** ***Medieval Latin (3)***
Readings in major Latin writings and documents of the Middle Ages.
***Prerequisite: 01:580:203 or 204 or permission of instructor.***

**01:580:303** ***Cicero: Philosophical Writings (3)***
Selected philosophical dialogues and rhetorical treatises of Cicero.
***Prerequisites: 01:580:203, 204.***

**01:580:304** ***Cicero: Orations (3)***
Selected orations of Cicero, with emphasis on the development of Cicero's style and the significance of historical and biographical background.
***Prerequisites: 01:580:203, 204.***

**01:580:310** ***Prose and Poetry in the Age of Augustus (3)***
The cultural renaissance under Augustus (44 BC-AD 14), with emphasis on the reading, in Latin, of selections from the writings of Virgil, Horace, Livy, Ovid, and the elegiac poets.
***Prerequisite: 01:580:203 or 204 or permission of instructor. May be jointly taught (in part) with 01:190:310. Students wishing to earn language credit in Latin should enroll in 01:580:310. Credit not given for both this course and 01:190:310.***

**01:580:321** ***Roman Comedy (3)***
Study of the principal meters, the theater, and the staging of plays through the reading of plays of Plautus and Terence.
***Prerequisites: 01:580:203, 204.***

**01:580:323** ***Lucretius (3)***
Readings from Lucretius' *De Rerum Natura* with analysis of its place within the literary and philosophical traditions of Rome and Greece.
***Prerequisites: 01:580:203, 204.***

**01:580:324** ***Sallust (3)***
Readings from Sallust's *Jugurthine War*, *Histories*, and *Catiline*, with a study of selected problems from the historical periods relevant to those works.
***Prerequisites: 01:580:203, 204.***

**01:580:325** ***The History of Livy (3)***
Readings from Livy's *Ab Urbe Condita* with a study of selected problems in Roman Republican history.
***Prerequisites: 01:580:203, 204.***

**01:580:327** ***Latin Elegy (3)***
Survey of Latin poetry written in elegiac meter, with selections from Catullus, Tibullus, Sulpicia, Propertius, and/or Ovid.
***Prerequisites: 01:580:203, 204.***

**01:580:328** ***Roman Satire (3)***
Selected poems of Horace, Martial, and Juvenal and a study of their interrelationship.
***Prerequisites: 01:580:203, 204.***

**01:580:329** ***Tacitus (3)***
Reading of a minor work of Tacitus and/or selections from the *Annals of Tacitus* with an investigation of their value as sources for Imperial history in the first century AD.
***Prerequisites: 01:580:203, 204.***

**01:580:335** ***Latin Prose Composition (3)***
Review of syntax and prose style; composition in Latin and translation into Latin of continuous passages of prose.
***Prerequisites: 01:580:203, 204.***

**01:580:369,370** ***The Seminar in Latin (3,3)***
Extensive and rapid reading in Latin literature from the early Roman Republic to the empire.
***Primarily for juniors and seniors majoring in classical humanities; open to others with permission of instructor.***

**01:580:401** ***Advanced Study of the Poetry of Ovid (3)***
Readings and interpretation of selected works of Ovid. A study of the poet's contribution to Roman literature and his importance in the Western literary tradition.
***Prerequisites: 01:580:203, 204.***

**01:580:402** ***Advanced Study of Vergil's Aeneid (3)***
Readings of Vergil's *Aeneid* with an analysis of selected problems in its interpretation.
***Prerequisites: 01:580:203, 204.***

**01:580:403** ***Readings in Latin Literature I: Literature of the Republic (3)***
Prose and poetry of Rome from its beginnings in the third century BC to the end of the republic in the first century BC. Extensive selections from epic, drama, lyric, elegy, pastoral, and other poetry and from history, rhetoric, and oratory.
***Prerequisites: 01:580:203, 204.***

**01:580:404** ***Readings in Latin Literature II: Literature of the Empire (3)***
Prose and poetry of imperial Rome. Extensive selections from epic, history, satire, the novel, and other genres, with emphasis on writers of the Augustan and Neronian ages.
***Prerequisites: 01:580:203, 204.***

**01:580:407** ***Advanced Study of the Poetry of Horace (3)***
Intensive reading of Horace's poems with emphasis on the variety of style and content.
***Prerequisites: 01:580:203, 204.***

# Latin American Studies 590 (SAS)

## LATIN AMERICAN STUDIES 590

School of Arts and Sciences

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Nydia Flores, Graduate School of Education and Spanish
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Raymond Sanchez Mayers, Social Work
Regina Marchi, Journalism and Media Studies
Renée Larrier, French
Robert R. Kaufman, Political Science
Robert Ramos, Latino & Caribbean Studies
Roberto Chang, Economics
Sean T. Mitchell, Anthropology (Newark)
Shanna Jean-Baptiste, French
Shantee Rosado, Africana Studies, Latino & Caribbean Studies
Sheila Cosminsky, Sociology, Anthropology, Criminal Justice (Camden)
Susan Martin-Márquez, Spanish and Portuguese and Comparative Literature
Tatiana Flores, Art History, Latino and Caribbean Studies
Tatiana Seijas, History
Thomas M. Stephens, Spanish and Portuguese
Ulla Berg, Latino and Caribbean Studies, Anthropology
Vickki Katz, School of Communication and Information
Yesena Barragan, History
Zaire Dinzey-Flores, Latino and Caribbean Studies, Sociology

The program in Latin American studies is administered by the Center for Latin American Studies, a clearinghouse and center of coordination for research, pedagogy, and extracurricular events pertaining to Latin America and its worldwide diasporas. The mission of the Center for Latin American Studies is to foster learning and research across disciplines and geographic boundaries, and to bring the richness of the scholarship on Latin American environment, economics, politics, culture, history, art, language, and literature to the larger Rutgers community. Academic courses, together with visiting writers, film series, concerts, conferences, and lectures, highlight topics in migration, health, environmental issues, human rights and democracy, cultural performance, literary innovation, and linguistic and political change in Latin American and greater hemispheric contexts. The center moves beyond traditional regionalisms toward a more thorough understanding of culture and society throughout the Americas.

Latin American Studies 590 (SAS)

# Learning Goals

# Learning Goals

Upon completion of the program students will:

1. demonstrate familiarity with several of the disciplines that comprise the field of Latin American studies, by proficiently employing different research methodologies and interdisciplinary approaches, including but not limited to anthropological, economic, environmental, geographic, historical, political, sociological, linguistic, literary, visual, cinematic, and/or performance analysis;

2. demonstrate substantive knowledge of the cultural concepts, historical legacies, and socioeconomic processes that inform modern Latin America and its diaspora;

3. demonstrate an understanding of the hemispheric and global connections between Latin America, the United States, and other regions;

4. demonstrate an understanding of issues of social justice in Latin America and its diaspora in order to participate as informed citizens in a global society;

5. demonstrate the research and critical thinking skills necessary to formulate clear and persuasive written and oral arguments;

6. be able to carry out basic research in Spanish and/or Portuguese and to converse with native speakers;

7. be prepared to pursue graduate study in Latin American studies or in one of the disciplines represented in the program; and/or

8. be prepared to pursue professional training and careers in fields such as business, education, journalism and media, international relations, law, nongovernmental work, public policy and planning, public health, and social work

Latin American Studies 590 (SAS)

# Major Requirements

# Major Requirements

The interdisciplinary major in Latin American studies is intended for students with an interest in the Latin American region and its diaspora. It offers students a range of course choices in a variety of fields in the arts and sciences. The major consists of 30 credits, of which 15 credits must be at the 300 level or above, completed with a grade of C or better.

Students must take the core course, 01:590:101 Latin America: An Introduction. Required courses are: 3 credits in history (01:508:260 Colonial Latin America, 01:508:262 Modern Latin America, 01:508:264 Latin America and the United States, 01:508:360 The History of Brazil, 01:508:362 Mexico, 01:508:369 Gender in Latin American History, or 01:508:370 History of Cuba); 6 credits in social sciences (any two of the following: 01:070:223 Anthropology of Latin America, 01:450:336 Latin America, 01:790:312 Change in Latin America; and 01:595:298 Latinos and Migration OR 01:595:299 Latinos and Community); 6 credits in Spanish-American or Brazilian literature and culture or art history; and a Seminar in Latin American Studies (01:590:401 or 402).

Students must also take 9 credits of elective courses with a Latin American focus, 6 credits of which must be at the 300 level or above; electives may include courses listed above not selected as required courses.

Majors must also satisfy the language proficiency requirement by completing either Spanish 01:940:215 Introduction to Hispanic Literature or 01:940:261 Introduction to the Study of Language (or above) OR Portuguese 01:810:201 Portuguese for Native Speakers or 01:810:203 Portuguese Conversation and Composition (or above). Students are encouraged to take a placement exam to determine their level of language ability.

Course selections for the major must be approved by the program director or an adviser.

Latin American Studies 590 (SAS)

# Minor Requirements

# Minor Requirements

The minor consists of 18 credits, of which 9 credits must be at the 300 level or above.

Students must take the core course, 01:590:101 Latin America: An Introduction. Required courses are: 3 credits in history (01:508:260 Colonial Latin America, 01:508:262 Modern Latin America, 01:508:264 Latin America and the United States, 01:508:360 The History of Brazil, 01:508:362 Mexico, 01:508:369 Gender in Latin American History, or 01:508:370 History of Cuba); 3 credits in social sciences (any two of the following: 01:070:223 Anthropology of Latin America, 01:450:336 Latin America, 01:790:312 Change in Latin America; and 01:595:298 Latinos and Migration OR 01:595:299 Latinos and Community); and 3 credits in Spanish-American or Brazilian literature and culture or art history.

Students must also take 6 credits of elective courses with a Latin American focus, 3 credits of which must be at the 300 level or above; electives may include courses listed above beyond those selected as required courses.

Minors must also satisfy the language proficiency requirement by completing either Spanish 01:940:215 Introduction to Hispanic Literature or 01:940:261 Introduction to the Study of Language (or above) OR Portuguese 01:810:201 Portuguese for Native Speakers or 01:810:203 Portuguese Conversation and Composition (or above). Students are encouraged to take a placement exam to determine their level of language ability.

Course selections for the minor must be approved by the program director or an adviser.

Latin American Studies 590 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To be eligible for honors work, students must have a cumulative grade-point average of 3.25 or higher and an average of 3.5 or higher in Latin American studies courses. Students are admitted to the departmental honors program by recommendation of a faculty adviser and permission of the director. Students must complete a capstone project. Departmental honors also are awarded to those students maintaining a grade-point average of 3.5 in the major and who complete the requirements for the School of Arts and Sciences honors program. Interested students are encouraged to apply at the department toward the end of their junior year. More detailed information is available in the departmental office.

For additional information about the program, consult the department's website.

Latin American Studies 590 (SAS)

# Courses

# Courses

**01:590:100** ***Themes in Latin American Studies (1.5)***
Introduction to the construct called Latin America: geography, peoples and groups, cultures, history, languages, music, art, and literature. Focus may vary, according to instructor interest.

**01:590:101** ***Latin America: An Introduction (3)***
Survey of Latin American culture and society from the precolonial era to the present day. Topics include culture, politics, literature, language, social inequality, and related issues.

**01:590:150** ***The Latin American Woman (3)***
Analysis of women's roles within the family structure in Latin America and the Caribbean. Examines the double standards imposed on men and women, the impact of socialization, and the development of a critical consciousness. ***Credit not given for both this course and 01:988:150.***

**01:590:201** ***Introduction to Latin American Civilization and Culture (3)***
Survey of Latin American culture from the colonial period to the present day. Consideration of chronicles of the Indies, documents on independence and nation formation, and canonical texts of modern literature and thought.

**01:590:250** *Sports in Latin America and the Caribbean (3)*
Analysis of contexts and evolution of sports and games in Latin American and Caribbean cultures. Topics may include Maya ballgame, capoeira, soccer fever, baseball, women in sports, and sport management.
*Credit not given for both this course and 01:595:250 or 01:940:250.*

**01:590:265** *Afro-Brazilian History (3)*
Overview of the history of the largest African diaspora community in the world. Encourages critical analysis of major issues in African-Atlantic diaspora studies. Principal scholarship supplemented with selected readings in literature, oral history, African-Brazilian movement documents, and iconography.
*Credit not given for both this course and 01:014:265, 01:014:410, 01:508:265, or 01:590:410.*

**01:590:298** *Latinos and Migration (3)*
Historical and contemporary experience of Latinos and Latin Americans with migration to/from the United States and migration within the United States. Development of regional, national, and transnational practices. Emphasis on causes and experience of migration.
*Credit not given for both this course and 01:050:295 or 01:595:298.*

**01:590:299** *Topics in Latin American Studies (3)*
Analysis of topics in the culture and society of Latin America.

**01:590:330** *Religion in Latin America (3)*
Exploration of the religious complexity of Latin America, including Christianity, indigenous and syncretic practices, and traditions.
*Credit not given for both this course and 01:840:330.*

**01:590:367** *The Afro-Latin American Experience (3)*
Examines profound impact of African diaspora on Latin American societies where persons of African descent represent significant minorities and numerical majorities. Explores how Afro-Latin Americans remember the past and experience the present.
*Credit not given for both this course and 01:508:367.*

**01:590:381** *Ancient Kingdoms: A History of the Aztecs, Incas and Mayas (3)*
This course treats the history of the three most powerful Native American states: the Aztecs, Incas and Mayas. It begins long before contact with Europeans and ends about two generations after the arrival of the newcomers. Students will learn what scholars have been able to uncover, now that we are relying more on sources written by Indigenous people and less on those produced by Europeans.

Credit not given for both this course and 01:508:381.

**01:590:393** *Modern Latin American Art (3)*
Latin American art from post-independence era to the second half of the 20th century.
*Credit not given for both this course and 01:082:393.*

**01:590:399** *Topics in Latin American Studies (3)*
Analysis of select topics in the culture and society of Latin America.

**01:590:401,402** ***Seminar in Latin American Studies (3,3)***
Correlation of studies through analysis of particular problems or periods in Latin American civilization. Reading, reports, and discussions.
***Credit not given for both these courses and 01:940:403,404.***

**01:590:460** ***Race, Class, and Ethnicity in Latin America (3)***
Investigation of racio-ethnic conflicts and racial formation and renegotiation in Latin America through literary and nonliterary sources. Consideration of class, racism, miscegenation, marginalization, and ethnonym.
***Prerequisite: One semester of 01:940:300-level Spanish literature or permission of department. Credit not given for both this course and 01:940:460.***

**01:590:493** ***Internship in Latin American Studies (1-3)***
Professional, supervised work in an approved organization or agency; an appropriately designed academic project required.
***Open only to juniors and seniors.***

**01:590:496** ***Independent Study (1-3)***
Independent study in the field of Latin American studies. Topic must not be already treated in a regularly offered course.
***Prerequisites: Permission of program director and instructor. Open only to juniors and seniors.***

**01:590:497,498** ***Honors in Latin American Studies (BA,BA)***
Preparation for comprehensive examination in Latin American studies and research paper prepared under direction of honors committee.
***Prerequisites: 01:940:394 or equivalent, and permission of Latin American Studies Program Committee. Open only to seniors.***

**01:590:499** ***Readings in Latin American Studies (3)***
Independent readings under faculty supervision. Project must be one not already treated in a formal course.
***Prerequisites: Permission of Latin American Studies Program Committee and instructor. May not be taken for more than one semester.***

# Latino and Caribbean Studies 595 (SAS)

## LATINO AND CARIBBEAN STUDIES 595

Department of Latino and Caribbean Studies, School of Arts and Sciences

**Website:** Here

**Chair:** Zaire Dinzey-Flores

**Undergraduate Director:** Ulla D. Berg

**Professors:**

Carlos U. Decena, B.A., Pennsylvania; Ph.D., New York

Tatiana Flores, B.A., M.A., Ph.D., Columbia

Aldo Lauria-Santiago, B.A., Princeton; M.A., New York; Ph.D., Chicago

Nelson Maldonado-Torres, B.A., Puerto Rico; Ph.D., Brown

Michelle Stephens, B.A., Stony Brook; M.Phil., Ph.D., Yale

Camilla Stevens, B.A., Tulane; M.A., New Mexico; Ph.D., Kansas

**Associate Professors:**

Ulla Berg, B.A., M.Phil., Copenhagen; M.A., Ph.D., New York

Zaire Z. Dinzey-Flores, B.A., Harvard; M.U.P., Ph.D., Michigan

Kathleen López, B.A., Virginia; M.A., Cornell; Ph.D., Michigan

Johana Londoño, BFA, Cooper Union; MPhil, Ph.D. New York

**Assistant Professors:**

Priscilla Fereirra, B.A., University of São Paulo-Brazil, M.A., Ph.D. UNC at Chapel Hill

Sebastián León, B.S., Florida State; M.A., George Washington; Ph.D., American

Shantee Rosado[KS1] [UB2], B.A. Macalester, M.A, Ph.D., Pennsylvania

Omaris Z. Zamora, B.A., Chicago; M.A., Ph.D., Texas

The Department of Latino and Caribbean Studies (LCS) offers a program of study that examines the histories, politics, and cultures of both U.S. Latino and Caribbean populations. We employ interdisciplinary, hemispheric, and transnational approaches to consider the ways U.S. Latino and Caribbean communities have been, and continue to be, shaped by the legacies of colonialism, slavery, globalization, and social, artistic, and intellectual activism. The department's interdisciplinary faculty and major/minor curriculum expose students to a wide range of scholarship, intellectual debates, and methodologies drawn from the social sciences and the humanities. We also offer a departmental certificate in multicultural competence to students who take 9 credits offered by LCS. The certificate enables students to demonstrate competency in one of the most important areas of change in the United States in the 21st century: the formation of an increasingly multicultural society. The department works closely with students to foster a comprehensive learning experience by teaching them to write well, speak articulately, and think analytically and creatively. These skills prepare students for success in many careers and fields of study in graduate or professional schools.

# Learning Goals

# Learning Goals

Latino and Caribbean studies majors will:

- be familiar with several of the disciplines that comprise the field of Latino and/or Caribbean studies, including but not limited to: anthropology, art history, cinema studies, education, geography, history, literature, media studies, music, philosophy, political science, sociology, and women's and gender studies;
- develop critical thinking skills and the ability to speak and write clearly and analytically;
- employ different research methodologies and interdisciplinary approaches in the humanities and/or social sciences, demonstrating proficiency in one or more of the following areas: historical, political, sociological, anthropological, environmental, philosophical, literary, visual, cinematic, musical, and/or performative analysis;
- develop multi- and intercultural competence and sensitivity to issues particular to Latino and/or Caribbean experience(s); and
- conduct individual research to formulate rigorous and convincing arguments in the field of Latino and/or Caribbean studies; honors students will perform and present original research.

Latino and Caribbean Studies 595 (SAS)

# Major Requirements

# Major Requirements

The major in Latino and Caribbean studies requires successful completion of twelve 3-credit courses or 36 credits.

**Introductory Course (3 credits)**

01:595:100 Introduction to Caribbean Studies (3)
*or*
01:595:101 Introduction to Latino Studies (3)

**Research Methodologies (3 credits)**

01:595:215 Research Methods in Latino and Caribbean Studies (3)

**Interdisciplinary Distributions (9 credits, one course from each of the following areas for a total of three 200-level courses):**

See department website or Degree Navigator for lists of courses in each area.

- *History, Politics, and Philosophy*
- *Culture and Creative Expressions*

- *Society, Community, and Environment*

**Capstone Course (3 credits)**

One 400-level seminar or another approved course

**Electives (18 credits)**

Six additional courses, three of which must be at the 300 or 400 level.

With the department's approval, students may replace up to two electives with courses that are offered by other departments or units of Rutgers University.

Credit may be offered for one course in Spanish language or composition at the 200 or 300 level.

Only one independent study course may be used to satisfy the requirements, except by students enrolled in the department's honors program.

Only grades of C or better will count toward the major requirements.

Latino and Caribbean Studies 595 (SAS)

# Minor Requirements

# Minor Requirements

The minor in Latino and Caribbean studies requires successful completion of six 3-credit courses.

**Introductory Course (3 credits)**

595:100 Introduction to Caribbean Studies (3)
*or*
595:101 Introduction to Latino Studies (3)

**Electives (15 credits)**

Five additional courses, two of which must be 300 or 400 level.

None of the courses in the minor may be substituted by courses outside the department.

Only one independent study course can be counted toward the minor.

Only grades of C or better will count toward the minor requirements.

Latino and Caribbean Studies 595 (SAS)

# Certificate in Latino and Caribbean Studies

# Certificate in Latino and Caribbean Studies

Students who are unable to major or minor in Latino and Caribbean Studies may earn the Certificate in Latino and Caribbean Studies. It is intended for students majoring in other SAS departments or other schools and planning for careers in education, social work, business, law, international relations, global development, public policy, medicine and public health, and journalism, among others. It is conferred to students at the time of graduation.

**Certificate Requirements:**

- Students must complete 9 credits of coursework in Latino and Caribbean Studies (595)
- Students must achieve a minimum grade of C for all courses
- Up to three credits may be taken on a Pass/No Credit basis
- Students who earn the Major or Minor in Latino and Caribbean Studies may not also earn the Certificate in Latino and Caribbean Studies

Latino and Caribbean Studies 595 (SAS)

# Honors Program

# Honors Program

To be eligible for the departmental honors program, students must have a minimum 3.25 grade-point average overall and a minimum 3.5 grade-point average in Latino and Caribbean studies courses. Interested majors are encouraged to apply toward the end of their junior year. Students are admitted to the program by recommendation of a faculty adviser and permission of the undergraduate director. To graduate with honors, students must complete a yearlong (6 credits) independent research project that culminates in a written thesis, creative work, or community-based program.

Departmental honors also are awarded to those students maintaining a grade-point average of 3.5 in the major and who complete the requirements for the Honors College or School of Arts and Sciences Honors Program.

Latino and Caribbean Studies 595 (SAS)

# Courses

# Courses

**01:595:100** ***Introduction to Caribbean Studies (3)***
Interdisciplinary introduction to the principal questions, themes, and debates in the field of Caribbean studies. Emphasis on the complex connections and fragmentation of the different histories, cultures, and nations of the Caribbean Basin.

**01:595:101** ***Introduction to Latino Studies (3)***
Interdisciplinary introduction to the principal questions, themes, and debates in the study of Latinos in the United States, including distinct immigrant, national origin, and ethnic groups.

**01:595:103** ***Latin Images and Identities Seminar (1.5)***
Full-semester seminar for students in the Latin Images Living-Learning Community. Offered fall and spring with varying content each semester.

***Open to Latin Images LLC students only. Pass/No Credit.***

**01:595:104** ***Latin Images and Identities Seminar (1.5)***
Full-semester 1.5-credit seminar for students in the Latin Images Living-Learning Community. Offered in fall and spring with varying content each semester.
***Open to Latin Images LLC students only. Pass/No Credit. Special Permission required.***

**01:595:201** ***African Belief Systems and the Latino Community (3)***
Historical examination of ancestor worship, Santería (Cuba), Vodun (Santo Domingo), Espiritismo (Puerto Rico), and other African-based belief systems. Formation from African to slave societies and use in contemporary period.
***Credit not given for both this course and 01:014:201.***

**01:595:202** ***Color-Lines and Borderlands (4)***
Introductory examination of the power of "color-lines" in producing divisions among peoples and individuals and exploration of the possibilities to cross borders of separation and create new forms of human connection in the 21st century.

**01:595:203** ***Music of the Caribbean (3)***
Music of the Caribbean and its relationship to the cultural production of Caribbean diasporas in the United States. Considers the musical traditions of Cuba, Dominican Republic, Haiti, Jamaica, and Puerto Rico, and also surveys the musical profiles of smaller Caribbean nations.

**01:595:204** ***History of the Caribbean to 1898 (3)***
History of the Caribbean from before the Spanish conquest until the consolidation of the U.S. imperial sphere in 1898. Emphasis on Spanish, English, and French colonialism and the formation of Jamaica, Saint Domingue/Haiti, Puerto Rico, Cuba, and Española/Dominican Republic.
***Credit not given for both this course and 01:508:271.***

**01:595:205** ***History of the Caribbean since 1898 (3)***
Overview of the history of the Caribbean since the formation of the U.S. sphere of influence in 1898. Emphasis on the Hispanic Caribbean and Haiti with consideration of the English-speaking nations.
***Credit not given for both this course and 01:508:272.***

**01:595:206** ***The Caribbean and the United States (3)***
Political relationships between the United States and the countries of the Caribbean Basin since 1898. Political history, political economy, colonialism, nationalism, and the conflicted and contradictory role of the United States in the formation of national states during the 20th century.

**01:595:210** ***Women in the Caribbean-Caribbean Women in the United States (3)***
Examines the experience of Caribbean women in nations of origin and in diasporic communities in the United States. Focus on work, migration, transnationalism, family, daily life, gender relations, and politics.
***Credit not given for both this course and 01:988:210.***

**01:595:212** ***Introductory Topics in Latino and Caribbean Studies (3)***
Study of select introductory social science and humanities topics in Caribbean and Latino studies.

**01:595:215** ***Research Methods in Latino and Caribbean Studies (3)***
Introduction to qualitative and quantitative or ethnographic, archival, and oral history research methods in Latino and Caribbean studies.

**01:595:220** ***Literature and Activism on the US-Mexico Border (3)***
Analysis and contextual understanding of literature and performance that explore the geopolitical space of the U.S.-Mexico border, with a special emphasis on the intersections of activism and the humanities. Taught in English.

Credit not given for this course and 01:940:220.

**01:595:224** ***Immigration and Society (3)***
Provides a sociological perspective and comparative lens on international migration by looking at the causes and consequences of immigration for the United States, Canada, France, Germany, and the United Kingdom. Explores why people migrate, examines different modes of assimilation, and compares immigration policies.
***Credit not given for both this course and 01:920:225.***

**01:595:225** ***Caribbean Cinema (3)***
Examination of the outstanding films produced in the Hispanic Caribbean region.

**01:595:226** ***Art and Visual Culture of the Caribbean (3)***
Introduction to art and visual culture of the Caribbean from pre-Conquest to the present. Representational practices in relation to the region's diversity, history of colonization, dictatorships, and revolutions. Role of the visual in defining national, gendered, classed, racial, and regional identities.
***Credit not given for both this course and 01:082:226.***

**01:595:230** ***Latinx Art (3)***
Survey of art produced by Latinas and Latinos across the United States from the 1950s to the present.
***Credit not given for both this course and 01:082:230.***

**01:595:240** ***Latino Literature and Culture (3)***
Survey of Latino/a literary voices drawn from the Mexican, Puerto Rican, Dominican, Cuban, and other Latin American migrations to the United States. Discussion of exile, resistance, and assimilation; political presence and identity formation; race, ethnicity, gender, and sexuality; and examination of literary modes and genres (autobiography, poetry, novel, film, music).
***Credit not given for both this course and 01:050:240.***

**01:595:250** ***Sports in Latin America and the Caribbean (3)***
Analysis of contexts and evolution of sports and games in Latin American and Caribbean cultures. Topics may include Maya ballgame, capoeira, soccer fever, baseball, women in sports, and sport management.
***Credit not given for both this course and 01:590:250 or 01:940:250.***

**01:595:251** *Caribbean Freedom (3)*
Ideas and arguments about freedom (personal, political, and economic) in the Caribbean region, in light of ideas generated by abolitionism, nationalism, and neoliberalism.

**01:595:266** *Puerto Rican Literature (3)*
Study of the development of Puerto Rican literature from the Spanish colonial period to the present. Emphasis on major writers: Pales Matos, Corretjer, Marquez, Gonzalez, Soto, Diaz, Valcarcel, Sanchez, and Blanco.
*Credit not given for both this course and 01:940:331,332.*

**01:595:268** *Cuban Literature (3)*
Study of the development of Cuban literature from the Spanish colonial period to the present. Emphasis on major writers such as: Plácido, Manzano, Martí, Guillén, Fernando Ortiz, Arenas, Casal, Achy Obejas, and Rivera-Valdés.
*Credit not given for both this course and 01:195:268 or 01:940:331,332.*

**01:595:269** *Dominican Literature (3)*
Study of the development of Dominican literature from the Spanish colonial period to the present. Emphasis on major writers such as Columbus, Pané, Galván, Bosch, Alvarez, Danticat, Andújar, Rita Indiana, and Junot Díaz.
*Credit not given for both this course and 01:195:269 or 01:940:331,332.*

**01:595:270** *Introduction to Caribbean Literature (3)*
Reading and discussion of poetry, prose, and drama by major literary figures representative of different histories and cultures of the Caribbean and its diaspora.
*Credit not given for both this course and 01:195:260 or 01:940:270.*

**01:595:271** *Immigrant States: Jersey's Global Routes (3)*
New Jersey as one of the top immigrant destinations in the United States, yet also one of the most ethnically and racially segregated states. Analysis of how and why racial/ethnic differences shape a person's experiences of and perspectives on the world locally, nationally, and internationally.
*Credit not given for both this course and 01:050:271 or 01:920:271 or 01:988:271.*

**01:595:280,281,282,283** *Topics in Latino and/or Caribbean Studies (1.5,1.5,1.5,1.5)*
Half-semester courses offered regularly on contemporary topics related to Latino and/or Caribbean studies.

**01:595:285,286,287,288** *Topics in Latino and/or Caribbean Studies (2,2,2,2)*
Two-credit courses offered regularly on contemporary topics related to Latino and/or Caribbean studies.

**01:595:295** *Latino and Caribbean Cultural Studies (3)*
Comparative study of Latino and Caribbean cultures by reviewing key definitions of culture, paying attention to the historical and disciplinary development of the term, as well as the key debates on cultural studies in the humanities.
*Credit not given for both this course and 01:050:295. Not open to first-year students.*

**01:595:296** *English-Caribbean Communities in the United States (3)*
Formation of diaspora from the former British Caribbean in the United States. New York City communities. Transnational experiences, racial and ethnic identities, upward mobility, family, and social networks.

**01:595:297** *Caribbean Societies (3)*
This course examines Caribbean societies through the perspective of social development. The course surveys the social, economic, political, and cultural realities in contemporary Caribbean societies with an eye to the policy

interventions devised to address them. The course is divided in two parts. In the first part, students are introduced to the central policy areas for social and economic development in the Caribbean, the definition of a social problem, and the history and theory behind ideas of development. In the second part, students examine a number of social development areas in order to assess the policies utilized to address them and begin to think about alternative social policy directions.
Credit not given for both this course and 01:920:287.

**01:595:298** *Latinos and Migration (3)*
Historical and contemporary experience of Latinos and Latin Americans with migration to/from the United States and migration within the United States. Development of regional, national, and transnational practices. Emphasis on causes and experience of migration.
*Credit not given for both this course and 01:590:298.*

**01:595:299** *Latinos and Community (3)*
Historical and contemporary formation and experience of Latino cultural, political symbolic, and geographic communities in comparative perspective. Participation of Latinos and Latin American migrants in broader communities.
*Open to second-and third-year students only.*

**01:595:300** *Slavery in the Caribbean (3)*
Analysis of different institutions of slavery in the Caribbean and the rise of the plantation societies. Investigating the effects on Europe and the Western Hemisphere and its legacy.
*Credit not given for both this course and 01:508:374.*

**01:595:301** *Latinos and Race (3)*
Various ways in which race is constituted and how dominant racial identities create a framework for Latino identity in the United States. How notions of white people, white culture, and whiteness are understood by populations racialized as the Other, particularly Latinos.
*Not open to first-year students. Credit not given for this course and 01:920:301.*

**01:595:302** *Dominican Transnational Cultures (3)*
Importance of transnationalism to the Dominican Republic from the "first encounter" with Europeans to contemporary migration and cultural patterns.
*Open to third- and fourth-year students only.*

**01:595:303** *Language and U.S. Latino/a Culture (3)*
Interrelation of diverse linguistic traits and practices in the production of U.S. Latino/a culture. Emphasis on Chicano/a, Mexican-American, Nuyorican/Puerto Rican, Dominican-American, Cuban, and Cuban-American contributions, in the context of historical and political processes.
*Credit not given for both this course and 01:940:303.*

**01:595:305** *Caribbean Urbanism and Urban Policy (3)*
Urbanism in the Caribbean since the colonial period; the social, economic, and political dynamics that have shaped the urban form and the experiences of those who inhabit these cities.
*Not open to first-year students.*

**01:595:306** ***Latino Youth Cultures (3)***
Latino youth cultures, subcultures, and countercultures. Urban youth, body image, masculinity/femininity. Youth and class, state institutions, surveillance practices. Education, schooling, bilingualism. Generational cohorts.
***Not open to first-year students.***

**01:595:307** ***Latino Ethnography (3)***
Cultural description of U.S. Latinos and their communities; introduction to reading, writing, and theorizing ethnography; ethnographic film; ethnography of migration and diaspora; testimonial as ethnography; locating anthropology within Latino studies.
***Credit not given for both this course and 01:050:327 or 01:070:321.***

**01:595:310** ***Mexican Migration to the United States (3)***
Origins and processes of international migration by people from Mexico to, from, and within the United States. Economic, political, social, and cultural histories of Mexico, including the effects of U.S. foreign policy and economic power; assimilation and incorporation of first- and second-generation Mexicans and transnational links. Impact on gender, class, and racial formation.
***Not open to first year students.***

**01:595:311** ***Puerto Rican Migration to the United States (3)***
Historical evolution of the movement of Puerto Ricans between the island and the United States examined within the colonial context and the international circulation of workers.

**01:595:312** ***Special Topics in Latino and Caribbean Studies (3)***
Study of select social science and historical topics in Caribbean and Latino studies.

**01:595:314** ***Caribbean Natural Disasters (3)***
Introduction to the various elements that influence the uneven impact of natural disasters in the Caribbean region. Material, economic, political, institutional, cultural, and social resources that facilitate or hinder adaptive capacity and resilience.

**01:595:316** ***Mexican Art Across Borders (3)***
Art, visual culture, and cultural history, with emphasis on the 20th century. Modernism, muralism, varied minor media and artists, post-revolutionary art, Mexican-American/Chicano Civil Rights Movement art, visual production, and politics.
***Not open to first-year students. Credit not given for both this course and 01:082:316.***

**01:595:319** ***Unraveling Race in Latino and Latin American Studies (3)***
Study of the history and cultural representation of race and ethnicity in Latin American and Latino studies from the colonial period to the present. Emphasis on major writers working with race, miscegenation, and racialization.
***Prerequisite: Reading knowledge of Spanish recommended. Credit not given for both this course and 01:195:319.***

**01:595:322** ***Latinas: Migration, Work, and Family (3)***
Interaction of work and family in Latinas' migration to the United States. Focus on reasons for migration, incorporation into U.S. society, and questions of continuity and change.
***Credit not given for both this course and 01:988:322.***

**01:595:323** ***U.S. Latina Feminists (3)***
Overview of diverse perspectives of U.S. Latina feminists based on their multiple positions as racialized ethnic women.

**01:595:324** ***Latinos in Film and Media (3)***
Examines the presence of Latinos in U.S. film and media as a site for cultural and political visibility and representation. Compares how a diverse array of representations establish, produce, transform, limit, or question the political and cultural visibility of Latinos in the United States.

**01:595:326** ***Genders, Sexualities, and the Caribbean (3)***
Historical and comparative examination of how sexuality and gender differences have been shaped by the insertion of the Caribbean region into the global economy since the colonial era.

**01:595:327** ***Genders and Sexualities in U.S. Latina/o Communities (3)***
Analysis of U.S. Latina/o cultures through a focus on gender, sexuality, and representation. Special attention to the lived experiences of Latina/os in contrast to representations of latinidad as physically and erotically excessive.

**01:595:328** ***Caribbean Politics and Development (3)***
Politics and development of Caribbean nation-states with special emphasis on internal and regional politics and their relationship with social questions. Party politics, ideologies, economic development, leadership, and political/social movements.
***Credit not given for both this course and 01:790:328.***

**01:595:329** ***Latino Politics in the United States (3)***
Political organization of Latino communities in the northeastern United States since World War II. Role of Latinos in shaping U.S. domestic and foreign policy; the impact of immigration and language policies on political organization.
***Credit not given for both this course and 01:790:329.***

**01:595:333** ***Caribbean Religion (3)***
Examines the history and role of the diverse religious components of the Caribbean Basin from indigenous practices to Catholicism, Protestantism, Judaism, and the emergence of African belief systems such as Vodou, Santeria, and Rastafarianism from the 18th century to the present.
***Credit not given for both this course and 01:840:333.***

**01:595:335** ***Caribbean Pluralities and Indo-Caribbean Literature (3)***
Selected major canonical works of the Anglophone Caribbean and Indo-Caribbean writers.
***Credit not given for both this course and 01:013:335 or 01:195:338.***

**01:595:336** ***Caribbean Borderlands (3)***
Regional analysis of basic human and physical differences affecting economic, political, and social conditions in the West Indies, Central America, and Mexico.
***Credit not given for both this course and 01:450:335***

**01:595:337** ***Global Haiti (3)***
Haiti in worldwide historical processes and political and economic systems.

**01:595:340** ***Religion and the Hispanic Community (3)***
Sociological comparison of religious institutions and practices under Spanish and U.S. influence. The role of religion in Caribbean migrations and processes of adaption in the United States.

**01:595:341** ***Theater of the Hispanic Caribbean: Migration and Memory (3)***
Exploration of Latino theater in the United States, with emphasis on the experience of migration in texts by authors from Cuba, the Dominican Republic, and Puerto Rico.

**01:595:342** ***Postcolonial Caribbean Theater and Performance (3)***
Cross-cultural exploration of postcolonial Caribbean theater and performance.

**01:595:350** ***The Literatures of the Americas (3)***
Comparative study of the literatures of the Americas from the 19th century to the present, focusing on novels, stories, essays, and poems written in the United States, Latin America, and the Caribbean.
***Credit not given for both this course and 01:195:351, 01:358:351, or 01:940:356.***

**01:595:351** ***Mexican-American History (3)***
Examination of major themes in Mexican-American/Chicano history since the 19th century. Topics include Spanish empire, Anglo-American conquest, racial hierarchies, labor migration, politics, popular culture, gender, sexuality, and social movements.
***Credit not given for both this course and 01:512:351.***

**01:595:354,356** ***Independent Study (3,3)***
***Prerequisite: Permission of instructor. Open only to junior and senior majors and minors in Latino and Caribbean studies.***

**01:595:361** ***Islands of Empire: Caribbean Colonial and Postcolonial Literatures (3)***
Literary, cultural, and artistic formations that emerged from New World slavery and colonialism, both throughout the Caribbean archipelago and across its many diasporas in the New and Old Worlds.

**01:595:364** ***Afro-LatinxGeographies in the U.S. ad Latin America (3)***
Examines uneven Afro-Latinx geographies in the US and Latin America. Interrogates how racialization and gender intersect spatial, economic, and environmental (in)justices that affect Afro-Latinxs communities across the Americas.
***Credit not given for both this course and 01:450:364.***

**01:595:367** ***The Afro-Latin American Experience (3)***
Examines profound impact of African diaspora on Latin American societies where persons of African descent represent significant minorities and numerical majorities. Explores how Afro-Latin Americans remember the past and experience the present.
***Credit not given for both this course and 01:508:367 or 01:590:367.***

**01:595:368** ***History of Latino Social Movements (3)***
History of Latino responses to inequality and discrimination. Citizenship, societal inclusion, cultural relevance, job mobility, and self-determination. Political and community responses to racialization. Politics of confrontation, negotiation, networking, alliances, legislation, litigation, and social mobilization.
***Not open to first-year students.***

**01:595:369** *Latino History (3)*
History of people of Latin American and Hispanic Caribbean descent in the United States over the last two centuries. Experiences of the exiled, labor migrants, refugees, and colonial subjects. Formation of communities, political and labor struggles, and racial/ethnic identities.
*Not open to first-year students. Credit not given for both this course and 01:512:360.*

**01:595:370** *Law and the Latino Community (3)*
Focus on the legal struggle of the Latino community to achieve equality in the United States. Analyzes organization of migrant workers, immigration laws, bilingual education, and the Latino struggle for equal representation in government.

**01:595:371** *History of Puerto Rico (3)*
Examination from pre-Columbian time to present. Focus on Spanish colonial policy, slavery and land tenure systems, emergence of national identity, U.S. invasion and rapid economic changes, and population control and migration.
*Credit not given for both this course and 01:508:371.*

**01:595:372** *History of Dominican Republic (3)*
From French invasion of Hispaniola to present. Role in Spanish empire, U.S. control in transition to sugar economy, Trujillismo, U.S. invasion in 1965, and impact of migration on society.
*Credit not given for both this course and 01:508:372.*

**01:595:389** *Black and Brown Bodies and Criminal Justice Systems (3)*
Examination of impacts of criminal justice systems on communities of color in the US, focusing on how social, political, ideological, and economic structures contribute to the disproportionate placement of Black and Brown bodies under systems of formal social control. Historical precursors and modern-day features of mass incarceration, state surveillance, migration-related controls, and current developments in criminal justice through a critical race theory and critical legal theory framework.
*Open to juniors and seniors.*

**01:595:390** *The History of Cuba (3)*
Study of Cuba from pre-Columbian times to the present day. Deals with the long battle for freedom during the 19th and 20th centuries.
*Credit not given for both this course and 01:508:370.*

**01:595:391** *Central American Revolutions (3)*
Central America since independence. Topics include revolt and revolution; formation of repressive states and labor-repressive capitalism; emergence of reformist and revolutionary movements.
*Credit not given for both this course and 01:508:366.*

**01:595:392** *The History of Haiti (3)*
Haiti from late colonial period to present day. Conquest, colonial Saint Domingue, France's empire, plantation economy and society, revolt, independence. Haiti's isolation, nationhood, U.S. influences, the Duvalier regimes, relations with neighbors.
*Not open to first-year students.*

**01:595:393** *Global Diasporas in Caribbean History (3)*
Intraregional migrations of Caribbean since the 18th century. Theories and concepts of migration; slavery; Asian indentured workers; European and American presence; labor migration; Panama Canal; export economies; race; citizenship; transnational dynamics.
*Credit not given for both this course and 01:508:393. Not open to first-year students.*

**01:595:394** *Barrio/Ghetto Life (3)*
Examines how marginalized neighborhood spaces that Latinos and Caribbean peoples occupy shape social experience. Origins and development of the concepts "ghetto" and "barrio" in the Americas; intersection of culture and policy in shaping everyday life; production of race, class, and gender in urban space; use of research skills to produce a community urban plan.

**01:595:400** *Topics in Puerto Rican and Caribbean Literature (3)*
Thematic approach to the textual analysis of selected poets, dramatists, essayists, and fiction writers.

**01:595:402** *Documenting Latino Lives (3)*
Ethnographic documentary filmmaking; Latino Community in film; film production. Video-production seminar on the social experience of Latinos in the United States. Project development, advanced production techniques, narrative structure, storytelling strategies, and ethical issues in filmmaking.
*Corequisite: Taken with 01:595:403, 1-credit Video Production Lab. Not open to first- and second-year students. Credit not given for both this course and 01:070:407.*

**01:595:403** *Video Production Lab for Latino Lives (1)*
Video production laboratory taken with 01:070:407 or 01:595:402 Documenting Latino Lives.
*Corequisite: 01:070:407 or 01:595:402. Not open to first- and second-year students. Credit not given for both this course and 01:070:408.*

**01:595:412** *Special Topics Seminar in Latino and Caribbean Studies (3)*
Seminar on advanced social science and historical topics in Caribbean and Latino studies.

**01:595:493** *Service Learning Internship (3)*
Community or policy-related service learning internship in Latino community.

**01:595:494** *Service Learning Internship (1)*
Community or policy-related service learning internship in Latino community.

**01:595:495,496** *Independent Study (3,3)*
*Prerequisite: Permission of instructor. Open only to junior and senior majors and minors in Latino and Caribbean studies.*

**01:595:497** *Senior Research Seminar in Latino and Caribbean Studies (3)*
Provides a forum for the organization of independent or coordinated research projects in Latino and Caribbean studies for seniors who are majors or minors in the department.

**01:595:498, 499** *Honors Research in Latino and Caribbean Studies (3,3)*
Independent research project for the Latino and Caribbean Studies honors program.
*Permission of instructor. Open only to junior and senior majors in Latino and Caribbean Studies.*

# Law (SAS)

## LAW

Since law schools do not require that any special undergraduate curriculum be followed, no one program can be described as the best preparation for law school. Students should seek a broad foundation in the arts and sciences. Many students preparing for law school choose majors in political science, history, English, modern languages, philosophy, or programs in mathematics and the sciences. In selecting a course of study, students should consult a prelaw adviser at the Office of Advising and Academic Services.

For information, refer to here.

Please also refer to the above resource for information on the three-plus-three bachelor's and juris doctor program with Rutgers Law School.

# 605 Leadership and Management (RBS-NB)

## 605 Leadership and Management

Major requirements for students who entered RBS *from fall 2017 to fall 2022:*

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (junior or senior year33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Management Courses**

33:620:369 International Business (3) (prerequisite: 33:620:301)
33:620:410 Executive Leadership (3) (prerequisite: 33:620:302)

**Electives: At least 6 credits (two courses) of the following:**

33:620:362 Effective Leadership Communications (3) (prerequisite: 33:620:302)
33:620:330 Women Leading in Business (3) (prerequisites: 33:620:301 or 33:620:302) 33:620:320 Cross Cultural Management (3) (prerequisite: 33:620:301)
33:620:350 Negotiations (3) (prerequisite: 33:620:301)
33:620:370 Managing Diversity in Organizations (3) (prerequisite: 33:620:301)
33:620:430 Team Building and Group Processes (3) (prerequisite: 33:620:301)

**Other elective courses (up to 6 credits)**

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.
If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.
Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Management Courses**

33:620:369 International Business (3) (prerequisite: 33:620:301)
33:620:410 Executive Leadership (3) (prerequisite: 33:620:302)

**Electives: At least 6 credits (two courses) of the following:**

33:620:362 Effective Leadership Communications (3) (prerequisite: 33:620:302)
33:620:330 Women Leading in Business (3) (prerequisites: 33:620:301 or 33:620:302) 33:620:320 Cross Cultural Management (3) (prerequisite: 33:620:301)
33:620:350 Negotiations (3) (prerequisite: 33:620:301)
33:620:370 Managing Diversity in Organizations (3) (prerequisite: 33:620:301)
33:620:430 Team Building and Group Processes (3) (prerequisite: 33:620:301)

**Other elective courses (up to 6 credits)**

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.
If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.
Students with more than one Business School major may only double count one RBS course between those majors.

# Life Sciences (SAS)

## LIFE SCIENCES

Division of Life Sciences, School of Arts and Sciences

**Website:** Here

**Dean:** Lori R. Covey

**Director, Office of Undergraduate Instruction:** Martha Haviland

**Chair, Department of Cell Biology and Neuroscience:** Megerditch Kiledjian

**Chair, Department of Genetics:** Tara C. Matise

**Chair, Department of Kinesiology and Health:** Brandon Alderman

**Chair, Department of Molecular Biology and Biochemistry:** Barth Grant

The following majors are available in the Division of Life Sciences:

**Biological Sciences 119**
**Cell Biology and Neuroscience 146**
**Exercise Science 377**

**Genetics 447**
**Molecular Biology and Biochemistry 694**
**Sport Management 955**

Students interested in the life sciences also may consider related tracks within major programs offered by the Department of Chemistry and Chemical Biology (chemical biology option) and the Department of Psychology (specialization in behavioral neuroscience).

The Division of Life Sciences coordinates, fosters, and integrates the instructional and research activities of a broad range of faculty with interests in the biological sciences. The principal units of the division include four departments: Cell Biology and Neuroscience, Genetics, Kinesiology and Health, and Molecular Biology and Biochemistry, as well as two sections, the biological chemistry section of the Department of Chemistry and Chemical Biology, and the biopsychology and behavioral neuroscience section of the Department of Psychology. The division's primary goal is to provide a high caliber of interdisciplinary teaching and research in the life sciences as it trains the next generation of teachers, researchers, and future health professionals.

Instruction in the life sciences has undergone enormous changes over the past 15 to 20 years. These changes reflect the intellectual revolution of the last two decades, as well as technical advances that have expanded greatly the tools available to life scientists. Today, students majoring in the life sciences at Rutgers University-New Brunswick experience an exciting atmosphere of learning that exposes them to the concepts and methods of these intellectual and technological advances. The students have open to them a plethora of learning avenues, ranging from thought-provoking lecture presentations to original and cutting-edge research opportunities in state-of-the-art laboratories. A first-class faculty and modern laboratory equipment reflect the division's commitment to provide its students with the best learning environment.

The division offers a wide spectrum of majors for students interested in the life sciences. These options range from a division-based major in biological sciences, designed to provide a general life sciences education, to department-based majors in cell biology and neuroscience, exercise science, genetics, molecular biology and biochemistry, and sport management aimed at providing specialized training, with a strong emphasis on research. Graduates of the division will be highly competitive for a range of postbaccalaureate opportunities, including graduate education and research, health-professions training, and biomedical and biotechnological research positions, as well as teaching careers in the sciences.

The first two years of the student's tenure at Rutgers is expected to revolve around the life sciences core curriculum, a series of basic offerings designed to provide the general background required for pursuing upper-division courses in any of the individual majors. Regardless of the major chosen, students are encouraged to participate in independent study within a research laboratory in order to take advantage of the rich expertise of the many life sciences faculty in New Brunswick and Piscataway. The exercise science and the sport management majors require an internship experience. The division also has a highly developed advising system, with dedicated and knowledgeable faculty advisers available to work with individual students in their selection of courses, completion of major requirements, and preparation for future careers.

Students may not major in more than one of the following majors in the Division of Life Sciences: Biological Sciences (119), Cell Biology and Neuroscience (146), Exercise Science (377), Genetics (447), Molecular Biology and Biochemistry (694), or Sport Management (955). Furthermore, students majoring in one of these four majors may not minor in Biological Sciences (119). Life science majors or minors may not be combined as double majors or as major/minors with Biomathematics (122), Biochemistry (115), or Microbiology (680).

No more than 16 credits from among the life science courses required for completion of any Division of Life Sciences major may be fulfilled by credits transferred from any school outside of Rutgers-New Brunswick.

For additional information and announcements about the Division of Life Sciences, please visit the division's website.

Life Sciences (SAS)

# Life Sciences Core Curriculum

# Life Sciences Core Curriculum

The life sciences core curriculum is a set of courses that include a series of introductory- and intermediate-level courses in the physical and life sciences forming a foundation of knowledge necessary to understand modern biology and to prepare for the more advanced courses required for each major. Following are core courses:

1. 01:119:115-116 General Biology (4,4)

2. 01:119:117 Biological Research Laboratory (2)

3. 01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)

4. 01:160:171 Introduction to Experimentation (1)

5. 01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)

6. 01:160:311 Organic Chemistry Laboratory (2)

7. 01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics (3,3)*

8. 01:750:205-206 General Physics Laboratory (1,1)*

9. 01:640:135,136 Calculus for the Life and Social Sciences (4,4) or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)**

10. 01:447:380 Genetics (4)***.

*01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

**Basic Statistics for Research (01:960:401, 3 credits), Basic Probability and Statistics (01:960:379, 3 credits), or Statistics I and II (01:960:211 and 212) may be substituted for the second semester of Calculus.

***Students majoring in genetics must take 01:447:384-385 (4,4) instead of 01:447:380

Life Sciences (SAS)

# Biological Sciences 119

# Biological Sciences 119

**Website:** Here

**Director:** Martha Haviland

**Director of Advising:** Anne Carr-Schmid

**Teaching Professor:**

Martha B. Haviland, B.A., Rutgers; M.S., A.M., Ph.D., Michigan[AC1] [SB2]

**Associate Teaching Professor:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Daniel Stern Cardinale, B.S., College of New Jersey; Ph.D., Rutgers

Monica S. Torres, B.S., National University of La Plata (Argentina); M.S., Ghent (Belgium); Ph.D., Rutgers

**Assistant Teaching Professors:**

Christy A. Beal, B.S., Rutgers; M.S., Ph.D., Delaware

Cominski, Tara, B.S., St. Peter's; M.S., Seton Hall; Ph.D. Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin (Stevens Point); M.S., Kansas State; Ph.D., Wisconsin (Madison)
Anne Keating, B.S., M.S., Ph.D., Rutgers

Lu, Haiyang, B.S., Hebei Univ. (China); M.S., Beijing Normal Univ. (China); Ph.D. City Univ. of NY

Nelson, Cassandra, B.S., Marquette; M.S., Indiana University School of Medicine; Ph.D., Marquette

Soliman, Mai, B.S., M.Sc. Montclair State; Ph.D., Rutgers

Gregg Transue, B.S., Pennsylvania State; M.S., Ph.D., Rutgers

Anthony J. Uzwiak, B.A., Ph.D., Rutgers

Villegas, Gabriel, B.A., Ph.D., Rutgers

Walczak, Alexandra, B.S., Ramapo College, Ph.D., Rutgers

Yu, Calvin, B.A. Skidmore; M.A., New York University; Ed.M. Rutgers


- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Minor Requirements

- Independent Study and Research in Biology
- Departmental Honors Program
- Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)
- Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)
- Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)
- Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)
- Courses


Life Sciences (SAS)

# Learning Goals

# Learning Goals

Our overarching goal for educating our students majoring in biological sciences is to inspire them to want to discover and understand the natural world. In the process of achieving this goal, we expect our students to acquire not only facts and concepts, but also skills and perspectives. We hope that our learning goals will both prepare our students for a variety of career objectives and supply them with the tools to become lifelong learners in the ever-evolving world of biological sciences.

*Learning Goals:*

I. To acquire the appropriate factual and conceptual knowledge that provides students with a foundation to further their education and career in the areas of life science or health science. Students will be able to demonstrate basic knowledge (e.g., identify, define, explain, etc.) of the concepts, practices, and principles that comprise the biological sciences.

II. To develop data analysis and statistical reasoning skills that prepare students for a society increasingly reliant on the use of data and information. Students will be able to interpret/evaluate patterns in data presented in tables, figures, and graphs, as well as be able to organize, summarize, and present data.

III. To develop the ability to use scientific reasoning as embodied by the structured process commonly known as the scientific method to empower students with the ability to generate and refine knowledge. Students will be able to evaluate and apply the practice of science.

IV. To develop critical thinking and problem-solving skills necessary to prepare students to evaluate, synthesize, and generate knowledge that provides them with a competitive advantage to adapt to an evolving, global, and knowledge-based society. Students will be able to demonstrate application of higher-order thinking (e.g., classify, diagnose, evaluate, synthesize, hypothesize, etc.). Students will develop an understanding of not only the connections within biology, but also the connections between biology and other scientific disciplines.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in biological sciences must have completed two semesters of General Biology and Biological Research Laboratory with a grade of C or better in each course. Both semesters of General Biology must have been completed at the same institution or on the same campus at Rutgers. No more than two courses with a grade of D may be used to fulfill the requirements of the major. A 2.0 grade-point average must be maintained in the life sciences core and elective courses applied toward the major. Students must meet with an adviser before they can successfully declare their major.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The program in biological sciences, administered through the Division of Life Sciences Office of Undergraduate Instruction, is intended to provide a broad and comprehensive training in modern biology. This course of study is recommended for those who wish to study biology as part of their liberal arts education, preparing them for a career in one of the health professions, graduate studies in biology, a teaching career in secondary schools (courses in education also are required), as well as employment in various areas of the life sciences. If a student wishes to concentrate his or her studies in a specific area of biology, he or she should consider a major offered by one of the departments in the Division of Life Sciences or in the School of Environmental and Biological Sciences. Faculty advisers are available to assist each student with course selection and program requirements.

A minimum of 20 credits of coursework from among general biology, genetics, and life sciences electives must be completed in residence. In other words, no more than 16 credits in this part of the major requirements may be transferred from any institution outside of Rutgers University-New Brunswick. This rule is intended to assure that students receiving degrees from Rutgers-New Brunswick have taken a minimum number of courses in their major with this faculty. Please keep in mind that although a course may transfer from another institution into one of the Rutgers-New Brunswick schools, it will not necessarily be accepted toward the major in biological sciences. Therefore, all transfer courses must be evaluated and accepted by the advising office of the Office of Undergraduate Instruction in order to count toward the major. As indicated earlier, students must complete both semesters of general biology at the same institution or on the same campus of Rutgers before becoming eligible to declare the biological sciences major. Any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation. Credits for cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major.

The course requirements for the biological sciences major are divided into two sections: the life sciences core courses and the life sciences electives.

*Required Life Sciences Core Courses (47 credits)*

01:119:115-116 General Biology I,II (4,4)
01:119:117 Biological Research Laboratory (2)
01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)
01:160:171 Introduction to Experimentation (1)
01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)*
01:160:311 Organic Chemistry Laboratory (2)
01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics***
01:750:205-206 General Physics Laboratory (1,1)***
01:640:135,~~138~~136 Calculus for the Life and Social Sciences (4,4)** or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)
01:447:380 Genetics (4)
* With approval from a Biological Sciences Advisor, 01:160:308/316 may be replaced by another elective course. Please meet with an Advisor to discuss.

**01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).
***Calculus II 01:640:13~~8~~6(4) may be substituted by 01:960:379 Basic Probability and Statistics (3), 01:960:401 Basic Statistics for Research (3), or 01:960:211-212 Statistics I,II (3,3).

*Life Sciences Electives (24 credits)*

It is highly recommended that students meet with a life sciences adviser in the Division of Life Sciences Office of Undergraduate Instruction when planning their elective courses. It is important that the courses taken complement each other as much as possible and are not merely a collection of unrelated topics.

The electives must include at least three laboratory courses, only one of which may be satisfied by research work. Biological Research Laboratory and "library research" do not qualify for this requirement. A minimum of six courses (18 credits) must be at the 300 or 400 level, including at least three separate laboratory courses or three courses with a laboratory component. The laboratory associated with genetics (01:447:382 or equivalent), if taken, may be used to satisfy one of the three laboratory requirements.

No course at the 100 level may be used to satisfy the life sciences elective requirements. A maximum of 6 credits of independent study/research/honors research may be used toward the 24 elective credits. Please keep in mind that a minimum grade-point average of 2.8 is required to enroll in an independent study/research course in biological sciences. Research courses can satisfy only one of the three laboratory requirements, regardless of number of credits. Courses taken on a pass/fail basis may not be used to satisfy requirements for the major in biological sciences. A grade-point average of 2.0 or better in courses credited toward the major is required. No more than two courses with a grade of D may be used to fulfill the requirements of the major.

The elective courses must include at least one course (3 or 4 credits) each from the Departments of Cell Biology and Neuroscience 146, Genetics 447, Molecular Biology and Biochemistry 694, and Ecology, Evolution, and Natural Resources 11:216 at the School of Environmental and Biological Sciences. A list of approved courses in subject areas in addition to those in the Division of Life Sciences (Biological Sciences 119, Cell Biology and Neuroscience 146, Genetics 447, and Molecular Biology and Biochemistry 694) will be published by the advising office of the Office of Undergraduate Instruction. It is strongly recommended that students consult this list, which is available

on the website, prior to registering for their courses. Generally, acceptable courses from other departments on any campus of Rutgers University have a year of general biology as a prerequisite; however, there are exceptions. It is imperative for students to consult the published list and meet with an adviser. Credits from cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks if double majoring with another permitted life sciences major, at least four of the 3-4 credit life science courses applied to the Biology major may not overlap with courses used to fulfill second major requirements. Given that biological sciences is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation.

Life Sciences (SAS)

# Minor Requirements

# Minor Requirements

The minor requires four courses of at least 3 credits each in life sciences subjects as well as General Biology and Biological Research Laboratory. Both semesters of General Biology must be completed at the same institution or on the same campus at Rutgers. No other course at the 100 level may be used to satisfy the minor. A minimum of 11 credits must be taken at Rutgers University-New Brunswick. A maximum of 3 credits of research in a life sciences subject may be used toward the minor. A minimum of three courses at the 300 level or above is required. If majoring in a permitted life sciences major, no more than two of the four life science courses applied to the minor requirements may overlap with courses used to fulfill major requirements. Only life sciences courses acceptable for the biological sciences major may be used for the minor. Courses in chemistry, mathematics, or physics do not count toward the minor. A grade-point average of 2.0 or better in courses credited toward the minor is required. No more than one course with a grade of D may be used to fulfill the requirements of the minor.

Life Sciences (SAS)

# Independent Study and Research in Biology

# Independent Study and Research in Biology

A minimum cumulative grade-point average of 2.8 is required for a student to register for an independent study/research course in biological sciences. A maximum of 6 credits of laboratory-based independent study, research, or honors projects may be used to fulfill the elective credits requirement in biology. The independent study/research form, available from the advising office of the Office of Undergraduate Instruction, must be completed and signed by the professor in whose laboratory the student will study prior to initiating the research project. Approval of a research proposal by the director of advising and a special permission number from the Office of Undergraduate Instruction is necessary for registration. Students may not earn academic credit for laboratory projects for which they are being paid. Students wishing to apply research credits from other departments toward the major in biological sciences must get approval from the advising office of the Office of Undergraduate Instruction, Division of Life Sciences, prior to beginning their research project.

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have a cumulative grade-point average of 3.0 or better and an average of 3.4 or better in life sciences core and elective courses credited toward the biological sciences major at the end of the junior year and previous research experience. At that time, the student should apply formally to the advising office of the Office of Undergraduate Instruction. Accepted students are expected to complete at least 6 credits over two semesters in an independent research project, resulting in a thesis, and to pass an oral examination before a faculty committee in the general field of the student's program of emphasis. If the research is done in a laboratory outside of the Division of Life Sciences, the examination committee must include at least one individual from the Division of Life Sciences faculty. Departmental Honors is completed in the fall and spring of senior year. Students accepted into special programs (e.g. BA/MD) may complete honors during junior year.

Honors students must register either for an honors course sequence in life sciences or for a course sequence in a school honors program. These decisions should be discussed with an adviser. An approval form (available in the advising office) must be completed.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

**Rutgers Undergraduate/Robert Wood Johnson Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

This program is designed for high-achieving premedical students of Rutgers University who are in their sophomore year. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and Robert Wood Johnson Medical School (RWJMS).

Application to this program is open to all undergraduate students enrolled at Rutgers University, New Brunswick. It is not directly associated with any one school within the university but see below for specific restrictions.

Admission is a two-stage and highly competitive process. In the first stage, undergraduate students are admitted into the program by an executive committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools of Rutgers University who have spent at least a year here. Prospective applicants from Rutgers University-Newark and Rutgers University-Camden must transfer to one of the units in New Brunswick for their sophomore year and complete at least 30 credits here. All applicants must have completed 4 semesters of college with a minimum of 60 credits. Applicants with an Associate¿s Degree, regardless of whether it was earned as a dual degree in high school or as a traditional degree after high school,

are ineligible to apply for the program. Admitted students will need to complete all of the core requirements of their undergraduate unit and major requirements with the exception of Biological Sciences and Cell Biology and Neuroscience majors, who may apply credit from the first professional year toward the major requirements. During the fourth year, students will be full time at the medical school and elective credits will count towards the undergraduate degree. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second stage occurs typically after the fourth year of study. It is the responsibility of the RWJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the RWJMS Admissions Committee. The purpose of this second, noncompetitive review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B (Honors or High Pass) in courses taken at both universities. However, recommendation is not automatic. The final decision rests with the RWJMS Admissions Committee. Upon approval by this admissions committee, the student will be permitted to continue into the fifth year of study and will be matriculated formally as a candidate for the M.D. degree at RWJMS.

Applicants to the B.A./M.D. program must be in their fourth semester at Rutgers University. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers, New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester and sustain it through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers University, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers-New Brunswick (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, two semesters of English, and organic chemistry lab must complete these requirements by the end of the third year of study. Students who did not take the SAT or ACT but who are admitted to the program will be required to take the MCAT by April of the junior year and score competitively with a total score of at least 508 (minimum single sub score of 123). An application form has been developed that allows the student to provide the executive committee with information it deems useful for its deliberations.

The bachelor's degree will be awarded upon completion of the undergraduate college and major requirements, by the end of year four. Upon satisfactory completion of year seven and all RWJMS requirements, the student will receive the medical degree.

Students who wish to pursue a major other than biological sciences must discuss their plans with the appropriate department in order to establish the requirements they need to complete for their major. For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from RWJMS will be applied toward the major (as stipulated below). The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements, usually by the end of year four. The number of credits, however, is not directly translated between the two universities; no more than 4 credits per laboratory course and 3 credits per non-laboratory course taken at RWJMS may be used toward the bachelor's degree at Rutgers.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and Intro to Biochemistry (01:694:301) and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must complete an additional approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick.

Students in the program must meet with advisers at the medical school and at their undergraduate school when planning their elective courses. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers' undergraduate units and RWJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

**Rutgers Undergraduate/New Jersey Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

The Rutgers Undergraduate/New Jersey Medical School joint program started in the fall of 2003. The purpose of the program is to permit students to begin their medical education after their third year or at least 96 degree credits at Rutgers. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and New Jersey Medical School (NJMS).

This program is only open to students enrolled in Rutgers University-New Brunswick schools.

Admission is a two-phase and highly competitive process. In the first phase, undergraduate students are admitted into the program by the Joint Program Executive Committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools at the New Brunswick location of Rutgers University who have been enrolled here for at least one year. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the NJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B in courses taken at Rutgers. Students must complete the Medical College Admission Test (MCAT) by January of the junior year before matriculating at NJMS and be required to be in the competitive range of other accepted NJMS students. This second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the NJMS Admissions Committee. However, recommendation is not automatic. The final decision

rests with the Medical School Admissions Committee. Upon approval by the Medical School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the M.D. degree at the New Jersey Medical School.

Applicants for the program must be in their fourth semester at Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, organic chemistry lab, and two semesters of English must complete these requirements by the end of the third year of study. An application form has been developed that allows the student to provide the committee with information the committee deems useful for its deliberations.

Students will be admitted at the end of the spring semester of year two and be formal members of the program beginning with year three. Prior to leaving the Rutgers undergraduate unit, students must satisfy all college and major requirements, except for the credits which they will receive from NJMS (please see next paragraph). For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from NJMS will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements by the end of year four. Upon satisfactory completion of year seven or eight, as well as all New Jersey Medical School requirements, the student will receive the medical degree.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and NJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

**Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine Joint Bachelor of Arts/Doctor of Medicine in Dentistry (B.A./D.M.D.) Program**

Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine joint program started in the spring of 2002. The purpose of the program is to permit students to begin their dental education after their third year or at least 98 credits at Rutgers. Specially selected students will obtain bachelor's and dental degrees in a seven-year program of study taken at Rutgers undergraduate units and Rutgers School of Dental Medicine.

This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick. The program is administered by the Health Professions Office.

Admission is a two-phase and competitive process. In the first phase, undergraduate students are admitted into the program by the Executive Committee of the Joint Program consisting of faculty from the appropriate units. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the Rutgers School of Dental Medicine Admissions Committee to review the credentials of students recommended by the articulated program executive committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for admission to the dental school. It is expected that students will have grades of A or B in courses taken at Rutgers University. Students must complete the Dental Admissions Test (DAT) and earn scores of 20 or better in Total Science, Academic Average, Organic Chemistry, General Chemistry, and Biology. Students may only take the DAT one time to qualify for this program. The second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the Rutgers School of Dental Medicine Admissions Committee. However, recommendation is not automatic. The final decision rests with the Dental School Admissions Committee. Upon approval by the Dental School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the Doctor of Medicine in Dentistry (D.M.D.) degree at the Rutgers School of Dental Medicine.

Applicants to the program must be in their fourth semester at the School of Arts and Sciences, Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at the School of Arts and Sciences, Rutgers-New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester, which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, two semesters of college-level mathematics (Calc I and either Calc II or an approved Statistics course) and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded

advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). If AP credit was granted for general chemistry, then organic chemistry I and II and laboratory and a course in biochemistry at Rutgers are required. If AP credit was granted for English, upper level English at Rutgers is required with the same amount of credit work. If AP credit was granted for physics, two approved courses from Physics or Kinesiology & Health at Rutgers are required. Those students who are admitted to the program without having two semesters of physics, biochemistry, organic chemistry lab, and two semesters of English, must complete these requirements by the end of the third year of study.

The B.A./D.M.D. program is a seven-year program with year one being the first undergraduate year. Students will be admitted at the end of the spring semester of year two and be formal members of the articulated program beginning with year three. Prior to leaving the School of Arts and Sciences, Rutgers-New Brunswick, students must satisfy all college and major requirements, except for the credits which they will receive from Rutgers School of Dental Medicine (please see below). For a student at the School of Arts and Sciences, Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from Rutgers School of Dental Medicine will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the general education and major requirements by end of year four. Upon satisfactory completion of year seven or eight, as well as all Rutgers School of Dental Medicine requirements, the student will receive the dental degree.

A student enrolled in the joint program completing a major in biological sciences at Rutgers-New Brunswick is required to complete any remaining Life Sciences Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers-New Brunswick, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/ research course may be applied toward the biological sciences major for students in the B.A./D.M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers-New Brunswick and Rutgers School of Dental Medicine.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

**Rutgers School of Arts and Sciences/Rutgers School of Health Professions Joint Bachelor of Arts/Master of Science Degree (B.A./M.S.) Physician Assistant Program**

This is a six-year (3+3) program offered jointly by the School of Arts and Sciences and the School of Health Professions (SHP). The program can be looked at as a two-phase program, an undergraduate phase followed by a professional phase. This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick, who are U.S. citizens, permanent residents of the United States, or international individuals currently on a student visa. At a minimum, applicants must be enrolled for one year at Rutgers-New Brunswick earning at least 30 credits.

The first phase of the program includes three years of undergraduate liberal arts and basic science education. Students may apply to the second (professional) phase in April of their second year by applying to the Physician Assistant (PA) program. Personal interviews will be required of those applicants being considered for admission. The interview will serve to determine the applicant's emotional and intellectual maturity, ability to communicate, and the potential to achieve career satisfaction within the physician assistant role. Applicants must have a cumulative and science GPA of 3.2. In cases where individuals may show high potential by improved performance, exceptions to this requirement may be considered. Please note that acceptance by Rutgers University does not guarantee acceptance by the PA program.

Applicants to the program must have completed the following courses with a grade of C or better: at least one semester (3 credits) of English composition, applied statistics or biostatistics (from Psychology, Biology, or Math departments), General Biology I and II with lab (119:115, 116, and 117, or equivalents); General Chemistry I and II with lab (160:161,162 and 171, or equivalents); and General Psychology (830:101, or equivalent). If the student has been granted AP credit by Rutgers for science courses, additional science courses will be required.

All applications must be received by June 1 and final notices of acceptance will be made by August 1. If the applicant is accepted into the program, it will be contingent on maintaining a 3.2 GPA through the end of the third undergraduate year at Rutgers-New Brunswick, and on all requirements for the undergraduate degree being met before the beginning of the fourth year. Students who are accepted into the second phase of the program will begin this phase at the beginning of their senior year. At the end of the senior year, these students will receive a bachelor of arts degree conferred by the School of Arts and Sciences, Rutgers University-New Brunswick. After completion of the remaining two years of the PA program, graduates will receive a master of science degree awarded by Rutgers School of Health Professions.

Before entering the second (professional) phase, a student accepted by this program must also complete for the PA program, Functional Human Anatomy (01:377:223), General Microbiology (01:447:390), Intro to Biochemistry (01:694:301) and Systems Physiology (01:146:356) (waived if Gen Bio II is completed at Rutgers-NB and not AP credit), and 6-8 additional credits of life science electives. Students majoring in biological sciences are required to have completed, in addition to the School of Arts and Sciences core distribution requirements, the Life Sciences Core requirements, Intro to Biochemistry (01:694:301) and General Microbiology (01:447:390) and one (three credit or more) course from the 216 subject area approved electives. Students with AP or transfer credit of General Biology I and II and lab must take an additional life science elective course for 3 or more credits. A maximum of 14 credits from SHP courses will be accepted toward the biological sciences major. Please be sure to meet with a biological sciences adviser when selecting life sciences elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and SHP.

For a complete description of the requirements for the major in biological sciences, please read the appropriate section under the Division of Life Sciences in this catalog.

For more information about this program, you may contact the PA program office at the School of Health Professions, 675 Hoes Lane, Piscataway, NJ 08854, at 732-235-4444; or the Division of Life Sciences, Health Professions Office at Rutgers University, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Courses

# Courses

With the exception of 01:119:115,116, and 117 General Biology I and II and Biological Research Laboratory, courses numbered at the 100 level may not be used for major credit in any of the majors within the Division of Life Sciences.

**01:119:098** ***Foundations for Biological Science (E2)***
Selected topics in general biology: introduction to cellular organization, metabolism, genetics, reproduction, and organ systems. Development of analytical reasoning and science-oriented study techniques.
***Preparation for college-level general biology.***

**01:119:103** ***Principles of Biology (4)***
Selected topics in general biology, including cell structure, genetics, plant and animal diversity, basic plant and animal biology, ecology, and evolution.
***Lec. 3 hrs., lab. 3 hrs. Designed for students who must take a one-semester laboratory course in introductory biology to meet major requirements. Credit not given for this course if student has already completed 01:119:115. Not for life sciences major credit.***

**01:119:109,110** ***Biology Practice Group (1,1)***
Students will work actively to (1) organize the lecture content, (2) identify what they are expected to do with that content (outcomes), (3) prepare and explain study aids (organizers) to ensure that they correctly understand the week¿s content, and (4) begin the self-evaluation process to gauge exam preparedness. Discussion of the basic methods and principles.
***Corequisite for 109 is 01:119:115; corequisite for 110 is 01:119:116.***

**01:119:111,112** ***Reading in General Biology (1,1)***
Discussion and reading providing extensive and advanced coverage of selected topics.
***Corequisite for 111 is 01:119:115; corequisite for 112 is 01:119:116.***

**01:119:115** ***General Biology I (4)***
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics. Lec. 3 hrs., Wkshp. 80 min.
***Prerequisite has two parts: writing (prerequisite of 01:355:101, 01:355:103, or 01:355:104, or placement into 355:101 or 355:104) and math (prerequisite of 01:640:026 or placement into 640:CMA, 640:PCA, 640:CLG, or 640:CLS).***

**01:119:116** *General Biology II (4)*
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics.
*Lec. 3 hrs., Wkshp. 80 min. Prerequisite: 01:119:115 with a grade of C or better. Credit not given for both this course and 01:119:102.*

**01:119:117** *Biological Research Laboratory (2)*
Laboratory designed to introduce and explore principles of research in the biological sciences by engaging in semester-long research projects requiring students to analyze data, synthesize new experiments, and evaluate findings.
*Prerequisite: 01:119:115 with a grade of C or better. Corequisite: 01:119:116.*

**01:119:120** *STEM Success Seminar (1.5)*
Increases ability to control academic success and improve transition to the university environment in furtherance of educational and career goals. Reflection on recent and current academic experience and career aspirations. Setting of priorities and alignment of time and effort towards those ends.
*By special permission only.*

**01:119:127-128** *Anatomy and Physiology: Health Sciences (4,4)*
Structure and function of human organ systems. Some microanatomy and biochemical aspects of physiology included.
*Lec. 3 hrs., lab. 3 hrs. For nursing, medical technology, physical therapy, and other professional students. Not for life sciences major credit.*

**01:119:131** *Microbiology for the Health Sciences (3)*
Introduction to microbes with emphasis on the nature and behavior of microorganisms, the interrelationships between microbes and the human host in health and disease, and the principles of prevention and control of infectious disease.
*Not open to students who have taken 01:447:390. For nursing and other professional students. Not for life sciences major credit. Prerequisites: 01:199:115-116 or 01:119:127-128.*

**01:119:132** *Microbiology for the Health Sciences Laboratory (1)*
Laboratory to accompany 01:119:131.
*Lab. 3 hrs. Pre- or corequisite: 01:119:131.*

**01:119:140** *The DNA Revolution (Honors) (3)*
Introduction to fundamentals of molecular genetics, biotechnology, and modern genetics, including a laboratory research project using molecular biology and bioinformatics techniques. Intended primarily for nonscience majors, but may also appeal to prospective chemists, physicists, engineers, and computer scientists.
*Restricted to first-year and sophomore students in the School of Arts and Sciences Honors Program or the Honors College. Credit not given for both this course and 01:119:140 or 01:694:215 or 315, or 01:447:315. Not for life sciences major credit.*

**01:119:148** *Moving Bodies: The Biology of Movement (3)*
Considers fundamental processes that allow humans and other animals to move, including structural basis (bones and muscles), control (brain and nervous system), conversion of food into energy (digestion and nutrition),

movement of food and oxygen to muscles (circulation), and some common and familiar injuries and illnesses and their treatments.
*Credit not given for both this course and 01:119:100, 103, 115-116, or 127-128. Not for life sciences major credit.*

**01:119:150** *Biology, Society, and Biomedical Issues (3)*
Discussion of current topics and issues in human health and medicine from a biological perspective.
*Credit not given for both this course and 11:115:100. Not for life sciences major credit.*

**01:119:154** *Genetics, Law, and Social Policy (3)*
Principles of human and behavioral genetics and their legal, ethical, and social implications. Topics include genetic screening, counseling, and engineering; reproductive regulation; and human behavior genetics.
*Prerequisite: Sophomore standing. Not for life sciences major credit or related major.*

**1:119:155** *Human Genetics (3)*
How our genes influence our development and health, how both normal traits and diseases are transmitted through families, how genetics is used in forensics and personalized medicine, and the genetic tests that are offered directly to consumers.
*Not for life sciences major credit.*

**01:119:156** *Genetics, Evolution, and Human Health (4)*
The human body and human behavior, shaped by more than four billion years of evolutionary processes. Scientific and social implications of current ideas and controversies of evolution and genetics.
*Not for life sciences major credit.*

**01:119:160** *Biology, Society, and Ecological Issues (3)*
Ecological and evolutionary ideas affecting space ecology; population increase, food supply, air and water pollution, war, and nuclear energy.
*Not for life sciences major credit or related major.*

**01:119:182** *Essentials of Human Reproduction (3)*
Anatomical and physiological bases of human sexuality; biological and cultural aspects of sexual differentiation and psychosexual development, contraception, venereal disease, and sexual lifestyles.
*Not for life sciences major credit or related major.*

**01:119:195** *Brain, Mind, and Behavior (3)*
Honors course discussing the interrelationship between the brain, the mind, and behavior.
*Open to students in the School of Arts and Sciences Honors Program or the Honors College. Not for life sciences major credit or related major.*

**01:119:199** *Preparation for General Biology (4)*
For first- and second-year students planning science majors. Enrollment based on placement scores. Selected concepts in biology, proven learning strategies for college science courses, and instruction in the scientific method. Prepares students for success in the General Biology sequence (01:119:115-117).
*Lec./rec. 3 hrs., lab. 3 hrs. Enrollment restricted by placement. Not for life sciences major credit.*

**01:119:201-202** ***Independent Study in Biology (1-3,1-3)***
Independent study under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. May not be used to fulfill a laboratory requirement.***

**01:119:204** ***Outreach in Biology (1)***
Introduction to the basic principles and best practices of outreach in the biological sciences. Emphasis on understanding how to translate technical concepts and techniques to lay audiences incorporating best practices in active learning, public speaking and curriculum development. Recommended for students interested in teaching careers and related positions in science communication.
***Prerequisites: 01:119:115, 01:119:116, and 01:119:117. By special permission.***

**01:119:205** ***Internship in Life Sciences (3)***
Development of experience and knowledge regarding the expectations, qualifications, competencies and responsibilities of professionals working within the life sciences through an internship experience with academic component. Integration of knowledge from life science coursework with the internship experience, development of new skills, and reflection on the learning experience.
***Prerequisites: 01:119:116 and 01:119:117. Open only to 119 Biology Majors.***

**01:119:307-308** ***Research in Biology (1-3,1-3)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to students majoring (or minoring) in biological sciences.***

**01:119:310** ***Communication in Biology (1)***
Effective skills for communicating science to a variety of audiences in a variety of forms including papers, grant proposals, teaching, and presentations to scientists and others. Provides support for students completing the 10-page research paper required for Research in Biology.
***Prerequisites: 01:119:307, 308, 407, or 408. Corequisites: 01:119:307, 308, 407, or 408.***

**01:119:311** ***Current Topics in Life Sciences (1)***
Directed readings and discussion of selected scientific topics and career stories with Rutgers Life Sciences Alumni.
***Junior or senior status and Division of Life Sciences major (subject code: 119, 146, 694, 447).***

**01:119:401** ***Clinical Practicum in the Health Professions (3)***
Development of advanced knowledge of and reflection on the qualifications, competencies, and responsibilities of physician health care providers through an internship experience and academic component integrating knowledge from life science coursework and the health care setting.
***Prerequisites: 3.4 science GPA. By special permission of the Office of Undergraduate Instruction only.***

**01:119:406-407** ***Research in Biology (1-4,1-4)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report is required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to seniors majoring (or minoring) in biological sciences.***

**01:119:408-409** ***Honors in Biology (3-6,3-6)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written thesis, oral presentation, and defense are required.
***Prerequisites: Declared biological sciences major. Permission of the Office of Undergraduate Instruction. Open only to seniors majoring in biological sciences who meet the requirements for departmental honors.***

**01:119:410** ***Honors Communication in Biological Sciences (1)***
Instruction on effective communication of scientific ideas and findings for both the scientific community as well as the general public. Support in writing honors theses and preparing for oral thesis defenses.
***Prerequisite: 01:119:408. Corequisite: 01:119:409.***

Life Sciences (SAS)

# Cell Biology and Neuroscience 146

# Cell Biology and Neuroscience 146

Department of Cell Biology and Neuroscience, School of Arts and Sciences

**Website:** Here

**Chair:** Megerditch Kiledjian

**Vice Chair and Undergraduate Director:** Gabriella D'Arcangelo

**Distinguished Professors:**

Joanna Burger, B.S., SUNY (Albany); M.S., Cornell; Ph.D., Minnesota

Megerditch Kiledjian, B.A., Rutgers; Ph.D., University of Pennsylvania

Melitta Schachner, Diploma in Biochemistry, Tübingen (Germany); Ph.D., Max-Planck Institut für Biochemie (Germany)

Wise Young, B.A., Reed; Ph.D., Iowa; M.D., Stanford

**Professors:**

Lori R. Covey, B.S., California (Riverside); Ph.D., Columbia

Gabriella D'Arcangelo, B.S., Bari (Italy); Ph.D., SUNY (Stony Brook)

Robin L. Davis, B.S., Pennsylvania State; M.A., San Diego State; Ph.D., Stanford

Bonnie Firestein, B.S., Michigan; Ph.D., California (San Diego)

Martin Grumet, B.S., Cooper Union; Ph.D., Johns Hopkins

Ronald P. Hart, B.S., Connecticut; Ph.D., Michigan

Arnold G. Hyndman, A.B., Princeton; Ph.D., California (Los Angeles)

Alice Y.-C. Liu, B.S., Chinese University of Hong Kong (China); Ph.D., Mount Sinai School of Medicine

Gary F. Merrill, B.S., Weber State; Ph.D., Michigan State

Kathleen M. Scott, B.A., Brown; Ph.D., Yale

**Associate Professors:**

Qian Cai, M.D., Shanghai Railway Med College (China); Ph.D., National Institutes of Health-Shanghai Second Medical University

Wei Dai, B.S., M.S., Beijing Normal (China); M.S., Texas Health Science Center; Ph.D., Baylor College of Medicine

Dunne Fong, B.S., Massachusetts; M.A., Ph.D., Princeton

Shu-Chan Hsu, B.S., Ph.D., British Columbia

Peng Jiang, B.S., Soochow (China); Ph.D., University of Science and Technology of China

Kelvin Y. Kwan, B.S., California Institute of Technology; Ph.D., Harvard

David Margolis, B.S., Brown; Ph.D., Washington (Seattle)

Ping Xie, B.S., Nanjing (China); Ph.D., Hong Kong University of Science and Technology

**Assistant Professors:**

Victoria Abraira, B.S., Southern California; Ph.D., Harvard

Santiago Cuesta, B.A., M.S., Ph.D., National University of Rosario (Argentina)

Brian Daniels, B.A., B.S., Southern Wesleyan (Central); Ph.D., Washington (Seattle)

Rafiq Huda, B.A., Carleton College; Ph.D., Northwestern University (Chicago)

Natasha O¿Brown, B.S., Davidson College; Ph.D., Stanford

Max Tischfield, B.A., Rutgers; Ph.D., Harvard

**Associate Research Professors:**
Xinfu Jiao, B. S., Xinxiang Medical College (China); M.S., Tongji Medical University (China); Ph.D., Shanghai Institute of Hematology (China)

Patricia Morton, B.S., Northwestern University; M.S., Ph.D., University of Wisconsin

**Assistant Research Professor:**

Dongming Sun, B.S., Beijing Medical University (China); Ph.D., Columbia University

**Assistant Teaching Professors:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Tara Cominski, B.S. St. Peter's University; Ph.D., Rutgers

Anne Keating, B.S., M.S., Ph.D., Rutgers

- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Options
- Departmental Honors Program
- Courses

Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Cell Biology and Neuroscience offers a course of study that provides fundamental and comprehensive training in the areas of cell biology and neuroscience. The major objective of this program is to prepare students for graduate studies in cell biology and neuroscience; entry into professional schools in medicine, dentistry, or other health-related fields; or employment in industrial and pharmaceutical companies.

*Learning Goals*

Students will:

I. master factual and conceptual knowledge in cell biology and neuroscience that will provide a solid foundation for success in advanced training and professional careers;

II. develop an ability to summarize, integrate, and organize information; and

III. use scientific reasoning to evaluate the potential for current research and new discoveries to improve our understanding of cell biology and neuroscience and its relevance to human health and to our society.

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# Entry Requirements of the Major

# Entry Requirements of the Major

The major in the Department of Cell Biology and Neuroscience is open to students after their first year who have completed Fundamentals of Neurobiology (01:146:245) or Fundamentals of Cell Biology (01:146:270), with a grade of C or better. Departmental approval is required.

A grade of C or better in all courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades.

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# Major Requirements

# Major Requirements

The Department of Cell Biology and Neuroscience offers a program of study from which students can select one of two tracks, depending upon particular interests and career goals: a general track (default) and an honors track. Students can apply to enter the honors track at the beginning of the senior year. This track requires a minimum GPA of 3.4 in courses credited toward the major, and departmental approval. A number of core courses are required of all students in the cell biology and neuroscience major, regardless of the chosen track. No more than 16 credits from among the life science courses required for completion of the cell biology and neuroscience major may be fulfilled by credits transferred from any school outside of Rutgers University-New Brunswick. Any life science courses applied to the major should be taken within 10 years of graduating.

***Required Core Courses (65 or more credits)***

01:119:115-116 General Biology (4,4)

01:119:117 Biological Research Laboratory (2)

01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)

01:160:171 Introduction to Experimentation (1)

01:160:307-308 or 01:160:315-316 Organic Chemistry (4,4)

01:160:311 Organic Chemistry Laboratory (2)

01:750:203-204 General Physics (3,3) or 01:750:193-194 Physics for the Sciences(4,4)*or 01:750:271-272 Honors Physics (3,3)

01:750:205-206 General Physics Laboratory (1,1)

01:640:135,136 or 01:640:151-152 Calculus I and II (4,4) or 01:640:135 and 01:960:401 Basic Stat for Research (3) or 01:960:379 Basic Prob and Stat or 01:640:135 and 01:960:212 Statistics II (3)**

01:447:380 Genetics (4)

01:146:245 Fundamentals of Neurobiology (3)

01:146:270 Fundamentals of Cell Biology (3)

01:694:395 Biochemistry for Life Sciences (3) or 01:694:407 Biochemistry (3)

Advanced Cell Biology and Neuroscience Courses: choose three of the following:

01:146:445 Synapses, Neurons, and Circuits (3)

01:146:447 Clinical Neurobiology (3)

01:146:465 Neurobiology of Pain and Addiction (3)

01:146:472 Developmental Biology (3)

01:146:473¿ Genetic Regulation in Cell Biology¿(3)

01:146:474 Immunology (3) or 01:146:476¿ Honors Immunology (3)

01:146:481 Protein Dynamics in Cell Biology (3)

* with approval from the Undergraduate Director or CBN Advisor 01:160:308 may be replaced by an additional elective course.
** Students who take who take Physics for the Sciences 01:750:193-194 (4,4) do not need an additional Physics laboratory.
*** Students with AP statistics equivalent of 01:960:211, transfer credit for 01:960:211, or who have taken 01:960:211 at Rutgers must take 01:960:212.

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# Options

# Options

*General Track; 4 credits*

This track is for students who, upon graduation, seek immediate employment or plan to attend professional schools in health-related fields. In addition to the required core courses, students must take the following courses:

1. One elective lecture courses at the 300-400 level in the life sciences area (equaling 36 or more credits)
2. One laboratory or research course (1-3 credits). Students can take a lecture course with an associated laboratory component (3-4 credits) to satisfy both requirements, or a stand-alone lecture plus a laboratory or research course.

*Honors Track; 12 credits*

This area of concentration is for students interested in research who, upon graduation, plan to attend graduate school or professional schools in health-related fields. A student must qualify for admission into the honors track. See the departmental honors program page in this catalog for student qualifications. In addition to the required core courses, students must complete the following courses, produce a written research thesis and an oral thesis presentation:

1. One elective lecture course at the 300-400 level in the life sciences area (3 or more credits).
2. 01:146:405 Honors Seminar (3).
3. 01:146:408-409 Honors Research (3,3).

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

Honors in cell biology and neuroscience are awarded to students who have successfully completed the honors track course requirements, submitted a written research thesis, and defended the thesis orally. To qualify for the honors track, a student must have attained a grade-point average of 3.4 or better in courses required for the major. The student should apply formally to the department for acceptance into the honors program by the end of the second semester of the junior year.

Life Sciences (SAS)

# Courses

# Courses

**01:146:201,202** *Independent Study in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. May not be used to fulfill a laboratory requirement. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:245** *Fundamentals of Neurobiology (3)*
Introduction to the biology of the nervous system. Topics covered include nerve cell signaling, sensory and motor systems, and higher brain processes.
***Prerequisites: 01:119:115-116.***

**01:146:270** *Fundamentals of Cell Biology (3)*
Principles of cell biology. Structure, function, and macromolecular organization of cellular organelles.
***Prerequisites: 01:119:115-116.***

**01:146:295** *Essentials of Cell Biology and Neuroscience (3)*
Provides a background in the biology of neural cells and cognition.
***Prerequisites: 01:119:115-116. Not intended for cell biology and neuroscience majors.***

**01:146:307,308** *Research in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research on an original problem under the direction of a member of the Rutgers faculty.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:322** *Human Histology (4)*
Structure of the tissues and organs of the human body. Lec. 3 hrs., lab. 3 hrs.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:328** ***Human Parasitology (3)***
Cell biology, epidemiology, pathogenesis, and clinical manifestations of human parasitic diseases.
***Prerequisites: 01:119:115-116.***

**01:146:329** ***Human Parasitology Laboratory (1)***
Laboratory to accompany the Human Parasitology lecture course 01:146:328. Lab. 3 hrs.
***Pre- or corequisite: 01:146:328.***

**01:146:340** ***Virology (3)***
Principles of virology including the molecular and cellular events that occur during virus replication, the host cell response, and pathogenesis. Emphasis on animal viruses that impact human health and disease. Strategies for controlling viruses.
***Prerequisite: 01:146:270.***

**01:146:350** ***Introduction to Light Microscopy for the Life Sciences (1, minicourse)***
This course offers a comprehensive exploration of advanced imaging techniques essential for studying tissues, cells, and organelles in the life sciences.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:356** ***Systems Physiology (3)***
Comprehensive study of the principal organ systems of laboratory animals and humans.
***Prerequisites: 01:119:115-116 and 01:160:161-162 or 163-164, and 171 Credit not given for both this course and 11:067:300.***

**01:146:357** ***Systems Physiology Laboratory (1)***
Laboratory to accompany the Systems Physiology lecture course 01:146:356. Lab. 3 hrs.
***Pre- or corequisite: 01:146:356.***

**01:146:405** ***Honors Seminar (3)***
This course is intended to help students prepare a written research thesis and practice the oral thesis presentation.
***Requires departmental permission. Open only to senior honors students majoring in cell biology and neuroscience. This course fulfills the SAS WCd core requirement.***

**01:146:406, 407** ***Research in Cell Biology and Neuroscience (1-3,1-3)***
Research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. Open only to students majoring in cell biology and neuroscience.***

**01:146:408-409** ***Honors Research (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member. Written report and oral presentation required. Culminates in a written thesis and oral thesis defense.
***Permission of department and an instructor willing to sponsor the student are required. Open only to seniors majoring in cell biology and neuroscience who meet the requirements for the departmental honors program.***

**01:146:410-411** ***Research Thesis in CBN I and II (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member and the course coordinator.
***Prerequisites: 01:146:307 or 01:146:308. Requires departmental permission and acceptance by a faculty mentor who will***

*host the student in the laboratory. Requires submission of a written thesis draft (I = Fall semester), and submission of a final written thesis and oral defense (II = Spring semester). Open to senior students majoring in cell biology and neuroscience who are not enrolled in the departmental honors program.*

**01:146:445** *Synapses, Neurons, and Circuits (3)*
Cellular and systems features of neurons and the fundamental unit of signaling in the nervous system, focusing on a small number of advanced topics. Focus on how to test hypotheses related to the topics addressed: intra- and inter- cellular communication; construction of neuronal networks; protein interactions at the synapse; and signal transduction pathways.
*Prerequisites: 01:146:245 and 01:146:270.*

**01:146:447** *Clinical Neurobiology (3)*
Development and function of the nervous system with an emphasis on diseases and disorders. Topics include neurodevelopment, demyelination, tumors, and viral infections; neurological disorders/diseases; injury to the spinal cord and brain and repair; and clinical trials and the future of spinal cord and brain trauma.
*Prerequisites: 01:146:245 and 01:146:270. Intended for senior students majoring in cell biology and neuroscience.*

**01:146:456** *Advanced Physiology (3)*
Preparation for advanced graduate study in physiology and for medical physiology (first-year medical school). Focus on mammalian physiology and the whole animal (whole organ) approach to classical experimental physiology.
*Prerequisites: 01:146:356. Intended for senior and junior students.*

**01:146:464** *Topics in Cell Biology and Neuroscience (3)*
Directed readings and discussion of selected topics in cell biology and neuroscience.
*Prerequisites: 01:146:245 and 01:146:270. Open to junior or senior students majoring in cell biology and neuroscience.*

**01:146:471** *Advanced Cell Biology Laboratory (3)*
Advanced laboratory methods in cell biology. Emphasis on light and electron microscopy, imaging, immunocytochemical techniques, tissue culture, and methods of identifying and separating macromolecules.
*Prerequisite: 01:146:270 or permission of instructor.*

**01:146:472** *Developmental Biology (3)*
Genetic, molecular and cellular processes that lead from egg to embryo to mature organism.
*Prerequisite: 01:146:270 or 01:447:380 or 01:447:384.*

**01:146:473** *Genetic Regulation in Cell Biology (3)*
Advanced topics in cell biology, focusing on genetic animal models, genomics, chromatin function, gene expression, and RNA biology.
*Prerequisite: 01:146:270.*

**01:146:474** *Immunology (3)*
Fundamental principles of immunology with emphasis on antibody formation, immunoglobulin molecules and genes, hypersensitivity reactions, and the cellular basis for the immune response.
*Prerequisites: 01:119:115-116 and 01:447:380 or 01:447:384. Recommended: 01:447:390.*

**01:146:475** ***Laboratory in Immunology (1)***
Biochemical and molecular analysis of immune cell function. Application of immunological techniques to the examination of normal and diseased states.
***Pre- or corequisite: 01:146:474.***

**01:146:476** ***Honors Immunology (3)***
Introduction to the immune system, with a focus on mammalian organisms (particularly humans). Focus on critical thinking and problem-solving abilities, as well as introduction to primary research addressing contemporary immunological questions. Open only to students enrolled in the Honors College, SAS Honors Program or CBN Honors Program.
***Prerequisites: 01:447:380 or 01:447:384. Credit not given for both this course and Immunology 01:146:474.***

**01:146:481** ***Protein Dynamics in Cell Biology (3)***
Advanced topics in cell biology, focusing on signal transduction (module 1), cell adhesion and protein transport (module 2) and cytoskeletal dynamics controlling cell movement (module 3).
***Prerequisite: 01:146:270.***

Life Sciences (SAS)

# Genetics 447

# GENETICS 447

Department of Genetics, School of Arts and Sciences

**Website:** Here

**Chair:** Tara C. Matise

**Vice-Chair & Undergraduate Director**: Gary A. Heiman

**Distinguished Professors:**

Maureen M. Barr, B.A., Rutgers; Ph.D., Columbia

James A. Knowles, B.S., Michigan; M. Sc., M.D., Ph.D., Albert Einstein Medicine

Tara C. Matise, B.S., Cornell; M.S., Ph.D., Pittsburgh

Jay A. Tischfield, B.S., City University of New York; M.Phil., Ph.D., Yale

Lei Yu, B.S., Jiangnan University (China); M.S., Institute of Genetics, National Academy of Sciences (China); Ph.D., California Institute of Technology

**Professors**:

Gary A. Heiman, B.A., Boston Univ.; M.Sc., Sarah Lawrence; Ph.D., Columbia

Kim S. McKim, B.A., Simon Fraser; Ph.D., British Columbia

Bryce E. Nickels, B.S., Miami; Ph.D., Harvard

Christopher G. Rongo, B.A., University of California, San Diego; Ph.D., Massachusetts Institute of Technology

Gleb P. Shumyatsky, B.A., Moscow State University; Ph.D., Institute of Molecular Biology (Moscow, Russia)

Andrew W. Singson, B.S., University of California, Davis; Ph.D., University of California, San Diego

Karen Schindler, B.S., Loyola; Ph.D., Thomas Jefferson

Michael Verzi, B.A., The College of New Jersey; Ph.D., University of California, San Francisco

Jinchuan Xing, B.S., Nankai (China); Ph.D., Louisiana State

**Associate Professors:**

Chris Ellison, B.A., Lewis and Clark; Ph.D., University of California, Berkeley

Derek Gordon, B.A., Rochester; Ph.D., State University of New York at Stony Brook

**Assistant Professors:**

Christina M. Bergey, B.A., M.A., Ph.D., New York University

Devanshi Jain, B.Sc. Hons., Ph.D., University College, London

Tetsuya Nakamura, B.S., Ph.D., Osaka (Japan)

Srujana Samhita Yadavalli, B. Tech., Anna University (India); Ph.D., Ohio State

Jiekun Yang B.S., Renmin University (China), M.S. UW-Madison, Ph.D. University of Virginia

**Associate Research Professors:**

Juan Wang, B.S., Ph.D., China Agricultural University (Beijing)

**Assistant Research Professors:**

Marco Azaro, B.A., Ph.D., Brown

**Teaching Professor:**

Martha Haviland, B.A. Rutgers; MS, AM, Ph.D. Michigan

**Associate Teaching Professor:**

Jessica Rispoli, B.S., Richmond; M.G.C., Maryland

Christine Seymour, B.S., Scranton; M.S. Arcadia University

**Associate Research Professor:**

Oleg Evgrafov, B.S., Moscow Physical Engineering Institute; M.S., Moscow Physical Engineering Institute; Ph.D,. Institute of General Genetics (Moscow); D.Sc., Research Center for Med. Genetics (Moscow)

**Assistant Teaching Professors:**

Tara P. Cominski, B.S, Saint Peter's; M.S., Seton Hall; Ph.D., Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin; M.S., Kansas State; Ph.D., Wisconsin

Anne Keating, B.S., Ph.D., Rutgers

Haiyang Lu, B.S., Hebei University, China; M.S., Beijing Normal University, China; Ph.D., City University of New York

Shama Khan, B.A., Rutgers University; M.P.H., Tulane; M.S. Epidemiology, Tulane University; M.S. Genetic Counseling, Arcadia University

Mai Soliman, B.S., M.Sc., Montclair State; Ph.D., Rutgers

Zainab Tanvir, B.A. Stonybrook University, M.S. Univ. Delaware, Ph.D., Rutgers

Alexandra Walczak, B.S., Ramapo College of NJ, Ph.D., Rutgers

**Faculty Emeriti:**

David E. Axelrod

Linda Brzustowicz

Terry McGuire

Howard C. Passmore

Amrik S. Sahota

Lee D. Simon

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# Learning Goals

# Learning Goals

**Learning Goals:**

The Department of Genetics is committed to teaching science through the way we do science: through the process of doing research. The curriculum of the Department of Genetics is centered around four main goals. These goals shape our innovative courses and provide the basis for lifelong learning.

I. Knowledge specific goals: Know the terms, concepts, and theories of genetics.

II. Integrate the material from multiple courses and research to think holistically and to see the whole as well as the parts.

III. Use genetic information and ideas to critically analyze published research articles in genetics.

IV. At the end of four years, all of our students will be able to design an experiment, carry out the research using the appropriate laboratory techniques, and analyze and interpret their data. They will also be able to communicate their discoveries through a written article appropriate for publication in a peer-reviewed genetics journal, and through talks or posters appropriate for scientific meetings.

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# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in this department must have been enrolled at Rutgers for at least one semester. In addition, students must:

1. Be an SAS student

2. Have a cumulative GPA of at least 2.00, and a GPA of at least 2.8 at the time of taking research for credit.

3. Have earned a C or better in these prerequisite courses or equivalents (25-26 credits):

a. General Biology I 01:119:115

b. General Biology II 01:119:116

c. General Biology Lab 01:119:117

d. General Chemistry I either 01:160:161 or 01:160:163

e. General Chemistry II either 01:160:162 or 01:160:164

f. Calculus I either 01:640:135 or 01:640:151

g. Calculus II or Statistic either 01:640:136, or 01:640:152, or 01:640:192, or 01:960:401, or 01:960:212, or 01:960:379

4. Students with an overall GPA < 3.0 must meet with the UGD before declaring the major.

a. Genetics is a credit-intensive major and has a requirement of a 2.80 GPA at the time of taking research for credit

b. Students entering the major with a GPA of < 3.0 may struggle to complete the major on time

5. Watch a Genetics Major Declaration Video

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# Major Requirements

# Major Requirements

The department offers a major with a strong emphasis on research. A minimum of 20 credits of coursework in the life sciences must be completed in residence. Genetics is a credit-intensive major. Excluding the prerequisite courses (25-26 credits) to get into the major (see above), there are between 54-56 credits to complete the major (60-62 for honors). A grade of "C" or better in courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades. Students may not double major in two Division of Life Sciences majors.

The requirements of the major consist of:

**A. Life Science Core Courses (19-21 credits)** - Required for all DLS Majors (Approved AP and Transfer credits may be substituted)

a. Intro to Experimentation 01:160:171

b. Organic Chemistry I 01:160:307 or 01:160:315

c. General Physics I (01:750:203 + 205 lab), or (01:750:271 + 275 lab), or 01:750:193, or 01:750 201
Note: 193 & 201 have integrated lab

d. General Physics II (01:750:204 + 206 lab) or (01:750:272 + 276 lab) or 01:750:194 or 01:750:202
Note: 194 & 202 have integrated lab

**B. Genetics Core (17 credits) -** Required for all Genetics Majors- All below credits must be completed at Rutgers

a. Genetic Analysis I 01:447:384

b. Genetic Analysis II 01:447:385

c. Lab Course Req. 01:447:315, or 01:447:302, or 01:447:203, or 01:447:303, or 01:694:214, or 01:694:215, or 01:694:316

d. Biochemistry for the Life Sciences 01:694:395 or 01:694:407

e. Communications in Genetics 01:447:430 or 01:447:414 + 01:447:415 (Honors, Thesis Writing senior year)

**C. Genetics Independent Scholarship (minimum 6 credits but 12 credits for honors**

Note: 2.8 minimum GPA to register for research

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

**D. Genetics Electives (6 credits)**

Fifty percent must be taken within the Genetics Major (i.e.; 01:447)

a. Genetics Electives See electives table

b. Genetics Electives See electives table

c. Genetics Electives See electives table

**E. Electives OR Independent Scholarship (6 credits)**

Note: Additional Genetics Lab may be used as an elective

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

c. Genetics Electives See electives table below

**Lab Note:** 01:694:214 and 01:694:215 are only offered to first-year students with AP Biology credit and AP General Chemistry credits (or taking General Chemistry concurrently). 01:447:203 is only offered to first-year students in the SAS Honors Program or the Honors College. Students cannot receive credit for both 01:447:203 and 01:447:302.

**Organic Chemistry Note:** If you are planning to pursue a graduate degree in which a full year of organic chemistry is suggested/required (e.g., med/dental school), we strongly recommend taking Organic Chemistry II + lab as an elective (6 credits)

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# Elective Courses

# Elective Courses

**Approved Genetics Electives**

(01:160:308 or 01:160:316) and (01:160:311 or 01:160:314-15) Organic Chemistry II + lab (6)

01:198:111 Introduction to Computer Science (4)

01:198:112 Data Structures (4)

01:447:203 Honors Computational Genetics (Honors) (3)

01:447:216 Analysis of Scientific Literature (Honors) (3)

01:447:245 Intro to Cancer (3)

01:447:302 Quantitative Biology and Bioinformatics (3)

01:447:303 Computational Genetics of Big Data (3)

01:447:315 Introduction to Research in Genetics (3)

01:447:354 Social, Legal, and Ethical Implications of the New Genetics (3)

01:447:356 Evolutionary Medicine (3)

01:447:370 Developmental Genetics (3)

01:447:390 General Microbiology (3)

01:447:392 Pathogenic Microbiology (3)

01:447:451 Genomes (3)

01:447:460 Genetics of Compulsive Behavior (3)

01:447:465 Genetic Approaches & Research Analysis (3)

01:447:470 Evolutionary Developmental Biology (3)

01:447:478 Special Topics in Genetics (3)

01:447:479 Special Topics in Genetics (3)

01:447:480 Topics in Molecular Genetics (3)

01:447:484 Behavioral and Neural Genetics (3)

01:694:411 Molecular Pathways and Signal Transduction (3)

01:694:412 Proteomics and Functional Genomics (3)

01:694:413 Chromatin and Epigenomics (3)

01:694:420 Membrane Dynamics in Health and Disease (3)

01:694:421 Spec. Top. Mol. Bio. & Biochem (3)

01:694:492 Gene Regulation in Cancer and Development (3)

11:126:427 Methods and Applications in Molecular Biology (4)

11:126:483 Nucleotide Sequence Analysis (3)

11:126:485 Bioinformatics (3)

11:680:480 Microbial Genetics and Genomics (3)

16:681:535 Human Genetics (3)

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# Departmental Honors

# Departmental Honors

**Departmental Honors**

The Department of Genetics recognizes graduating students who have made outstanding academic achievements by awarding **departmental honors**. The department awards two types of departmental honors (see below) and these are awarded at the discretion of the Genetics Honors Committee. To be considered, students must meet all criteria for that type of honors and submit the honors request application by the deadline (April 1st of senior year).

The two types of departmental honors and their criteria are as follows:

**1. GENETICS HONORS- RESEARCH**

a. GPA requirement: a student must have attained, at the end of the junior year, a cumulative GPA of at least 3.4 and a Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete 6 or more credits of Honors in Genetics (01:447:408-409) during senior year

c. Complete a total of 12 or more research credits (including the 6 credits of 01:447:408-409)

d. Complete Honors Thesis and Communication in Genetics 447:414 and 415 during senior year

e. Complete and defend a research thesis before a faculty committee (see Thesis Guidelines)

f. Present at Honors Day

Students can apply to do an Honors thesis by completing the relevant sections of the Independent Scholarship Form. Students must register either for an Honors course sequence in Genetics (01:447: 408 and 409) or for a course sequence in a college Honors Program (See Handbook). These decisions should be discussed with an advisor and approved by the Department Vice Chair. Accepted students are expected to complete at least 12 credits in an independent research project, resulting in a thesis. Students may do research with Rutgers faculty outside of the Department with the approval of their advisor and the Vice Chair. Students will prepare a thesis and present an oral defense to a committee of three faculty. At least one member of the committee must come from the Department of Genetics. Students will present their research at a Departmental Symposium in April. Students contemplating an Honors thesis should refer to the much more detailed instructions and details in Section IX and Section X of the Student Handbook. For information on the thesis, see Thesis Guidelines.

**Level of Honors:** In determining the level of honors, the honors/awards committee takes into consideration multiple factors in aggregate, including but not limited to (1) cumulative GPA, (2) thesis defense committee recommendation, (3) research mentor evaluation, (4) faculty evaluation of presentation at Honors Day, and (5) whether or not the student took the honors versions of Genetic Analysis 1 and/or 2 (i.e., 01:447:384:H1 and/or 01:447:385:H1) and the grades received in those courses.

**2. Genetics Honors - Certificate Program**

a. GPA requirement: A student must have attained, by April 1st of senior year, a cumulative GPA of at least 3.4 and Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete a departmental certification program (i.e.; CompGen, Cancer or Genetic Counseling).

c. By April 1st, the student must formally apply to request consideration for Certificate Honors by completing the Genetics Honors- Certificate Program Form

* *The honors committee may award Honors, High Honors or Highest Honors*

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# Undergraduate Certificate Programs

# Undergraduate Certificate Programs

The Department of Genetics offers two certificate programs. Students who complete one of these Certificates are eligible to receive Departmental Honors.

1) Genetic Counseling Certificate Program

The Department of Genetics offers an undergraduate **Genetic Counseling Certificate Program (GCCP).** The GCCP program is intended for a select group of students interested in applying to the masters-level programs in genetic counseling. The goal is to provide students with guidance, coursework, and relevant clinical experience to improve their graduate school applications. This is a highly competitive option and is **only open to declared genetics majors**. Not all applicants will be accepted. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in genetics and does not replace minors. The certificate is NOT in lieu of completing the masters-level programs in genetic counseling. At the end of the program students will:

- understand genetic counseling as a profession ·
- understand application requirements for masters-level programs
- gain experience in talking with people who are in crisis
- gain experience in a clinical genetic counseling clinic

2) Certificate in Computational Genetics

The Department of Genetics offers a Certificate in Computational Genetics (CCG) for Genetics majors. The volume of data being generated in Genetics and related life science fields has been expanding tremendously in recent years, and career opportunities for geneticists with computational and quantitative expertise are simultaneously growing. This certificate program is intended for students who are either interested in applying to graduate-level programs,

or planning careers, in Computational Genetics/Biology, Statistical Genetics, Bioinformatics, or other programs in quantitative biomedical related research. The goal of the CCG is to provide students with guidance, coursework, and relevant data design and analysis experience to prepare them for graduate studies in the field or entry-level informatics jobs. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained competence in genetic data analysis using basic computer programming and statistical analysis.
- Be prepared to apply to M.S. or Ph.D. graduate programs in the areas of Computational Genetics and Bioinformatics.
- Be prepared to apply for career positions in industry, biotech companies, pharmaceutical companies, medical centers, or universities

3) Cancer Research Certificate

The Department of Genetics offers a Certificate in Cancer Research (CCR) for Genetics majors. Completion of the Certificate in Cancer Research will provide an advantage when applying to MD, PhD, and MS programs and facilitate transitions to careers with Cancer-related missions. The goal of the CCR is to provide students with a rigorous and Cancer-specialized curriculum. Students will do at least one year of research in a nation-leading Cancer Research Lab and students will be expected to participate in community engagement and develop skills to build community outside of academia. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained knowledge in Cancer Genetics with an expanded curriculum focused on Cancer biology.
- Have at least one year of experience conducting laboratory research in a Cancer research lab.
- Be prepared to apply to M.S., MD, or Ph.D. graduate programs in the areas of Cancer Genetics or for career positions in industry, biotech companies, pharmaceutical companies, medical centers, policy-driving institutes, or universities.

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# Courses

# Courses

**01:447:203** ***Honors Computational Genetics (Honors) (3)***
Honors computational genetics is a computer-based laboratory course that introduces students to the use of computers in biological research. This course is for students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. In the first half of the course, students will receive instruction in introductory computer programming (Python). In the second half of the course, students will practice writing code in Python via in-depth computational projects in genetics and genomics. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on

assignments. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and genomic data analysis. Prior experience with computer programming is neither necessary nor is it expected for students who enroll in this course.

This course is for freshman or sophomore Honors students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major.The course fulfills the laboratory requirement for the Genetics major.
***Prerequisites: Students must be in their first or second year at Rutgers in an approved Honors program (e.g., the Honors College or the SAS Honors Program). General Biology I (01:119:115) and be at least co-registered for General Biology II (01:119:116)) or have placed out of these two courses (e.g., through AP credit or approved transfer credit). Credit not given for both 01:447:203 and 01:447:302.***

**01:447:216** ***Analysis of Scientific Literature (Honors) (3)***
A systematic approach to the reading, analyzing, and understanding of primary literature in genetics; emphasis will be placed on data analysis and experimental design and demystifying the process of reading a scientific journal article.
***Prerequisites: 01:119:115-116. Highly recommended: 01:694:215. Open only to freshmen and sophomores in the SAS or SEBS Honors Program. By permission only.***

**01:447:245** ***Introduction to Cancer (3)***
Introduction to Cancer provides the student with an overview of conventional and state-of-the-art aspects of oncogenesis. Students will become familiar with the process involved in neoplastic transformation to the cancer phenotype through aspects of epidemiology, pathophysiology, virology, in vitro and in vivo cellular transformation and genetics. They will then apply these aspects to the understanding of classic therapeutic modalities and new state-of-the-art rational therapies. This comprehensive course will concentrate on the human disease process by applying clinical aspects of oncogenesis during a series of Grand Rounds discussions that will include recent patient clinical cases and their outcomes.
***Prerequisites: 01:119:115-116. Credit not given for both this course and 01:447:495.***

**01:447:302** ***Quantitative Biology and Bioinformatics (3)***
Introduction to the use of computers and computer programming to develop applications for research in genetics and molecular biology. Application topics will include evolutionary genetics, association analysis and genetics mapping, and structural biology.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill an elective requirement or taken instead of 01:447:315 Introduction to Research in Genetics by students majoring in Genetics. Credit not given for both 01:447:203 and 01:447:302***

**01:447:303** ***Computational Genetics of Big Data (3)***
The main focus of this course is the application of R programming to the analysis of genetic data, particularly big data sets with multiple measurements. The primary data sets considered will contain RNA-seq and/or other expression data for multiple/all genes in a given set of individuals. This course is for junior or senior students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. Students will learn how to acquire such data, format it for R, plot the data, and perform statistical analyses. In addition, students will learn how to simulate data under different hypotheses, and how to perform power and sample size calculations

for different statistical methods applied to real or simulated data. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on assignments. Guest investigators will frequently make short presentations (in person or by skype) to provide illustrations of how programming and informatics is critical for their research. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and data analysis.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course.***

**01:447:315** *Introduction to Research in Genetics (3)*
Basic principles and methods of research with microbial model systems used in the analysis and manipulation of genes, followed by a research project in molecular genetics.
***Prerequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 (or equivalent) or 01:160:163-164, 171. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course. Credit not given for both this course and 01:694:315. Open only to genetics majors***

**01:447:354** *Social, Legal, and Ethical Implications of the New Genetics (3)*
Social, legal, and ethical implications of new modern genetic techniques, for example: genetic screening, stem cells and cloning, forensic genetics, genetic engineering of plants, animals, and humans, genetic enhancement, gene therapy, and the new eugenics.
***Prerequisites: Genetics (01:447:380) or Genetics Analysis (01:447:384)***

**01:447:356** *Evolutionary Medicine (3)*
In this course, we examine human health from an evolutionary perspective, exploring the impact that our evolutionary heritage has on modern human diseases, both chronic and infectious. We will learn how the framework of evolutionary biology and modern genetic tools can inform our understanding of issues relevant to clinical and public health. Rather than focus on the immediate mechanisms underlying disease, we will endeavor to understand the ultimate factors that influence susceptibility, such as past natural selection. The course topics are wide-ranging, but particular attention is paid to emerging infectious diseases, as well as non-communicable diseases that may be exacerbated by facets of modern lifestyles.

Through lectures, critical analysis of the primary literature and popular science news, and class discussions, students will learn how evolutionary principles can be practically applied to medicine. Key readings each session will focus on genetic techniques for understanding evolutionary medicine, while additional readings will incorporate perspectives from diverse fields.

By fully participating in this course, students will be able to appreciate how modern susceptibility to non-communicable and infectious diseases has been influenced by past evolutionary processes; critically evaluate evolutionary hypotheses related to health and medicine, including those found in popular science articles; and know how genetic techniques are applied within an evolutionary framework to understand ultimate reasons for disease.
***Prerequisites: (01:447:380 or 384) AND (01:960:401 or 01:960:212).***

**01:447:370** *Developmental Genetics (3)*
How genes influence the developmental processes of an organism. Topics include gene regulatory networks, signaling pathways, stem cell biology, and the role of developmental genetics in human disease.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:380** *Genetics (4)*
Introduction to the mechanisms of heredity and evolution. Mechanisms of Mendelian inheritance, meiosis, recombination, gene mutation, and mapping, and an introduction to modern biochemical, molecular, and population genetics.
*Lec. 3 hrs., rec. 1 hr. Prerequisites: 01:119:115-116 and 01:160:161-162 or 01:160:163-164. Credit not given for both this course and 01:447:384-385 or 11:067:328 or 11:776:305.*

**01:447:382** *Genetics Laboratory (1)*
Laboratory to accompany 01:447:380. Not accepted for elective credit for Genetics majors.
*Lab. 3 hrs. Pre- or corequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)*

**01:447:384-385** *Genetic Analysis I,II (4,4)*
Experimental methods and concepts in genetics, with emphasis on their application to genetic research. Part I covers transmission genetics and breeding analyses, basic molecular genetics, isolation and characterization of mutations, and chromosome structure and function. Part II covers mathematical genetics, recombinant DNA, genomics, and special topics relevant to modern genetic research.
*Open only to majors in genetics or by permission of instructor. Credit not given for both this course and 01:447:380 or 11:067:328 or 11:776:305. Prerequisites for 01:447:384 are 01:119:115-116 (General Biology I & II) or 01:160:161-162 or 01:160:163-164 (General Chemistry I & II). Prerequisite for 01:447:385 is 01:447:384.*

**01:447:390** *General Microbiology (4 includes laboratory)*
Microorganisms are an essential component of the human environment and are significant not only for the disease they cause, but also for their ecological, agricultural, pharmaceutical, and industrial benefits. This course will introduce students to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms and their applications. The lab component of the course will introduce microscopy and staining techniques, the growth cycle and generation of a standard curve, physiological characteristics of microorganisms, and bacterial transformation. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include: History and Overview of Microbiology, Cell Structure and function, Microbial Growth, Nutrition, culture, and metabolism, Virology, Bacterial genetics, Microbial evolution and systematics, Bacteria and Archaea, Nutrient cycles, Genetic Engineering and Biotechnology, Waste treatment, Anaerobic respiration and Nitrogen fixation, Antibiotics and chemotherapeutic agents, Normal Flora, Virulence, Toxins, Epidemiology, and Microbial Diseases.

This is an upper-level course that focuses on the basic principles of microbiology. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include:
*Prerequisites: General Biology 01:119:115-116-117 or 01:119:101-102 and General Chemistry 01:160:161-162-171 (or higher) and Organic Chemistry 01:160:307. Credit not given for both this course and 11:680:390.*

**01:447:392** *Pathogenic Microbiology (3)*
This course will integrate basic microbiology and infectious diseases. The first quarter of the course will provide the conceptual basis of microbial morphology, metabolism and growth, heredity and variation, pathogenicity and antimicrobial chemotherapy. Then this course will introduce the students to one real life patient case study each week, moving the course toward an understanding of specific human diseases (e.g., pharyngitis, meningitis) as might be expected in a clinical environment. Each case will include a patient history, differential diagnosis, clinical cues, laboratory data, pathogenesis, treatment and prevention, additional points and references. The objective is not to attempt to cover every infectious disease or microorganism, but rather to use examples that would stress the key

principles of microbial pathogenesis, differential diagnosis and appropriate treatment and prevention. This course is intended for Life Science majors or those with a strong background in the Biological Sciences.
***Prerequisites: General Biology (01:119:115-117), General Chemistry (01:160:161-162-171), and Organic Chemistry (01:160:305. and 01:160:315. Systems Physiology is recommended.***

**01:447:406-407** ***Research in Genetics (3)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Permission of department and cumulative grade-point average of 2.8 or better. Open only to students majoring in Genetics.***

**01:447:408-409** ***Honors in Genetics (3-6,3-6)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Open by permission to seniors majoring in genetics who meet the requirements for the departmental honors program. Corequisite: 01:447:414 (fall) and 415 (spring).***

**01:447:410** ***Research in Genetics - Writing Intensive (3)***
Research in Genetics- Writing Intensive is intended to provide you with an opportunity to engage in original laboratory research under the direct supervision of a faculty mentor, usually in the faculty member¿s research laboratory. You are expected to carry out your own research project. NOTE: this research requires a heavy commitment of time and effort and can impact your performance in coursework, especially if you have not yet managed the foundational material for the discipline. Fulfills the writing and communication requirements of the SAS Core Curriculum.
***Prerequisites: 01:447:302, 447:315, or permission of department. Registration is by special permission only. Cumulative grade-point average of 2.8 or better. Declared genetics major.***

**01:447:414** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods, and reference sections of their thesis and outline the results and discussion.
***Corequisites: 01:447:408. For seniors completing departmental honors; by special permission only.***

**01:447:415** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods and reference sections of their thesis and outline the results and discussion.
***Prerequisite: 01:447:408. Corequisite: 01:447:409. For seniors completing departmental honors; by special permission only.***

**01:447:430** ***Effective Communication Skills in Genetics (3)***
Communication is an essential part of science. Whether it is communicating research findings to other scientists or conveying complex concepts to a lay audience, a scientist must be able to effectively communicate their research to succeed. Communication in science is typically through publications, posters, or oral presentations. The goal of this course is to provide students practice in effectively communicating scientific findings. This includes preparing and revising an introduction for scientific papers, writing a research description for general audience, and preparing and

giving presentations (both oral and poster).
***Prerequisites: Declared major in Genetics; must have completed one semester of Research in Genetics, Advanced Independent Study, or Genetic Counseling Rotation. By special permission only.***

**01:447:451** *Genomes (3)*
This course will focus on Genomics, Proteomics and Bioinformatics from a Genetics perspective. Special attention will be given to the organization and functioning of the human genome.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:460** *Genetics of Compulsive Behavior (3)*
Compulsive urge can be channeled toward productive endeavors such as a strong drive to succeed in competitions, schooling, and career. On the other hand, improper handling of compulsive urge may lead to problematic behaviors such as alcoholism, drug use, gambling, and other undesirable behaviors. There are also conditions that are medically defined as disorders, with certain types of compulsive behaviors as part of the diagnostic symptoms, such as OCD and ADD/ADHD. There is evidence that genetics contribute to compulsive behavior in humans, and research in animal models has begun to uncover the molecular factors that underlie the genetic basis of compulsive behavior. Discussion of primary literature and other scientific publications that deal with the molecular and genetic basis of compulsive behavior. Emphasis will be placed on the development of skills for critical thinking and effective writing.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:465** *Genetic Approaches and Research Analysis (3)*
This class will teach students how to read, interpret and analyze research articles. The class will follow an active learning format, where we will discuss seminal and recent research articles in depth: What was the scientific question or problem? What methods and strategies were used to address it? What were the findings and conclusions? What are the alternative interpretations and methods that could have been applied? What questions are remaining?
This class will expose students to a diverse selection of research literature, involving genetic and molecular analyses in model organisms such as mice, worms, flies and yeast. The class series will begin with a research article presented by the teacher. During the majority of the class series, students will be divided into groups of 4-5. Each group will be assigned one research article and be required to work together to a) interpret, b) analyze and c) present the article in the form of an oral presentation to the class. Students will be graded on their ability to perform each of these tasks and on active participation during presentations by other groups. All groups will also be required to complete and be graded on a written discussion summary assignment at the end of each article discussion. This summary assignment may take many forms, e.g., preparation of a graphical abstract, subway advert, or other creative forms of expression.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:470** *Evolutionary Developmental Biology (3)*
Evolutionary origins of the vertebrate body plan are major problems in biology. While paleontology and comparative anatomy have revealed the evolutionary trajectories of the organs, recent genetics, genomics and embryology are becoming powerful tools to answer classical questions. The goals of this course are twofold; 1) obtain fundamental knowledge of anatomy, embryology, and the latest genomics and 2) learn how to integrate genetics, genomics and embryology to answer evolutionary questions through active discussion in the classroom. The training to discover and answer scientific questions in animal diversity will be performed at the American Museum of Natural History.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:478,479** ***Special Topics in Genetics (3,3)***
Directed readings and discussion of selected topics of special interest in genetics. Topics will vary according to semester and/or instructor.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:480** ***Topics in Molecular Genetics (3)***
Current research topics in microbial and molecular genetics. Lectures, discussions, and critical analyses of journal articles.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:484** ***Behavioral and Neural Genetics (3)***
Influence of genetics on the nervous system and behavior of various organisms. Overview of field including experimental analysis of behavior, development of the nervous system, and sensory systems. Emphasis on reading and interpreting original research,
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:488** ***Genetic Counseling Rotation (3)***
The goal of this course is to provide students with an understanding of the genetic counseling career. Students will be placed at a local Genetic Counseling clinic to shadow a genetic counselor for one semester. During the semester, the student is expected to spend 8-9 hours a week at the rotation plus meet weekly with course director (attendance is mandatory). Course grade will be based on 1) Case presentation to Genetic Counseling group 2) ten Genetic Counseling case summary logs, and 3) evaluation by the clinical supervisor.
***Prerequisites: Declared Genetics major, cumulative GPA of 2.8 or greater, and accepted into the undergraduate Genetic Counseling Certificate Program (GCCP).***

**01:447:489,490** ***Advanced Independent Study in Genetics (3,3)***
Advanced independent study in Genetics is an opportunity for students to complete a scholarly project under the direct supervision of a faculty mentor. Projects are varied; e.g. library research on a topic of mutual interest to both the student and the faculty member, computer simulations, informative website design, or development of teaching materials. This course may not used for laboratory research.
***Prerequisites: 01:447:384 and permission of department. Open only to students majoring in Genetics***

Life Sciences (SAS)

# Molecular Biology and Biochemistry 694

# MOLECULAR BIOLOGY AND BIOCHEMISTRY 694

Department of Molecular Biology and Biochemistry, School of Arts and Sciences

**Website:** Here

**Chair:** Barth Grant

**Undergraduate Chair:** Samuel Gunderson

**Professors:**

Gyan Bhanot, B.S., Baroda (India); Ph.D., Cornell

Steven J. Brill, B.S., Maryland; Ph.D., SUNY (Stony Brook)

Monica Driscoll, B.A., Rutgers; Ph.D., Harvard

Isaac Edery, B.S., Ph.D., McGill (Canada)

Barth Grant, B.A., Virginia; Ph.D., Princeton

Kenneth D. Irvine, B.A., Williams College; Ph.D., Stanford

Fumio Matsumura, B.A., Tokyo; Ph.D., Nagoya (Japan)

Konstantin V. Severinov, M.Sc., Moscow State; Ph.D., Russian Academy of Sciences

Ruth Steward, B.S., Ph.D., Basel (Switzerland)

Andrew K. Vershon, B.A., Bennington College; Ph.D., Massachusetts Institute of Technology

Eileen P. White, B.S., Rensselaer Polytechnic Institute; Ph.D., SUNY (Stony Brook)

**Associate Professors:**

Stephen Anderson, A.B., Ph.D., Harvard

Sam Bunting, B.A., Oxford; Ph.D., Cambridge

Guoping (Sam) Gu, B.A., Peking (China); Ph.D., California (Santa Cruz)

Samuel I. Gunderson, B.S., Minnesota; Ph.D., University of Wisconsin, Madison

Mikel Zaratiegui, B.S., Ph.D., Navarra (Spain)

**Assistant Professors:**

Annika Barber, B.S., Bryn Athyn College; Ph.D., Thomas Jefferson

Jia Fei, B.S., Yunnan (China); Ph.D., Zurich (Switzerland)

Tina Liu, B.S. Yale; Ph.D. Harvard

Yang Lyu, B.S. Beijing, China; Ph.D. Guangzhou, China

Kevin Monahan, B.S., Haverford; Ph.D., Harvard

**Assistant Teaching Professor:**

Gabe Villegas B.A., Rutgers; Ph.D., Rutgers


- Learning Goals
- Entry Requirements of the Major
- Major Requirements

- Course Requirement Options
- Research Options
- Departmental Honors Program
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Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Molecular Biology and Biochemistry offers a course of study in which traditional and modern biochemistry are integrated with studies in molecular biology. In addition to traditional courses, students are required to carry out undergraduate research work in a Rutgers professor¿s lab who serves as the host and mentor. This course of study prepares students for graduate studies in molecular biology and biochemistry and related fields, entry into professional schools in medicine or other health professions, or employment in industries (e.g., biotechnology, pharmaceuticals) in which molecular biology and biochemistry skills are in demand. The same learning goals are also used for nonmajor students taking molecular biology and biochemistry courses.

*Learning Goals:*

I. Students should demonstrate an understanding of the knowledge that is needed to begin biomedical research and that is required for postgraduate exams and studies.

II. Students should demonstrate the ability to find and evaluate information about specific biological systems or problems.

III. Students should demonstrate the ability to design experiments and critically analyze data.

IV. Students should demonstrate the ability to communicate their research and findings orally through seminar and poster presentations and through written research papers.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

The molecular biology and biochemistry (MBB) major is open to students beyond their first year who have a 2.0 cumulative grade-point average and have received grades of C or better in courses taken toward the major, except by special permission of the department undergraduate chair. The MBB major is also open to first year students with AP credits. In all cases, students interested in the MBB major should contact the Undergraduate Director, Sam Gunderson.  A grade of C or better in all courses credited toward the major is required for graduation and each course may be repeated only once to replace D/F grades.

Departmental approval is required to declare the major in molecular biology and biochemistry. Students who want to register for the MBB major must first meet with the Undergraduate Chair Sam Gunderson, Nelson lab, Room A322/A320 (848-445-1016 gunderson@dls.rutgers.edu) to discuss details about the major.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

A core of courses is required for completion of the major in molecular biology and biochemistry. Students supplement the core with additional required and elective courses in one of three options. Given that molecular biology and biochemistry is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life science courses applied to the major in molecular biology and biochemistry should be taken within 10 years of graduating. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major. Returning students must meet with their adviser to discuss their path to graduation. All students are required to write research reports and present them at a seminar.

***Required Core Courses (58 credits)***

01:119:115-116 General Biology (4,4)*
01:119:117 Biological Research Laboratory (2)*
01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)*
01:160:171 Introduction to Experimentation (1)*
01:160:309 Organic Chemistry Laboratory (2) (recommended)* or 01:160:311 Organic Chemistry Laboratory (2)
01:160:315-316 Principles of Organic Chemistry (4,4) (recommended)* or 01:160:307-308 Organic Chemistry (4,4)
01:447:380 Genetics (4)*
01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4) *(recommended) or 01:640:135-136 Calculus for the Life and Social Sciences I,II (4,4)**
01:694:407 Molecular Biology and Biochemistry (3) or 01:694:395 Biochemistry for the Life Sciences (3)
01:694:315 Introduction to Molecular Biology and Biochemistry Research (3) or 01:694:215 Honors Introduction to Molecular Biology and Biochemistry Research (4) or 01:694:214 Introduction to Molecular Biology Research (3) or 01:694:316 Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)
01:694:408 Molecular Biology and Biochemistry (3)
01:694:383 Molecular Biology and Biochemistry Seminar: Careers in Science (1)
01:694:484 Molecular Biology and Biochemistry Seminar: Research Presentations (1)
01:750:203-204 General Physics (3,3)***

01:750:205-206 General Physics Laboratory (1,1)***

*Life sciences core course
**01:960:401 Basic Statistics for Research (3) or 01:960:211-212 Statistics I,II (3,3) may be substituted for the second semester of calculus.
***01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

Life Sciences (SAS)

# Course Requirement Options

# Course Requirement Options

In addition to the required core courses, the Department of Molecular Biology and Biochemistry (MBB) offers two course options to students to fulfill the requirements for the major. Course option one comprises taking advanced electives and is intended to expose MBB students to different current topics in molecular biology and biochemistry. Course option two is for students interested in biophysical questions and research and comprises taking Physical Chemistry and Multivariable Calculus. Students completing course option two will also receive a minor in chemistry are encouraged to take the physical chemistry courses as they will fulfill the minor requirements. Course option two is intended to expose MBB students to different current topics in molecular biology and biochemistry.

*Course Option One (13 credits)*

Two 3-credit courses offered by the MBB department from the following list: 01:694:230; 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

One 400-level, 3-credit elective course offered by any department in the Division of Life Sciences or approved by the MBB department. See degree navigator or the MBB department website for a list of approved courses.

*Course Option Two (9 credits)*

01:160:341-342 Physical Chemistry: Biochemical Systems (3,3) or 01:160:327-328 Physical Chemistry (3,3) (requires 01:640:251 as a prerequisite). Other combinations of Physical Chemistry are possible so see degree navigator for further details.

01:640:251 Multivariable Calculus (4)

One 3-credit course offered by the MBB department from the following list: 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

*Electives*

Because the list of approved electives is changing, students should discuss their elective options directly with their departmental faculty advisers and with the MBB Undergraduate Director, Sam Gunderson. A list of currently approved electives can be found on the MBB department website. In addition to the undergraduate courses listed, advanced students are encouraged to choose electives from the School of Graduate Studies.

Life Sciences (SAS)

# Research Options

# Research Options

The Department of Molecular Biology and Biochemistry (MBB) offers two laboratory research options (laboratory option one and laboratory option two), as well as a nonlaboratory research option (nonlaboratory option). In all cases, students must take one of the Introduction to Molecular Biology and Biochemistry Research courses (01:694:214, 01:694:215, 01:694:315, or 01:694:316) and 01:694:383, 484 Seminars in Molecular Biology and Biochemistry. Course 01:694:215 is only for first-year honors students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:214 is for first-year students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:315 is for either qualified sophomores or junior students in the major. Course 01:694:316 is for either qualified sophomores or junior honors students in the major.

*Laboratory Option One (>12 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6,2-6)

01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (6,6)

A minimum of 12 credits is required in research courses. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Laboratory Option Two (6 to 11 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6) or 01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (4-6,4-6)

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

A minimum accumulation of 6 credits is required in research courses. Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Note that students applying for honors must complete 4 up to 6 credits of honors coursework per semester for two semesters. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Nonlaboratory Option (9 credits)*

01:694:489,490 Literature Research in Molecular Biology and Biochemistry (3,3). This non-lab option is almost never used and will need approval from the Undergraduate Director, Sam Gunderson

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Students taking this option may not apply for departmental honors.

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have attained, at the end of the junior year, a cumulative grade-point average of at least 3.4 and a grade-point average of 3.4 or better in courses required for the major. Exceptional students not meeting these criteria but wishing to apply for honors research may petition the Department of Molecular Biology and Biochemistry at the beginning of their senior year. Students accepted into the program are expected to complete two semesters (6 credits per semester) of honors coursework. A written honors thesis and an oral thesis presentation are required. Students enrolled in 01:694:495,496 Honors Laboratory Research or any of the various school honors programs are eligible to receive departmental honors at the time of graduation.

Life Sciences (SAS)

# Courses

# Courses

**01:694:214** ***Introduction to Molecular Biology Research (3)***
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities available to undergraduates at the university.
***Prerequisites: For first-year students only who have placed out of General Biology (01:119:115,116, and 117) with AP credits, and 01:160:161 or 01:160:163. Corequisite: 01:160:162 or 164.***

**01:694:215** ***Honors Introduction to Molecular Biology and Biochemistry Research (4)***
Basic principles and methods of research, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisite: Limited only to first-year SAS Honors Program or Honors College students who have placed out of General Biology (01:119:115,116, and 117) with AP credits. Corequisites: 01:160:161 or 01:160:163 (or AP credits) and 01:640:135 or 01:640:151 (or AP credits).***

**01:694:230** ***Analytical Methods in Biology (3)***
Mathematical methods and tools to analyze and interpret biological and biomedical data, including probability theory; Bayes Theorem; the binomial, Poisson, and normal distributions; limit theorems; error analysis; tests of statistical significance; parameter estimation; curve fitting; sampling techniques; random number generation; and Monte Carlo methods. Analysis of sequencing and microarray data, such as sequence alignment, phylogeny inference, population structure, selection, and human migration.
***Prerequisites: 01:119:115-116 and 01:640:135 or 151.***

**01:694:281,282** *Sophomore Laboratory Research (2-6,2-6). 281 is Fall, 282 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Credits in this course cannot be used toward the required research credits for laboratory option. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:283** *01:694:283 Undergraduate Laboratory Research (2-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
Typically for rising Juniors and Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

***Prerequisite: Students must complete a special permission form and have it signed by their research and MBB faculty mentors before they can register of the course.***

**01:694:301** *Introductory Biochemistry and Molecular Biology (3)*
Chemistry and metabolism of proteins, carbohydrates, lipids, nucleic acids, and other biologically important compounds.
***Prerequisite: 01:160:209 or 307. Not for students majoring in molecular biology and biochemistry. Credit not given for both this course and 01:694:407, 11:115:301, or 11:115:403.***

**01:694:313** *Introductory Biochemistry Laboratory (1)*
Techniques used in research, clinical, and food laboratories, including tests of biological materials, methods of separation, and determination of enzyme activities.
***Lab. 3 hrs. Pre- or corequisite: 01:694:301. Not for students majoring in molecular biology and biochemistry.***

**01:694:315** *Introduction to Molecular Biology and Biochemistry Research (3)*
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities at the university available to undergraduates.
***Pre- or corequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 or 01:160:163-164, 171. Credit not given for both this course and 01:447:315, 01:694:214, 215, or 316. Open only to MBB majors.***

**01:694:316** *Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)*
Basic principles and methods of research in molecular biology, biochemistry, and genetics, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisites: 01:119:116 and (01:160:162 or 01:160:164). For MBB or genetics majors only or those planning on being MBB or genetics majors. Special permission required.***

**01:694:381,382** *Undergraduate Laboratory Research (3-6,3-6). 381 is Fall, 382 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:383** *Molecular Biology and Biochemistry Seminar: Careers in Science (1)*
Discussion of career options in the life sciences, finding a research laboratory, performing literature searches, reading a scientific paper, and creating posters and abstracts. This course should be taken in the beginning of the third year.
*Open to MBB majors only.*

**01:694:384** *Undergraduate Laboratory Research (1-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

*For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.*

**01:694:385** *MBB Research and Writing (3)*

Research project in the laboratory of a faculty member. Seminar on science communication. Written and oral reports of research carried out during the semester required.

*Prerequisites: MBB majors only. Students need a GPA of 2.8 or better to enroll in research.*

**01:694:390** *Introductory Computational Biology (3)*
Disciplines of biochemistry and molecular biology and genomics all include collection and analysis of large data sets. Hands on use in a computer lab will permit students to learn and apply computer languages such as Python and R to analyze large data including for example DNA mutations and structural variations (SVs), RNA-seq and ChIP-seq as part of understanding genes and gene regulation.
*Prerequisite: 01:447:380 or 01:447:384*

**01:694:395** *Biochemistry for Life Sciences (3)*
The course is intended for life science majors and takes a holistic approach to Biochemistry. You will learn the basics of proteins, enzymology, nucleic acids and metabolism and use these as foundations to discuss exemplary metabolic pathways for their importance to homeostasis and, when dysregulated, to disease including observable phenotypes and what current strategies are used to treat these disorders. Coursework will consist of quizzes, homework, exams and one graded paper.

*Prerequisites: 01:160:307 or 01:160:315*

**01:694:407** *Biochemistry (3)*
Protein structure and function, structure of lipids, membranes and carbohydrates, catalysis of biochemical reactions, intermediary metabolism, oxidative phosphorylation, membrane transport, lipid metabolism, signal transduction, photosynthesis, protein secretion, targeting and turnover, nitrogen, amino acid, and nucleotide metabolism.
*Pre- or corequisites: 01:160:307-308 or 315-316. Credit not given for both 01:694:407 and 01:694:301, 11:115:301, or 11:115:403.*

**01:694:408** *Molecular Biology and Biochemistry (3)*
Disciplines of biochemistry and molecular biology as interlocking and mutually complementary fields of study. Lectures on structure of DNA, RNA, recombinant DNA approaches, DNA replication, repair and recombination, mobile genetic elements, transcription, gene regulation, RNA splicing, translation, and viral gene expression.
***Prerequisite: 01:694:407 or 01:694:301 or 01:694:395 or 11:115:403. Credit not given for both 01:694:408 and 01:146:478 or 11:126:481.***

**01:694:411** *Molecular Pathways and Signal Transduction (3)*
Lectures and discussion of current research areas of advanced molecular and structural biology: transcription, posttranscriptional regulation, cell cycle, neurobiology, protein folding, macromolecular recognition, and molecular virology.
***Pre- or corequisites: 01:694:407 and 408, or 01:447:384-385 or 11:115:403-404 or 11:126:481.***

**01:694:412** *Proteomics and Functional Genomics (3)*
Survey of modern techniques of protein biochemistry, bioinformatics, proteomics, and functional genomics, including basic concepts of protein structure and function, protein folding, protein characterization and purification, enzyme kinetics, NMR and X-ray crystallography, mass spectrometry, yeast two hybrid, and various techniques and approaches to functional and structural genomics.
***Prerequisites: [(01:694:301 OR 01:694:407 OR 01:694:395) AND (01:447:380) OR (01:447:384)]***

**01:694:413** *Chromatin and Epigenomics (3)*

Introduction to chromatin dynamics, particularly the structural and biochemical modifications of chromatin that underlie epigenetic states and their effects on gene expression and development.

***Pre- or corequisites: Prerequisite: 01:694:408 or 01:146:478 or 01:447:385.***

**01:694:420,421** *Special Topics in Molecular Biology and Biochemistry (3,3)*
Directed reading and discussion of selected topics of special interest in molecular biology and biochemistry. Topics will vary according to semester and/or instructor.
***Pre- or corequisites: [(01:694:301 or 01:694:407) and (01:447:380 or (01:447:384)] or equivalent.***

**01:694:481,482** *Advanced Undergraduate Laboratory Research (BA, BA). 481 is Fall, 482 is Spring.*
Research project in the laboratory of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484.

**01:694:484** *Molecular Biology and Biochemistry Seminar: Research Presentations (1)*
Oral presentation of student's own research results and the research interests of the laboratory with which the student is associated. Presentation at a required poster session.
***Students should take this course in the spring semester of their senior year. MBB majors only.***

**01:694:489,490** *Literature Research in Molecular Biology and Biochemistry (1-3,1-3)*
Literature research projects on a selected subject under the direction of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484. This course is rarely used, therefore contact the Undergraduate Director if you are considering to take this course.
***Prerequisites: 01:694:214, 215 or 315, 407, 408, and 383.***

**01:694:492** ***Gene Regulation: Clocks to Cancer (3)***
Explanation of MBB as an experimental science and how molecular biologists know what they know. Covers all aspects of gene regulation from transcription to protein modification to explain how 25,000 human genes can make millions of different protein isoforms and mRNA and ncRNA. Mechanisms of molecular clocks and cancer addressed in terms of gene regulation complexity,feedback loops and rate-limiting steps with emphasis on the methods, experimental design,
***Prerequisites:(01:694:407 BIOCHEM) OR (01:447:384 GEN ANALY) OR (11:126:481 MOLE GEN) OR (11:115:403 GEN BIOCHEM) OR (01:694:395 BioChem LS)***

**01:694:495,496** ***Honors Laboratory Research (BA)***
Two-semester-long Honors research project in the laboratory of a faculty member. In the Fall semester, 01:694:495 students are required to attend a seminar each week on writing a thesis and preparing an oral thesis presentation. In the Spring semester, students take 01:694:496 where they complete their Honors thesis and give their oral presentation to their honors committee.

# Linguistics 615 (SAS)

## LINGUISTICS 615

Department of Linguistics, School of Arts and Sciences

**Website:** Here

**Chair:** Kristen Syrett

**Undergraduate Program Director:** Troy Messick

**Distinguished Professors:**

Mark Baker, B.S., Ph.D., Massachusetts Institute of Technology

**Professors:**

Akinbiyi Akinlabi, B.A., M.A., Ph.D., University of Ibadan (Nigeria)

Viviane Déprez, Licence, Strasbourg (France); M.A., Syracuse; Ph.D., Massachusetts Institute of Technology

Kristen Syrett, B.A., Catholic University; M.Ed., Loyola; Ph.D., Northwestern

Bruce Tesar, B.S., Western Michigan; M.S., Ph.D., Colorado (Boulder)

**Associate Professors:**

Adam Jardine, B.A., New Hampshire; Ph.D., Delaware

Adam McCollum, B.A., Presbyterian College; M.A., Florida; Ph.D., California (San Diego)

Yimei Xiang, B.A., Peking University; Ph.D., Harvard

**Assistant Professors:**

Dorothy Ahn, B.A., University of Pennsylvania; Ph.D., Harvard

Maria Kouneli, B.A., Yale, Ph.D., New York University

Troy Messick, B.A., Michigan; M.A., Ph.D., Connecticut

**Associate Teaching Professor:**

Crystal Akers, B.A., Swarthmore College; Ph.D., Rutgers

**Assistant Teaching Professor:**

Barnali Mazumdar, B.A., University of Calcutta; M.Phil. Jawaharlal Nehru University, Ph.D., Louisiana State University

**Faculty Emeriti:**

Maria Bittner, B.A., Oxford; Ph.D., Texas (Austin)

José Camacho, Licenciatura, Universidad Complutense de Madrid; M.A., Ph.D., University of Southern California

Veneeta Dayal, B.A., M.A., M.Phil., Delhi University; Ph.D., Cornell

Paul de Lacy, B.A., M.A., Auckland (New Zealand); Ph.D., Massachusetts (Amherst)

Jane Grimshaw, B.A., University College London; Ph.D., Massachusetts (Amherst)

Alan Prince, B.A., McGill; Ph.D. Massachusetts Institute of Technology

Kenneth Safir, B.A., Massachusetts (Amherst); Ph.D., Massachusetts Institute of Technology



# Learning Goals

# Learning Goals

**Learning Goals for Linguistics Majors and Minors**

Students will be able to reason about language scientifically; demonstrate knowledge of cross-linguistic variability and universal patterns in language; evaluate a range of views on the nature, origin, and/or structure of language; and identify what someone knows when they know a language.

Majors and minors who complete the core courses in linguistics will demonstrate technical mastery over the tools of linguistic analysis in syntax, phonology, semantics, and pragmatics and apply linguistic theory in these areas. They will be able to investigate and analyze linguistic data; demonstrate strong problem-solving skills; extend their understanding of theoretical linguistics into other domains of linguistic research; apply the techniques of linguistics to new topics; and access current research in the field.

Linguistics 615 (SAS)

# Major Requirements

# Major Requirements

A major in linguistics consists of 12, 3-credit courses offered by the School of Arts and Sciences, distributed as follows:

1. Introduction: one introductory course (01:615:201)

2. Theory: four B core theoretical courses (01:615:305, 315, 325, 350)

3. Electives: six courses

a. At least three (3-6) C courses chosen from a list of linguistics courses at the 300 level or above

b. At most three (0-3) D courses chosen from a list of linguistics courses at the 300 level or above and/or from the list of approved courses from outside the department

4. Capstone experience: either a senior honors thesis (01:615:495/496) or the advanced seminar (01:615:497)

Grades of C or better must be earned in all coursework that is to be applied to the major.

Linguistics 615 (SAS)

# Minor Requirements

# Minor Requirements

A minor in linguistics consists of seven 3-credit courses offered by the School of Arts and Sciences, distributed as follows:

1. Introduction: one introductory course (01:615:201)

2. Theory: three B core theoretical courses (options: 01:615:305, 315, 325, 350)

3. Electives: three courses

a. At least one B or C course chosen from a list of linguistics courses at the 300 level or above.

b. Two C or D courses chosen from a list of linguistics courses at the 300 level or above and/or from the list of approved courses from outside the department.

Grades of C or better must be earned in all coursework that is to be applied to the minor.

Linguistics 615 (SAS)

# Bachelor of Arts in Speech and Hearing Sciences in Linguistics

Bachelor of Arts in Speech and Hearing Sciences in Linguistics

1. Introduction: One introductory course (01:615:201)

2. Theory: four B core theoretical courses (01:615:305, 315, 325, 350)

3. Electives: six courses

The required number of courses from 3 of the following sets of courses:

a. 2 courses from (01:615:440, 01:615:451)

b. 1 course from Linguistics Courses Group C

c. 3 Courses from (Linguistics Courses Group C or D)

4. Capstone experience: One course from (01:615:495, 496).

Grades of C or better must be earned in all coursework that is to be applied to the major.

5. Certificate in Speech and Hearing Sciences - Required Courses:

A total of 5 courses from (01:615:391, 01:615:392, 01:615:393, 01:615:440, 01:615:451).

6. Certificate in Speech and Hearing Sciences - Electives:

Elective Set I: A total of 3 credits from (Cognitive Science, Education, Psychology, Statistics electives).

And

Elective Set II: A total of 3 credits from (Biology, Chemistry, Physics electives).

Linguistics 615 (SAS)

# Certificate in Speech and Hearing Sciences

Certificate in Speech and Hearing Sciences

Linguistics 615 (SAS)

# Departmental Honors Program

Departmental Honors Program

All students graduating with at least a 3.8 GPA in the linguistics major are designated as graduating with departmental honors. Only those students completing a senior honors thesis are eligible for high or highest honors.

To be considered for a senior honors thesis, a student must have a cumulative grade-point average of 3.0 or better and a grade-point average of 3.6 or better in courses counting toward the linguistics major. Linguistics majors intending to write a senior honors thesis who have an agreed-upon faculty advisor must then submit a written proposal to the undergraduate program director and their faculty advisor no later than May 31 of their junior year. This proposal should clearly indicate the proposed thesis topic, the faculty advisor, and a general plan for working together with the advisor over the summer (optional) and into the next academic year. These details may be rather general, and specified at a later time.

Students selected to participate in the program enroll in 01:615:495 and 496 and spend two semesters researching and writing an honors thesis under the supervision of a faculty member in the Department of Linguistics.

The thesis must be submitted by March 31 of the senior year. An oral examination on the thesis is given by a thesis evaluation committee consisting of at least two linguistics department faculty members and a possible graduate student in linguistics in the first two weeks of April. The committee does not include the student's thesis supervisor.

On the basis of the thesis committee's report and if necessary, in consultation with the undergraduate program director and the faculty advisor, the department determines whether the student is to be recommended for high or highest departmental honors.
All honors thesis students are designated as Paul Robeson Scholars. Only those thesis students earning highest honors are nominated for the Henry Rutgers Scholar Award, evaluation of which is conducted outside of the department by a separate School of Arts and Sciences committee.

Linguistics 615 (SAS)

# Student Awards

# Student Awards

Department of Linguistics Award for Academic Excellence: Awarded to a linguistics major with the highest GPA in linguistics, and who demonstrates overall academic excellence.

Department of Linguistics Award for Research Excellence: Awarded to a linguistics major who has demonstrated outstanding accomplishments in research and promise as a researcher.

Robert Jeffers Memorial Award: Awarded to a linguistics student in recognition of outstanding leadership and service in the Department of Linguistics.

Linguistics 615 (SAS)

# Courses

# Courses

**01:615:101** ***Exploring Language (3)***
Wide-ranging examination of human language as a social, cultural, cognitive, historical, and formal phenomenon.
***May not be used for major or minor credit.***

**01:615:190** ***Invented Languages (1.5)***
Introduction to linguistic properties of familiar and less familiar languages, natural and artificial. Content varies depending on the language or languages chosen.
***May not be used for major or minor credit.***

**01:615:191** ***Linguistics, the Internet, and Social Media (1.5)***
Examination of language use on the internet and in social media through scholarly and popular sources. Investigation of current trends using linguistics research methodologies. Content varies to emphasize timely linguistic trends.
***May not be used for major or minor credit.***

**01:615:201** ***Introduction to Linguistic Theory (3)***
Structural properties of human language as illuminated by modern linguistic theory. Sentence structure, sound patterns, word form, and aspects of meaning. Principles of Universal Grammar.
***Required for all majors and minors; serves as a prerequisite for most other courses. Credit not given for both this course and 01:730:421.***

**01:615:215** ***Language of Advertising (3)***
Examines advertising strategies from a linguistic perspective, focusing on how sounds, sentence structures, and meanings are used in persuasive messages.

**01:615:305** ***Syntax (3)***
Structure of phrases and sentences in natural language. Universal grammar and interlinguistic variation. X-bar theory. Case, NP- and Wh-movement, anaphora, binding, and government. Lexical representation. Logical form.
***Prerequisite: 01:615:201.***

**01:615:315** ***Phonology (3)***
Sound structure of language. Phonetic underpinnings; phonological representation; rule systems; constraint interaction. Syllable structure; feature geometry; vowel harmony; stress, accent, and tone.
***Prerequisite: 01:615:201.***

**01:615:325** ***Semantics (3)***
Meaning in natural language. Construction of the meaning of the whole from the meaning of the parts. Syntactic structure and semantic interpretation. Model theoretic semantics.
***Prerequisite: 01:615:201.***

**01:615:330** ***Historical Linguistics (3)***
Change of language structure through time. Methods of reconstructing dead languages. Syntactic and phonological rule systems as locus of change. Language families; the deep reconstruction controversy.
***Prerequisite: 01:615:201.***

**01:615:350** ***Pragmatics (3)***
Relation of language to the discourse context. Language usage. Linguistic structure beyond the sentence level. Sample topics: conversational maxims, implicature, presuppositions, speech act theory, reference and deixis
***Prerequisite: 01:615:201.***

**01:615:371** ***Psychology of Language (3)***
Production, perception, and acquisition of language at the level of sound (phonology), words (morphology and the lexicon), and grammar (syntax).
***Prerequisite: 01:615:201. Credit not given for both this course and 01:830:351.***

**01:615:381** ***Sociolinguistics (3)***
Emphasizes insights into the use of language in society provided by a generative linguistics approach to natural language.
***Prerequisite: 01:615:201.***

**01:615:391** ***Anatomy and Physiology of the Speech Mechanism (3)***
Anatomy (structure) and physiology (function) of the systems and processes involved in speech production. Respiratory, phonatory, articulatory, resonatory, and nervous systems. Prerequisite content required for students planning to pursue a higher-level degree in the speech and hearing sciences, including speech pathology and audiology; emphasizes clinically relevant information.
***Prerequisite: 01:615:201.***

**01:615:392** ***Introduction to Communication Disorders (3)***
Introduction to the study of human communication disorders, from the typical acquisition of speech and language milestones to the nature, causes, assessment, and treatment of communication and swallowing disorders; examination of the professional roles and responsibilities of speech-language pathologists and audiologists. Required for a higher-level degree in the speech and hearing sciences.
***Prerequisite: 01:615:201.***

**01:615:393** ***Audiology (3)***
Introduction to the profession and practice of audiology through an overview of anatomy and physiology of the auditory system, physical properties of sound relevant to hearing assessment, techniques for hearing assessment, and auditory disorders. Covers the prerequisite content to pursue a higher-level degree in the speech and hearing sciences.
***Prerequisite: 01:615:201.***

**01:615:394** ***Speech and Hearing Science (3)***
Introduction to the fundamentals of speech and hearing science, as applicable to speech-language pathology and audiology. Students will develop an understanding of the basic physical properties of sound or pressure waves, learn about the acoustics and perception of speech, describe perceptual correlates related to these sound properties and the anatomy and physiology of the speech production and hearing mechanism related to these properties, and explain variability that occurs. Covers the prerequisite content to pursue a higher-level degree in the speech and hearing sciences.
***Prerequisite: 01:615:201***

**01:615:407** ***Francophone Linguistics (3)***
Study of advanced problems of syntax in French and Francophone dialects and Creole in conjunction with theoretical problems in linguistics.
***Prerequisite: 01:615:201 or 01:420:333. Credit not given for both this course and 01:420:407.***

**01:615:411** ***Morphology (3)***
Structure of words in natural language. Word formation and syntax. Effects of word structure on sound patterning. Inflection, derivation, compounding, headedness, and scope of affixes.
***Prerequisite: 01:615:305 or 315.***

**01:615:415** ***Evolution of the Human Language Capacity (3)***
Origins of the human language capacity in the evolutionary history of mankind.
***Prerequisite: 01:615:305, 315, 325, or 350.***

**01:615:420** ***Speech Acts (3)***
Investigation of philosophical issues surrounding how speakers use language to communicate. What goals do people accomplish by speaking? What resources does a language offer for achieving those goals? How do speakers deploy those linguistic resources to achieve their communicative goals on particular occasions?
***Prerequisite: 01:615:350. Credit not given for this course and 01:730:320.***

**01:615:421** ***Language Typology (3)***
Similarities and differences between grammatical systems, with focus on syntax. Role of principled variation in Universal Grammar. Overt and nonovert movement, pro-drop, case marking, and anaphora. Markedness.
***Prerequisite: 01:615:305.***

**01:615:425** ***Romance Linguistics (3)***
Comparison of principal syntactic and phonological structures of French, Spanish, Italian, and other Romance languages. Stress patterns; vowel and consonant shifts. Pro-drop language, inflection, and inversion. Contrast with English.
***Prerequisites: 01:615:201 and one of 01:615:305, 315, or 325.***

**01:615:431** ***Investigations into an Unfamiliar Language (3)***
Study of the linguistic structure of an unfamiliar language, based on in-class work with a native-speaking consultant.
***Prerequisite: 01:615:305, 315, 325, or 350.***

**01:615:435** ***Experimental Methodologies in Language Acquisition (3)***
A review of experimental methodologies used by linguists to investigate language acquisition, including an in-depth focus on the linguistic phenomena being acquired by the language learner. Hands-on experience designing experiments and analyzing data.
***Prerequisites: 01:615:305.***

**01:615:440** ***Language Development (3)***
Overview of child language development in the major subfields of Linguistics: phonology, morphology, syntax, semantics, and pragmatics. Covers child language production and comprehension, developmental milestones, theoretical frameworks, experimental methodologies, the role of the adult speaker, and multiple factors influencing language development. Involves hands-on work emphasizing communication with speech-language pathologists, parents, educators, and other professionals.
***Prerequisite: 01:615:201***

**01:615:441** ***Linguistics and Cognitive Science (3)***
Linguistic theory and the human mind/brain. Acquisition and processing of natural language. Parsing. Formal learning. Language deficits. Symbolic and connectionist approaches to language.
***Prerequisite: 01:615:305, 315, 325, or 350.***

**01:615:445** ***Language and Cognition (3)***
Understanding language and cognition. Language structure, linguistic and conceptual representations, and cognitive processes.
***Prerequisites: 01:185:201, 01:615:201. Credit not given for both this course and 01:185:410 or 01:185:340.***

**01:615:451** ***Phonetics (3)***
Articulatory mechanisms of speech. Physical characteristics of speech sounds; interpretation of spectrograms. Description and transcription of the sounds of the world's languages.
***Prerequisite: 01:615:305, 315, 325, or 350.***

**01:615:455** ***Computational Linguistics (3)***
An introduction to theoretical and practical issues in computational linguistics for linguistics majors. Students will learn basic programming techniques and apply them to the scientific study of language. Topics may include automata and formal language theory, regular expressions, syntactic and semantic parsing, functional programming, statistical methods, chatbots, and learning. No prior knowledge of programming or computer science is required.
***Prerequisite: 01:615:201.***

**01:615:461** ***Linguistics of Signed Languages (3)***
Introduces the fundamental structure of natural signed languages spoken around the world. Covers the essentials of signed language phonology, syntax, and semantics. Includes discussion of deaf culture and of art and media in the signed languages medium.
***Prerequisite: 01:615:201.***

**01:615:465** ***An Introduction to Prosody (3)***
Prosodic structure of language. Intonation in conversation, phonetic and phonological cues, sociophonetics of intonation, prosodic development, prosody in atypical populations and technological application. Prosody and intonation data collection and transcription.
***Prerequisite: 01:615:201 and either 615:315 or 615:451.***

**01:615:471** ***Selected Topics in Linguistics (3)***
Study of selected areas in linguistics.
***Prerequisite: 01:615:305, 315, 325, or 350.***

**01:615:481** ***Language and Law (3)***
Introduction to forensic linguistics. Examination of the linguistic analyses of language in legal settings and how language is used and interpreted by suspects, police, laws, and courts. Topics may include syntax, semantics, phonetics, phonology, morphology, pragmatics, and sociolinguistics.
***Prerequisite: 01:615:305, 315, 325, or 350.***

**01:615:491** ***Practicum in Linguistics (3)***
Linguistic research techniques. Participation in a research group that focuses on a specific topic, defined by the course instructor.
***Prerequisite: 01:615:305, 315, 325, or 350.***

**01:615:493,494** ***Independent Study (3,3)***
Independent research carried out under supervision of a linguistics faculty member.
***Prerequisites: Permission of major advisor and instructor.***

**01:615:495,496** ***Senior Honors Thesis (3,3)***
Supervised research and writing of a senior honors thesis.
***Prerequisites: Senior status; permission of major advisor.***

**01:615:497** ***Advanced Undergraduate Seminar (3)***
Students are introduced to a research topic. Work in small groups selecting a project related to the topic, with the goal of making a public presentation (e.g., poster, video, PowerPoint) at the end of the semester. Topics vary.
***Prerequisites: Open only to linguistics majors; special permission.***

Approved courses in other departments counting toward the major or minor as electives are listed on the Department of Linguistics website, in the undergraduate area (in the major/minor descriptions and course descriptions).

# Programs of Study: Majors and Minors (RBS-NB)

## PROGRAMS OF STUDY: MAJORS AND MINORS

The business studies program is only part of the student's academic program. Students will complement their professional education with coursework in the humanities, mathematics, natural sciences, and social and behavioral sciences. In order to design an integrated academic program, full-time students should plan their program over four years. During the first three semesters, the student should formulate a schedule that is comprised of the six prerequisite courses and liberal arts core curriculum requirements. During the remaining five semesters, the schedule focuses on completing the remaining credits required of the business major. Students should also plan to take additional general elective credits to ensure that their total degree credits equals 120, the number of credits needed for the bachelor of science degree. Business majors should consult with a Rutgers Business School: Undergraduate-New Brunswick advisor when they are planning their academic program.

The following are prerequisite courses that students must complete during their first three (four at most) semesters and before they are eligible to take additional business courses:

**Prerequisite Courses (19 credits)**
01:198:170 Computer Applications for Business (3)
01:220:102 Introduction to Microeconomics (3)
01:220:103 Introduction to Macroeconomics (3)
01:640:135 Calculus I (4)
01:960:285 Introductory Statistics for Business (3)
33:010:272 Introduction to Financial Accounting (3)

**Liberal Arts Core Curriculum Requirements (minimum 27 credits)**
In addition to the six eligibility courses and courses that are required for the major, all Rutgers Business School: Undergraduate-New Brunswick students must complete the following liberal arts core curriculum requirements:
1) Contemporary Challenges (two courses)
2) Areas of Inquiry (six courses)
3) Cognitive Skills and Processes (five courses).
All courses must be at least 3 credits and must be taken for degree credit. Pass/no credit courses may not be used to fulfill these requirements. Students should see Degree Navigator for specific courses and conditions.

**Major Requirements (56-62 credits)**
The major requirements for Rutgers Business School: Undergraduate-New Brunswick programs of study can be divided into two parts: business core course requirements that all students must complete regardless of their choice of major program (accounting, business analytics and information technology, finance, leadership and management, marketing, or supply chain management), and a combination of required and elective courses that students take according to their choice of major. Students must complete the requirements of the major that are in effect at the time of their admission into the major. All core courses and required courses specific to the major must be completed with a grade of C or better.

- 010 Accounting
- 136 Business Analytics and Information Technology (BAIT)
- 390 Finance
- 605 Leadership and Management
- 630 Marketing
- 799 Supply Chain Management
- 135 Business Administration Minor
- 382 Entrepreneurship Minor

# Marine Sciences 628 (SEBS)

## MARINE SCIENCES 628

**Marine Sciences 628**

**Degree:** B.S.

**Director:** Silke Severmann, Marine and Coastal Sciences Building, Room 303D, 848-932-3488 (silke@marine.rutgers.edu)

**Program Webpage:** Here

Marine science is the study of the marine environment and its interactions with the Earth, the biosphere, and the atmosphere. It is, therefore, an interdisciplinary science requiring a knowledge of the principles of physics, geology and geophysics, mathematics, chemistry, and biology. A major in marine sciences provides students with a broad curriculum in the sciences, which demonstrates how the different disciplines can be brought to bear on understanding marine processes and managing ocean resources wisely.

The major prepares students for graduate work in oceanography or one of the basic disciplines, civil service careers in environmental management, employment in the many applied environmental and marine science fields, or teaching in secondary schools.

The marine science courses emphasize the improvement of oral and written communication skills, and competency in reading, understanding, and synthesizing scientific literature. Courses at all levels emphasize hands-on, experiential learning in the laboratory or the field. Students also are required to complete the experience-based education requirement with at least one semester or summer of supervised, independent research.

**Options**

The program includes the following options:

***Marine Biology/Biological Oceanography.*** This option prepares students for professional opportunities or graduate study in oceanography or the biological sciences. Concentrations within the option permit students to focus on different levels of biological organization at the molecular, cellular, organismic, community, or ecosystem level. Depending on their choice of electives, students also may fulfill the requirements of a major in the biological sciences or ecology and natural resources.

***Marine Chemistry.*** This option prepares students for professional opportunities or graduate study in oceanography or chemistry. Depending on their choice of electives, students may also fulfill the requirements of a major in chemistry.

***Marine Geology.*** This option prepares students for graduate study in oceanography, geology, environmental science, or an allied field, as well as for immediate employment. Depending on their choice of electives, students may also fulfill the requirements of a major in geological sciences.

***Physical Oceanography.*** This option prepares students for graduate study in physical oceanography, meteorology, fluid dynamics, or a related field, as well as immediate employment in environmental agencies or consulting firms and technical positions in marine sciences.

***Directed Marine Studies.*** This option prepares students for professional opportunities in oceanography, the biological sciences, and related fields. It differs from the other four options in requiring students to complete one of several minor and certificate programs offered by the School of Arts and Sciences or the School of Environmental and Biological Sciences, either the Professional Writing Certificate (355), the minor in Education (300), the Certificate in Environmental Geomatics (372), the minor in Environmental Policy, Institutions, and Behavior (374), the minor in Fisheries Science (392), the minor in Sustainability, or a program approved by the Undergraduate Program Director. This requirement is included in order to ensure that students in this option will acquire a focused set of knowledge and skills to complement their marine science studies and to help them find employment upon graduation. Students in this option would choose the minor or certificate program that fulfills part of their major requirements no later than in their fourth semester of study at the university.

# Learning Goals

# Learning Goals

1. Master the basic biological, chemical, physical, and geological principles of marine science.

2. Analyze and interpret contemporary oceanographic datasets.

3. Show evidence of scientific literacy, and communicate the information effectively both orally and in writing.

4. Develop, conduct, and report on an applied research experience in marine science in collaboration with a scientific mentor.

5. Evaluate contemporary global issues and the ethics of how the ocean's resources are used.

Marine Sciences 628 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of marine sciences major requirements, courses, and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent [WC] and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

# Major Requirements For All Students Regardless of Matriculation Date

**A. REQUIRED COURSES (12)**

*Professional Ethics*
Ethical issues in marine sciences are addressed throughout the program in both introductory and advanced courses, especially within the framework of the experience-based education requirement.

- 01:960:401 Basic Statistics for Research (3)
- 11:628:120 Introduction to Oceanography (3)
- 11:628:320 Dynamics of Marine Ecosystems (3)
- 11:628:363 Oceanographic Methods and Data Analysis: Biol/Chem (3) OR 11:628:364 Oceanographic Methods and Data Analysis: Biol/Physical (3)

**B. OPTIONS (63-78)**

**1. Marine Biology/Biological Oceanography (70-74)**
*Required Courses (58-59)*

- 01:119:115-116 General Biology I&II (4+4)
- 01:119:117 Biological Research Lab (2)
- 01:447:380 Genetics (4) OR 11:776:305 Plant Genetics (4)
- 01:160:161-162 General Chemistry I&II (4+4)
- 01:160:171 Introduction to Experimentation (1)
- 01:160:307-308 Organic Chemistry I&II (4+4) OR
    - 01:160:209 Elementary Organic Chemistry (3) AND 01:694:301/11:115:301 Introductory Biochemistry (3) AND 01:694:313/11:115:313 Introductory Biochemistry Laboratory (1)
- 01:640:135-136 Calculus I&II (4+4)
- 01:750:193-194 Physics for the Sciences I&II (4+4)
- 11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
- 11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
- Experiential Learning (6)

*One of the following (3-4):*

- 01:146:356 Systems Physiology (3) AND 01:146:357 Systems Physiology Lab. (1)
- 11:216:360 Animal Physiological Ecology (3)
- 11:680:481 Microbial Physiology (3)
- 11:776:382 Plant Physiology (4)

*One of the following (3-4):*

- 11:628:321 Ichthyology (4)
- 11:680:390 General Microbiology (4)
- 11:216:323 Ornithology (4)
- 11:216:324 Invertebrate Zoology (4)
- 11:216:325 Vertebrate Zoology (4)
- 11:776:400 Fungi in the Environment (3)

*One of the following (3-4):*

- 11:628:405 Molecular Microbial Oceanography (3)
- 11:628:410 Biophysical Interactions: Barnacles to Jellyfish (3)
- 11:628:476 History of the Earth System (3)
- 11:670:451 Remote Sensing of the Ocean and Atmosphere (3)
- 11:216:240 Behavioral Biology (4)
- 11:216:351 Principles of Ecology (3)
- 11:216:486 Principles of Evolution (3)

*At least 3 credits from the following:*

- 11:628:201-203, 205-210 Topics in Marine Science (1.5)
- 11:628:309 Fishery Science (3)
- 11:628:317 Aquaculture (3)
- 11:628:340 Identification of Marine Invertebrates (2)
- 11:628:341 Hydrothermal Vents (3)
- 11:628:451 Physical Oceanography (4)
- 11:628:472 Chemical Oceanography (3)
- 11:628:402 The Role of Polar Regions in the Earth System
- 11:628:474 Coastal Biogeochemical Cycles in a Changing World

**2. Marine Chemistry (66-68)**

*Required courses (60)*

- 01:119:115-116 General Biology I&II (4+4)
- 01:119:117 Biological Research Lab (2)
- 01:160:161-162 General Chemistry I&II (4+4)
- 01:160:171 Introduction to Experimentation (1)
- 01:160:251 Analytical Chemistry (3)
- 01:160:307-308 Organic Chemistry I&II (4+4)
- 01:160:311 Organic Chemistry Laboratory (2)

- 01:160:348 Instrumental Analysis (3)
- 01:640:151-152 Calculus for Mathematical and Physical Sciences I&II (4+4)
- 01:750:203-204 General Physics I&II (3+3)
- 01:750:205-206 General Physics Laboratory I&II (1+1)
- 11:628:472 Chemical Oceanography (3)
- Experiential Learning (6)

*One of the following (3-4)*

- 01:460:101 Introductory Geology (3)
- 01:460:304 Introduction to Geochemistry (4)
- 01:460:417 Environmental Geochemistry (3)
- 11:375:202 Chemical Principles Environmental Science (3)
- 11:375:340 Environmental Applications of Organic Chemistry (3)
- 11:375:360 Soils and Water (4)
- 11:375:444 Water Chemistry (3)
- 11:670:323 Thermodynamics of the Atmosphere (3)
- 11:670:451 Remote Sensing of the Ocean and Atmosphere (3)

*At least 3 credits from the following (3-4):*

- 11:628:201-203, 205-210 Topics in Marine Science (1.5)
- 11:628:309 Fishery Science (3)
- 11:628:317 Aquaculture (3)
- 11:628:340 Identification of Marine Invertebrates (2)
- 11:628:341 Hydrothermal Vents (3)
- 11:628:402 The Role of Polar Regions in the Earth System
- 11:628:405 Molecular Microbial Oceanography (3)
- 11:628:410 Biophysical Interactions: from Barnacles to Jellyfish (3)
- 11:628:451 Physical Oceanography (4)
- 11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
- 11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
- 11:628:474 Coastal Biogeochemical Cycles in a Changing World

**3. Marine Geology (71-74)**

*Required Courses (59)*

- 01:119:115-116 General Biology I&II (4+4)
- 01:119:117 Biological Research Lab (2)
- 01:160:161-162 General Chemistry I&II (4+4)
- 01:160:171 Introduction to Experimentation (1)

- 01:460:101 Intro Geology (3)
- 01:460:330 Sedimentary Geology (4)
- 01:460:451 Marine Geology (3)
- 01:750:203-206 General Physics I+II and Lab I+II (4+4)
- 01:640:151-152 Calculus for Mathematical and Physical Sciences I&II (4+4)
- 01:750:203-204 General Physics I&II (3+3)
- 01:750:205-206 General Physics Laboratory I&II (1+1)
- Experiential Learning (6)

*One of the following (3-4)*

- 11:628:402 The Role of Polar Regions in the Earth System
- 11:628:451 Physical Oceanography (4)
- 11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
- 11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
- 11:628:472 Chemical Oceanography (3)
- 11:628:474 Coastal Biogeochemical Cycles in a Changing World

*One of the following (3-4)*

- 01:450:321 Geographic Information System (3)
- 01:460:303 Paleontology (4)
- 01:460:304 Introduction to Geochemistry (4)
- 01:460:407 Structural Geology (4)
- 01:460:414 Hydrological Processes (3)
- 01:460:453 Paleoecology (3)

*One of the following (3-4)*

- 01:450:403 Advanced Physical Geography (3)
- 01:460:306 Introduction to Geophysics (4)
- 01:460:417 Environmental Geochemistry (3)
- 11:628:476 History of the Earth Systems (3)
- 11:670:451 Remote Sensing of the Ocean & Atmosphere (3)

**4. Physical Oceanography (63-64)**

*Required Courses (51-52)*

- 01:119:103 Principles of Biology (3)
- 01:160:161-162 General Chemistry I&II (4+4)
- 01:160:171 Introduction to Experimentation (1)

- 01:640:151-152 Calculus for Mathematical and Physical Sciences I&II (4+4)
- 01:640:251 Multivariable Calculus (4)
- 01:640:252 Differential Equations (3) OR 01:640:244 Differential Equations/Engineers & Physics (4)
- 14:440:127 Intro Computers/Engineers (3) OR 11:670:212 Computational Methods Meteorology (3)
- 01:640:373 Numerical Analysis (3) OR 01:198:323 Numerical Analysis & Computing (3)
- 01:750:203-204 General Physics I&II (3+3)
- 01:750:205-206 General Physics Laboratory I&II (1+1)
- 11:628:451 Physical Oceanography (4)
- Experiential Learning (6)

*Four of the following with at least one from Group A and at least one from Group B:*

Group A

- 01:640:250 Introduction Linear Algebra (3)
- 01:640:421 Advanced Calculus/Engineers (3)
- 14:650:312 Fluid Mechanics (3)

Group B

- 11:628:402 The Role of Polar Regions in the Earth System
- 11:628:410 Biophysical Interactions: from Barnacles to Jellyfish (3)
- 11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
- 11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
- 11:628:472 Chemical Oceanography (3)
- 11:628:474 Coastal Biogeochemical Cycles in a Changing World
- 11:670:324 Atmospheric Thermodynamics (3)
- 11:670:451 Remote Sensing of the Ocean & Atmosphere (3)

**5. Directed Marine Studies (74-78)**

*Required Courses (44)*

- 01:119:115-116 General Biology I&II (4+4)
- 01:119:117 Biological Research Lab (2)
- 01:447:380 Genetics (4) OR 11:776:305 Plant Genetics (4)
- 01:160:161-162 General Chemistry I&II (4+4)
- 01:160:171 Introduction to Experimentation (1)
- 01:640:135 Calculus I (4)
- 01:750:193-194 Physics for the Sciences I&II (4+4)
- 11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
- 11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
- Experiential Learning (3)

*One of the following (3-4):*

- 01:146:356 Systems Physiology (3) AND 01:146:357 Systems Physiology Lab. (1)
- 11:216:360 Animal Physiological Ecology (3)
- 11:680:481 Microbial Physiology (3)
- 11:776:382 Plant Physiology (4)

*One of the following (3-4):*

- 11:628:321 Ichthyology (4)
- 11:680:390 General Microbiology (4)
- 11:216:323 Ornithology (4)
- 11:216:324 Invertebrate Zoology (4)
- 11:216:325 Vertebrate Zoology (4)
- 11:776:400 Fungi in the Environment (3)

*One of the following (3-4):*

- 11:628:405 Molecular Microbial Oceanography (3)
- 11:628:410 Biophysical Interactions: Barnacles to Jellyfish (3)
- 11:628:476 History of the Earth System (3)
- 11:670:451 Remote Sensing of the Ocean and Atmosphere (3)
- 11:216:240 Behavioral Biology (4)
- 11:216:351 Principles of Ecology (3)
- 11:216:486 Principles of Evolution (3)

*At least 3 credits from the following:*

- 11:628:201-203, 205-210 Topics in Marine Science (1.5)
- 11:628:309 Fishery Science (3)
- 11:628:317 Aquaculture (3)
- 11:628:340 Identification of Marine Invertebrates (2)
- 11:628:341 Hydrothermal Vents (3)
- 11:628:402 The Role of Polar Regions in the Earth System
- 11:628:451 Physical Oceanography (4)
- 11:628:472 Chemical Oceanography (3)
- 11:628:474 Coastal Biogeochemical Cycles in a Changing World

*Completion of an approved Minor or Certificate Program (~ 18 credits)*

Professional Writing Certificate (355), the minor in Education (300), the Certificate in Environmental Geomatics (372), the minor in Environmental Policy, Institutions, and Behavior (374), the minor in Fisheries Science (392), the minor in Sustainability (374), or a program approved by the Undergraduate Program Director.

# 630 Marketing (RBS-NB)

## 630 Marketing

Major requirements for students who entered RBS ***prior to the fall 2023 semester***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (junior or senior year33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)

**Required Marketing Courses**

33:630:385 Marketing Research (3) (prerequisites: 33:136:385 and 33:630:301)
33:630:374 Consumer Behavior (3) (prerequisite: 33:630:301)
33:630:452 Marketing Strategy and Decision-Making (3) (prerequisite: 33:630:385 and seniors only)

**Four Marketing Electives (12)**

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Marketing Courses**

33:630:385 Marketing Research (3) (prerequisites: 33:136:385 and 33:630:301)
33:630:374 Consumer Behavior (3) (prerequisite: 33:630:301)
33:630:452 Marketing Strategy and Decision-Making (3) (prerequisite: 33:630:385 and seniors only)

**Four Marketing Electives (12)**

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

# Mathematics 640 (SAS)

## MATHEMATICS 640

Department of Mathematics, School of Arts and Sciences

**Website:** Here

**Chair:** Stephen D. Miller

**Undergraduate Vice-Chair:** Avraham Soffer

**Associate Undergraduate Vice-Chair for Assessment:** Lewis Hirsch

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Michael Beals, B.A., M.S., Chicago; Ph.D., Princeton

Lev A. Borisov, B.S., Moscow State; Ph.D., Michigan

Fioralba Cakoni, Dip. Math, M.S., Tirana (Albania); Ph.D., Patras/Tirana (Albania)

Eric Carlen, B.A., Virginia; Ph.D., Princeton

Sagun Chanillo, B.S., M.S., Indian Institute of Technology; Ph.D., Purdue

Paul Feehan, B.Eng., Dublin; M.S., Missouri; M.A., Southern California; M.S., Ph.D., Columbia

Gerald Goldin, Graduate School of Education; Ph.D., Princeton

Sheldon Goldstein, B.S., M.A., Ph.D., Yeshiva

Xiaojun Huang, B.S., Nanjing Aeronautical Institute (China); M.S., Wuhan (China); Ph.D., Washington

Henryk Iwaniec, Ph.D., Warsaw

Jeffry Kahn, B.S., Rensselaer Polytechnic Institute; Ph.D., Ohio State

János Komlós, Ph.D., Eötvös (Budapest)

Joel L. Lebowitz, B.S., CUNY (Brooklyn College); M.S., Ph.D., Syracuse

James Lepowsky, A.B., Harvard; Ph.D., Massachusetts Institute of Technology

Yanyan Li, B.S., Hefei (China); M.S., Academica Sinica (Taiwan); Ph.D., New York

Feng Luo, B.S., Beijing; Ph.D., California (San Diego)

Stephen D. Miller, A.B., California (Berkeley); M.A., Ph.D., Princeton

Konstantin Mischaikow, Ph.D., Wisconsin

Fred S. Roberts, Director, DIMACS; A.B., Dartmouth College; M.S., Ph.D., Stanford

Xiaochun Rong, B.S., M.A., Beijing Teachers College (China); Ph.D., SUNY (Stony Brook)

Michael Saks, B.S., Ph.D., Massachusetts Institute of Technology

Natasa Sesum, B.A., Belgrade (Yugoslavia); Ph.D., Massachusetts Institute of Technology

Avraham Soffer, B.S., M.S., Ph.D., Tel Aviv

Simon Thomas, B.S., Ph.D., London

Pham Tiep, Ph.D., Moscow State (Russia)

Michael S. Vogelius, Cand. Scient., Aarhus (Denmark); Ph.D., Maryland

Charles Weibel, B.S., B.A., Michigan; S.M., Ph.D., Chicago

Christopher Woodward, A.B., Harvard; Ph.D., Massachusetts Institute of Technology

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**Professors:**

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Zheng-Chao Han, B.S., Beijing; M.S., Ph.D., New York

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Kasper Larsen, Ph.D., Southern Denmark

Liping Liu, B.E., Beijing; Ph.D., Minnesota

Juan Pablo Mejia-Ramos, Graduate School of Education, B.S., Universidad de Los Andes (Colombia); M.S., Ph.D., Warwick (UK)

Vladimir Retakh, M.A., Ph.D., Moscow Pedagogical Institute

Siddhartha Sahi, B.S., Delhi (India); M.A., Ph.D., Yale

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Chi Li , Ph.D., Princeton

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Konstantin Matveev , Ph.D., Harvard

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Shari Prevost, Ph.D., Rutgers

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Sara Soffer, B.S., Tel-Aviv; M.S., California Institute of Technology; Ph.D., Rutgers

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Matthew Charnley, Ph.D., Rutgers

Mariano Echeverria, Ph.D., Virginia

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Sheila Tabanli, Ph.D., Missouri University of Science and Technology

Peter Ullman, M.S., Emporia State

Laurent Vera , Ph.D,, California (Los Angeles)

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József Beck, Ph.D., Hungarian Academy of Sciences

Haim Brezis, Doctorat, Paris

Richard Bumby, Ph.D., Princeton

Terence Butler, Ph.D., Indiana

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Francois Treves, Ph.D., Université Paris IV-Sorbonne (France)

Bertram Walsh, Ph.D., Michigan

Robert Wilson, Ph.D., Yale

Mathematics 640 (SAS)

# Learning Goals

# Learning Goals

Majors will be able to employ problem-solving skills in a wide range of modern mathematics, analyze quantitative information and apply advanced mathematics techniques and concepts where appropriate, communicate rigorous mathematical ideas and reasoning effectively, appropriately use supporting technology, and work cooperatively as part of a team to solve mathematical problems. Top students will demonstrate experience in research. Students in combined math/education programs will be able to demonstrate a broad perspective on mathematics, including the history of the subject, and an understanding of the connections between college mathematics and the state's curriculum framework. Students in the bachelor of science (B.S.) program (honors track) will be prepared to engage in graduate-level work in a doctoral program.

Minors will be able to demonstrate an understanding of the special nature of mathematical thinking, create and communicate mathematical arguments, and apply mathematical knowledge and techniques in advanced courses in their major discipline.

Biomath majors will be able to employ problem-solving skills in a wide range of modern mathematics; solve mathematical problems and apply mathematics, mathematical concepts, and mathematical models to problems in biology; communicate rigorous mathematical ideas and mathematical reasoning effectively; conduct laboratory work in the biological sciences; and pursue graduate study, medical school, or research jobs in government and industry.

The general liberal arts student will be able to employ elementary mathematics and discuss bringing abstract mathematics to bear on areas related to everyday life, such as political science, personal finance, or games of chance. Students whose majors require more advanced mathematics will be adequately prepared. Students aiming toward careers in elementary school education will be able to pass state-mandated examinations before certification, and to satisfy the university's course requirements related to certification. Students aiming at actuarial careers will be able to pass the exams for professional certification, including the P, FM, and LTAM exams.

Mathematics 640 (SAS)

# Major Requirements

# Major Requirements

The Department of Mathematics annually publishes a *Brochure for Math Majors*, which contains detailed information about the math major program; copies of this brochure may be obtained on the web here.

**The requirements for a math major are as follows:**

1. Three semesters of calculus (01:640:151-152, and 251 or equivalent), Introductory Linear Algebra (01:640:250), and Elementary Differential Equations (01:640:252). Courses 01:640:250, 251, and 252 must be passed with grades of C or better. Majors normally should take both 01:640:250 and 251 no later than the first semester of their sophomore year.

2. 01:198:107 Computing for Mathematics and the Sciences with a grade of C or better. (01:198:111 Introduction to Computer Science or 14:332:252 Programming Methodology I may be substituted for 01:198:107.) It is recommended strongly that this course be completed by the end of the second semester of the sophomore year.

3. The completion of all the requirements in one of the mathematics major options listed below. (Students must notify the mathematics department in writing if they are not following the standard mathematics major option. Courses in other departments may not be substituted).

**Grade Requirements for Mathematics Majors**

To be admitted to the mathematics major program, a student normally must have completed three semesters of calculus with a grade of C or better in each course. To continue as a mathematics major, a student must make satisfactory progress toward completing the program. Satisfactory progress for a full-time student normally means passing at least one mathematics course at an appropriate level each semester with a grade of C or better. To complete the mathematics major program, a student must receive grades of C or better in 01:640:250, 251, and 252 and in all but one of the further mathematics courses. A student also must receive grades of C or better in the courses in other departments (e.g., computer science) used to fulfill the requirements of the program.

**Mathematics Major Options**

***Option A, Standard Mathematics (Curriculum Code 640).*** In addition to the requirements above, to complete the standard mathematics major a student must pass eight 300- to 400-level mathematics courses, excluding 01:640:491,492. All but one of these courses (curriculum code 640) must be passed with a grade of C or better. At least four of the upper-level courses used to complete the major must be taken at Rutgers University-New Brunswick, including one of 01:640:311,312, 411-412, and one of 01:640:350, 351, 451-452. An appropriate Rutgers graduate mathematics course may be substituted for the required analysis and/or algebra course, with departmental approval.

Recommended are probability (01:640:477), statistics (01:640:481), a course in mathematical modeling (01:640:321, 338, or 478), and a course in discrete mathematics (01:640:338, 354, 428, or 454). Also recommended is a two-semester sequence of mathematically oriented courses in some other discipline.

***Option B, Honors Track.*** The Department of Mathematics offers a special honors track to qualified students. Admission to the honors track is by application, which is available from the mathematics undergraduate office or from the mathematics department website. Students should normally apply no later than the end of the first semester of their sophomore year. Students in the honors track will have their progress reviewed by the honors committee, and are expected to earn a B or better in their advanced math courses (300 level and above). Students who successfully complete the honors track are eligible for graduation with a bachelor of science.

Each student in the honors track will be assigned a faculty adviser. Together with the adviser, he or she will formulate a proposed course plan, subject to the approval of the mathematics honors committee. This course of study will normally include 01:640:291 and 292 (01:640:151,152, 251, and 252 may be accepted if approved by the Honors Committee); either 01:198:107 or 01:198:111; 01:640:250, 300 (honors), 411-412, and 451-452; two semesters of 1-credit honors seminar, at least one at the junior/senior level; and four mathematics electives as approved by the honors committee.

**Option C, Actuarial Mathematics Track**. The actuarial track in mathematics requires 66 credits, primarily in mathematics and economics, as indicated below. See Brochure for Math Majors.

I. Core Math and Computer Science Courses (21 credits total)
Calculus I-IV; 01:640:151, 152, 251, 252
Linear Algebra; 01:640:250
Computer Science; 01:198:107 or 01:198:111

II. Core Economics and Accounting Courses (9 credits total)
Micro- and macroeconomics; 01:220:102, 01:220:103
Accounting 33:010:272

III. Additional Mathematics Courses (21 credits total)
Required courses:

01:640:285 Introduction to Interest Theory for Actuarial Sciences (3) (covers material on the SOA FM exam; students who pass the FM exam may be excused from this requirement)

01:640:477 Mathematical Theory of Probability (3) (Covers Material on the SOA P exam)

01:640:481 Mathematical Theory of Statistics (3) (Covers Material on the SOA P exam)

01:640:486 Mathematics of Life Contingent Risk Models I (3) (covers material on the SOA LTAM exam)

Elective courses: three additional mathematics courses at the level of 300 and above. The following are recommended:
01:640:485 Introduction to Mathematical Finance (3) (covers material on the SOA FM exam)
01:640:478 Introduction to Stochastic Processes (3)
01:640:487 Mathematics of Life Contingent Risk Models II (3) (covers material on the SOA LTAM exam)
01:640:354 Linear Optimization (3)
01:640:373 Numerical Analysis (3)

IV. Additional Economics courses (15 credits)
Required:
01:220:320 Intermediate Microeconomic Analysis (3)
01:220:321 Intermediate Macroeconomic Analysis (3)
01:220:322 Econometrics (3)

Students must take two additional electives from the following list:

Other 300/400-level math courses
01:220:421 Economic Forecasting and Big Data (3)
01:220:413 Financial Economics (3)
01:220:423 Advanced Time Series and financial Econometrics (3)
01:220:481 Economics of Uncertainty (3)

**Biomathematics Interdisciplinary Major (Curriculum Code 122)**

The biomathematics interdisciplinary major requires 63-67 credits distributed as follows: mathematics 33 credits, and biology and cognate fields 30-34 credits. A grade of C or better in courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades. See *Brochure for Math Majors.*

Core biology and chemistry required courses:

01:119:115-116 General Biology I and II (4,4), or equivalent
01:160:161-162 General Chemistry I and II (4,4), or equivalent
01:160:171 Introduction to Experimentation (1)

Mathematics required courses:

01:640:151,152, 251 Calculus for Mathematical and Physical Sciences I, II, and III (4,4,4)
01:640:250 Introductory Linear Algebra (3)
01:640:252 Elementary Differential Equations (3)
01:640:336 Dynamical Models in Biology (3)
01:640:338 Discrete and Probabilistic Models in Biology (3)
01:640:477 Mathematical Theory of Probability (3)
01:640:481 Mathematical Theory of Statistics (3)

One of the following courses:

01:640:350 Linear Algebra (3)
01:640:373 Numerical Analysis (3)
01:640:423 Elementary Partial Differential Equations (3)
01:640:428 Graph Theory (3)
01:640:454 Combinatorics (3)
01:640:478 Introduction to Stochastic Processes (3)

Required lab, one of the following:

01:146:357 (1); 01:146:475 (1); 14:125:315 (1)

Note: 01:447:390 is a 4-credit elective (see below) and includes a lab that satisfies this requirement.

Electives:
Four courses from the following list. 01:447:380 is highly recommended. No more than one course from 14:125 (biomedical engineering) can count as an elective.

01:146:245 Fundamentals of Neurobiology (3)
01:146:270 Fundamentals of Cell and Developmental Biology (3)
01:146:302 or 01:447:302 Computers in Biology (3)
01:146:356 Systems Physiology (3)
01:146:445 Advanced Neurobiology (3)
01:146:470 Advanced Cell Biology (3)
01:146:474 Immunology (3)
01:185:335 Neural Structure of Language (3)
01:185:350 Fundamentals of Cognitive Neuroscience (3)
01:160:305 (3) or 307 (4) or 315 (4) Organic Chemistry
01:160:306 (3) or 308 (4) or 316 (4) Organic Chemistry
01:447:380 Genetics (4)
01:447:384 Genetic Analysis (4)
01:447:390 General Microbiology (4)
01:447:480 Topics in Molecular Genetics (3)
01:447:486 Evolutionary Genetics (3)
11:704:486 Principles of Evolution (3)
11:216:351 Principles of Applied Ecology (3)
11:216:431 Fundamentals of Ecological and Environmental Modeling (4)
11:216:486 or 11:704:486 Principles of Evolution (3)
11:776:495 Functional Genomics for Research (3)
16:215:513 Population Genetics (01:447:380) (3)

No more than one of:

01:146:478 Molecular Biology (3)
01:694:301 Introductory Biochemistry and Molecular Biology (3)
01:694:407 Biochemistry (3)
01:694:408 Molecular Biology and Biochemistry (3)

No more than one of:

14:125:303 Biomedical Transport Phenomena (3)
14:125:403 Cardiovascular Engineering (3)
14:125:407 Fundamentals of Computer Tomography (3)
14:125:410 Sensory Processes, Mechanisms, and Computational Models (3)
14:125:437 Computational Systems Biology (3)

**Graduation with Honors in Biomathematics**

The interdisciplinary major in biomathematics has a program to recognize graduating biomathematics majors for outstanding performance. Such students, upon graduation, may be awarded honors in biomathematics.

Note that the requirements for graduation with honors in biomathematics are distinct from other honors graduation programs such as the honors program of the School of Arts and Sciences. Students may qualify for one or more honors programs, in multiple departments.

Students who will meet the requirements for biomathematics graduation honors and wish to be considered for graduation with honors in biomathematics should file the Intent to Complete Biomathematics Honors by February of their senior year, in order to ensure consideration.

To graduate with biomathematics honors, a biomathematics major must:

1. have a cumulative grade-point average of 3.4 or better in the five mathematics courses at or above the 300 level taken to fulfill the biomathematics required and elective courses;
2. have a cumulative grade-point average of 3.4 or better in the four courses taken to fulfill the biomathematics required upper-level science courses;
3. have an overall cumulative grade-point average of 3.0;
4. at least one of 01:640:336 and 01:640:338 must be completed with a grade of B+ or better; and
5. must have completed with a B+ or better grade in the biomathematics research courses 01:122:491 and 01:122:492.

**Statistics-Mathematics Interdisciplinary Major (Curriculum Code 961)**

See Statistics 960.

Mathematics 640 (SAS)

# Minor Requirements

# Minor Requirements

A minor in mathematics consists of three semesters of calculus (ordinarily 01:640:151-152, 251), linear algebra (01:640:250), and four additional 3- or 4-credit courses, one of which may be either 01:640:244 or 252, and the rest of which must be 300- or 400-level mathematics courses (curriculum code 640). Three of the four courses beyond 01:640:251 must be taken at Rutgers University-New Brunswick. Grades of C or better are required in 01:640:250 and 251; at most, one D is permitted in the four courses beyond 01:640:250.

Mathematics 640 (SAS)

# Departmental Honors Programs

# Departmental Honors Programs

Eligible first-year students and sophomores may take 01:640:291 and 292, which are honors courses in second-, third-, and fourth-semester calculus, respectively. The department also offers an honors version of 01:640:300 Introduction to Mathematical Reasoning and honors versions of proof-based courses in abstract algebra and real analysis.

Entry into these courses is determined by the department and is based on the student's previous performance in mathematics. The department occasionally offers honors sections of other courses.

To graduate with departmental honors, a mathematics major must have a cumulative grade-point average of at least 3.4 or better in mathematics courses at the 300 level or above and an overall cumulative grade-point average of at least 3.0, and must complete successfully two courses that are either approved independent study courses, approved graduate courses, approved sections of 300- or 400-level courses, or an approved project. A student who would like to have a course count toward the two-course honors requirement must apply at the department office no later than the first week of classes of the semester during which he or she takes the course. The determination of whether a candidate graduates with departmental honors depends on the student's total performance in mathematics (including the written exposition of mathematical ideas). A more detailed description of the honors program can be obtained at the departmental offices or on the website.

Mathematics 640 (SAS)

# Preparation for Secondary School Teaching

# Preparation for Secondary School Teaching

There are several paths that Rutgers students can follow to prepare for a career in secondary school teaching.

1. The five-year mathematics teacher preparation program in the Rutgers University Graduate School of Education (GSE) integrates the mathematics undergraduate program with teaching preparation, leading to a bachelor of arts (B.A.) degree in mathematics, a master of education (M.Ed.) degree, and New Jersey teacher certification. Students must apply for admission (usually in the junior year), complete a standard mathematics major, satisfy undergraduate requirements set by the GSE as well as those set by the School of Arts and Sciences, and, in the fifth year, complete additional coursework, including an additional mathematics elective, and do a student teaching internship. The nine required mathematics courses at the 300 to 400 level must include 01:640:300, 311, 351, 435, 437, 477, 481, and an applied math course.

2. After completing the mathematics major, students may obtain an M.Ed. and New Jersey teacher certification through the Rutgers GSE postbaccalaureate certification program or through postbaccalaureate certification programs at other institutions. Application to the program may be made in the fall of a student's senior year or anytime after graduation. This 45-credit program requires coursework in both mathematics and education as well as a student teaching internship, and may be pursued either full time or part time.

3. Other paths to secondary school mathematics teaching include: 1) "alternate route" certification, which usually requires a period of apprenticeship in a high school and 200 hours of coursework at a cooperating college or university; and 2) teaching without certification in a private independent or parochial school.

Prospective teachers should contact the mathematics department and/or the Office of Teacher Education in the Graduate School of Education as early as possible in their undergraduate careers and should stay informed about the rapidly evolving procedures and standards for certification. Further information on all Rutgers teaching programs can be obtained from GSE or from the website.

Mathematics 640 (SAS)

# Five-Year Bachelor of Arts/Master's Programs

# Five-Year Bachelor of Arts/Master's Programs

Many career paths in business, industry, and government depend on mathematical modeling and mathematical analysis. Rutgers offers five-year B.A./M.S. tracks that help to prepare students for entry into such careers. Tracks leading to master's degrees are available in fields such as economics, mathematical finance, industrial and systems engineering, and statistics. There is also a five-year, dual-degree track with the Graduate School of Education (see the catalog section Preparation for Secondary School Teaching). With proper planning, students in these tracks can finish a bachelor of arts degree in mathematics and a master's degree from one of these fields within five years.

The various tracks differ in details and requirements, but share the following common features. Undergraduate math majors apply for entry into a five-year track before their senior year. Accepted applicants are admitted to the master's program contingent upon successful completion of their undergraduate mathematics degree, plus additional coursework in their area of applied interest. Typically, this requires students to take as undergraduates more than the standard 120 credits needed for graduating with a bachelor of arts degree. Some of these credits will be in graduate courses and will count toward the master's degree. In the fifth year, accepted students complete the coursework for the master's program. More detailed information on the five-year tracks is available on the mathematics department webpage.

Students will find that a mathematics major is excellent preparation for graduate study in statistics, operations research, industrial engineering, economics, or financial mathematics, even if they choose not to pursue a five-year track. Such students would apply to graduate programs in these areas in their senior year, as normal. Departmental advisers can guide students in their selection of coursework outside the mathematics department to best prepare them for the graduate programs of their choice.

Mathematics 640 (SAS)

# Before Taking Mathematics Courses

# Before Taking Mathematics Courses

Entering first-year students and most transfer students are required to take the mathematics placement test before registering for any mathematics course at Rutgers University-New Brunswick. Students will be informed by their school of the times for taking the test.

Mathematics 640 (SAS)

# Courses

# Courses

The following abbreviations are used in the course listing.

1. CALC1 indicates that the prerequisite is any one of 01:640:135 or 151.

2. CALC2 indicates that the prerequisite is 01:640:152.

3. CALC3 indicates that the prerequisite is any one of 01:640:251 or 291.

4. CALC4 indicates that the prerequisite is any one of 01:640:244, 252, or 292.

5. CR1 indicates that students may not receive credit for more than one of the first-semester calculus courses 01:640:135 or 151.

6. CR2 indicates that students may not receive credit for more than one of the courses including second-semester topics 01:640:136 or 152.

7. CR3 indicates that students may not receive credit for more than one of the courses including third-semester topics 01:640:251 or 291.

8. CR4 indicates that students may not receive credit for more than one of the fourth-semester courses 01:640:244, 252, or 292.

**01:640:011** ***Precalculus I Workshop (E2)***
Workshop to accompany 01:640:111.
***Corequisite: 01:640:111.***

**01:640:012** ***Precalculus II Workshop (E2)***
Workshop to accompany 01:640:112.
***Corequisite: 01:640:112.***

**01:640:013** ***Preparation for Calculus Workshop (E2)***
Workshop to accompany 01:640:123. Hybrid online.
***Corequisite: 01:640:123.***

**01:640:025** ***Elementary Algebra (E3)***
Operations with polynomials, rational and square root expressions, exponents, solving linear and quadratic equations, basic applications, and graphing.

**01:640:026** ***Intermediate Algebra (E3)***
Absolute value equations and inequalities, radical expressions, rational exponents, quadratic equations and inequalities, introduction to functions, and topics in analytic geometry.
***Prerequisite: 01:640:025 or appropriate performance on the placement test in mathematics.***

**01:640:103** *Topics in Mathematics for the Liberal Arts (3)*
Topics in mathematics including voting theory, apportionment, fair division, exponential growth in nature and finance, Euler circuits, Traveling Salesman Problem, and networks.
*An elementary course for liberal arts majors. Prerequisite: 01:640:025 or appropriate performance on the placement test in mathematics. May not be used as an elective for the math major or minor.*

**01:640:104** *Introduction to Probability (3)*
Concrete introduction to probability and its applications, with some statistics. Intended for majors in social science or liberal arts disciplines.
*Prerequisite: 01:640:026 or 027 or placement. May not be used as an elective for the math major or minor. May not be taken for credit simultaneously with or after a student has received credit for any of the following courses: 01:640:477, 01:198:206, 01:960:379, 01:960:381, 14:332:226, 14:540:210.*

**01:640:106** *Mathematics of Money (3)*
Introduction to the uses of college-level mathematics in personal finance applications, including mortgages, student loans, and leasing. Some related nonfinancial applications. May not be used as an elective for the math major or minor. Not intended for students majoring in business, economics, or STEM fields.
*Prerequisite: 01:640:025.*

**01:640:107** *Number and Operation for K-8 Teaching (3)*
Reexamination of familiar mathematical ideas, primarily about number systems and arithmetic operations, in the context of mathematics as a whole and from the perspective of young students first learning them. Emphasis on reasoning and communication.
*Prerequisites: 01:640:025 or appropriate performance on the placement test in mathematics, and permission of department. For students interested in pursuing a career in elementary school teaching. May not be used as an elective for the math major or minor.*

**01:640:108** *Problem Solving and Reasoning with Discrete Mathematics (3)*
Discrete mathematics as a tool for developing problem-solving and reasoning skills. Applications of vertex-edge graphs and systematic counting, which can be introduced at K-8 grade levels. For students interested in a career in teaching in elementary or middle schools.
*Prerequisites: 01:640:026 or 027 or appropriate performance on the placement test in mathematics, and permission of department. May not be used as an elective for the math major or minor.*

**01:640:109** *Geometry and Measurement for Middle Grades Teaching (3)*
Math content course on geometry and measurement stressing depth of understanding needed for effective middle grade teaching. Justifying procedures and formulas. Multiple points of view in explanations. Geometric objects in two and three dimensions. Transformations, symmetry, congruences, similarity, scaling. Perimeter, area, volume. Error estimates in measurement. Changing units.
*Prerequisites: 01:640:026 or 107 or placement into 01:640:111, and permission of department. Primarily for those intending to teach in grades K-8.*

**01:640:110** *Algebra for Middle School Teachers (3)*
Examines algebraic thinking in the context of middle school algebra, with emphasis on mathematical reasoning, conceptual reasoning, and communicating concepts effectively.
*Intended for future and current K-8 teachers. Prerequisite: 01:640:107 or permission of the department.*

**01:640:111-112** *Precalculus I,II (2,2)*
Math 111: Algebraic expressions, algebraic equations, inequalities, functions, and graphing. Math 112: Exponential, logarithmic, and trigonometric functions.
*Prerequisite: 01:640:026 or appropriate performance on the placement test in mathematics. Corequisites: 01:640:011 for 111; 01:640:012 for 112. These two courses cover the same material as 01:640:115, but at a slower pace. Students may not receive more than 4 normal credits for any combination of 01:640:111-112 and 115.*

**01:640:115** *Precalculus College Mathematics (4)*
Algebraic expressions, algebraic equations, inequalities, functions, and graphing. Exponential, logarithmic, and trigonometric functions.
*Prerequisite: 01:640:026 or appropriate performance on the placement test in mathematics. Students may not receive more than 4 normal credits for any combination of 01:640:111-112 and 115. Students who feel unprepared for this course (who have not had math for several years or whose mathematical background is weak) should consider taking 01:640:111-112, which covers the same material as 115 but at a slower pace and begins with an extensive review of intermediate algebra.*

**01:640:123** *Preparation for Calculus I (2)*
Beginning after six weeks of the semester for students who start Calculus 1 and encounter serious difficulties. Intensive review of topics in algebra and precalculus, in context of how they are used in Calculus 1. Hybrid online.
*Prerequisite: Placement into CALC1.*

**01:640:125** *Methods of Mathematical Problem Solving (2)*
Equips students with effective methods for mathematical problem solving drawing on research into the relevent cognitive science and expert practices. Provides the scientifically-based strategic knowledge to succeed in the mathematics courses.

**01:640:131** *Calculus I Practicum (1)*
Application of algorithms studied in 01:640:135 to problems.
*Corequisite: 01:640:135.*

**01:640:135-136** *Calculus I,II for the Life and Social Sciences (4,4)*
Primarily for majors in the social sciences, business, and pharmacy. Students in the life sciences should take 135-136 or 151-152. Students intending to take more than two semesters of calculus should take 151-152. Students should review the requirements for their intended major when choosing between 135-136 and 151-152.
*Prerequisite for 135: 01:640:112 or 115 or appropriate performance on the placement test in mathematics. Prerequisite for 136: CALC1. Credit restrictions: CR1, CR2.*

**01:640:138** *Calculus II for the Biological Sciences (4)*
Techniques of integration, elementary differential equations and their applications to biological sciences, and an introduction to linear algebra. For students who do not intend to continue beyond 01:640:250.
*For biological sciences majors. Prerequisite: CALC1. Credit restriction: CR2.*

**01:640:151-152** *Calculus I, II for Mathematical and Physical Sciences (4,4)*
For mathematics, physics, computer science, statistics, chemistry, or engineering majors. Techniques of integration, elementary differential equations, sequences, infinite series, Taylor series, parametric equations, polar coordinates. Students should review the requirements for their intended major when choosing between 135-136 and 151-152.
*Prerequisite for 151: 01:640:112 or 115 or appropriate performance on the placement test in mathematics. Prerequisite for 152: 01:640:151 or 01:640:135 with a C or better. Credit restrictions: CR1, CR2.*

**01:640:195,196** ***Seminar in Mathematics I,II (1,1)***
Discussion of selected topics in mathematics. For first- and second-year students.
***Prerequisite: Permission of department. Corequisite: Enrollment in a calculus course.***

**01:640:197** ***Topics in Mathematics for K-8 Teaching I (3)***
Topics covered vary. Details available at registration.
***Prerequisites: 01:640:026 or 027 or appropriate performance on the placement test in mathematics, and permission of the department. For students interested in a career in K-8 teaching. May not be used as an elective for the math major or minor. May be repeated for credit, with permission of the department.***

**01:640:198** ***Topics in Mathematics (3)***
Topics covered vary. Details available at registration.
***Prerequisite: 01:640:026 or 027 or appropriate performance on the placement test in mathematics, and permission of the department. May not be used as an elective for the math major or minor. May be repeated for credit, with permission of the department.***

**01:640:244** ***Differential Equations for Engineering and Physics (4)***
First- and second-order ordinary differential equations; introduction to linear algebra and systems of ordinary differential equations.
***Prerequisite: CALC3. Credit restriction: CR4. Pre- or corequisite: 01:640:247 or 01:640:250.***

**01:640:247** ***Fundamentals of Matrix Algebra (3)***
Basics of linear algebra; matrix operations, linear independence, inverses, determinants. Equivalent in content to the first third of 01:640:250.
***Prerequisite: CALC1.***

**01:640:250** ***Introductory Linear Algebra (3)***
Systems of linear equations, Gaussian elimination, matrices and determinants, vectors in two- and three-dimensional Euclidean space, vector spaces, introduction to eigenvalues and eigenvectors. Possible additional topics: systems of linear inequalities and systems of differential equations.
***Prerequisite: 640:112 or 115, or Placement.***

**01:640:251** ***Multivariable Calculus (4)***
Analytic geometry of three dimensions, partial derivatives, optimization techniques, multiple integrals, vectors in Euclidean space, and vector analysis.
***Prerequisite: CALC2. Credit restriction: CR3.***

**01:640:252** ***Elementary Differential Equations (3)***
First- and second-order ordinary differential equations; systems of ordinary differential equations.
***Prerequisites: 01:640:250 and CALC3. Credit restriction: CR4.***

**01:640:285** ***Introduction to Interest Theory for Actuarial Sciences (3)***
Compound interest rate theory and application to valuation of financial instruments; measurement of interest; present value; equations of value and yield rates; amortization; annuities; bond valuation; duration; immunization.
***Prerequisite: 01:640:251.***

**01:640:291** ***Honors Calculus III (4)***
Covers the same material as 01:640:251 and 252 in a more thorough and demanding fashion.
***Registration by special permission of department. Credit restriction: CR3. Grades of B or better are required to continue in the honors sequence.***

**01:640:292** ***Honors Calculus IV (4)***
First- and second-order ordinary differential equations; systems of ordinary differential equations. A more thorough and demanding alternative to 01:640:244 or 252.
***Prerequisite: 01:640:291 or permission of department. Pre- or corequisite: 01:640:250. Credit restrictions: CR4. Grades of B or better are required to continue in the honors sequence.***

**01:640:300** ***Introduction to Mathematical Reasoning (3)***
Fundamental abstract concepts common to all branches of mathematics. Special emphasis placed on ability to understand and construct rigorous proofs.
***Prerequisite: 01:640:250 or 01:640:251 or 01:640:291.***

**01:640:311** ***Introduction to Real Analysis I (4)***
Introduction to language and fundamental concepts of analysis. The real numbers, sequences, limits, continuity, and differentiation in one variable.
***Prerequisites: CALC4 and C or better in 01:640:300; or permission of department.***

**01:640:312** ***Introduction to Real Analysis II (3)***
Series of numbers and functions, integration of functions of one variable, pointwise and uniform convergence, differential calculus in several variables, implicit and inverse function theorems.
***Prerequisite: 01:640:311.***

**01:640:321** ***Introduction to Applied Mathematics (3)***
Mathematical models of mechanical vibrations, population dynamics, and traffic flow, involving ordinary differential equations and nonlinear first-order partial differential equations.
***Prerequisite: CALC4.***

**01:640:325** ***Foundations of Quantum Mechanics (3)***
Interdisciplinary course, intended primarily for juniors and seniors majoring in mathematics, physics, or philosophy, dealing with what can be concluded from quantum mechanics about the nature of reality.
***Prerequisite: CALC4 or permission of instructor. Credit not given for both this course and 01:556:325.***

**01:640:336** ***Dynamical Models in Biology (3)***
Models for biological processes based on ordinary and partial differential equations. Topics selected from models of population growth, predator-prey dynamics, biological oscillators, reaction-diffusion systems, pattern formation, neuronal and blood flow physiology, neural networks, and biomechanics.
***Prerequisites: CALC4 and 01:640:250.***

**01:640:338** ***Discrete and Probabilistic Models in Biology (3)***
Models for biological processes based on discrete mathematics (graphs, combinatorics), probabilistic and optimization methods, Markov chains and Markov fields, Monte-Carlo simulation, maximum-likelihood estimation, entropy, and information. Applications selected from epidemiology, inheritance and genetic drift, combinatorics and sequence alignment of nucleic acids, energy optimization in protein structure prediction, and topology of

biological molecules.
*Prerequisites: 01:640:250, 251; and either 01:198:206, 01:640:477, 01:960:381, 14:332:321, or 14:540:210. Only one of 01:640:338 and 339 may count for credit toward any math major or minor option.*

**01:640:339** *Mathematical Models in the Social Sciences (3)*
Introduction to the modeling process and survey of mathematical models from such areas as economics, sociology, psychology, and urban and policy science. Models dealing with energy use, air pollution, currency transfer, transportation, bargaining, voting, auctions, ecommerce, learning, and allocation of scarce resources. Models use graphs, signed graphs, Markov chains, n-person games, consensus functions, and differential equations.
*Prerequisites: 01:640:250; and either 01:640:477, 01:198:206, or 01:960:381. Only one of 01:640:338 and 339 may count for credit toward any math major or minor option.*

**01:640:348** *Cryptography (3)*
Applications of algebra and number theory to cryptography (encryption/decryption) and cryptanalysis (attacking encrypted messages). Topics include congruences, finite fields, finding large primes, pseudoprimes, and primality testing, as well as the Vigenere and Hill ciphers, the Data Encryption Standard, probabilistic, trapdoor attacks on encrypted messages, and public key ciphers.
*Prerequisites: 01:640:250; one of 01:640:300, 356, or 477; or permission of department.*

**01:640:350** *Linear Algebra (3)*
Continuation of 01:640:250. Abstract vector spaces and linear transformations, inner product spaces, diagonalization, and canonical forms. Possible additional topics: systems of ordinary differential equations and numerical techniques.
*Prerequisites: CALC4, 01:640:250, and C or better in 01:640:300; or permission of department.*

**01:640:351-352** *Introduction to Abstract Algebra I,II (4,3)*
Abstract algebraic systems, including groups, rings, fields, polynomials, and some Galois theory.
*Prerequisites: CALC3, 01:640:250, and C or better in 01:640:300; or permission of department.*

**01:640:354** *Linear Optimization (3)*
Linear programming problems, the simplex method, duality theory, sensitivity analysis, introduction to integer programming, the transportation problem, network flows, and other applications.
*Prerequisite: 01:640:250. Credit not given for both this course and 01:640:453 or 01:711:453.*

**01:640:356** *Theory of Numbers (3)*
Properties of the natural numbers, congruences, diophantine equations, and elementary arithmetical functions.
*Prerequisites: CALC3 and 01:640:300, or permission of department.*

**01:640:357** *Topics in Applied Algebra (3)*
Material relevant for various applications. Topics chosen from finite Fourier and wavelet transforms for signal and image processing, coding theory, algebraic graph theory, algebraic combinatorics, and algebraic computational complexity. Details available at time of registration.
*Prerequisites: CALC3 and 01:640:250.*

**01:640:361** *Set Theory (3)*
Introduction to set theory. The set-theoretic foundations of mathematics, including the construction of the real number system. Countable and uncountable sets, cardinal numbers, and ordinals, the axiom of choice.
*Prerequisites: 01:640:300 and one of 01:640:250 or CALC3, or permission of department. Credit not given for both this course and 01:730:423.*

**01:640:373-374** *Numerical Analysis I,II (3,3)*
Analysis of numerical methods for the solution of linear and nonlinear equations, approximation of functions, numerical differentiation and integration, and the numerical solution of initial and boundary value problems for ordinary differential equations.
*Prerequisites: CALC4 and familiarity with a computer language. Credit not given for both these courses and 01:198:323, 324.*

**01:640:395** *Studies in Mathematics (3)*
Topics vary from semester to semester. Details available at time of registration.

**01:640:403** *Introductory Theory of Functions of a Complex Variable (3)*
First course in the theory of a complex variable. Cauchy's integral theorem and its applications. Taylor and Laurent expansions, singularities, conformal mapping.
*Prerequisite: CALC4.*

**01:640:411-412** *Mathematical Analysis I,II (3,3)*
Rigorous analysis of the differential and integral calculus of one and several variables.
*Prerequisites: Permission of department and instructor. For students preparing for graduate study in the mathematical sciences.*

**01:640:421** *Advanced Calculus for Engineering (3)*
Laplace transforms, numerical solution of ordinary differential equations, Fourier series, and separation of variables method applied to the linear partial differential equations of mathematical physics (heat, wave, and Laplace's equation).
*Primarily for mechanical engineering majors. Prerequisite: CALC4. Credit not given for both this course and 01:640:423.*

**01:640:423** *Elementary Partial Differential Equations (3)*
Linear partial differential equations of mathematical physics (heat, wave, and Laplace's equation), separation of variables, Fourier series.
*Prerequisite: CALC4. Credit not given for both this course and 01:640:421.*

**01:640:428** *Graph Theory (3)*
Colorability, connectedness, tournaments, Eulerian and Hamiltonian paths, orientability, and other topics from the theory of finite linear graphs, with an emphasis on applications chosen from social, biological, computer science, and physical problems.
*Prerequisites: CALC3 and 01:640:250.*

**01:640:432** *Introduction to Differential Geometry (3)*
Investigation of the properties of curves and surfaces using methods of analysis.
*Prerequisite: 01:640:311.*

**01:640:435** *Geometry (3)*
Various geometries, including projective and non-Euclidean geometries, and geometric axiom systems.
*Prerequisites: CALC3, 01:640:250 and 300; or permission of department.*

**01:640:436** *History of Mathematics until 1800 (3)*
Selected topics from the history of mathematics including number systems; Euclidean geometry; the development of algebra in China, India, the Islamic world, and Europe; and calculus.
*Prerequisites: 01:640:250 and 01:640:251. Credit not given for both this course and 01:640:437. Recommended to be taken after 01:640:435.*

**01:640:437** *History of Mathematics (3)*
Selected topics from the history of mathematics including number systems; Euclidean geometry; the development of algebra in China, India, the Islamic world, and Europe; and calculus; selected modern topics.
*Prerequisites: 01:640:250 and 01:640:251 or 01:640:291. Recommended to be taken after Geometry. Credit not given for both this course and 01:640:436. Open only to Math (640) and Stats/Math (961) majors.*

**01:640:441-442** *Introductory Topology I,II (3,3)*
Math 441: Introduction to topology with emphasis on the foundations of analysis; Euclidean spaces, metric spaces, topological spaces, and their properties; applications to analysis. Math 442: Basic concepts of algebraic topology, including the fundamental group, plane curves, homotopy, and a brief introduction to homology.
*Prerequisites: CALC4 and either 01:640:311 or permission of department.*

**01:640:451-452** *Abstract Algebra I,II (3,3)*
Rigorous study of abstract algebraic systems including groups, rings, and fields.
*Prerequisites: Permission of department and instructor. For students preparing for graduate study in the mathematical sciences.*

**01:640:453** *Theory of Linear Optimization (3)*
Emphasis on the theory of linear optimization. Topics include convex sets, polyhedra, Farkas lemma, canonical forms, simplex algorithm, duality theory, revised simplex method, primal-dual methods, complementary slackness theorem, maximal flows, transportation problems, and two-person game theory.
*Prerequisite: 01:640:250. Credit not given for both this course and 01:640:354 or 01:711:453. Cross-listed with 01:711:453.*

**01:640:454** *Combinatorics (3)*
Existence and enumeration of designs and patterns such as codes, graphs, and block designs, and extremal problems related to such objects. Emphasis on applications to computer, biological, physical, and social problems.
*Prerequisites: CALC2 and 01:640:250.*

**01:640:461** *Mathematical Logic (3)*
Intuitive and formal development of the sentential and predicate calculus. Special emphasis given to questions of consistency, completeness, and independence. Formal systems; incompleteness and undecidability; theorems of Gödel. Exploration of which properties of structures can be defined in the first-order language.
*Prerequisites: CALC3 and either 01:640:300 or permission of department.*

**01:640:468** *Connecting Advanced Mathematics to High School Content (3)*
Connects math major course content to curricular content of grades 9 through 12. Shows how advanced mathematics justifies and elucidates high school material taught without full justification. Provides connections between concepts and procedures to facilitate recall and application of content knowledge both for exposition and for response to student misconceptions. Focus on applications of reasoning, real analysis, and abstract algebra to high school topics.
***Prerequisite: Permission of instructor. Primarily for fifth-year students in the high school mathematics certification program.***

**01:640:477** *Mathematical Theory of Probability (3)*
Basic probability theory in both discrete and continuous sample spaces, combinations, random variables and their distribution functions, expectations, law of large numbers, central limit theorem.
***Prerequisite: CALC3. Credit not given for both this course and 01:198:206, 14:332:226, 14:332:321, 14:540:210, or 01:960:381.***

**01:640:478** *Introduction to Stochastic Processes (3)*
Markov chains for discrete-time models, Poisson processes, Markov chains for continuous-time models, queueing theory, renewal processes.
***Prerequisites: 01:640:250 and either 01:640:477 or both 01:640:251 and 01:960:381. Credit not given for both this course and 01:640:424.***

**01:640:481** *Mathematical Theory of Statistics (3)*
Fundamental principles of mathematical statistics, sampling distributions, estimation, testing hypotheses, correlation analysis, regression, analysis of variance, nonparametric methods.
***Prerequisites: 01:640:250 and either 01:640:477 or both 01:640:251 and 01:960:381. Credit not given for both this course and 01:960:382.***

**01:640:485** *Introduction to Mathematical Finance (3)*
Study of the mathematical theory and financial concepts used to model and analyze financial derivatives. Topics include martingales, Brownian motion, and stochastic differentials, with applications to discrete and continuous time stochastic models of asset prices, option pricing, the Black-Scholes pricing model, and hedging.
***Prerequisites: 01:640:250, CALC4, and 01:640:477 or 01:960:381 or 14:332:226. Recommended for students interested in economics, statistics, finance, or actuarial mathematics.***

**01:640:486** *Mathematics of Life Contingent Risk Models I (3)*
Survival models, life tables. Valuation of benefits, premiums, and standard single life insurance and annuity products. Covers part of the syllabus for Exam LTAM of the Society of Actuaries.
***Prerequisites: 01:640:285 and (01:640:477 or 01:960:381). May not be used as an elective for the math major. May be used for the math minor.***

**01:640:487** *Mathematics of Life Contingent Risk Models II (3)*
Continuation of Mathematics of Life Contingent Risk Models I. Policy values, multiple state models, pension mathematics, effect of interest rate risk, emerging costs of traditional life insurance. Covers part of the syllabus for Exam LTAM of the Society of Actuaries.
***Prerequisite: C or better in 01:640:486. Credit not given for both this course and 01:640:478.***

**01:640:491,492** ***Undergraduate Mathematics Seminar (1,1)***
Reading, presentation, and discussion of mathematical topics.
***Prerequisite: Permission of department. Pass/no credit only.***

**01:640:493,494** ***Individual Study in Mathematics (1-3 BA,1-3 BA)Prerequisite: Permission of department.***

**01:640:495** ***Selected Topics in Mathematics (3)***

**01:640:496** ***Research in Mathematics (3)***

**01:640:497,498** ***Honors in Mathematics (3,3)***

**01:122:491,492** ***Research in Biomathematics (3,3)***
Research in a selected subject conducted with the supervision of a faculty member. Research proposals must receive prior approval of the director and codirector of the biomathematics program.
***Prerequisite: Permission of program director.***

# Medicine and Dentistry (SAS)

## MEDICINE AND DENTISTRY

The Association of American Medical Colleges, the American Association of Colleges of Osteopathic Medicine, and the American Dental Association have set the following entrance requirements for their member medical and dental schools:

| **Subject** | **Credits** |
|---|---|
| Biology | 8 |
| Chemistry: General Inorganic | 8 |
| Chemistry: Organic | 8 |
| English | 6 |
| Humanities | 6 |
| Physics | 8 |
| Biochemistry | 3/4* |
| Psychology | 3* |
| Sociology | 3* |
| Statistics | 3* |

*These courses are recommended for the Medical College Admissions Test (MCAT) as of 2015.

All four science areas should include a laboratory. In addition, some medical and dental schools may require

knowledge of a foreign language, a year of college mathematics, and additional work in the sciences. There is, however, no prescribed premedical major. Applicants to medical and dental schools should have excellent records, especially in the sciences, as well as experience in a health care field. Also, all schools recognize the importance of well-developed communication skills and a strong background in the humanities and the social sciences.

Before sitting for either the MCAT or Dental College Admissions Test (DAT), it is recommended that students take coursework in psychology, sociology, statistics, and other biomedical sciences such as biochemistry, genetics, physiology, and/or cell biology. Students should contact the Rutgers Health Professions Office (848-445-5667) for more information.

(See also Health Professions Office in the School of Arts and Sciences chapter of this catalog.)

# Medieval Studies 667 (SAS)

## Medieval Studies 667

School of Arts and Sciences

**Website:** Here

**Program Director:** Sarah Novacich

**Program Faculty**:

Tuna Artun, History, PhD., Princeton

T. Corey Brennan, Classics; Ph.D., Harvard

Jessey Choo, Asian Languages and Culture; Ph.D., Princeton

Serena Connolly, Classics; Ph.D., Yale

Leah DeVun, History; Ph.D., Columbia

Anthony Dibattista, History; Ph.D., Rutgers

Diane Shane Fruchtman, Religion, PhD., Indiana University

Charles Häberl, AMESALL, PhD, Harvard

Samantha Kelly, History, PhD., Northwestern

Stacy Klein, English; Ph.D., Ohio State

Tia Kolbaba, Religion; Ph.D., Toronto

Brian Leftow, Philosophy; PhD., Yale

James Masschaele, History; Ph.D., Toronto

James Niessen, Alexander Library, PhD., Indiana University

Sarah Novacich, English; Ph.D, Yale

Dámaris Otero-Torres, Spanish and Portuguese, PhD., UC San Diego

Ana Pairet-Vinas, French; Ph.D., University of Pennsylvania

Hieu Phung, Asian Languages and Cultures, PhD., University of Hawaii

Stephen Reinert, History; Ph.D., UCLA

Gary Rendsburg, History/ Jewish Studies, PhD, NYU

Larry Scanlon, English, PhD., Johns Hopkins

Tamara Sears, Art History, PhD., University of Pennsylvania

Wendy Swartz, Asian Languages and Cultures; Ph.D., UCLA

Paola Tartakoff, History/Jewish Studies; Ph.D., Columbia

Erik Thunø, Art History; Ph.D., Johns Hopkins

Alessandro Vettori, Italian; Ph.D., Yale

Haruko Wakabayashi, Asian Languages and Cultures, PhD., Princeton

Emma Wasserman, Religion; Ph.D., Yale

Laura Weigert, Art History; Ph.D., Northwestern

Laura White, Italian; Dottore in Lettere, Trieste (Italy); Ph.D., UCLA

Azzan Yadin-Israel , Jewish Studies, PhD., UC Berkeley

Medieval Studies 667 (SAS)

# Learning Goals

# Learning Goals

*Majors and Minors* have the opportunity to build individualized courses of interdisciplinary study to gain familiarity with different centuries and geographies of the medieval world, including its major cultural and intellectual trends, its demography, and its social formations and institutions. In addition, they are encouraged to become aware of the latest scholarly developments; the continuing areas of uncertainty and controversy; the variety and character of the sources for the modern study of the Middle Ages; the history of the study of the Middle Ages by modern interdisciplinary scholarship; and the influence of medieval culture on our own cultural moment.

*Majors* also will be able to demonstrate intermediate competence in at least one language (in addition to English) central to medieval culture; as well as competence in at least two of the constituent disciplines of Medieval Studies with some understanding of the benefits and challenges of interdisciplinary study.

Medieval Studies 667 (SAS)

# Major Requirements

# Major Requirements

The major in medieval studies requires 30 credits of coursework, as follows:

1. The equivalency of four semesters of study of a language other than English, or one semester of Old English Language and Literature. Students can satisfy this requirement by demonstrating proficiency through test scores, coursework, or a combination of the two.

2. 6 credits in introductory courses on medieval civilization, chosen from 01:667:281 Medieval Civilization I; 01:667:282 Medieval Civilization II; 01:082:105 Introduction to Art History, Prehistory to 1400; 01:098:241 East Asian Civilizations: Premodern Era; 01:506:271 Jewish History I: Ancient and Medieval.

3. 3 credits in the seminar in medieval studies, currently offered as 01:667:481 Senior Seminar in Medieval Studies, or equivalent course by permission. Many 400-level courses with a significant focus on the Middle Ages will also satisfy this requirement.

4. 18 credits in six elective courses chosen from approved cognate courses on medieval Europe offered in affiliated departments. Of the six elective courses, at least four must be at the 300 level or above. No more than three elective courses may be from any one department.

Medieval Studies 667 (SAS)

# Minor Requirements

# Minor Requirements

The interdisciplinary minor in medieval studies consists of seven courses distributed as follows:

1. 2 courses selected from the following: 01:510:209 (Emergence of Medieval Europe)/ 01:667:281 (Medieval Civilization, I); 01:510:211 (Harvest of the Middle Ages)/01:667:282 (Medieval Civilization, II); 01:506:271 Jewish History I: Ancient and Medieval; 01:082:105 Introduction to Art History, Prehistory to 1400; 01:098:241 East Asian Civilizations: Premodern Era.

2. 01:667:481 or equivalent 400-level course by permission.

3. Four courses selected from the list of approved courses for the minor.

At least five of the seven courses must be taken outside the student's major. A minimum of three of the seven courses must be at the 300 level or above, and the minor must include at least two courses in each of two disciplines outside the student's major.



# Courses

# Courses

**01:667:220** *Greek Food from Antiquity to Today (3)*
Food and foodways of Greek-speaking peoples from ancient times to the present, with special emphasis on problems of continuity and change.
*Credit not given for this course and 01:489:220, 01:510:222, 01:685:220, or 01:190:220.*

**01:667:281,282** *Medieval Civilization (3,3)*
Intellectual, technological, artistic, and social developments as reflected in specific manifestations from each period. First semester: from Justinian to the Crusades (400-1100), including *Beowulf*, Haghia Sophia, the *Song of Roland*, the manor. Second semester: from Romanesque to Renaissance (1100-1450), including troubadour music, Chartres, the Black Death, Dante.
*Credit not given for both these courses and 01:510:209,210.*

**01:667:380** *Topics in Medieval Studies (3)*
Selected topics in any of the fields constituting medieval studies. Details available at the time of registration.

**01:667:387** *Touching History: The World of Medieval Manuscripts (3)*
An introduction to medieval manuscripts and to book culture from before the age of printing, with particular attention to the scribal transmission of ancient and classical texts (Bible, Homer, Qur'an, Beowulf, etc.).

Credit not given for both this course and 01:506:388 or 01:563:387 or 01:840:388)

**01:667:388** *The Cultures of the Middle Ages (3)*
A detailed survey of a particular medieval society, with special emphasis on the complex interactions between different ethnic and cultural traditions of the medieval world. Topics covered vary depending on the interests and expertise of the professor.
*Credit not given for both this course and 01:195:388, 01:350:388, or 01:358:308.*

**01:667:390** *Independent Study (3)*
Independent work on a topic developed in consultation with instructor.
*Prerequisite: Permission of director.*

**01:667:481** *Senior Seminar in Medieval Studies (3)*
Interdisciplinary course taught by faculty drawn from the humanities and social science disciplines. Topics in medieval civilization vary from year to year. Research paper required; supervised by faculty in two disciplines.

# Approved Courses

# Approved Courses

Many courses that are not officially cross-listed with medieval studies are approved for satisfaction of major and minor requirements. The list below is representative, but new courses are regularly being added: contact that director regarding courses with medieval content that are not listed below. Also check the medieval studies online list of approved courses.

01:013:201 Classical Literatures of Africa, the Middle East, and South Asia (3)¿

01:082:105 Introduction to Art History I (3)

01:082:308 Italy, 1250-1400: The Hinge between Medieval and Renaissance (3)

01:082:312 Byzantine Art (3)

01:082:318 Myth and Legend in Art (3)

01:082:320 Islamic Art and Architecture (3)

01:082:347 Early Northern European Painting (3)

01:082:373 Early Medieval Art (3)

01:082:374 Romanesque and Gothic Art (3)

01:082:377 Gothic Art (3)

01:082:379 Imagery and Architecture of Medieval Rome (3)

01:082:397 Medieval Architecture (3)

01:082:473 Illuminated Manuscripts (3)

01:165:341 Major Traditions in Chinese Thought (3)

01:165:471 Early "China" in the "World": Cosmography, Epistemology, & Encountering the Strange (3)

01:358:303 Literature of Medieval Courts (3)

01:358:304 Medieval Literature of Dissent (3)

01:358:305 Medieval Romance (3)

01:358:306 Chaucer (3)

01:358:307 Medieval Women Writers (3)

01:358:308 Cultures of the Middle Ages (3)

01:358:309 Issues and Problems in Medieval Literature and Culture (3)

01:358:411 Old English Language and Literature (3)

01:358:412 Seminar: Old English Language and Literature (3)

01:358:422 Seminar: Topics in Medieval Literature and Culture (3)

01:420:403 History of the French Language (3)

01:420:415 Medieval French Literature (3)

01:470:331 German Literature of the Middle Ages (3)

01:470:341 German Civilization I: Fifth through 15th Centuries (3)

01:508:303 The Classical Age of Islam (3)

01:508:410 Medieval Turkey (3)

01:510:205 History of the Byzantine Empire (3)

01:510:207 Byzantine Civilization (3)

01:510:213 The Crusades (3)

01:510:214 European Intellectual Tradition (3)

01:510:255 Dracula: Facts and Fictions (3)

01:510:307 The Roman World in Late Antiquity (3)

01:510:309 A History of Western Morals (3)

01:510:313 Medieval Spain: Muslims, Christians, and Jews (3)

01:510:314 Jews, Heretics, and the Inquisition (3)

01:510:315 Reform and Dissent in the Middle Ages (3)

01:510:316 Food and Drink in Medieval Europe (3)

01:510:337 Medieval Kings and Queens (3)

01:510:338 England in the Middle Ages (3)

01:510:345 English Constitutional History to 1688 (3)

01:510:351 Medieval Italy 476-1300 (3)

01:510:357 Medieval Germany (3)

01:510:441 The Social History of Medieval England (3)

01:560:315 Dante and Medieval Culture (3)

01:560:331,332 Dante in Translation (3,3)

01:560:401,402 Italian Literature of the 13th and 14th Centuries (3,3)

01:560:415,416 Dante (3,3)

01:563:201 Jewish History: Ancient and Medieval (3)

01:563:250 Spirituality and Mysticism in Judaism (3)

01:563:311 Classical Jewish Philosophy (3)

01:565:320 Samurai Tradition (3)

01:580:302 Medieval Latin (3)

01:685:303 The Classical Age of Islam (3)

01:730:304 The Origins of Medieval Philosophy (3)

01:730:305 Philosophy in the High Middle Ages (3)

01:730:306 Between Medieval and Modern Philosophy (3)

01:730:374 Islamic Philosophy (3)

01:840:312 Greek Christianity (3)

01:840:313 Latin Christianity (3)

01:940:405 Civilization of Spain (3)

01:940:415 Medieval Spanish Literature (3)

01:940:417 History of the Spanish Language (3)

07:700:211 Studies in Music History (3)

# Meteorology 670 (SEBS)

## METEOROLOGY 670

**Degree:** B.S.

**Director:** Steven Decker (decker@envsci.rutgers.edu)

**Program Webpage:** Here

Meteorology is the study of weather and climate, of the characteristics, structure, and processes of the atmosphere. Students learn how to forecast the weather and how to understand climate change. The emphasis of the bachelor of science degree program is on developing a broad understanding of the fundamental physical and dynamic processes governing the motions and behavior of the atmosphere, and its interactions with the underlying land and ocean surfaces. Basic courses in chemistry, physics, and mathematics are the prerequisite foundation on which the meteorology program is built. Students who wish to pursue an undergraduate meteorology degree should have a strong high school or equivalent background in mathematics and the sciences prior to enrollment. This program meets all the U.S. federal government civil service requirements for classification as a meteorologist and the American Meteorological Society recommendations for undergraduate meteorology programs.

Meteorology 670 (SEBS)

# Learning Goals

# Learning Goals

A successful meteorology graduate will be able to:

1. Conduct a weather discussion and apply diagnostic, prognostic, and technological tools to evaluate atmospheric processes across a multitude of scales.

2. Demonstrate integrated understanding of the linked Earth-atmosphere-ocean-cryosphere-biosphere system, including the roles of atmospheric chemistry and human impacts on the system.

3. Apply critical and analytical thinking to solve relevant scientific problems in both individual and collaborative settings.

4. Effectively communicate scientific information orally and in writing, including by electronic means, at an appropriate level for their audience.

5. Demonstrate mastery of the mathematical and physical foundations of meteorology and climatology as well as key atmospheric processes that occur at a variety of spatial and temporal scales.

6. Understand and utilize the principles of proper ethical behavior within the atmospheric sciences and be aware of the scientific limits of prediction.

Meteorology 670 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

To enter meteorology courses at the 300 and 400 level and to satisfy the major requirements, students must achieve a grade of C or better in the following courses:

01:640:151-152 Calculus for Mathematical and Physical Sciences

01:640:251 Multivariable Calculus

01:750:203-204 General Physics *and* 01:760:205-206 General Physics Laboratory

11:670:101 Introduction to Meteorology

11:670:102 Introduction to Climate Science

Meteorology 670 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

**SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)**

*Parts of the SEBS core are satisfied by the major requirements.*

**Contemporary Challenges**(6 credits)*Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities*[CC-D]*and Our Common Future*[CC-O]

**Experiential Learning**(3 credits)*Students must participate in a certified experience that meets this goal*[EL]

**Natural Sciences**(6 credits)*Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences*[NS]

**Historical Analysis**(3 credits)*Students must take one course*[HST]

**Social Analysis**(6 credits)*SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis*[SCL]

**Arts and Humanities**(3 credits)*Students must complete one course*[AH]

**Writing and Communication** (6 credits) Students must complete two courses, one in [WC], and the other in [WCD]. For Meteorology majors, the [WCD] course must be one of the following:

01:355:302 Scientific and Technical Writing (3) or
01:355:201 Research in the Disciplines (3) or
01:355:301 College Writing and Research (3)

**Quantitative and Formal Reasoning** (6 credits) Students must take two courses [QQ; QR]

## Graduation Requirements for the Meteorology Major (75 or 76 credits)

For an up-to-date description of meteorology major requirements, courses, and course sequences please refer to the program website here.

**Quantitative Skills(22 credits)**
01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)*
01:640:244 Differential Equations for Engineering and Physics (4)
01:640:251 Multivariable Calculus (4)
11:670:212 Computational Methods for Meteorology (3)
11:375:303 Numerical Methods in Environmental Science (3) or
01:960:401 Basic Statistics for Research (3) or
01:960:379 Basic Probability and Statistics (3)

*Calculus courses satisfy SEBS Quantitative [QQ] and Formal Reasoning [QR] requirements.

**Physical Sciences (13 credits)**
01:160:161 General Chemistry (4)
01:160:171 Introduction to Experimentation (1)
01:750:203-204 General Physics (3,3)
01:750:205-206 General Physics Laboratory (1,1)

**Meteorology (37 or 38 credits)**
11:670:101 Introduction to Meteorology (3)**
11:670:102 Introduction to Climate Science (3)***
11:670:211 Meteorological Analysis (3)
11:670:323 Thermodynamics of the Atmosphere (3)
11:670:324 Dynamics of the Atmosphere (3)
11:670:431 Physical Meteorology (3)
11:670:433 Weather Analysis and Forecasting I: Synoptic Meteorology (4)****
11:670:434 Weather Analysis and Forecasting II: Mesoscale Meteorology (3)
11:670:451 Remote Sensing of the Ocean and Atmosphere (3)
11:670:461 Climate Dynamics (3)

**Satisfies SEBS Natural Sciences [NS] (Physical) requirement
***Satisfies SEBS Natural Sciences [NS] (Environmental) requirement
****Satisfies SEBS Experiential Learning [EL] requirement

*Also choose two courses from the following list:*
11:375:346 Introduction to Atmospheric Chemistry (3)
11:628:451 Physical Oceanography (4)
11:670:414 Hydrologic Processes (3)
11:670:444 Tropical Meteorology (3)
11:670:453 Air Quality Modeling (3)

**Capstone Experience (3 credits)**
Complete at least three credits from among the following courses:
11:554:298 Honors Tutorial II (1)
11:554:301/2 Aresty Research Assistantship (1.5)
11:554:397/8 Honors Tutorial III/IV (arr)
11:554:487/8 G. H. Cook Honors Program (arr)

11:670:334 Severe Weather Forecasting Field Trip (3)
11:670:493/4 Research Problems in Meteorology (arr)
11:902:300 SEBS Internship I (arr)

**ELECTIVES (23-24 credits or more)**
In addition to courses meeting the above requirements, students must take enough other courses offered by the university to bring their total number of credits to the minimum of 128 required for graduation. Although not required, many meteorology students use these electives to complete a minor. A minor in mathematics, requiring only four more mathematics courses, is the most popular. Students also consider other fields, including oceanography, physics, environmental sciences, and environmental and business economics. Students are strongly encouraged to do internships, which provide valuable career-related experience and contacts, and to pursue research with faculty members. Both can be taken for academic credit.

*A student must achieve a grade of C or better in the following courses:*

Physics 1 (01:750:203 and 205)
Physics 2 (01:750:204 and 206)
Calculus 1 (01:640:151)
Calculus 2 (01:640:152)
Multivariate Calculus (01:640:251)
Introduction to Meteorology (11:670:101)
Introduction to Climate Science (11:670:102)

Students preparing for graduate study in meteorology or atmospheric science are encouraged to consider additional courses in meteorology, oceanography, computer science, and mathematics such as:

11:670:414 Hydrologic Processes (3)
11:670:444 Tropical Meteorology (3)
11:670:453 Air Quality Modeling (3)
11:628:451 Physical Oceanography (4)
01:198:323 Numerical Analysis and Computing (4)
01:640:250 Introduction to Linear Algebra (3)
01:640:423 Elementary Partial Differential Equations (3)
01:640:477 Mathematical Theory of Probability (3)

# Microbiology 680 (SEBS)

## MICROBIOLOGY 680

**Degree:** B.S.

**Director:** Ines Rauschenbach (inesrau@sebs.rutgers.edu)

**Program Webpage:** Here

Microorganisms are the smallest living things, the oldest form of life on earth, ubiquitous in the biosphere and central to the essential life processes on earth. The microbiology curriculum emphasizes the uniqueness of microbial biology, its enormous diversity, and the biochemical basis of microbial life.

The curriculum examines the diverse roles of microorganisms and covers the fundamentals of microbial diversity, physiology, and genetics. The focus is on the examination of microorganisms; microbial processes in natural and managed environments; and their effects on human, animal, plant, and environmental health. The nature and activity of microbial populations in aquatic and terrestrial ecosystems, the interactions within microbial communities, and biogeochemical cycles and energy flows are explored. The curriculum provides students with a fundamental understanding of the applications of microbes in biotechnology, the food industry, agriculture, and medicine. Recent advances in microbial molecular biology and biotechnology have led to an in-depth understanding of the physiology, genetics, and taxonomy of microbes. Microbes are central to the food, biotechnology, and pharmaceutical industries and are broadly utilized ranging from food fermentations and biosynthetic processes to waste treatment and biodegradation of toxic chemicals. The field of microbiology is a major contributor toward industrial development; human, animal, and plant health; environmental integrity; and agricultural productivity.

The primary objectives of the curriculum are to broadly educate students regarding the biology of microorganisms. The curriculum prepares students for positions in industry, government, and graduate/professional study in life sciences through extensive coursework combined with laboratory and research experience.

Microbiology 680 (SEBS)

# Learning Goals

# Learning Goals

1. Graduates will be able to illustrate and describe the biology of microorganisms, focusing on microbial processes and their effects on other organisms and the environment, microbial communities, and biogeochemical cycles.

2. Graduates will be able to apply the scientific method to formulate questions and hypotheses, design experiments, employ appropriate methodology to solve problems in microbiology, and be able to analyze, interpret, and present scientific data in microbiology.

3. Graduates will be able to critically evaluate scientific literature and explain their findings in written and oral format.

4. Graduates will be able to summarize ethical and current issues in microbiology and apply a code of ethics for microbiologists including ethical conduct, scientific integrity, and the dignity of the profession and practice of microbiology.

Microbiology 680 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

To enter upper-level microbiology (11:680) courses, students must have completed 01:119:115-116,117 General Biology (formerly 01:119:101-102) and 01:160:161-162 General Chemistry with grades of C or better.

Microbiology 680 (SEBS)

# Residency Requirements for the Major

# Residency Requirements for the Major

A minimum of 20 credits of coursework from among the required and elective courses. Proficiency in microbiology, not including quantitative skills (8), must be completed in residence. Of these 20 credits, at least 12 credits must be completed from 680 courses.

This rule is intended to assure that students receiving degrees from Rutgers University-New Brunswick have taken a minimum number of courses in their major with New Brunswick faculty. Please keep in mind that although a course may transfer from another institution into one of the Rutgers-New Brunswick schools, it will not necessarily be accepted toward the major in microbiology. Therefore, transfer courses must be evaluated and accepted by the program director in order to count toward the major.

Microbiology 680 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

All students, regardless of matriculation date must complete a minimum of 20 credits of microbiology major coursework from among the required and elective courses (Area VIII). Proficiency in microbiology, not including quantitative skills (8 credits), must be completed in residence. Of these 20 credits, at least 12 credits must be completed from 680 courses. This rule is intended to assure that students receiving degrees from Rutgers University-New Brunswick have taken a minimum number of courses in their major with New Brunswick faculty. Please keep in mind that although a course may transfer from another institution into one of the Rutgers-New Brunswick schools, it will not necessarily be accepted toward the major in microbiology. Therefore, transfer courses must be evaluated and accepted by the undergraduate program director in order to count toward the major.

For an up-to-date description of microbiology major requirements, courses, and course sequences please refer to the program website here.

# GRADUATION REQUIREMENTS - SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

*Options are chosen from lists of courses certified in each learning goal: Here.*

***Note: The SEBS Core Curriculum requirements differ slightly from SAS Core Curriculum requirements.***

**Contemporary Challenges (6 credits)** *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning (3 credits)** *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences (6 credits)***Two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis (3 credits)** *One course* [HST]

**Social Analysis (6 credits)** *Two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities (3 credits)** *One course* [AH]

**Writing and Communication (6 credits)** *01:355:101 or its equivalent* [WC] *and one course in communicating effectively in modes appropriate to a discipline or area of inquiry* [WCD]

**Quantitative and Formal Reasoning (6 credits)** *Two courses* [QQ; QR]

# GRADUATION REQUIREMENTS FOR THE MAJOR

# GRADUATION REQUIREMENTS FOR THE MAJOR

**A. Introductory Life and Physical Sciences (44 credits)**

- 01:119:115-116 General Biology (4,4)*
- 01:119:117 Biological Research Laboratory (2)
- 01:160:161-162 General Chemistry (4,4)*
- 01:160:171 Introduction to Experimentation (1)
- 01:640:151 Calculus for Mathematics and Physical Sciences (4)**
- 01:960:401 Basic Stats for Research (3)** (other calculus courses may be substituted)
- 01:160:370 - 308 Organic Chemistry (4,4)*** OR 01:160:315 - 316 Principles of Organic Chemistry (4,4)
- 01:447:380 Genetics (4)
- 01:750:193-194 Physics for the Sciences (4,4)* or equivalent

**Up to 6 credits can be applied to the SEBS Core-Natural Sciences*

***Up to 6 credits can be applied to the SEBS Core-Quantitative and Formal Reasoning*

****Students intending to apply to medical school should be aware that many schools require laboratories in organic chemistry and physics.*

**B. Core Microbiology (44 Credits, including electives)**

- 11:680:390 General Microbiology (*Must pass General Microbiology with a minimum grade of C to satisfy prerequisite requirement for: 11:680:401, 11:680:491, 11:680:492, 11:680:494, 11:680:480, and 11:680:481.)
- 11:680:480 Microbial Genetics and Genomics or 11:126:481 Molecular Genetics (3)
- 11:680:481 Microbial Physiology (3)
- 11:680:491 Microbial Ecology and Diversity (3)
- 11:680:494 Applied Microbiology (4)
- 11:680:401 Ethics and Issues in Microbiology (1)
- 11:680:495 Seminar in Microbiology (1)
- 11:115:403-404 General Biochemistry (4,3)
- 11:115:413 Experimental Biochemistry (3)

**Microbiology Electives (15) (Semesters Taught)***
**Please note that no more than one course with a grade of D may be used to fulfill the core microbiology requirements of the major.*

- 11:126:407 Comparative Virology (3) (fall every other year)
- 11:126:427 Methods in Applications in Molecular Biology (4) (fall)
- 11:126:482 Molecular Genetics Laboratory (3) (spring)
- 11:126:484 Tools for Bioinformatic Analysis (3) (spring)
- 11:126:485 Bioinformatics (fall)
- 01:146:328 Human Parasitology (3) (fall)
- 01:146:340 Virology (3) (fall, even years only)
- 01:146:474 Immunology (3) (fall)
- 01:146:475 Laboratory in Immunology (1) (spring)
- 11:216:405 Evolution in Infectious Diseases (3) (spring)
- 11:375:302 Water and Wastewater Treatment (3) (fall)
- 11:375:312 Environmental Microbiology Laboratory (2) (fall)
- 11:375:411 Environmental Microbiology (3) (spring)
- 11:375:453 Soil Ecology (3) (fall)
- 11:400:423 Food Microbiology (3) (spring)
- 01:447:392 Pathogenic Microbiology (3) (fall)
- 01:447:480 Topics in Molecular Genetics (3) (spring)
- 11:680:410 Microbiology and Culture of Cheese and Wine (3) (summer)
- 11:680:486 Analytical Methods in Microbiology (3) (spring, even years)
- 11:680:492 Microbial Ecology Laboratory (3) (spring, odd years)
- 11:680:475 Microbiomes and Health (3) (spring)
- 11:776:302 General Plant Pathology (3) (fall)

- 11:776:400 Fungi in the Environment (3) (fall)
- 11:680:497, 498 Research in Microbiology (fall/spring/summer) - One to three credits of research may be substituted for an equal number of credits of elective courses, with the approval of the curriculum coordinator.

**C. Unspecified Electives (up to 3)**

# Middle Eastern Studies 685 (SAS)

## MIDDLE EASTERN STUDIES 685

School of Arts and Sciences

**Website:** Here

**Director, Center for Middle Eastern Studies (CMES):** Toby Jones

**Director, Middle Eastern Studies Program (MESP):** Neda Bolourchi

**Executive Committee, Center for Middle Eastern Studies/Middle Eastern Studies Program:**

Toby Jones, History; Ph.D., Stanford

Maya Mikdashi, Women's, Gender, and Sexuality Studies, Middle Eastern Studies; Ph.D., Columbia

Sandra Russell-Jones, History, Religion; Ph.D., Pennsylvania

Deepa Kumar, Journalism; Ph.D., Pittsburgh

Omar Dewachi, Anthropology; Ph.D., Harvard

Asle Zengin, Women¿s Gender, and Sexuality Studies; Ph.D., Toronto

For information about the Center for Middle Eastern Studies or the Middle Eastern studies program and declaring a major or minor in Middle Eastern studies, contact the CMES director or MESP director at Lucy Stone Hall, Room B-316, Rutgers, The State University of New Jersey, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854, or by email at mideast@rci.rutgers.edu. Information also may be found at the center's website. Rutgers faculty or students who want to be added to the center's email list can do so on the webpage: Here.



# Learning Goals

# Learning Goals

*Majors* will be able to demonstrate language proficiency at the 300 level or above in one of the Middle Eastern languages (Arabic, Hebrew, Persian, and Turkish); an interdisciplinary foundational knowledge of the languages

and cultures of the Middle East; and, an understanding of key themes in Middle Eastern cultures, history, and contemporary social, economic, and political issues. *Majors* will be able to engage in cross-cultural communication and understanding; analyze how stereotypes hinder intercultural understanding; think dynamically about the relationship between the United States and the third world; and, initiate, research, and write a semester-length independent research paper.

*Minors* will be able to demonstrate introductory level language proficiency (one year) in one of the Middle Eastern languages (Arabic, Hebrew, Persian, and Turkish); an interdisciplinary foundational knowledge of the languages and cultures of the Middle East; and, a basic understanding of key themes in Middle Eastern cultures, history, and contemporary social, economic, and political issues. *Minors* will be able to engage in cross-cultural communication and understanding; analyze how stereotypes hinder intercultural understanding; think dynamically about the relationship between the United States and the third world; and, initiate, research, and write a semester-length independent research paper.

Middle Eastern Studies 685 (SAS)

# Major Requirements

# Major Requirements

The interdisciplinary major in Middle Eastern studies consists of a total of 34 credits that are distributed among the following courses. Students must complete all courses counting toward the major in Middle Eastern studies with a grade of C or better.

**Core Middle Eastern Studies courses (12 credits)**

*1. Introduction to the Modern Middle East (3 credits) 01:685:100*

This course should be taken as early as possible, in the freshman year, or as soon as the major is declared.

*2. Historical Survey (3 credits)*

One of the following three courses should be taken as early as possible, in the freshman year, or as soon as the major is declared.

01:685:201/01:508:201/01:014:205 Islamic Civilization

01:685:305/01:508:205 History of the Modern Middle East

01:685:304/01:508:304 Ottoman Empire

*3. Senior Seminar (3 credits) 01:685:493; 01:685:494; 01:685:499*

Senior Seminars in Middle Eastern Studies are offered every semester and focus on a particular topic, such as The United Nations and the Middle East; Women's Movements in the Middle East; and The Middle East in Western Popular Culture and Mass Media.

In lieu of the Senior Seminar in Middle Eastern Studies, students may substitute an equivalent Senior Seminar in a related discipline (e.g., art history, history, Jewish studies, political science, religion, sociology, or women's, gender, and sexuality studies) that has the Middle East as its focus, with the approval of the director of the Middle Eastern studies program (MESP).

*4. Arts/Literature (3 credits) 01:013:201; 01:013:221; 01:082:320*

The arts/literature requirement can be satisfied by choosing one of the courses listed above in either the AMESALL or the art history department. Upon the director's approval, students can also take related courses in other disciplines.

**Middle Eastern Language (16 credits)**

Students can choose to study any of the following Middle Eastern languages:

Arabic

Hebrew

Persian

Turkish

Less common languages, arranged in consultation with the AMESALL department and the MESP director.

Language courses at Rutgers are typically worth 4 credits (as opposed to the standard 3), therefore, majors should plan to spend four semesters studying their chosen language. All 16 credits must be in the same language--you cannot mix and match.

Students who arrive at Rutgers having completed coursework in their chosen language elsewhere may take a placement test. If the student tests beyond the intermediate level, they need only complete 8 (or 6, depending on the specific courses chosen) credits of language study, at the advanced level, in consultation with the MESP director. Advanced placement students must document their previous language study (students with native language abilities are not eligible to use their native language as their language of study).

**Electives (6 credits)**

The remaining 6 elective credits are taken from other courses offered by Middle Eastern studies, or from approved cross-listed courses relevant to the Middle East offered by contributing departments. Language courses may not be taken to fulfill elective requirements. Some examples of accepted courses from contributing departments are: Islam and Democracy (political science); Jews in the Islamic World (Jewish studies); and Women and Society in the Islamic Middle East (history).

Students may also pursue an internship (3 credits) for elective credit. There are many different types of internships available locally or off campus that would be acceptable for elective credit for the major.

# Minor Requirements

# Minor Requirements

The interdisciplinary minor in Middle Eastern studies consists of a total of 23 credits that are distributed among the following courses. Students must complete all courses counting toward the major in Middle Eastern studies with a grade of C or better.

**Core Middle Eastern Studies courses (12 credits)**

*1. Introduction to the Modern Middle East (3 credits) 01:685:100*

This course should be taken as early as possible, in the freshman year, or as soon as the major is declared.

*2. Historical Survey (3 credits)*

One of the following three courses should be taken as early as possible, in the freshman year, or as soon as the major is declared.

01:685:201/01:508:201/01:014:205 Islamic Civilization

01:685:305/01:508:205 History of the Modern Middle East

01:685:304/01:508:304 Ottoman Empire

*3. Senior Seminar (3 credits) 01:685:493; 01:685:494; 01:685:499*

Senior Seminars in Middle Eastern Studies are offered every semester and focus on a particular topic, such as The United Nations and the Middle East; Women's Movements in the Middle East; and The Middle East in Western Popular Culture and Mass Media.

In lieu of the Senior Seminar in Middle Eastern Studies, students may substitute an equivalent Senior Seminar in a related discipline (e.g., art history, history, Jewish studies, political science, religion, sociology, or women's, gender, and sexuality studies) that has the Middle East as its focus, with the approval of the director of the Middle Eastern studies program (MESP).

*4. Arts/Literature (3 credits) 01:013:201; 01:013:221; 01:082:320*

The arts/literature requirement can be satisfied by choosing one of the courses listed above in either the AMESALL or the art history department. Upon the director's approval, students can also take related courses in other disciplines.

**Middle Eastern Language (8 credits)**

Students can choose to study any of the following Middle Eastern languages:

Arabic

Hebrew

Persian

Turkish

Less common languages, arranged in consultation with the AMESALL department and the MESP director.

Language courses at Rutgers are typically worth 4 credits (as opposed to the standard 3), therefore, majors should plan to spend four semesters studying their chosen language. All 8 credits must be in the same language--you cannot mix and match.

Students who arrive at Rutgers having completed coursework in their chosen language elsewhere may take a placement test. If the student tests beyond the intermediate level, they need only complete 4 (or 3, depending on the specific courses chosen) credits of language study, at the advanced level, in consultation with the MESP director. Advanced placement students must document their previous language study (students with native language abilities are not eligible to use their native language as their language of study).

**Electives (3 credits)**

The remaining 6 elective credits are taken from other courses offered by Middle Eastern studies, or from approved cross-listed courses relevant to the Middle East offered by contributing departments. Language courses may not be taken to fulfill elective requirements. Some examples of accepted courses from contributing departments are: Islam and Democracy (political science); Jews in the Islamic World (Jewish studies); and Women and Society in the Islamic Middle East (history).

Students may also pursue an internship (3 credits) for elective credit. There are many different types of internships available locally or off campus that would be acceptable for elective credit for the major.

Middle Eastern Studies 685 (SAS)

# Honors

# Honors

Middle Eastern studies program (MESP) honors will be awarded to senior Middle Eastern studies (685) majors who enroll in the Middle Eastern studies courses, Honors Thesis 685:497/498, and successfully complete a Middle Eastern studies honors thesis. In order to be eligible for departmental honors, an MESP major will have successfully completed at least 15 credits in Middle Eastern studies courses with a grade-point average 3.4 or better in these courses and have an overall grade-point average of 3.0 or better at the beginning of the fall semester of senior year.

Middle Eastern Studies 685 (SAS)

# Program Courses

# Program Courses

The Middle Eastern studies program, which is affiliated with the Center for Middle Eastern Studies, is an interdisciplinary major and minor. In addition to courses originating in the Middle Eastern studies program, the

major and minor include courses anchored in other departments that are approved for the Middle Eastern studies major or minor, many of which are cross-listed. Cross-listed courses usually utilize the same last three digits of the course number as the listing in the originating department. The Middle Eastern studies code designation is 01:685:__. For example, course 01:790:351 Contemporary Politics in the Middle East, a political science course, is offered simultaneously within Middle Eastern studies as course 01:685:351, with the same title. Credit is not given for both a Middle Eastern studies course (01:685:__) and its corresponding cross-listed course.

Summary descriptions of cross-listed and other approved courses may be found under the relevant originating department's subject code listing (e.g., for a description of 01:685:385 Arab Politics and Society, consult the parallel course entry in the political science program, which is 01:790:385).

Middle Eastern Studies 685 (SAS)

# Courses Originating in Middle Eastern Studies

# Courses Originating in Middle Eastern Studies

**01:685:100** ***Introduction to the Modern Middle East (3)***
Introduction to the languages and cultures of the Middle East and facilities of cross-cultural communication and understanding between the people of the West and of the Middle East.
***Credit not given for both this course and 01:563:100.***

**01:685:200** ***Ancient Near East (3)***
Origins and development of the societies of Mesopotamia, Egypt, Asia Minor, and the Levant, through the period of the Persian Empire.
***Credit not given for both this course and 01:508:200, 01:190:200 and 01:563:200.***

**01:685:201** ***Islamic Civilization (3)***
Survey of Islamic societies from seventh-century Arabia to modern times. Religious, political, military, social, economic, and cultural institutions and organizational patterns.
***Credit not given for this course and 01:489:220, 01:510:222, 01:667:220, or 01:190:220.***

**01:685:220** ***Greek Food from Antiquity to Today (3)***
Food and foodways of Greek-speaking peoples from ancient times to the present, with special emphasis on problems of continuity and change.
***Credit not given for this course and 01:489:220, 01:510:222, 01:667:220, or 01:190:220.***

**01:685:225** ***Global Arabic (3)***
Traces the historical development of Arabic as a global language, the various meanings Arabic has come to acquire in various parts of world, and the functions it has come to serve in different periods and different global spaces. Arabic's interactions with other languages and their sociolinguistic implications. Taught in English.
***Credit not given for this course and 01:013:225.***

**01:685:226** ***Islam (3)***
Muhammad and the development of Muslim beliefs and practices; major movements and their effects on historical and current events.
***Credit not given for both this course and 01:840:226.***

**01:685:230** ***Introduction to Third World Cinema: Middle East and North Africa (3)***
Analyze Third World cinema in the context of sociopolitical issues such as race, class, and gender; relation between Third World cinema and the West; roles of women, youth, and marginal groups. Examine and compare cultural understandings of the concepts of modern and traditional.

**01:685:236** ***History and Cultures of Iran (3)***
Introduction to Iranian civilization through its historical, material, and intellectual cultures. A diachronic view of cultural tropes, intellectual and nationalist movements, and political governing systems that transformed Iran over the course of the three significant historical periods: the ancient and medieval dynasties, the period from the 19th century to the end of the Pahlavis Monarchy, and the Islamic Republic of the post-1979 Revolution.

**01:685:240** ***Muslims and Islamic Institutions in America (3)***
Explores the bonds of Muslim community, the meaning of Muslim-American identity, how immigrant groups are assimilated into American society, and institutional frameworks being adopted for national integration.
***Credit not given for both this course and 01:014:356 or 01:685:355.***

**01:685:241** ***History of Islamophobia (3)***
This course surveys the history of Western anxiety about Islam from its origins to the present, exploring the theological, political, and cultural forces behind it. It examines how Islamophobia has been institutionalized through discrimination, exclusion and violence against Muslims and those perceived as Muslim. The term 'Islamophobia' is analyzed through engaging with multidisciplinary debates that interrogate the term and its limitations, and its complex relation to religious bias and racism.
***Credit not given for both this course and 01:508:203 or 01:840:228***

**01:685:282** ***Israeli-Palestinian Conflict (3)***
Overview of the hundred-year old Arab-Israeli conflict, the controversies it has generated, the attempts to resolve it, and how outsiders to the conflict learn about it and experience it.
***Credit not given for both this course and 01:508:212, 01:508:300; 01:563:282; 01:563:300; or 01:685:300.***

**01:685:295** ***Special Topics in Middle Eastern Studies (3)***
Study of a specifically defined subject of Middle Eastern studies. Subjects vary according to individual instructors; contact the undergraduate director for information.

**01:685:306** ***Minorities in the Middle East (3)***
Survey of peoples, languages, and religions found in the contemporary Middle East, with a focus upon underrepresented groups and transnational issues. Emphasizes their histories, their roles in the contemporary Middle East, and their evolving relationships with the dominant group of the nations in which they are found.
***Credit not given for both this course and 01:013:308 or 01:840:306.***

**01:685:324** ***Women Writers of the Arab World (3)***
Comprehensive overview of emergence and development of fiction by Middle Eastern women through translated works with emphasis on comparative feminisms in literature. Taught in English.
***Credit not given for this course and 01:013:325 or 01:988:315.***

**01:685:330** ***Major Themes in Contemporary Iranian Cinema (3)***
Examines major films from postrevolutionary Iranian cinema. Major themes: the role of religion in film, art, feminism, children in adult roles, city versus rural and tribal spaces, and the gradual erosion of political and cultural restrictions.

**01:685:331** ***Impacts of Media Technologies and Globalization on the Middle East (3)***
Examines how media, especially information technology, have changed societies in the modern Middle East. Tensions between traditional values and modernity as they manifest in the widespread application of computer technology. Challenges to authoritarian governments in the Middle East by the proliferation and democratization of public access to technology. Introduction to the languages and cultures of the Middle East and facilitation of cross-cultural communication and understanding between the people of the West and of the Middle East.

**01:685:335** ***Ta'zieh (Passion Play): Religious Rituals, History, and Shi'ite Culture (3)***
Examination of the Persian passion play *Ta'zieh*, its roots in Shi'ite history, and its ritual and aesthetic dimensions.

**01:685:336** ***History and Cultures of Iran (3)***
Introduction to Iranian history through its social, cultural, and political developments.

**01:685:346** ***Media in the Arab World (3)***
Examines media in the Arab world from mid-19th century print sources to modern electronic media. The role that satellite channels, such as al Jazeera, play in contemporary political discourse in Arabic.

**01:685:353** ***Islamic Law and Jurisprudence (3)***
Introduction to Islamic legal theory in its historical and modern contexts. Contrasts Islamic law and legal theory with Western legal theory and constitutional thought.
***Credit not given for both this course and 01:790:457.***

**01:685:357** ***Islam and Democracy in the Arab World (3)***
Current debates about why the Arab world is reluctant to embrace democracy and why some governments in the Arab world remain authoritarian. Includes the role of Islam in political, economic, and cultural discourse.
***Credit not given for both this course and 01:790:367.***

**01:685:395,396** ***Special Topics in Middle Eastern Studies (3,3)***
Study, in a discussion-oriented format, of a specifically defined subject of Middle Eastern studies.
***Subjects vary according to individual instructors; contact the undergraduate director for information.***

**01:685:447** ***Twentieth-Century Social Movements in Iran (3)***
The Constitutional Revolution of 1906-09; impact of the Russian Revolution on social movements in Iran and the emergence of nationalist movements in Iran's Azerbaijan, Gilan, and Kurdistan provinces; Mossaddegh's oil nationalization effort and its aftermath; the 1979 Revolution in Iran; and the ongoing struggle for social and political freedoms.

**01:685:480,481,482** ***Internship in Middle Eastern Studies (3,3,3)***
Students work in outreach projects or with a designated agency concerned with Middle Eastern affairs; requires an appropriately designed academic project, resulting in a paper.
***Prerequisite: Permission of program director.***

**01:685:495,496** ***Advanced Topics in Middle Eastern Studies (3,3)***
Intensive study, in a discussion-oriented format, of a specifically defined subject of Middle Eastern studies. Subjects vary according to individual instructors; contact the center director for information.
***Prerequisite: 01:685:100.***

**01:685:497,498** ***Honors Thesis (3,3)***
Research for and writing of an original work of scholarship.
***Prerequisite: Permission of program.***

**01:685:499** ***Senior Seminar in Middle Eastern Studies (3)***
Ways of looking at and interpreting Middle Eastern societies, cultures, histories, languages, religions, etc. Examines popular scholarly materials including artwork, films, fiction, and essays using modern methods of critical analysis.
***Prerequisites: 01:685:100 or 01:563:100. Open to seniors only.***



# Middle Eastern Studies Courses Offered by Other Departments

# Middle Eastern Studies Courses Offered by Other Departments

**A. African, Middle Eastern, and South Asian Languages and Literatures (for Hebrew language courses, see Jewish Studies below)**

01:013:110 (01:563:145; 01:685:145) Introduction to Aramaic (3)

01:013:130 (01:685:130) Comics in the Middle East (3)

01:013:140 Elementary Arabic I (4)

01:013:141 Elementary Arabic II (4)

01:013:176 (01:723:103) Elementary Persian I (4)

01:013:177 (01:723:104) Elementary Persian II (4)

01:013:190 (01:973:105) Elementary Turkish I (4)

01:013:191 (01:973:106) Elementary Turkish II (4)

01:013:201 (01:685:204) Crossroads: Classical Literatures of Africa, the Middle East, and South Africa (3)

01:013:203 Language and Society in Africa, the Middle East, and South Asia (3)

01:013:221 (01:685:221; 01:195:221) Introduction to the Literatures of the Middle East (3)

01:013:240 (01:013:227; 01:685:227; 01:074:240) Intermediate Arabic I (4)

01:013:241 (01:013:228; 01:685:228; 01:074:241) Intermediate Arabic II (4)

01:013:242 Classical Arabic I (4)

01:013:243 Classical Arabic (3)

01:013:276 (01:723:276) Intermediate Persian I (4)

01:013:277 (01:723:204) Intermediate Persian II (4)

01:013:290 (01:973:215) Intermediate Turkish I (4)

01:013:291 (01:973:216) Intermediate Turkish II (4)

01:013:301 Topics in AMESALL (3)

01:013:302 Topics in AMESALL (1.5)

01:013:314 Islam and African Literatures (3)

01:013:322 (01:685:323) Middle Eastern Folklore and Myth (3)

01:013:325 (01:685:324, 01:988:315) Women Writers of the Arab World (3)

01:013:329 (01:685:322) Moroccan Culture (3)

01:013:340 (01:013:327; 01:685:327; 01:074:340) Advanced Arabic I (3)

01:013:341 (01:013:328; 01:685:328; 01:074:341) Advanced Arabic II (3)

01:013:342 (01:013:437) Modern Arabic Literatures (3)

01:013:343 (01:195:237) Arabic Classical Literatures (3)

01:013:346 (01:195:337; 01:685:347) Literature and Memory in the Arab World (3)

01:013:376 (01:723:303) Advanced Persian I (3)

01:013:377 (01:723:304) Advanced Persian II (3)

01:013:378 Modern Persian Literatures (3)

01:013:379 Classical Persian Literatures (3)

01:013:390 Advanced Turkish I (3)

01:013:391 Advanced Turkish II (3)

01:013:401 Senior Seminar in Literature and Society (3)

01:013:402 Advanced Topics in AMESALL (3)

01:013:409 (01:563:409) Introduction to the Semitic Languages (3)

01:013:476 Theory and Practice of Persian Translation I (3)

01:013:477 Theory and Practice of Persian Translation II (3)

**B. Art History**

01:082:320 (01:685:320; 01:667:320) Islamic Art and Architecture (3)

**C. History**

01:078:210 Armenians in World History (3)

01:506:363 (01:685:363) Imperialism (3)

01:506:367 (01:685:367) Protest and Revolution (3)

01:506:375 (01:563:375; 01:685:375; 01:070:375) Jewish Immigrant Experience (3)

01:508:200 (01:190:200; 01:563:200; 01:685:200) Ancient Near East (3)

01:508:201 (01:685:201; 01:014:205) Islamic Civilization (3)

01:508:205 (01:685:203; 01:563:205) History of the Modern Middle East (3)

01:508:110 (01:685:110; 01:840:125) Political Islam: Present and Past (3)

01:508:212 (01:508:300; 01:563:282; 01:563:300; 01:685:282; 01:685:300) The Arab-Israeli Conflict (3)

01:508:303 (01:685:303) The Classical Age of Islam (3)

01:508:304 (01:685:304) Ottoman Empire (3)

01:508:306 War and Revolution in Iran and Iraq (3)

01:508:307 (01:685:307; 01:988:308) Women and Society in the Islamic Middle East (3)

01:508:316 (01:563:316; 01:685:316; 01:988:316) Israeli Women: Historical and Literary Perspectives (3)

01:510:205 (01:685:205; 01:489:205) History of the Byzantine Empire (3)

01:510:207 (01:685:207; 01:489:207) Byzantine Civilization (3)

01:510:217 (01:685:217) From Byzantium to the Ottomans (3)

01:510:382 (01:685:382; 01:489:382) History of Modern Greece (3)

01:510:384 (01:685:384; 01:489:381) Cyprus: A Global History (3)

01:510:213 (01:685:213) The Crusades (3)

**D. Jewish Studies**

*Hebrew Language Courses*

01:563:101 (01:013:152; 01:685:101) Elementary Modern Hebrew (4)

01:563:102 (01:013:153) Elementary Modern Hebrew (4)

01:563:131 (01:013:252; 01:685:131) Intermediate Modern Hebrew (4)

01:563:132 (01:013:253; 01:685:132) Intermediate Modern Hebrew (4)

01:563:210 (01:013:352; 01:685:210) Advanced Modern Hebrew (3)

01:563:211 (01:013:353; 01:685:211) Advanced Modern Hebrew (3)

*Culture and Literature*

01:563:201 (01:685:208; 01:506:271) Jewish History: Ancient and Medieval (3)

01:563:280 (01:685:280; 01:508:209) Jerusalem Contested: A City's History from Jewish, Christian, and Muslim Perspectives (3)

01:563:281 (01:685:281; 01:508:211) Modern Israeli Culture (3)

01:563:371 (01:013:354) Contemporary Hebrew Literature and Media (3)

01:563:372 (01:013:355) Introduction to Modern Israeli Literature (3)

01:563:393 (01:195:393) Israeli Film (3)

01:563:397 Topics in Jewish Studies (3)

01:563:471 (01:013:452) Readings in Modern Hebrew Literature (3)

01:563:485 (01:013:455) Hebrew Literature and Israeli Society (3)

**E. Political Science**

01:790:317 (01:685:317) Globalization and the Non-Western World (3)

01:790:351 (01:685:351; 01:563:351) Contemporary Politics in the Middle East (3)

01:790:352 (01:563:352; 01:685:352) Israeli Politics (3)

01:790:359 (01:685:359) Women and Politics in the Middle East (3)

01:790:367 (01:685:357) Islam and Democracy in the Middle East (3)

01:790:385 (01:685:385) Arab Politics and Society (3)

01:790:451 (01:563:451; 01:685:451) Critical Perspectives on the Middle East (3)

01:790:452 (01:685:452) Advanced Topics in Middle Eastern Politics (3)

01:790:455 (01:685:455) Culture and Revolution in the Middle East (3)

01:790:457 (01:685:457) Islamic Law and Jurisprudence (3)

**F. Religion and Philosophy**

01:730:374 (01:840:374; 01:685:374) Islamic Philosophy (3)

01:840:203 (01:685:233) Islamic Scriptures: Quran and Hadith (3)

01:840:226 (01:685:226) Islam (3)

01:840:312 (01:685:312; 01:489:312) Greek Christianity (3)

01:840:325 (01:685:325) Prophet Muhammad (3)

01:840:328 Shi'i Islam (3)

01:840:329 (01:685:329) Medieval Arabic Religious Texts (3)

01:840:356 (01:685:356) Sufism: Mystical Islam (3)

01:840:456 Seminar on Rumi (3)

01:840:482 (01:685:482) Seminar in Islamic Ethics (3)

# Military Education, Air Force 690 (SAS)

## MILITARY EDUCATION, AIR FORCE 690

Department of Aerospace Studies, Office of the Executive Vice President for Academic Affairs

**Website:** Here

**Department Chair:** Lieutenant Colonel Kristine E. Poblete, U.S. Air Force, Ed.D.

**Professor:**

Lieutenant Colonel Kristine E. Poblete, B.A., Washington State University; M.S., Duquesne University; Ed.D., University of Southern California

**Assistant Professors:**

Captain Megan M. Chaplin, B.A., Hiram College; M.S., Southern New Hampshire University

Captain Samuel H. Kim, B.A., New York University; M.A., Columbia University

Technical Sergeant Emad N. Delos Reyes, B.S., University of Maryland Global Campus

# Air Force Reserve Officer Training Corps

# Air Force Reserve Officer Training Corps

Air Force Reserve Officer Training Corps (AFROTC) is a voluntary program of military education and leadership development open to qualified students in all academic majors of the university. Upon completion of the AFROTC program and the attainment of a baccalaureate-level degree, the cadet receives a commission as an officer in the U.S. Air Force or Space Force. A monthly subsistence is provided during the junior and senior years.

Military Education, Air Force 690 (SAS)

# Scholarships

# Scholarships

Scholarships are awarded on a competitive basis in increments of four, three, and two years. Current information on scholarships is available on the web here and at the local Rutgers detachment website.

Military Education, Air Force 690 (SAS)

# Program Requirements

# Program Requirements

Typically, AFROTC is a four-year program; however, in many circumstances students may join during any semester as long as they have at least three years of school left in either an undergraduate- or graduate-level course of study (or a combination of both). Interested students should inquire about special programs that may need as little as one to two years to complete.

***Four-Year Program.*** The first two years of the four-year candidate program are called the General Military Course (GMC) and are voluntary. The GMC is designed to acquaint the new college student with the Air Force.

Enrollment in the GMC does not place the student under any military service obligation. Requirements for the GMC include 03:690:121,122 and 221,222 scheduled for one hour per week over the first four semesters. In addition, Leadership Laboratory (03:690:171,172 and 271,272) is scheduled each week for three hours. One academic credit is awarded for the classroom work in each semester of the GMC.

Four-year candidates must attend a nineteen-day leadership, evaluation, and development encampment prior to their junior year.

During his or her sophomore year, the student may apply for entrance into the Professional Officer Course (POC). The POC is contractual and is scheduled during the junior and senior years. Obligations include enlisting in the Air Force Reserve, completion of degree requirements, and acceptance of a commission in the U.S. Air Force if tendered. Semester requirements for the POC include attendance at leadership laboratory and classes. The POC courses are 03:690:323,324; 371,372; 423,424; and 471,472. Three academic credits are awarded for the

classroom work in each semester of the POC. Students who successfully complete the POC are commissioned as second lieutenants in the Air Force upon graduation and have an initial active duty obligation of four years. This active duty period is longer for certain positions such as pilots, combat systems officers, remotely piloted aircraft pilots, and air battle managers.

***Three-Year Program.*** The three-year candidate program offers college students, who have at least three full academic years remaining, an opportunity to catch up with their contemporaries and complete the AFROTC program. Three-year candidates take an accelerated schedule of courses their first year in the program in order to make up missed military training objectives.

Military Education, Air Force 690 (SAS)

# Military Science Minor

# Military Science Minor

The department offers two options to earn a military science minor: commission track and non-commission track. To declare the minor, notify your academic adviser or the professor of military science. Additionally, students not seeking a commission may take the leadership development lower-division lecture only courses for academic credit only.

Military Education, Air Force 690 (SAS)

# Membership Qualifications

# Membership Qualifications

To qualify for membership in the Air Force ROTC program (as a cadet), a student must be a citizen of the United States or be able to verify active pursuit of U.S. citizenship. Non-U.S. citizens may not contract or accept scholarship funding. The student must be at least 14 years of age, physically qualified, and enrolled as a full-time student. All Rutgers students are eligible to take AFROTC academic classes, even if they are not members of AFROTC. To apply for membership in the program, students should contact the Recruiting Officer at 848-932-7706 or via email at rotc485@afrotc.rutgers.edu.

Military Education, Air Force 690 (SAS)

# Non-Cadet Enrollment

# Non-Cadet Enrollment

Rutgers students who desire a varied aerospace education without seeking a commission are encouraged to enroll in classes on a space-available basis for the purpose of academic credit only. These students are not required to attend traditional ROTC activities, including the Leadership Laboratory. For more information, call 848-932-7706, or send an email to rotc485@afrotc.rutgers.edu.

Military Education, Air Force 690 (SAS)

# Uniforms and Allowances

# Uniforms and Allowances

Uniforms and textbooks are supplied to all students enrolled in AFROTC. Students enrolled in the Professional Officer Course (POC) and scholarship students receive a monthly graduated stipend ranging from $300 to $500, depending on their year in school.

Military Education, Air Force 690 (SAS)

# Courses

# Courses

**03:690:121,122** ***The Foundations of the United States Air Force (1,1)***
Survey course designed to introduce students to the United States Air Force and encourage participation in Air Force Reserve Officer Training Corps. Featured topics include: overview of ROTC; special programs offered through ROTC; mission and organization of the Air Force; brief history of the Air Force; introduction to leadership and leadership related issues; Air Force Core Values; Air Force officer opportunities; and an introduction to communication skills. Leadership Laboratory is mandatory for AFROTC cadets and complements this course by providing cadets with followership experiences.

**03:690:171,172** ***Leadership Laboratory I (0,0)***
Fundamentals of drill and ceremonies; physical fitness training; leadership exercises; and military-related skill sets.
***Corequisites: 03:690:121,122. Enrollment limited to Air Force ROTC cadets.***

**03:690:221,222** ***The Evolution of Air and Space Power (1,1)***
Designed to examine general aspects of air and space power through a historical perspective. Utilizing this perspective, the course covers a time period from the first balloons and dirigibles to the space-age global positioning systems of the Afghan/Iraqi wars. Historical examples are provided to extrapolate the development of Air Force capabilities (competencies) and missions (functions) to demonstrate the evolution of what has become today's USAF air and space power. As a whole, this course provides the students with a knowledge-level understanding for the general element and employment of air and space power from an institutional doctrinal and historical perspective. Leadership Laboratory is mandatory for AFROTC cadets and complements this course by providing cadets with followership experiences.

**03:690:271,272** ***Leadership Laboratory II (0,0)***
Continuation of Leadership Laboratory I. Advanced drill and ceremonies; physical fitness training and evaluation; leadership exercises; and military-related skill sets.
***Corequisites: 03:690:221,222. Enrollment limited to Air Force ROTC cadets.***

**03:690:323,324** ***Air Force Leadership Studies (3,3)***
Study of leadership; management fundamentals; professional knowledge; leadership ethics; problem-solving strategies; and communication skills required of an Air Force junior officer. Case studies are used to examine Air

Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. A mandatory Leadership Laboratory complements this course by providing advanced leadership experiences in officer-type activities, giving students the opportunity to apply leadership and management principles of this course.

**03:690:371,372** ***Leadership Laboratory III (0,0)***
Advanced leadership experience in planning, organizing, directing, coordinating, controlling, and communicating.
***Corequisites: 03:690:323,324. Enrollment limited to Air Force ROTC cadets.***

**03:690:423,424** ***National Security Affairs (3,3)***
Examines the national security process, regional studies, advanced leadership ethics, and Air Force doctrine. Special topics of interest focus on the military as a profession, officership, military justice, civilian control of the military, preparation for active duty, and current issues affecting military professionalism. Within this structure, continued emphasis is given to refining communication skills. A mandatory Leadership Laboratory complements this course by providing advanced leadership experiences, giving students the opportunity to apply the leadership and management principles of this course.

**03:690:471,472** ***Leadership Laboratory IV (0,0)***
Advanced leadership and management skills and their application.
***Corequisites: 03:690:423,424. Enrollment limited to Air Force ROTC cadets.***

# Military Education, Army 691 (SAS)

## MILITARY EDUCATION, ARMY 691

Department of Military Education (Army), Office of the Executive Vice President for Academic Affairs

**Website:** Here

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**Phone:** 848-932-7313 or 848-932-3216, Michelle Lawrence, Rutgers Department Liaison

**Department Chair:** LTC Javier A. Cortez

**Professor of Military Science:**

LTC Javier A. Cortez, B.S., Excelsior College; M.A., Liberty

**Assistant Professors of Military Science:**

CPT John K. Donaho, B.S., Houston

CPT Matthew M. Gournaris, B.S., West Chester University of Pennsylvania

CPT James D. Greenawalt, B.S., Idaho

CPT Robert H. Marsh, B.S., West Point

Military Education, Army 691 (SAS)

# Army Reserve Officer Training Corps (ROTC)

# Army Reserve Officer Training Corps (ROTC)

Army ROTC is a leadership and management development program designed to commission second lieutenants in the U.S. Army. The Rutgers ROTC Scarlet Knight Detachment recruits, develops, trains, and mentors confident, physically fit, adaptive cadets who are prepared for successful leadership positions as second lieutenants in the active duty Army, National Guard, or Reserves. The program consists of 21 credits: 18 credits of military education courses taken over eight semesters, plus one department-approved course in American military history.

Military Education, Army 691 (SAS)

# Officer Commission Track Requirements

# Officer Commission Track Requirements

Two paths lead to commissioning: a two-year program and a four-year program.

**Two-Year Program.** The two-year program offers qualified students an alternate method of entry into the advanced course. A) Students taking this option attend four weeks of leadership and military skill training at Fort Knox, Kentucky, during the summer before entering the advanced course. B) Students with prior and/or current military service members who have completed basic training successfully within any branch of the armed forces may also receive commissioning credit for the basic course and use the two-year option.

**Four-Year Program.** The first two years of the four-year program constitute the basic course and do not include an obligation to the Army. Successful completion of the basic course is required for contracting as a cadet in the junior year. Basic course classes meet once a week for one class period (1.5 credits). Attendance at the military leadership lab on Friday mornings (three class periods) is required. The junior and senior years constitute the advanced course. These classes meet for three hours a week for 3 credits, and attendance at the Friday labs is required. Additionally, required field training exercises are conducted off campus approximately one weekend per semester.

Military Education, Army 691 (SAS)

# Military Science Minor

# Military Science Minor

The department offers two options to earn a military science minor: commission track and non-commission track. To declare the minor, notify your academic adviser or the professor of military science. Additionally, students not seeking a commission may take the leadership development lower-division lecture only courses for academic credit only.

**Non-Commissioning Track - Army Option (21 credits)**

The requirements to complete the non-commission track requirements include the following: basic course components, one course in American military history, and four leadership courses. To apply for the non-commission track minor, notify your academic adviser or the department professor of military science.

*Basic Course:*

03:691:101 Foundations of Officership and Basic Leadership (1.5)
03:691:102 Foundations of Officership and Basic Leadership (1.5)

03:691:201 Individual Leadership Studies (1.5)
03:691:202 Individual Leadership Studies (1.5)

One course of American military history: For course descriptions offered by other departments, please refer to the individual department websites.

01:512:240 World War I (3)
01:512:242 World War II (3)
01:512:301 The American Revolution (3)
01:512:303 American Civil War and Reconstruction (3)
01:512:305 U.S. History, 1914-1945 (WWI-WWII) (3)
01:512:306 U.S. History, 1945 to the Present (3)
01:512:347 War, Peace, and the Military of the United States to 1877 (3)
01:512:348 War, Peace, and the Military of the United States since 1877 (3)
01:512:352 American Foreign Policy since 1898 (3)
01:512:354 History of the Cold War (3)
01:790:319 American Foreign Policy (3)
01:790:324 The Causes of War (3)
01:790:323 Defense Policy (3)
01:988:270 War: Critical Perspectives (3)

Four courses from the following, with at least TWO at the 300 level: (may not use the same course to meet this requirement and the previous requirement). For course descriptions offered by other departments, please refer to the individual department websites.

01:713:202 Introduction to Organizational Leadership (3)
01:713:308 Leadership in a Diverse Workplace (3)
01:508:300 The Arab-Israeli Conflict (3)
01:508:306 War and Revolution in Iran and Iraq (3)
01:512:240 World War I (3)
01:512:242 World War II (3)
01:512:301 The American Revolution (3)
01:512:303 American Civil War and Reconstruction (3)
01:512:305 U.S. History, 1914-1945 (WWI-WWII) (3)
01:512:306 U.S. History, 1945 to the Present (3)
01:512:347 War, Peace, and the Military of the United States to 1877 (3)
01:512:348 War, Peace, and the Military of the United States since 1877 (3)
01:512:352 American Foreign Policy since 1898 (3)

01:512:354 American, Russia, and the Cold War (3)
01:730:330 The Ethics of War and Conflict (3)
01:790:319 American Foreign Policy (3)
01:790:323 Defense Policy (3)
01:790:324 The Causes of War (3)
01:790:363 Conflict Resolution in World Politics (3)
01:830:373 Organizational and Personnel Psychology (3) (Prereq: 01:830:101)
01:920:273 OR 01:988:270 War: Critical Perspectives (3)
04:192:101 Introduction to Communication (3)
10:501:360 Principles of Public Management (3)
33:620:370 Managing Diversity in Organizations (3) (Prereq: 33:620:300)
37:575:312 Conflict and Conflict Resolution in the Work Place (3)

Military Education, Army 691 (SAS)

# Contracting and Enrollment Qualifications

# Contracting and Enrollment Qualifications

To qualify for contracting and enrollment into the advanced course of the ROTC program, for the purpose of commissioning, an individual must be enrolled as a full-time undergraduate or graduate student with at least 60 degree credits, maintain a minimum 2.0 cumulative and ROTC grade-point average, be a citizen of the United States between 18 and 32 years of age (inclusive), meet U.S. Army medical qualifications, excel in the ROTC leadership development program, maintain a high standard of physical fitness as determined by the U.S. Army Physical Fitness Test, and attain a National Security Agency background security clearance.

Military Education, Army 691 (SAS)

# Uniforms and Allowances

# Uniforms and Allowances

Government-issued uniforms and equipment are provided to all contracted cadets enrolled in Army ROTC. These items must be returned to the ROTC department at the end of each semester or as directed by the ROTC supply officer.

Contracted cadets enrolled in the basic or advanced course of Army ROTC receive $420 as a monthly stipend while attending classes. Army tuition and fees scholarship recipients receive the cadet stipend plus $1,200 for books per year. New Jersey Army National Guard members who are also Army ROTC cadets may be eligible for additional tuition benefits.

Military Education, Army 691 (SAS)

# Summer and Winter Break Training Opportunities

# Summer and Winter Break Training Opportunities

Qualified cadets may compete for training opportunities at Airborne, Air Assault, Mountain Warfare, and Northern Warfare schools. There are summer opportunities for contracted cadets to study abroad, involving identified critical language and subject areas. Cadets attend one month of summer training at Fort Knox, Kentucky, before their senior year. Following summer training, rising seniors have the opportunity to participate in Cadet Troop Leadership Training (CTLT) for two to four weeks with the Army branch of their choice at domestic and international locations.

Military Education, Army 691 (SAS)

# Distinguished Military Student/Distinguished Military Graduate

# Distinguished Military Student/Distinguished Military Graduate

Distinguished Army ROTC students are so designated at the beginning of their senior year by the professor of military science on the basis of high scholarship, evidence of high moral character, military aptitude, and demonstrated leadership ability. Distinguished military graduates are those who rank in the top 20 percent of Army ROTC graduates nationwide, as determined by the national Order of Merit Listing (OML).

Military Education, Army 691 (SAS)

# Physical Training

# Physical Training

Physical development is focused on the physically challenging requirements of being an Army officer. Students develop their ability to maintain personal fitness and build an appreciation for teamwork, inspire a will to win, and be successful. Physical fitness training is conducted four mornings a week and is required of all cadets pursuing a commission.

Military Education, Army 691 (SAS)

# Non-Cadet Enrollment

# Non-Cadet Enrollment

Rutgers students who desire a varied education without seeking a commission are encouraged to enroll in either the non-commission track minor or the basic course (lecture only 100- and 200-level lecture courses), for academic credit only. Non-commission track and basic course students are not required to attend additional ROTC activities, including the leadership laboratory.

Military Education, Army 691 (SAS)

# Army ROTC Extracurricular Activities

# Army ROTC Extracurricular Activities

There are many opportunities for involvement for Rutgers Army ROTC cadets, including the Scabbard and Blade National Honor Society; the annual Rutgers Army ROTC Hope for the Warriors 5K Run; the Ranger Challenge Team; the annual Army Ten Miler in Washington, D.C.; ROTC intramural athletics teams; ROTC-sponsored blood drives; and various community service projects.

Military Education, Army 691 (SAS)

# Courses

# Courses

**03:691:101** *Foundations of Officership (1.5)*
Introduces basic Army structure, customs, and traditions as well as different concepts that are critical to effective leadership. Cadets/students learn how the personal development of life skills and attributes such as critical thinking, goal setting, time management, physical fitness, ethics, values, and stress management relate to leadership, Officership, and the Army profession.

**03:691:102** *Basic Leadership (1.5)*
Overviews leadership fundamentals such as setting direction, problem solving, listening, presenting briefs, providing feedback, and using effective writing skills. Explores different dimensions of leadership values, attributes, skills, and actions.
***Prerequisite: 03:691:101 or permission of department chair.***

**03:691:103,104** *Military Leadership Laboratory (0,0)*
Practical exercises in basic military skills and leadership techniques as a member of the rifle squad.
***Lab. 5.5 hrs. Corequisites: 03:691:101, 102.***

**03:691:201** *Individual Leadership Studies (1.5)*
Explores the dimensions of creative and innovative tactical leadership strategies and style by examining team dynamics and historical leadership theories that form the basis of Army leadership framework. Case studies provide tangible context for learning the Soldier's Creed and Warrior Ethos.
***Prerequisites: 03:691:101, 102; or permission of department chair.***

**03:691:202** *Leadership and Teamwork (1.5)*
Examines the challenges of leading tactical teams in the complex contemporary operating environment. Highlights dimensions of terrain analysis, patrolling, and operations orders. Students develop greater self-awareness as they assess their own leadership styles and practice communication and team-building skills.
***Prerequisites: 03:691:101, 102, 201; or permission of department chair.***

**03:691:203,204** ***Military Leadership Laboratory (0,0)***
Practical exercises in basic military skills and leadership techniques as a rifle team leader.
***Lab. 5.5 hrs. Corequisites: 03:691:201, 202.***

**03:691:391** ***Military Leadership and Problem Solving (3)***
Challenges students to study, practice, and evaluate adaptive leadership skills techniques in preparation for the Leadership Development and Assessment Course. Students begin to analyze and evaluate their own leadership values, attributes, skills, and actions. Students receive systematic and specific feedback on their leadership abilities.
***Prerequisites: 03:691:101, 102, 201, 202; or permission of department chair.***

**03:691:392** ***Military Leadership and Ethics (3)***
Increasingly intense situational leadership challenges to build student awareness and skills in leading tactical operations. Students review aspects of combat, stability, and support operations. Students are evaluated on what they know and do as leaders in preparation for the summer Leadership Development and Assessment Course.
***Prerequisites: 03:691:101, 102, 201, 202, and 391; or by permission of department chair.***

**03:691:393,394** ***Military Leadership Laboratory (0,0)***
Practical exercises in basic military skills and leadership techniques at the rifle platoon/company level.
***Lab. 5.5 hrs. Corequisites: 03:691:391, 392.***

**03:691:491** ***Military Leadership and Management (3)***
Develops student proficiency in planning, executing, and assessing complex operations, functioning both as a leader and as a member of a staff, and providing performance feedback to subordinates. Lessons and practical exercise prepare the student to make the final transition to becoming an Army officer.
***Prerequisites: 03:691:391, 392; or permission of instructor.***

**03:691:492** ***Officership (3)***
Explores the dynamics of leading in complex situations of current military operations in the contemporary operating environment. Examines differences in customs and courtesies, military law, principles of war, and rules of engagement in the face of international terrorism. Significant emphasis on leading by example.
***Prerequisite: 03:691:491 or permission of department chair.***

**03:691:493,494** ***Military Leadership Laboratory (0,0)***
Practical exercises in basic military skills and leadership techniques as staff members and leaders at the rifle company and battalion level.
***Lab. 5.5 hrs. Corequisites: 03:691:491, 492. Enrollment limited to and required of all Army ROTC cadets.***

**03:691:495,497** ***Independent Study (3,3)***
Selected additional research topics related to military leadership and training.
***This course is not a requirement for commissioning.***

**03:691:496,498** ***Military Leadership Laboratory (0,0)***
Practical team training related to specified topic of the Independent Study course.
***This course is not a requirement for commissioning.***

# Military Education, Naval 692 (SAS)

## MILITARY EDUCATION, NAVAL 692

Department of Military Education (Naval), Office of the Executive Vice President for Academic Affairs

**Website:** Here

**Department Chair:** Captain Jessica R. Parker, U.S. Navy

**Professor:**

Captain Jessica R. Parker, U.S. Navy; B.S., U.S. Naval Academy; M.S., University of Arkansas

**Assistant Professors:**

Commander Charles Eaton, U.S. Navy. B.S., U.S. Naval Academy; M.A., University of Rhode Island; M.O., Graduate School of Oceanography (URI)

Captain Sean Ferraro, U.S. Marine Corps; B.S., Maryland

Lieutenant Cal Cisneros, U.S. Navy;. B.S., U.S. Naval Academy

Lieutenant Brady Kuzmick, U.S. Navy;. B.S., Florida State University



# Naval Reserve Officers Training Corps (ROTC)

# Naval Reserve Officers Training Corps (ROTC)

The Naval Reserve Officers Training Corps (NROTC) program is a voluntary program of military education and leadership development with Navy, Marine Corps, and Navy Nurse options. NROTC is open to qualified male and female students of all academic majors of the university. Navy students earn 22 elective credits plus 16-17 calculus and calculus-based physics credits; Marine Corps students earn 16 credits; and Navy Nurse students earn 10 elective credits. Upon completion of NROTC program academic requirements and attainment of a baccalaureate-level degree, midshipmen are commissioned as ensigns in the Navy or second lieutenants in the Marine Corps. Selected applicants for the program are awarded scholarships through a highly competitive national selection process, and receive full tuition and other financial benefits. Those participants enrolled on a nonscholarship basis compete to obtain a commissioning, and, if approved, receive a stipend and training benefits in their third and fourth years in the program.

Military Education, Naval 692 (SAS)

# Mission

# Mission

The mission of the Naval Reserve Officers Training Corps program is to develop young men and women morally, mentally, and physically, and to instill in them the highest ideals of honor, courage, and commitment. The program educates and trains young men and women for leadership positions in an increasingly technical Navy and Marine Corps.

Military Education, Naval 692 (SAS)

# Program Requirements

# Program Requirements

The Department of Naval Science offers several programs of instruction for men and women leading to commissions in the U.S. Navy or U.S. Marine Corps.

**Navy:** Navy option students complete a course of instruction tailored toward a career in the professional communities in the Navy, including Surface Warfare (conventional and nuclear power), Submarine Warfare (nuclear power), Aviation, Explosive Ordnance Disposal, and SEAL. All Navy option scholarship students must complete the required calculus and calculus-based physics courses by the end of their sophomore and junior years, respectively, in addition to a full regimen of naval science courses.

*Required Courses (36 credits)*

01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4) or equivalent

01:750:123-124, 227 Analytical Physics (2,2,3) or 01:750:203,204 General Physics (3,3) or equivalent

03:692:101 Introduction to Naval Science (2)

03:692:102 Sea Power and Maritime Affairs (2)

03:692:103,104 Naval Science Laboratory (0,0)

03:692:201 Leadership and Management (3)

03:692:202 Navigation (3)

03:692:203,204 Naval Science Laboratory (0,0)

03:692:301 Naval Ship Systems I: Engineering (3)

03:692:302 Naval Ship Systems II: Weapons (3)

03:692:303,304 Naval Science Laboratory (0,0)

03:692:401 Naval Operations and Seamanship (3)

03:692:403,404 Naval Science Laboratory (0,0)

03:692:490 Leadership and Ethics (3)

**Marine:** Marine option students follow a similar course of study but replace several Navy courses with Marine Corps-specific classes required for their respective career paths. Marine option students are not required to take calculus or calculus-based physics unless required for their academic major.

*Required Courses (16 credits)*

03:692:101 Introduction to Naval Science (2)

03:692:102 Sea Power and Maritime Affairs (2)

03:692:103,104 Naval Science Laboratory (0,0)

03:692:201 Leadership and Management (3)

03:692:211 The Evolution of Warfare (3)

03:692:212 Fundamentals of Maneuver Warfare (3)

03:692:203,204 Naval Science Laboratory (0,0)

03:692:303,304 Naval Science Laboratory (0,0)

03:692:403,404 Naval Science Laboratory (0,0)

03:692:490 Leadership and Ethics (3)

**Navy Nurse:** Navy Nurse option students need only complete Introduction to Naval Science, Sea Power and Maritime Affairs, and the two leadership courses while pursuing a degree in nursing.

*Required Courses (10 credits)*

03:692:101 Introduction to Naval Science (2)

03:692:102 Sea Power and Maritime Affairs (2)

03:692:103,104 Naval Science Laboratory (0,0)

03:692:201 Leadership and Management (3)

03:692:203,204 Naval Science Laboratory (0,0)

03:692:303,304 Naval Science Laboratory (0,0)

03:692:403,404 Naval Science Laboratory (0,0)

03:692:490 Leadership and Ethics (3)

All midshipmen are required to attend the weekly Naval Science Laboratory. These two-hour sessions offer the student an active role in the management and direction of the midshipman battalion and provide time for the midshipmen to explore professional topics.

Military Education, Naval 692 (SAS)

# Military Science Minor

# Military Science Minor

The department offers two options to earn a military science minor: commission track and non-commission track. To declare the minor, notify your academic adviser or the professor of military science. Additionally, students not seeking a commission may take the leadership development lower-division lecture only courses for academic credit only.

Military Education, Naval 692 (SAS)

# Scholarships

# Scholarships

Scholarship opportunities are offered for Navy, Marine Corps, and Navy Nurse option applicants. Typically, Naval Reserve Officers Training Corps is a four-year program, although other programs of shorter duration may be available. Students who were not selected for a four-year scholarship are encouraged to join as College Program (or nonscholarship) students as early as practicable. Potential College Program students should contact the professor of naval science as, periodically, scholarships are available for College Program students. All information on scholarship programs including entrance requirements, physical requirements, academic requirements, application process, and selection process can be found here.

Military Education, Naval 692 (SAS)

# Membership Qualifications

# Membership Qualifications

To qualify for enrollment in the Naval Reserve Officers Training Corps (NROTC) program, an individual must be a United States citizen or national between 17 and 27 years of age inclusive (possibly up to 30 years of age based on prior service) and physically qualified by Navy or Marine Corps standards. Students with 30 or more semester hours or 45 or more quarter hours of college credit upon application or students already enrolled in NROTC College Program are not eligible for four-year NROTC scholarships; these students should see the professor of naval science to discuss other scholarship opportunities.

Students interested in a career in the Navy or Marine Corps through the NROTC program should visit here for full entrance requirements.

Military Education, Naval 692 (SAS)

# Non-Midshipman Naval Science Class Enrollment

# Non-Midshipman Naval Science Class Enrollment

Rutgers students with an interest in military history or wanting to learn more about the Navy or Marine Corps but not desiring a commission are encouraged to enroll in classes on a space-available basis for the purpose of academic credit only. These students are not required to attend traditional Naval Reserve Officers Training Corps activities, including Naval Science Lab or drill time. For more information, contact the Department of Military Education (Naval).

Military Education, Naval 692 (SAS)

# Uniforms and Allowances

# Uniforms and Allowances

Uniforms and naval science textbooks are supplied for all students enrolled in naval science courses. Additionally, scholarship students receive a textbook stipend and a monthly subsistence allowance.

Military Education, Naval 692 (SAS)

# Physical Training

# Physical Training

Scholarship, college program, and active duty Navy and Marine Corps students must meet all physical fitness requirements of their prospective service. The Naval Reserve Officers Training Corps program embraces a culture of fitness, and midshipmen can be expected to participate in rigorous and demanding physical activity throughout the school year.

Military Education, Naval 692 (SAS)

# Summer Training

# Summer Training

A summer training period is held annually to furnish Naval Reserve Officers Training Corps (NROTC) midshipmen experience in the practical application of their studies in naval science. Student midshipmen participate in four- to six-week summer training cruises throughout the world during each of the three summers between their freshman and senior years. Marine option midshipmen attend a seven-week Marine Corps Officer Candidates School in the

summer between their junior and senior year. Nurse option midshipmen participate in four-week cruises tailored to the nursing program. The first class cruise (between their junior and senior year) satisfies the USC 10 (Title 10) commissioning requirement for all NROTC midshipmen and may not be waived.

Military Education, Naval 692 (SAS)

# NROTC Extracurricular Activities

# NROTC Extracurricular Activities

Naval Reserve Officers Training Corps students are encouraged to participate in university-sponsored extracurricular activities such as clubs and sports.

Military Education, Naval 692 (SAS)

# Courses

# Courses

**03:692:101** *Introduction to Naval Science (2)*
Introduction to the organization and culture of the U.S. Department of Defense and the naval service. Customs and traditions of the service, basic leadership, ethics and character development, junior officer duties, and basic shipboard procedures and safety.
***Prerequisite: Permission of department.***

**03:692:102** *Sea Power and Maritime Affairs (2)*
U.S. historical evolution of sea power, its concepts, theories, and applications, and relationships to current trends. Impact of world situation, U.S. national interest, changing technology, and naval leadership on the evolving concept of sea power.
***Prerequisite: Permission of department.***

**03:692:103,104** *Naval Science Laboratory (0,0)*
Instruction and practical application in leadership and associated military skills. Topics may include drill and ceremonies, physical fitness and swimming testing, cruise preparation, cruise evaluation, safety awareness, preparation for commissioning, personal finances, insurance, and applied exercises in naval ship systems, navigation, naval operations, naval administration, and military justice.
***Graded pass/no credit. Prerequisite: Permission of department.***

**03:692:201** *Leadership and Management (3)*
Basic management, decision-making, and moral leadership. Goal establishment, prioritization, planning and forecasting in a task-centered organization. Measures of organizational effectiveness, overcoming resistance to change, effective communications, counseling, team building, and resolution of disciplinary and personnel matters.
***Prerequisite: Permission of department.***

**03:692:202** ***Navigation (3)***
Theory, principles, procedures, and application of plotting, piloting, and electronic navigation, and an introduction to maneuvering boards. Piloting techniques, the use of charts, the use of visual and electronic aids, and the theory of operation of both magnetic and gyrocompasses. Other topics include tides, currents, effects of wind/weather, voyage planning, and the international/inland rules of navigation.
***Prerequisite: Permission of department.***

**03:692:203,204** ***Naval Science Laboratory (0,0)***
Instruction and practical application in leadership and associated military skills. Topics may include drill and ceremonies, physical fitness and swimming testing, cruise preparation, cruise evaluation, safety awareness, preparation for commissioning, personal finances, insurance, and applied exercises in naval ship systems, navigation, naval operations, naval administration, and military justice.
***Graded pass/no credit. Prerequisite: Permission of department.***

**03:692:211** ***The Evolution of Warfare (3)***
Traces the development of warfare to the present day. Causes of continuity and change in the means and methods of warfare. Influence of political, economic, and societal factors on the conduct of war, with significant attention on the role of technological innovation in changing the battlefield.
***Prerequisite: Permission of department.***

**03:692:212** ***Fundamentals of Maneuver Warfare (3)***
Political, strategic, operational, and tactical/technical aspects of amphibious warfare, and the evolution of the U.S. Marine Corps. Structure and capabilities of the present day U.S. Marine Corps as a forward deployed and rapid deployment force and development of Expeditionary Maneuver Warfare concepts.
***Prerequisite: Permission of department.***

**03:692:301** ***Naval Ship Systems I: Engineering (3)***
Principles of design and operation of ships. Description and analysis of major types of propulsion plants, both conventional and nuclear. Principles of thermodynamic cycles, electrical theory, power generation and distribution, auxiliary machinery systems. Ship construction, strength, and stability in intact and damaged conditions. Factors and design criteria for seaworthiness, structural integrity, and operational employment.
***Course may be repeated for credit with consent of department. Prerequisite: Permission of department.***

**03:692:302** ***Naval Ship Systems II: Weapons (3)***
Introduction to the physical theory of acoustic and electromagnetic wave generation and propagation; the design and use of electronic, electromechanical, and pneumatic systems; and the combination of these systems to perform detection and analysis of objects sharing and traversing common environments.
***Prerequisite: Permission of department.***

**03:692:303,304** ***Naval Science Laboratory (0,0)***
Instruction and practical application in leadership and associated military skills. Topics may include drill and ceremonies, physical fitness and swimming testing, cruise preparation, cruise evaluation, safety awareness, preparation for commissioning, personal finances, insurance, and applied exercises in naval ship systems, navigation, naval operations, naval administration, and military justice.
***Graded pass/no credit. Prerequisite: Permission of department.***

**03:692:401** *Naval Operations and Seamanship (3)*
Introduction to ship operations at sea. Principles of navigation including the rules of the road for prevention of collisions at sea, vector analysis of relative motion, ship behavior and characteristics in maneuvering, precise ship positioning, use of aids to navigation, meteorology, and electronic navigation.
***Prerequisite: Permission of department.***

**03:692:403,404** *Naval Science Laboratory (0,0)*
Instruction and practical application in leadership and associated military skills. Topics may include drill and ceremonies, physical fitness and swimming testing, cruise preparation, cruise evaluation, safety awareness, preparation for commissioning, personal finances, insurance, and applied exercises in naval ship systems, navigation, naval operations, naval administration, and military justice.
***Graded pass/no credit. Prerequisite: Permission of department.***

**03:692:490** *Leadership and Ethics (3)*
Capstone. Prepares for leadership in the naval service of the 21st century through integration of Western moral traditions and ethical philosophy with topics such as military leadership, core values, and professional ethics; the Uniform Code of Military Justice and Navy regulations; and the roles of enlisted members, junior and senior officers, command relationships, and the conduct of warfare.
***Prerequisite: Permission of department.***

# Military Science Minor (Military Science 691N, Naval Science 692N, Aerospace Science 693N, Non-Commissioning 695N) (SAS)

## MILITARY SCIENCE MINOR (MILITARY SCIENCE 691N, NAVAL SCIENCE 692N, AEROSPACE SCIENCE 693N, NON-COMMISSIONING 695N)

**Program:** Military Science Minor (17-25 credits)

**Adviser:** SAS Adviser and/or Department of Aerospace Science, Military Science, and Naval Science

**Departments:**
School of Arts and Sciences, Office of Advising and Academic Services
Departments of Aerospace Science, Military Science, and Naval Science

# Minor Description

# Minor Description

American military forces have played an important role in our domestic and international history and will continue to have significant involvement in policy arenas relating to national security and international relations.

The interdisciplinary military science minor, administered by the Departments of Aerospace Science, Military Science, and Naval Science is available in four tracks:

- Tracks AS, MS, and NS are the methods through which students become contracted cadets or midshipmen, committed to participating in any of the three Reserve Officer Training Corps (ROTC) programs (Air Force, Army, Navy) with the intent to commission as an officer into the Armed Forces after graduation.
- Track NC is open to all students providing them with a broad perspective on the military with analysis of national security affairs and all service branches of the Armed Forces from a historical and social scientific perspective.

Students who plan to complete the requirements for the minor should consult an undergraduate adviser in the School of Arts and Sciences or any of the professors for the Air Force, Army, Navy, or ROTC programs.

Military Science Minor (Military Science 691N, Naval Science 692N, Aerospace Science 693N, Non-Commissioning 695N) (SAS)

# Learning Goals

# Learning Goals

Upon completion of the military science minor students will be able to:

- Provide a broad perspective on the military and branches of service: Air Force, Army, and/or Navy;
- Demonstrate and apply an understanding of individual and group dynamics and formal and informal leadership;
- Demonstrate and apply an understanding of governmental applications of power; and
- Demonstrate preparation for commissioning (AS, MS, and NS tracks only).

Military Science Minor (Military Science 691N, Naval Science 692N, Aerospace Science 693N, Non-Commissioning 695N) (SAS)

# Aerospace Science Track

# Aerospace Science Track

**Aerospace Science Track (19 credits)**

03:690:121 and 03:690:122 Heritage and Values (1,1)
03:690:221 and 03:690:222 Team and Leadership Fundamentals (1,1)
03:690:323 and 03:690:324 Leading People and Effective Communication (3,3)

03:690:423 and 03:690:424 National Security Leadership Responsibilities and Commissioning Preparation (3,3)
03:690:171 MIL LEADERSHIP LAB (0)
03:690:271 MIL LEADERSHIP LAB (0)
03:690:371 MIL LEADERSHIP LAB (0)
03:690:471 MIL LEADERSHIP LAB (0)

*One course from the following:*

01:512:240 World War I (3)
01:512:242 World War II (3)
01:512:301 The American Revolution (3)
01:512:303 American Civil War and Reconstruction (3)
01:512:305 U.S. History, 1914-1945 (WWI-WWII) (3)
01:512:306 U.S. History, 1945 to the Present (3)
01:512:347 War, Peace, and the Military of the United States to 1877 (3)
01:512:348 War, Peace, and the Military of the United States since 1877 (3)
01:512:352 American Foreign Policy since 1898 (3)
01:512:354 History of the Cold War (3)
01:790:319 American Foreign Policy (3)
01:790:323 Defense Policy (3)
01:790:324 The Causes of War (3)
01:988:270 War: Critical Perspectives (3)

Military Science Minor (Military Science 691N, Naval Science 692N, Aerospace Science 693N, Non-Commissioning 695N) (SAS)

# Non-Commissioning Track - Army Option (21 credits)

# Non-Commissioning Track - Army Option (21 credits)

**Non-Commissioning Track - Army Option (21 credits)**

The requirements to complete the non-commission track requirements include the following: basic course components, one course in American military history, and four leadership courses. To apply for the non-commission track minor, notify your academic adviser or the department professor of military science.

*Basic Course:*

03:691:101 Foundations of Officership and Basic Leadership (1.5)
03:691:102 Foundations of Officership and Basic Leadership (1.5)

03:691:201 Individual Leadership Studies (1.5)
03:691:202 Individual Leadership Studies (1.5)

One course of American military history: For course descriptions offered by other departments, please refer to the individual department websites.

01:512:240 World War I (3)
01:512:242 World War II (3)
01:512:301 The American Revolution (3)
01:512:303 American Civil War and Reconstruction (3)
01:512:305 U.S. History, 1914-1945 (WWI-WWII) (3)
01:512:306 U.S. History, 1945 to the Present (3)
01:512:347 War, Peace, and the Military of the United States to 1877 (3)
01:512:348 War, Peace, and the Military of the United States since 1877 (3)
01:512:352 American Foreign Policy since 1898 (3)
01:512:354 History of the Cold War (3)
01:790:319 American Foreign Policy (3)
01:790:324 The Causes of War (3)
01:790:323 Defense Policy (3)
01:988:270 War: Critical Perspectives (3)

Four courses from the following, with at least TWO at the 300 level: (may not use the same course to meet this requirement and the previous requirement). For course descriptions offered by other departments, please refer to the individual department websites.

01:713:202 Introduction to Organizational Leadership (3)
01:713:308 Leadership in a Diverse Workplace (3)
01:508:300 The Arab-Israeli Conflict (3)
01:508:306 War and Revolution in Iran and Iraq (3)
01:512:240 World War I (3)
01:512:242 World War II (3)
01:512:301 The American Revolution (3)
01:512:303 American Civil War and Reconstruction (3)
01:512:305 U.S. History, 1914-1945 (WWI-WWII) (3)
01:512:306 U.S. History, 1945 to the Present (3)
01:512:347 War, Peace, and the Military of the United States to 1877 (3)
01:512:348 War, Peace, and the Military of the United States since 1877 (3)
01:512:352 American Foreign Policy since 1898 (3)
01:512:354 American, Russia, and the Cold War (3)
01:730:330 The Ethics of War and Conflict (3)
01:790:319 American Foreign Policy (3)
01:790:323 Defense Policy (3)
01:790:324 The Causes of War (3)
01:790:363 Conflict Resolution in World Politics (3)
01:830:373 Organizational and Personnel Psychology (3) (Prereq: 01:830:101)
01:920:273 OR 01:988:270 War: Critical Perspectives (3)
04:192:101 Introduction to Communication (3)
10:501:360 Principles of Public Management (3)
33:620:370 Managing Diversity in Organizations (3) (Prereq: 33:620:300)
37:575:312 Conflict and Conflict Resolution in the Work Place (3)

# Music (MGSA)

## MUSIC

Department of Music, Mason Gross School of the Arts

The Department of Music is a member of the National Association of Schools of Music.

See the Mason Gross School of the Arts section for faculty listing, descriptions of all Music (700) courses, Applied Music 701 courses, and bachelor of music (B.M.) program information.



## B.A. Music Major

## B.A. Music Major

To declare the major in music, students must have completed level II of both Music Theory and Aural Skills with a grade of C+ or better in the following courses:

- Music Theory II (07:700:122) and
- Aural Skills II (07:700:124) or Advanced Aural Skills II (07:700:154)

Music majors in the bachelor of arts (B.A.) program are required to complete at least 41 credits, distributed as follows:

- 13 credits of music theory: 07:700:121,122, 127, 221, 222
- 8 credits of aural skills: 07:700:123 or 153, 124 or 154, 223 or 253, 224 or 254*
- 12 credits of music history: 07:700:301-302, 303, and either 419 or 420
- four semesters of performance study (4 credits)
- four semesters of large ensemble (4 credits)

*Students are placed in aural skills or advanced aural skills by the appropriate faculty.

In order to graduate with a major in music, students must pass a piano proficiency examination. Students must achieve a minimum grade-point average of 2.5 in courses required for the major. At least 15 of the 41 credits required for the major must be taken at Rutgers.

# B.A. Music Minor

# B.A. Music Minor

The music minor consists of a minimum of 18 credits, distributed as follows: (1) at least 6 credits in music theory (07:700:103), which is also offered online as 07:700:133 and 07:700:104; (2) at least 6 credits in music history; and (3) 6 elective credits in music.

Students may **not** earn credit for both 07:700:103 and 07:700:133.

The courses most commonly used for music history are: Introduction to Music (07:700:101), which is also offered online as 07:700:131, and Introduction to Music History (07:700:102). The music history requirement may also be satisfied by the following courses: Studies in Music History (07:700:211, 212), which is also offered online as 07:700:231, 232; Studies in Major Composers (07:700:237, 238); Jazz Appreciation (07:700:291), which is offered online as From Jazz to Hip-Hop: African-American Music in the 21st Century (07:700:234); Music of the Worlds (07:700:292), which is offered online as Studies of World Music (07:700:241); and Special Topics in Music (07:700:295, 296).

Students may **not** earn credit for both 07:700:101 and 07:700:131.

Students may **not** earn credit for both 07:700:291 and 07:700:234.

Students may **not** earn credit for both 07:700:292 and 07:700:241.

The electives may be satisfied by further courses in music theory or music history, by ensemble participation, and by some approved music-related courses from other departments. At least 6 of the 18 credits required for the minor must be taken at Rutgers. Exceptions to the prescribed distribution of requirements must be approved by the Mason Gross School of the Arts Department of Music coordinator of undergraduate studies.

Music (MGSA)

# B.A. Music Technology Minor

# B.A. Music Technology Minor

Music technology is a rapidly growing field that includes the study of acoustics, recording, production, composition, analysis, programming, and hardware design. The minor in music technology combines theoretical concepts in scientific, technical, and musical subjects with the opportunity to apply these concepts in a practical manner.

Students declare the Minor in Music Technology through their school of enrollment.

**Program Requirements**

07:700:103 or 07:700:133 Introduction to Music Theory (face-to-face/online) or above (3)

07:700:105 or 07:700:135 Making Music with Computers: Introduction to Digital Audio (face-to-face/online) (3)*

07:700:284 Digital Audio Composition (3)

07:700:311 Art of Production I: Recording (3)

07:700:312 Art of Production II: Mixing (3)

Advanced technology electives (choose one):

07:700:469 Interactive Computer Music (3)

07:700:470 Electroacoustic Musical Instrument Design (3)

*Music majors will substitute 07:700:127 Introduction to Music Technology for 07:700:105/135.

**Minor Eligibility**

- Students must receive a minimum grade of C in each required course in order to declare the minor
- Students may transfer up to six credits from another institution towards completion of the minor pending a review of the syllabus from the previous institution
- Students may not receive both the certificate in recording arts and minor in music technology
- Students matriculated in degree programs outside of the Mason Gross School of the Arts must declare the Minor in Music Technology through their school of enrollment

**Core Curriculum for Recording Arts Certificate (18 credits)**

07:700:103 Introduction to Music Theory or higher level (face-to-face) (3) or 07:700:133 (online)

07:700:105 Making Music with Computers: Introduction to Digital Audio (face-to-face) or 07:700:135 (online)

07:700:284 Digital Audio Composition (3)**

07:700:XXX The Business of Music (3)

07:700:311 Art of Production I: Recording (3)

07:700:312 Art of Production II: Mixing (3)

*Music majors will substitute Introduction to Music Technology (07:700:127) or 07:700:105/135

**Digital Audio Composition (07:700:284) is typically offered each Spring semester; however, there is a time of conflict with Art of Production II (07:700:312). Therefore, if taking these courses in the same academic year, it is suggested that students take both Digital Audio Composition (07:700:284) and Art of Production (07:700:311) in the Fall semester and Art of Production II (07:700:312) in the Spring semester.

Music (MGSA)

# Departmental Honors Program

# Departmental Honors Program

The Department of Music offers an honors program to qualified students majoring in music. Before the end of the junior year, interested students who meet departmental requirements for honors candidacy should apply in

writing to the coordinator of undergraduate studies for admission to the honors program. To complete the program successfully, the candidate must submit an honors paper prepared under the supervision of a member of the faculty (07:700:495 Senior Honors Tutorial) and maintain a cumulative grade-point average of 3.0 or better and a grade-point average of 3.5 or better in the major.

Music (MGSA)

## Courses for Nonmajors

## Courses for Nonmajors

The department offers a variety of courses for the nonmajor. In general, 07:700:101 and/or 103 provide the prerequisites for most other nonmajor courses in music. Several nonmajor courses are offered online (700:131, 133, 135, 230, 231, 232, 233, 234, 235, 239, 241, 242, 243). Some ensembles and other performance courses are also open to nonmajors. See the listing under Applied Music 701 in the Mason Gross School of the Arts section.

# Life Sciences (SAS)

## LIFE SCIENCES

Division of Life Sciences, School of Arts and Sciences

**Website:** Here

**Dean:** Lori R. Covey

**Director, Office of Undergraduate Instruction:** Martha Haviland

**Chair, Department of Cell Biology and Neuroscience:** Megerditch Kiledjian

**Chair, Department of Genetics:** Tara C. Matise

**Chair, Department of Kinesiology and Health:** Brandon Alderman

**Chair, Department of Molecular Biology and Biochemistry:** Barth Grant

The following majors are available in the Division of Life Sciences:

**Biological Sciences 119**
**Cell Biology and Neuroscience 146**
**Exercise Science 377**
**Genetics 447**
**Molecular Biology and Biochemistry 694**
**Sport Management 955**

Students interested in the life sciences also may consider related tracks within major programs offered by the Department of Chemistry and Chemical Biology (chemical biology option) and the Department of Psychology (specialization in behavioral neuroscience).

The Division of Life Sciences coordinates, fosters, and integrates the instructional and research activities of a broad range of faculty with interests in the biological sciences. The principal units of the division include four departments: Cell Biology and Neuroscience, Genetics, Kinesiology and Health, and Molecular Biology and Biochemistry, as well as two sections, the biological chemistry section of the Department of Chemistry and Chemical Biology, and the biopsychology and behavioral neuroscience section of the Department of Psychology. The division's primary goal is to provide a high caliber of interdisciplinary teaching and research in the life sciences as it trains the next generation of teachers, researchers, and future health professionals.

Instruction in the life sciences has undergone enormous changes over the past 15 to 20 years. These changes reflect the intellectual revolution of the last two decades, as well as technical advances that have expanded greatly the tools available to life scientists. Today, students majoring in the life sciences at Rutgers University-New Brunswick experience an exciting atmosphere of learning that exposes them to the concepts and methods of these intellectual and technological advances. The students have open to them a plethora of learning avenues, ranging from thought-provoking lecture presentations to original and cutting-edge research opportunities in state-of-the-art laboratories. A first-class faculty and modern laboratory equipment reflect the division's commitment to provide its students with the best learning environment.

The division offers a wide spectrum of majors for students interested in the life sciences. These options range from a division-based major in biological sciences, designed to provide a general life sciences education, to department-based majors in cell biology and neuroscience, exercise science, genetics, molecular biology and biochemistry, and sport management aimed at providing specialized training, with a strong emphasis on research. Graduates of the division will be highly competitive for a range of postbaccalaureate opportunities, including graduate education and research, health-professions training, and biomedical and biotechnological research positions, as well as teaching careers in the sciences.

The first two years of the student's tenure at Rutgers is expected to revolve around the life sciences core curriculum, a series of basic offerings designed to provide the general background required for pursuing upper-division courses in any of the individual majors. Regardless of the major chosen, students are encouraged to participate in independent study within a research laboratory in order to take advantage of the rich expertise of the many life sciences faculty in New Brunswick and Piscataway. The exercise science and the sport management majors require an internship experience. The division also has a highly developed advising system, with dedicated and knowledgeable faculty advisers available to work with individual students in their selection of courses, completion of major requirements, and preparation for future careers.

Students may not major in more than one of the following majors in the Division of Life Sciences: Biological Sciences (119), Cell Biology and Neuroscience (146), Exercise Science (377), Genetics (447), Molecular Biology and Biochemistry (694), or Sport Management (955). Furthermore, students majoring in one of these four majors may not minor in Biological Sciences (119). Life science majors or minors may not be combined as double majors or as major/minors with Biomathematics (122), Biochemistry (115), or Microbiology (680).

No more than 16 credits from among the life science courses required for completion of any Division of Life Sciences major may be fulfilled by credits transferred from any school outside of Rutgers-New Brunswick.

For additional information and announcements about the Division of Life Sciences, please visit the division's website.

Life Sciences (SAS)

# Life Sciences Core Curriculum

# Life Sciences Core Curriculum

The life sciences core curriculum is a set of courses that include a series of introductory- and intermediate-level courses in the physical and life sciences forming a foundation of knowledge necessary to understand modern biology and to prepare for the more advanced courses required for each major. Following are core courses:

1. 01:119:115-116 General Biology (4,4)

2. 01:119:117 Biological Research Laboratory (2)

3. 01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)

4. 01:160:171 Introduction to Experimentation (1)

5. 01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)

6. 01:160:311 Organic Chemistry Laboratory (2)

7. 01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics (3,3)*

8. 01:750:205-206 General Physics Laboratory (1,1)*

9. 01:640:135,136 Calculus for the Life and Social Sciences (4,4) or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)**

10. 01:447:380 Genetics (4)***.

*01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

**Basic Statistics for Research (01:960:401, 3 credits), Basic Probability and Statistics (01:960:379, 3 credits), or Statistics I and II (01:960:211 and 212) may be substituted for the second semester of Calculus.

***Students majoring in genetics must take 01:447:384-385 (4,4) instead of 01:447:380

Life Sciences (SAS)

# Biological Sciences 119

# Biological Sciences 119

**Website:** Here

**Director:** Martha Haviland

**Director of Advising:** Anne Carr-Schmid

**Teaching Professor:**

Martha B. Haviland, B.A., Rutgers; M.S., A.M., Ph.D., Michigan[AC1] [SB2]

**Associate Teaching Professor:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Daniel Stern Cardinale, B.S., College of New Jersey; Ph.D., Rutgers

Monica S. Torres, B.S., National University of La Plata (Argentina); M.S., Ghent (Belgium); Ph.D., Rutgers

**Assistant Teaching Professors:**

Christy A. Beal, B.S., Rutgers; M.S., Ph.D., Delaware

Cominski, Tara, B.S., St. Peter's; M.S., Seton Hall; Ph.D. Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin (Stevens Point); M.S., Kansas State; Ph.D., Wisconsin (Madison)
Anne Keating, B.S., M.S., Ph.D., Rutgers

Lu, Haiyang, B.S., Hebei Univ. (China); M.S., Beijing Normal Univ. (China); Ph.D. City Univ. of NY

Nelson, Cassandra, B.S., Marquette; M.S., Indiana University School of Medicine; Ph.D., Marquette

Soliman, Mai, B.S., M.Sc. Montclair State; Ph.D., Rutgers

Gregg Transue, B.S., Pennsylvania State; M.S., Ph.D., Rutgers

Anthony J. Uzwiak, B.A., Ph.D., Rutgers

Villegas, Gabriel, B.A., Ph.D., Rutgers

Walczak, Alexandra, B.S., Ramapo College, Ph.D., Rutgers

Yu, Calvin, B.A. Skidmore; M.A., New York University; Ed.M. Rutgers


- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Minor Requirements

- Independent Study and Research in Biology
- Departmental Honors Program
- Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)
- Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)
- Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)
- Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)
- Courses


Life Sciences (SAS)

# Learning Goals

# Learning Goals

Our overarching goal for educating our students majoring in biological sciences is to inspire them to want to discover and understand the natural world. In the process of achieving this goal, we expect our students to acquire not only facts and concepts, but also skills and perspectives. We hope that our learning goals will both prepare our students for a variety of career objectives and supply them with the tools to become lifelong learners in the ever-evolving world of biological sciences.

*Learning Goals:*

I. To acquire the appropriate factual and conceptual knowledge that provides students with a foundation to further their education and career in the areas of life science or health science. Students will be able to demonstrate basic knowledge (e.g., identify, define, explain, etc.) of the concepts, practices, and principles that comprise the biological sciences.

II. To develop data analysis and statistical reasoning skills that prepare students for a society increasingly reliant on the use of data and information. Students will be able to interpret/evaluate patterns in data presented in tables, figures, and graphs, as well as be able to organize, summarize, and present data.

III. To develop the ability to use scientific reasoning as embodied by the structured process commonly known as the scientific method to empower students with the ability to generate and refine knowledge. Students will be able to evaluate and apply the practice of science.

IV. To develop critical thinking and problem-solving skills necessary to prepare students to evaluate, synthesize, and generate knowledge that provides them with a competitive advantage to adapt to an evolving, global, and knowledge-based society. Students will be able to demonstrate application of higher-order thinking (e.g., classify, diagnose, evaluate, synthesize, hypothesize, etc.). Students will develop an understanding of not only the connections within biology, but also the connections between biology and other scientific disciplines.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in biological sciences must have completed two semesters of General Biology and Biological Research Laboratory with a grade of C or better in each course. Both semesters of General Biology must have been completed at the same institution or on the same campus at Rutgers. No more than two courses with a grade of D may be used to fulfill the requirements of the major. A 2.0 grade-point average must be maintained in the life sciences core and elective courses applied toward the major. Students must meet with an adviser before they can successfully declare their major.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The program in biological sciences, administered through the Division of Life Sciences Office of Undergraduate Instruction, is intended to provide a broad and comprehensive training in modern biology. This course of study is recommended for those who wish to study biology as part of their liberal arts education, preparing them for a career in one of the health professions, graduate studies in biology, a teaching career in secondary schools (courses in education also are required), as well as employment in various areas of the life sciences. If a student wishes to concentrate his or her studies in a specific area of biology, he or she should consider a major offered by one of the departments in the Division of Life Sciences or in the School of Environmental and Biological Sciences. Faculty advisers are available to assist each student with course selection and program requirements.

A minimum of 20 credits of coursework from among general biology, genetics, and life sciences electives must be completed in residence. In other words, no more than 16 credits in this part of the major requirements may be transferred from any institution outside of Rutgers University-New Brunswick. This rule is intended to assure that students receiving degrees from Rutgers-New Brunswick have taken a minimum number of courses in their major with this faculty. Please keep in mind that although a course may transfer from another institution into one of the Rutgers-New Brunswick schools, it will not necessarily be accepted toward the major in biological sciences. Therefore, all transfer courses must be evaluated and accepted by the advising office of the Office of Undergraduate Instruction in order to count toward the major. As indicated earlier, students must complete both semesters of general biology at the same institution or on the same campus of Rutgers before becoming eligible to declare the biological sciences major. Any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation. Credits for cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major.

The course requirements for the biological sciences major are divided into two sections: the life sciences core courses and the life sciences electives.

*Required Life Sciences Core Courses (47 credits)*

01:119:115-116 General Biology I,II (4,4)
01:119:117 Biological Research Laboratory (2)
01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)
01:160:171 Introduction to Experimentation (1)
01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)*
01:160:311 Organic Chemistry Laboratory (2)
01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics***
01:750:205-206 General Physics Laboratory (1,1)***
01:640:135,~~138~~136 Calculus for the Life and Social Sciences (4,4)** or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)
01:447:380 Genetics (4)
* With approval from a Biological Sciences Advisor, 01:160:308/316 may be replaced by another elective course. Please meet with an Advisor to discuss.

**01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).
***Calculus II 01:640:13~~8~~6(4) may be substituted by 01:960:379 Basic Probability and Statistics (3), 01:960:401 Basic Statistics for Research (3), or 01:960:211-212 Statistics I,II (3,3).

*Life Sciences Electives (24 credits)*

It is highly recommended that students meet with a life sciences adviser in the Division of Life Sciences Office of Undergraduate Instruction when planning their elective courses. It is important that the courses taken complement each other as much as possible and are not merely a collection of unrelated topics.

The electives must include at least three laboratory courses, only one of which may be satisfied by research work. Biological Research Laboratory and "library research" do not qualify for this requirement. A minimum of six courses (18 credits) must be at the 300 or 400 level, including at least three separate laboratory courses or three courses with a laboratory component. The laboratory associated with genetics (01:447:382 or equivalent), if taken, may be used to satisfy one of the three laboratory requirements.

No course at the 100 level may be used to satisfy the life sciences elective requirements. A maximum of 6 credits of independent study/research/honors research may be used toward the 24 elective credits. Please keep in mind that a minimum grade-point average of 2.8 is required to enroll in an independent study/research course in biological sciences. Research courses can satisfy only one of the three laboratory requirements, regardless of number of credits. Courses taken on a pass/fail basis may not be used to satisfy requirements for the major in biological sciences. A grade-point average of 2.0 or better in courses credited toward the major is required. No more than two courses with a grade of D may be used to fulfill the requirements of the major.

The elective courses must include at least one course (3 or 4 credits) each from the Departments of Cell Biology and Neuroscience 146, Genetics 447, Molecular Biology and Biochemistry 694, and Ecology, Evolution, and Natural Resources 11:216 at the School of Environmental and Biological Sciences. A list of approved courses in subject areas in addition to those in the Division of Life Sciences (Biological Sciences 119, Cell Biology and Neuroscience 146, Genetics 447, and Molecular Biology and Biochemistry 694) will be published by the advising office of the Office of Undergraduate Instruction. It is strongly recommended that students consult this list, which is available

on the website, prior to registering for their courses. Generally, acceptable courses from other departments on any campus of Rutgers University have a year of general biology as a prerequisite; however, there are exceptions. It is imperative for students to consult the published list and meet with an adviser. Credits from cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks if double majoring with another permitted life sciences major, at least four of the 3-4 credit life science courses applied to the Biology major may not overlap with courses used to fulfill second major requirements. Given that biological sciences is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation.

Life Sciences (SAS)

# Minor Requirements

# Minor Requirements

The minor requires four courses of at least 3 credits each in life sciences subjects as well as General Biology and Biological Research Laboratory. Both semesters of General Biology must be completed at the same institution or on the same campus at Rutgers. No other course at the 100 level may be used to satisfy the minor. A minimum of 11 credits must be taken at Rutgers University-New Brunswick. A maximum of 3 credits of research in a life sciences subject may be used toward the minor. A minimum of three courses at the 300 level or above is required. If majoring in a permitted life sciences major, no more than two of the four life science courses applied to the minor requirements may overlap with courses used to fulfill major requirements. Only life sciences courses acceptable for the biological sciences major may be used for the minor. Courses in chemistry, mathematics, or physics do not count toward the minor. A grade-point average of 2.0 or better in courses credited toward the minor is required. No more than one course with a grade of D may be used to fulfill the requirements of the minor.

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# Independent Study and Research in Biology

# Independent Study and Research in Biology

A minimum cumulative grade-point average of 2.8 is required for a student to register for an independent study/research course in biological sciences. A maximum of 6 credits of laboratory-based independent study, research, or honors projects may be used to fulfill the elective credits requirement in biology. The independent study/research form, available from the advising office of the Office of Undergraduate Instruction, must be completed and signed by the professor in whose laboratory the student will study prior to initiating the research project. Approval of a research proposal by the director of advising and a special permission number from the Office of Undergraduate Instruction is necessary for registration. Students may not earn academic credit for laboratory projects for which they are being paid. Students wishing to apply research credits from other departments toward the major in biological sciences must get approval from the advising office of the Office of Undergraduate Instruction, Division of Life Sciences, prior to beginning their research project.

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# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have a cumulative grade-point average of 3.0 or better and an average of 3.4 or better in life sciences core and elective courses credited toward the biological sciences major at the end of the junior year and previous research experience. At that time, the student should apply formally to the advising office of the Office of Undergraduate Instruction. Accepted students are expected to complete at least 6 credits over two semesters in an independent research project, resulting in a thesis, and to pass an oral examination before a faculty committee in the general field of the student's program of emphasis. If the research is done in a laboratory outside of the Division of Life Sciences, the examination committee must include at least one individual from the Division of Life Sciences faculty. Departmental Honors is completed in the fall and spring of senior year. Students accepted into special programs (e.g. BA/MD) may complete honors during junior year.

Honors students must register either for an honors course sequence in life sciences or for a course sequence in a school honors program. These decisions should be discussed with an adviser. An approval form (available in the advising office) must be completed.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

**Rutgers Undergraduate/Robert Wood Johnson Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

This program is designed for high-achieving premedical students of Rutgers University who are in their sophomore year. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and Robert Wood Johnson Medical School (RWJMS).

Application to this program is open to all undergraduate students enrolled at Rutgers University, New Brunswick. It is not directly associated with any one school within the university but see below for specific restrictions.

Admission is a two-stage and highly competitive process. In the first stage, undergraduate students are admitted into the program by an executive committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools of Rutgers University who have spent at least a year here. Prospective applicants from Rutgers University-Newark and Rutgers University-Camden must transfer to one of the units in New Brunswick for their sophomore year and complete at least 30 credits here. All applicants must have completed 4 semesters of college with a minimum of 60 credits. Applicants with an Associate¿s Degree, regardless of whether it was earned as a dual degree in high school or as a traditional degree after high school,

are ineligible to apply for the program. Admitted students will need to complete all of the core requirements of their undergraduate unit and major requirements with the exception of Biological Sciences and Cell Biology and Neuroscience majors, who may apply credit from the first professional year toward the major requirements. During the fourth year, students will be full time at the medical school and elective credits will count towards the undergraduate degree. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second stage occurs typically after the fourth year of study. It is the responsibility of the RWJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the RWJMS Admissions Committee. The purpose of this second, noncompetitive review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B (Honors or High Pass) in courses taken at both universities. However, recommendation is not automatic. The final decision rests with the RWJMS Admissions Committee. Upon approval by this admissions committee, the student will be permitted to continue into the fifth year of study and will be matriculated formally as a candidate for the M.D. degree at RWJMS.

Applicants to the B.A./M.D. program must be in their fourth semester at Rutgers University. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers, New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester and sustain it through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers University, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers-New Brunswick (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, two semesters of English, and organic chemistry lab must complete these requirements by the end of the third year of study. Students who did not take the SAT or ACT but who are admitted to the program will be required to take the MCAT by April of the junior year and score competitively with a total score of at least 508 (minimum single sub score of 123). An application form has been developed that allows the student to provide the executive committee with information it deems useful for its deliberations.

The bachelor's degree will be awarded upon completion of the undergraduate college and major requirements, by the end of year four. Upon satisfactory completion of year seven and all RWJMS requirements, the student will receive the medical degree.

Students who wish to pursue a major other than biological sciences must discuss their plans with the appropriate department in order to establish the requirements they need to complete for their major. For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from RWJMS will be applied toward the major (as stipulated below). The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements, usually by the end of year four. The number of credits, however, is not directly translated between the two universities; no more than 4 credits per laboratory course and 3 credits per non-laboratory course taken at RWJMS may be used toward the bachelor's degree at Rutgers.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and Intro to Biochemistry (01:694:301) and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must complete an additional approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick.

Students in the program must meet with advisers at the medical school and at their undergraduate school when planning their elective courses. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers' undergraduate units and RWJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

**Rutgers Undergraduate/New Jersey Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

The Rutgers Undergraduate/New Jersey Medical School joint program started in the fall of 2003. The purpose of the program is to permit students to begin their medical education after their third year or at least 96 degree credits at Rutgers. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and New Jersey Medical School (NJMS).

This program is only open to students enrolled in Rutgers University-New Brunswick schools.

Admission is a two-phase and highly competitive process. In the first phase, undergraduate students are admitted into the program by the Joint Program Executive Committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools at the New Brunswick location of Rutgers University who have been enrolled here for at least one year. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the NJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B in courses taken at Rutgers. Students must complete the Medical College Admission Test (MCAT) by January of the junior year before matriculating at NJMS and be required to be in the competitive range of other accepted NJMS students. This second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the NJMS Admissions Committee. However, recommendation is not automatic. The final decision

rests with the Medical School Admissions Committee. Upon approval by the Medical School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the M.D. degree at the New Jersey Medical School.

Applicants for the program must be in their fourth semester at Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, organic chemistry lab, and two semesters of English must complete these requirements by the end of the third year of study. An application form has been developed that allows the student to provide the committee with information the committee deems useful for its deliberations.

Students will be admitted at the end of the spring semester of year two and be formal members of the program beginning with year three. Prior to leaving the Rutgers undergraduate unit, students must satisfy all college and major requirements, except for the credits which they will receive from NJMS (please see next paragraph). For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from NJMS will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements by the end of year four. Upon satisfactory completion of year seven or eight, as well as all New Jersey Medical School requirements, the student will receive the medical degree.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and NJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

**Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine Joint Bachelor of Arts/Doctor of Medicine in Dentistry (B.A./D.M.D.) Program**

Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine joint program started in the spring of 2002. The purpose of the program is to permit students to begin their dental education after their third year or at least 98 credits at Rutgers. Specially selected students will obtain bachelor's and dental degrees in a seven-year program of study taken at Rutgers undergraduate units and Rutgers School of Dental Medicine.

This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick. The program is administered by the Health Professions Office.

Admission is a two-phase and competitive process. In the first phase, undergraduate students are admitted into the program by the Executive Committee of the Joint Program consisting of faculty from the appropriate units. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the Rutgers School of Dental Medicine Admissions Committee to review the credentials of students recommended by the articulated program executive committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for admission to the dental school. It is expected that students will have grades of A or B in courses taken at Rutgers University. Students must complete the Dental Admissions Test (DAT) and earn scores of 20 or better in Total Science, Academic Average, Organic Chemistry, General Chemistry, and Biology. Students may only take the DAT one time to qualify for this program. The second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the Rutgers School of Dental Medicine Admissions Committee. However, recommendation is not automatic. The final decision rests with the Dental School Admissions Committee. Upon approval by the Dental School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the Doctor of Medicine in Dentistry (D.M.D.) degree at the Rutgers School of Dental Medicine.

Applicants to the program must be in their fourth semester at the School of Arts and Sciences, Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at the School of Arts and Sciences, Rutgers-New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester, which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, two semesters of college-level mathematics (Calc I and either Calc II or an approved Statistics course) and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded

advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). If AP credit was granted for general chemistry, then organic chemistry I and II and laboratory and a course in biochemistry at Rutgers are required. If AP credit was granted for English, upper level English at Rutgers is required with the same amount of credit work. If AP credit was granted for physics, two approved courses from Physics or Kinesiology & Health at Rutgers are required. Those students who are admitted to the program without having two semesters of physics, biochemistry, organic chemistry lab, and two semesters of English, must complete these requirements by the end of the third year of study.

The B.A./D.M.D. program is a seven-year program with year one being the first undergraduate year. Students will be admitted at the end of the spring semester of year two and be formal members of the articulated program beginning with year three. Prior to leaving the School of Arts and Sciences, Rutgers-New Brunswick, students must satisfy all college and major requirements, except for the credits which they will receive from Rutgers School of Dental Medicine (please see below). For a student at the School of Arts and Sciences, Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from Rutgers School of Dental Medicine will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the general education and major requirements by end of year four. Upon satisfactory completion of year seven or eight, as well as all Rutgers School of Dental Medicine requirements, the student will receive the dental degree.

A student enrolled in the joint program completing a major in biological sciences at Rutgers-New Brunswick is required to complete any remaining Life Sciences Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers-New Brunswick, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/ research course may be applied toward the biological sciences major for students in the B.A./D.M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers-New Brunswick and Rutgers School of Dental Medicine.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

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# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

**Rutgers School of Arts and Sciences/Rutgers School of Health Professions Joint Bachelor of Arts/Master of Science Degree (B.A./M.S.) Physician Assistant Program**

This is a six-year (3+3) program offered jointly by the School of Arts and Sciences and the School of Health Professions (SHP). The program can be looked at as a two-phase program, an undergraduate phase followed by a professional phase. This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick, who are U.S. citizens, permanent residents of the United States, or international individuals currently on a student visa. At a minimum, applicants must be enrolled for one year at Rutgers-New Brunswick earning at least 30 credits.

The first phase of the program includes three years of undergraduate liberal arts and basic science education. Students may apply to the second (professional) phase in April of their second year by applying to the Physician Assistant (PA) program. Personal interviews will be required of those applicants being considered for admission. The interview will serve to determine the applicant's emotional and intellectual maturity, ability to communicate, and the potential to achieve career satisfaction within the physician assistant role. Applicants must have a cumulative and science GPA of 3.2. In cases where individuals may show high potential by improved performance, exceptions to this requirement may be considered. Please note that acceptance by Rutgers University does not guarantee acceptance by the PA program.

Applicants to the program must have completed the following courses with a grade of C or better: at least one semester (3 credits) of English composition, applied statistics or biostatistics (from Psychology, Biology, or Math departments), General Biology I and II with lab (119:115, 116, and 117, or equivalents); General Chemistry I and II with lab (160:161,162 and 171, or equivalents); and General Psychology (830:101, or equivalent). If the student has been granted AP credit by Rutgers for science courses, additional science courses will be required.

All applications must be received by June 1 and final notices of acceptance will be made by August 1. If the applicant is accepted into the program, it will be contingent on maintaining a 3.2 GPA through the end of the third undergraduate year at Rutgers-New Brunswick, and on all requirements for the undergraduate degree being met before the beginning of the fourth year. Students who are accepted into the second phase of the program will begin this phase at the beginning of their senior year. At the end of the senior year, these students will receive a bachelor of arts degree conferred by the School of Arts and Sciences, Rutgers University-New Brunswick. After completion of the remaining two years of the PA program, graduates will receive a master of science degree awarded by Rutgers School of Health Professions.

Before entering the second (professional) phase, a student accepted by this program must also complete for the PA program, Functional Human Anatomy (01:377:223), General Microbiology (01:447:390), Intro to Biochemistry (01:694:301) and Systems Physiology (01:146:356) (waived if Gen Bio II is completed at Rutgers-NB and not AP credit), and 6-8 additional credits of life science electives. Students majoring in biological sciences are required to have completed, in addition to the School of Arts and Sciences core distribution requirements, the Life Sciences Core requirements, Intro to Biochemistry (01:694:301) and General Microbiology (01:447:390) and one (three credit or more) course from the 216 subject area approved electives. Students with AP or transfer credit of General Biology I and II and lab must take an additional life science elective course for 3 or more credits. A maximum of 14 credits from SHP courses will be accepted toward the biological sciences major. Please be sure to meet with a biological sciences adviser when selecting life sciences elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and SHP.

For a complete description of the requirements for the major in biological sciences, please read the appropriate section under the Division of Life Sciences in this catalog.

For more information about this program, you may contact the PA program office at the School of Health Professions, 675 Hoes Lane, Piscataway, NJ 08854, at 732-235-4444; or the Division of Life Sciences, Health Professions Office at Rutgers University, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

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# Courses

# Courses

With the exception of 01:119:115,116, and 117 General Biology I and II and Biological Research Laboratory, courses numbered at the 100 level may not be used for major credit in any of the majors within the Division of Life Sciences.

**01:119:098** ***Foundations for Biological Science (E2)***
Selected topics in general biology: introduction to cellular organization, metabolism, genetics, reproduction, and organ systems. Development of analytical reasoning and science-oriented study techniques.
***Preparation for college-level general biology.***

**01:119:103** ***Principles of Biology (4)***
Selected topics in general biology, including cell structure, genetics, plant and animal diversity, basic plant and animal biology, ecology, and evolution.
***Lec. 3 hrs., lab. 3 hrs. Designed for students who must take a one-semester laboratory course in introductory biology to meet major requirements. Credit not given for this course if student has already completed 01:119:115. Not for life sciences major credit.***

**01:119:109,110** ***Biology Practice Group (1,1)***
Students will work actively to (1) organize the lecture content, (2) identify what they are expected to do with that content (outcomes), (3) prepare and explain study aids (organizers) to ensure that they correctly understand the week¿s content, and (4) begin the self-evaluation process to gauge exam preparedness. Discussion of the basic methods and principles.
***Corequisite for 109 is 01:119:115; corequisite for 110 is 01:119:116.***

**01:119:111,112** ***Reading in General Biology (1,1)***
Discussion and reading providing extensive and advanced coverage of selected topics.
***Corequisite for 111 is 01:119:115; corequisite for 112 is 01:119:116.***

**01:119:115** ***General Biology I (4)***
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics. Lec. 3 hrs., Wkshp. 80 min.
***Prerequisite has two parts: writing (prerequisite of 01:355:101, 01:355:103, or 01:355:104, or placement into 355:101 or 355:104) and math (prerequisite of 01:640:026 or placement into 640:CMA, 640:PCA, 640:CLG, or 640:CLS).***

**01:119:116** *General Biology II (4)*
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics.
*Lec. 3 hrs., Wkshp. 80 min. Prerequisite: 01:119:115 with a grade of C or better. Credit not given for both this course and 01:119:102.*

**01:119:117** *Biological Research Laboratory (2)*
Laboratory designed to introduce and explore principles of research in the biological sciences by engaging in semester-long research projects requiring students to analyze data, synthesize new experiments, and evaluate findings.
*Prerequisite: 01:119:115 with a grade of C or better. Corequisite: 01:119:116.*

**01:119:120** *STEM Success Seminar (1.5)*
Increases ability to control academic success and improve transition to the university environment in furtherance of educational and career goals. Reflection on recent and current academic experience and career aspirations. Setting of priorities and alignment of time and effort towards those ends.
*By special permission only.*

**01:119:127-128** *Anatomy and Physiology: Health Sciences (4,4)*
Structure and function of human organ systems. Some microanatomy and biochemical aspects of physiology included.
*Lec. 3 hrs., lab. 3 hrs. For nursing, medical technology, physical therapy, and other professional students. Not for life sciences major credit.*

**01:119:131** *Microbiology for the Health Sciences (3)*
Introduction to microbes with emphasis on the nature and behavior of microorganisms, the interrelationships between microbes and the human host in health and disease, and the principles of prevention and control of infectious disease.
*Not open to students who have taken 01:447:390. For nursing and other professional students. Not for life sciences major credit. Prerequisites: 01:199:115-116 or 01:119:127-128.*

**01:119:132** *Microbiology for the Health Sciences Laboratory (1)*
Laboratory to accompany 01:119:131.
*Lab. 3 hrs. Pre- or corequisite: 01:119:131.*

**01:119:140** *The DNA Revolution (Honors) (3)*
Introduction to fundamentals of molecular genetics, biotechnology, and modern genetics, including a laboratory research project using molecular biology and bioinformatics techniques. Intended primarily for nonscience majors, but may also appeal to prospective chemists, physicists, engineers, and computer scientists.
*Restricted to first-year and sophomore students in the School of Arts and Sciences Honors Program or the Honors College. Credit not given for both this course and 01:119:140 or 01:694:215 or 315, or 01:447:315. Not for life sciences major credit.*

**01:119:148** *Moving Bodies: The Biology of Movement (3)*
Considers fundamental processes that allow humans and other animals to move, including structural basis (bones and muscles), control (brain and nervous system), conversion of food into energy (digestion and nutrition),

movement of food and oxygen to muscles (circulation), and some common and familiar injuries and illnesses and their treatments.
*Credit not given for both this course and 01:119:100, 103, 115-116, or 127-128. Not for life sciences major credit.*

**01:119:150** *Biology, Society, and Biomedical Issues (3)*
Discussion of current topics and issues in human health and medicine from a biological perspective.
*Credit not given for both this course and 11:115:100. Not for life sciences major credit.*

**01:119:154** *Genetics, Law, and Social Policy (3)*
Principles of human and behavioral genetics and their legal, ethical, and social implications. Topics include genetic screening, counseling, and engineering; reproductive regulation; and human behavior genetics.
*Prerequisite: Sophomore standing. Not for life sciences major credit or related major.*

**1:119:155** *Human Genetics (3)*
How our genes influence our development and health, how both normal traits and diseases are transmitted through families, how genetics is used in forensics and personalized medicine, and the genetic tests that are offered directly to consumers.
*Not for life sciences major credit.*

**01:119:156** *Genetics, Evolution, and Human Health (4)*
The human body and human behavior, shaped by more than four billion years of evolutionary processes. Scientific and social implications of current ideas and controversies of evolution and genetics.
*Not for life sciences major credit.*

**01:119:160** *Biology, Society, and Ecological Issues (3)*
Ecological and evolutionary ideas affecting space ecology; population increase, food supply, air and water pollution, war, and nuclear energy.
*Not for life sciences major credit or related major.*

**01:119:182** *Essentials of Human Reproduction (3)*
Anatomical and physiological bases of human sexuality; biological and cultural aspects of sexual differentiation and psychosexual development, contraception, venereal disease, and sexual lifestyles.
*Not for life sciences major credit or related major.*

**01:119:195** *Brain, Mind, and Behavior (3)*
Honors course discussing the interrelationship between the brain, the mind, and behavior.
*Open to students in the School of Arts and Sciences Honors Program or the Honors College. Not for life sciences major credit or related major.*

**01:119:199** *Preparation for General Biology (4)*
For first- and second-year students planning science majors. Enrollment based on placement scores. Selected concepts in biology, proven learning strategies for college science courses, and instruction in the scientific method. Prepares students for success in the General Biology sequence (01:119:115-117).
*Lec./rec. 3 hrs., lab. 3 hrs. Enrollment restricted by placement. Not for life sciences major credit.*

**01:119:201-202** ***Independent Study in Biology (1-3,1-3)***
Independent study under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. May not be used to fulfill a laboratory requirement.***

**01:119:204** ***Outreach in Biology (1)***
Introduction to the basic principles and best practices of outreach in the biological sciences. Emphasis on understanding how to translate technical concepts and techniques to lay audiences incorporating best practices in active learning, public speaking and curriculum development. Recommended for students interested in teaching careers and related positions in science communication.
***Prerequisites: 01:119:115, 01:119:116, and 01:119:117. By special permission.***

**01:119:205** ***Internship in Life Sciences (3)***
Development of experience and knowledge regarding the expectations, qualifications, competencies and responsibilities of professionals working within the life sciences through an internship experience with academic component. Integration of knowledge from life science coursework with the internship experience, development of new skills, and reflection on the learning experience.
***Prerequisites: 01:119:116 and 01:119:117. Open only to 119 Biology Majors.***

**01:119:307-308** ***Research in Biology (1-3,1-3)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to students majoring (or minoring) in biological sciences.***

**01:119:310** ***Communication in Biology (1)***
Effective skills for communicating science to a variety of audiences in a variety of forms including papers, grant proposals, teaching, and presentations to scientists and others. Provides support for students completing the 10-page research paper required for Research in Biology.
***Prerequisites: 01:119:307, 308, 407, or 408. Corequisites: 01:119:307, 308, 407, or 408.***

**01:119:311** ***Current Topics in Life Sciences (1)***
Directed readings and discussion of selected scientific topics and career stories with Rutgers Life Sciences Alumni.
***Junior or senior status and Division of Life Sciences major (subject code: 119, 146, 694, 447).***

**01:119:401** ***Clinical Practicum in the Health Professions (3)***
Development of advanced knowledge of and reflection on the qualifications, competencies, and responsibilities of physician health care providers through an internship experience and academic component integrating knowledge from life science coursework and the health care setting.
***Prerequisites: 3.4 science GPA. By special permission of the Office of Undergraduate Instruction only.***

**01:119:406-407** ***Research in Biology (1-4,1-4)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report is required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to seniors majoring (or minoring) in biological sciences.***

**01:119:408-409** ***Honors in Biology (3-6,3-6)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written thesis, oral presentation, and defense are required.
***Prerequisites: Declared biological sciences major. Permission of the Office of Undergraduate Instruction. Open only to seniors majoring in biological sciences who meet the requirements for departmental honors.***

**01:119:410** ***Honors Communication in Biological Sciences (1)***
Instruction on effective communication of scientific ideas and findings for both the scientific community as well as the general public. Support in writing honors theses and preparing for oral thesis defenses.
***Prerequisite: 01:119:408. Corequisite: 01:119:409.***



# Cell Biology and Neuroscience 146

# Cell Biology and Neuroscience 146

Department of Cell Biology and Neuroscience, School of Arts and Sciences

**Website:** Here

**Chair:** Megerditch Kiledjian

**Vice Chair and Undergraduate Director:** Gabriella D'Arcangelo

**Distinguished Professors:**

Joanna Burger, B.S., SUNY (Albany); M.S., Cornell; Ph.D., Minnesota

Megerditch Kiledjian, B.A., Rutgers; Ph.D., University of Pennsylvania

Melitta Schachner, Diploma in Biochemistry, Tübingen (Germany); Ph.D., Max-Planck Institut für Biochemie (Germany)

Wise Young, B.A., Reed; Ph.D., Iowa; M.D., Stanford

**Professors:**

Lori R. Covey, B.S., California (Riverside); Ph.D., Columbia

Gabriella D'Arcangelo, B.S., Bari (Italy); Ph.D., SUNY (Stony Brook)

Robin L. Davis, B.S., Pennsylvania State; M.A., San Diego State; Ph.D., Stanford

Bonnie Firestein, B.S., Michigan; Ph.D., California (San Diego)

Martin Grumet, B.S., Cooper Union; Ph.D., Johns Hopkins

Ronald P. Hart, B.S., Connecticut; Ph.D., Michigan

Arnold G. Hyndman, A.B., Princeton; Ph.D., California (Los Angeles)

Alice Y.-C. Liu, B.S., Chinese University of Hong Kong (China); Ph.D., Mount Sinai School of Medicine

Gary F. Merrill, B.S., Weber State; Ph.D., Michigan State

Kathleen M. Scott, B.A., Brown; Ph.D., Yale

**Associate Professors:**

Qian Cai, M.D., Shanghai Railway Med College (China); Ph.D., National Institutes of Health-Shanghai Second Medical University

Wei Dai, B.S., M.S., Beijing Normal (China); M.S., Texas Health Science Center; Ph.D., Baylor College of Medicine

Dunne Fong, B.S., Massachusetts; M.A., Ph.D., Princeton

Shu-Chan Hsu, B.S., Ph.D., British Columbia

Peng Jiang, B.S., Soochow (China); Ph.D., University of Science and Technology of China

Kelvin Y. Kwan, B.S., California Institute of Technology; Ph.D., Harvard

David Margolis, B.S., Brown; Ph.D., Washington (Seattle)

Ping Xie, B.S., Nanjing (China); Ph.D., Hong Kong University of Science and Technology

**Assistant Professors:**

Victoria Abraira, B.S., Southern California; Ph.D., Harvard

Santiago Cuesta, B.A., M.S., Ph.D., National University of Rosario (Argentina)

Brian Daniels, B.A., B.S., Southern Wesleyan (Central); Ph.D., Washington (Seattle)

Rafiq Huda, B.A., Carleton College; Ph.D., Northwestern University (Chicago)

Natasha O¿Brown, B.S., Davidson College; Ph.D., Stanford

Max Tischfield, B.A., Rutgers; Ph.D., Harvard

**Associate Research Professors:**
Xinfu Jiao, B. S., Xinxiang Medical College (China); M.S., Tongji Medical University (China); Ph.D., Shanghai Institute of Hematology (China)

Patricia Morton, B.S., Northwestern University; M.S., Ph.D., University of Wisconsin

**Assistant Research Professor:**

Dongming Sun, B.S., Beijing Medical University (China); Ph.D., Columbia University

**Assistant Teaching Professors:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Tara Cominski, B.S. St. Peter's University; Ph.D., Rutgers

Anne Keating, B.S., M.S., Ph.D., Rutgers

- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Options
- Departmental Honors Program
- Courses

Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Cell Biology and Neuroscience offers a course of study that provides fundamental and comprehensive training in the areas of cell biology and neuroscience. The major objective of this program is to prepare students for graduate studies in cell biology and neuroscience; entry into professional schools in medicine, dentistry, or other health-related fields; or employment in industrial and pharmaceutical companies.

*Learning Goals*

Students will:

I. master factual and conceptual knowledge in cell biology and neuroscience that will provide a solid foundation for success in advanced training and professional careers;

II. develop an ability to summarize, integrate, and organize information; and

III. use scientific reasoning to evaluate the potential for current research and new discoveries to improve our understanding of cell biology and neuroscience and its relevance to human health and to our society.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

The major in the Department of Cell Biology and Neuroscience is open to students after their first year who have completed Fundamentals of Neurobiology (01:146:245) or Fundamentals of Cell Biology (01:146:270), with a grade of C or better. Departmental approval is required.

A grade of C or better in all courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The Department of Cell Biology and Neuroscience offers a program of study from which students can select one of two tracks, depending upon particular interests and career goals: a general track (default) and an honors track. Students can apply to enter the honors track at the beginning of the senior year. This track requires a minimum GPA of 3.4 in courses credited toward the major, and departmental approval. A number of core courses are required of all students in the cell biology and neuroscience major, regardless of the chosen track. No more than 16 credits from among the life science courses required for completion of the cell biology and neuroscience major may be fulfilled by credits transferred from any school outside of Rutgers University-New Brunswick. Any life science courses applied to the major should be taken within 10 years of graduating.

***Required Core Courses (65 or more credits)***

01:119:115-116 General Biology (4,4)

01:119:117 Biological Research Laboratory (2)

01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)

01:160:171 Introduction to Experimentation (1)

01:160:307-308 or 01:160:315-316 Organic Chemistry (4,4)

01:160:311 Organic Chemistry Laboratory (2)

01:750:203-204 General Physics (3,3) or 01:750:193-194 Physics for the Sciences(4,4)*or 01:750:271-272 Honors Physics (3,3)

01:750:205-206 General Physics Laboratory (1,1)

01:640:135,136 or 01:640:151-152 Calculus I and II (4,4) or 01:640:135 and 01:960:401 Basic Stat for Research (3) or 01:960:379 Basic Prob and Stat or 01:640:135 and 01:960:212 Statistics II (3)**

01:447:380 Genetics (4)

01:146:245 Fundamentals of Neurobiology (3)

01:146:270 Fundamentals of Cell Biology (3)

01:694:395 Biochemistry for Life Sciences (3) or 01:694:407 Biochemistry (3)

Advanced Cell Biology and Neuroscience Courses: choose three of the following:

01:146:445 Synapses, Neurons, and Circuits (3)

01:146:447 Clinical Neurobiology (3)

01:146:465 Neurobiology of Pain and Addiction (3)

01:146:472 Developmental Biology (3)

01:146:473¿ Genetic Regulation in Cell Biology¿(3)

01:146:474 Immunology (3) or 01:146:476¿ Honors Immunology (3)

01:146:481 Protein Dynamics in Cell Biology (3)

* with approval from the Undergraduate Director or CBN Advisor 01:160:308 may be replaced by an additional elective course.
** Students who take who take Physics for the Sciences 01:750:193-194 (4,4) do not need an additional Physics laboratory.
*** Students with AP statistics equivalent of 01:960:211, transfer credit for 01:960:211, or who have taken 01:960:211 at Rutgers must take 01:960:212.

Life Sciences (SAS)

# Options

# Options

*General Track; 4 credits*

This track is for students who, upon graduation, seek immediate employment or plan to attend professional schools in health-related fields. In addition to the required core courses, students must take the following courses:

1. One elective lecture courses at the 300-400 level in the life sciences area (equaling 36 or more credits)
2. One laboratory or research course (1-3 credits). Students can take a lecture course with an associated laboratory component (3-4 credits) to satisfy both requirements, or a stand-alone lecture plus a laboratory or research course.

*Honors Track; 12 credits*

This area of concentration is for students interested in research who, upon graduation, plan to attend graduate school or professional schools in health-related fields. A student must qualify for admission into the honors track. See the departmental honors program page in this catalog for student qualifications. In addition to the required core courses, students must complete the following courses, produce a written research thesis and an oral thesis presentation:

1. One elective lecture course at the 300-400 level in the life sciences area (3 or more credits).
2. 01:146:405 Honors Seminar (3).
3. 01:146:408-409 Honors Research (3,3).

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

Honors in cell biology and neuroscience are awarded to students who have successfully completed the honors track course requirements, submitted a written research thesis, and defended the thesis orally. To qualify for the honors track, a student must have attained a grade-point average of 3.4 or better in courses required for the major. The student should apply formally to the department for acceptance into the honors program by the end of the second semester of the junior year.

Life Sciences (SAS)

# Courses

# Courses

**01:146:201,202** *Independent Study in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. May not be used to fulfill a laboratory requirement. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:245** *Fundamentals of Neurobiology (3)*
Introduction to the biology of the nervous system. Topics covered include nerve cell signaling, sensory and motor systems, and higher brain processes.
***Prerequisites: 01:119:115-116.***

**01:146:270** *Fundamentals of Cell Biology (3)*
Principles of cell biology. Structure, function, and macromolecular organization of cellular organelles.
***Prerequisites: 01:119:115-116.***

**01:146:295** *Essentials of Cell Biology and Neuroscience (3)*
Provides a background in the biology of neural cells and cognition.
***Prerequisites: 01:119:115-116. Not intended for cell biology and neuroscience majors.***

**01:146:307,308** *Research in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research on an original problem under the direction of a member of the Rutgers faculty.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:322** *Human Histology (4)*
Structure of the tissues and organs of the human body. Lec. 3 hrs., lab. 3 hrs.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:328** ***Human Parasitology (3)***
Cell biology, epidemiology, pathogenesis, and clinical manifestations of human parasitic diseases.
***Prerequisites: 01:119:115-116.***

**01:146:329** ***Human Parasitology Laboratory (1)***
Laboratory to accompany the Human Parasitology lecture course 01:146:328. Lab. 3 hrs.
***Pre- or corequisite: 01:146:328.***

**01:146:340** ***Virology (3)***
Principles of virology including the molecular and cellular events that occur during virus replication, the host cell response, and pathogenesis. Emphasis on animal viruses that impact human health and disease. Strategies for controlling viruses.
***Prerequisite: 01:146:270.***

**01:146:350** ***Introduction to Light Microscopy for the Life Sciences (1, minicourse)***
This course offers a comprehensive exploration of advanced imaging techniques essential for studying tissues, cells, and organelles in the life sciences.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:356** ***Systems Physiology (3)***
Comprehensive study of the principal organ systems of laboratory animals and humans.
***Prerequisites: 01:119:115-116 and 01:160:161-162 or 163-164, and 171 Credit not given for both this course and 11:067:300.***

**01:146:357** ***Systems Physiology Laboratory (1)***
Laboratory to accompany the Systems Physiology lecture course 01:146:356. Lab. 3 hrs.
***Pre- or corequisite: 01:146:356.***

**01:146:405** ***Honors Seminar (3)***
This course is intended to help students prepare a written research thesis and practice the oral thesis presentation.
***Requires departmental permission. Open only to senior honors students majoring in cell biology and neuroscience. This course fulfills the SAS WCd core requirement.***

**01:146:406, 407** ***Research in Cell Biology and Neuroscience (1-3,1-3)***
Research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. Open only to students majoring in cell biology and neuroscience.***

**01:146:408-409** ***Honors Research (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member. Written report and oral presentation required. Culminates in a written thesis and oral thesis defense.
***Permission of department and an instructor willing to sponsor the student are required. Open only to seniors majoring in cell biology and neuroscience who meet the requirements for the departmental honors program.***

**01:146:410-411** ***Research Thesis in CBN I and II (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member and the course coordinator.
***Prerequisites: 01:146:307 or 01:146:308. Requires departmental permission and acceptance by a faculty mentor who will***

*host the student in the laboratory. Requires submission of a written thesis draft (I = Fall semester), and submission of a final written thesis and oral defense (II = Spring semester). Open to senior students majoring in cell biology and neuroscience who are not enrolled in the departmental honors program.*

**01:146:445** *Synapses, Neurons, and Circuits (3)*
Cellular and systems features of neurons and the fundamental unit of signaling in the nervous system, focusing on a small number of advanced topics. Focus on how to test hypotheses related to the topics addressed: intra- and inter- cellular communication; construction of neuronal networks; protein interactions at the synapse; and signal transduction pathways.
*Prerequisites: 01:146:245 and 01:146:270.*

**01:146:447** *Clinical Neurobiology (3)*
Development and function of the nervous system with an emphasis on diseases and disorders. Topics include neurodevelopment, demyelination, tumors, and viral infections; neurological disorders/diseases; injury to the spinal cord and brain and repair; and clinical trials and the future of spinal cord and brain trauma.
*Prerequisites: 01:146:245 and 01:146:270. Intended for senior students majoring in cell biology and neuroscience.*

**01:146:456** *Advanced Physiology (3)*
Preparation for advanced graduate study in physiology and for medical physiology (first-year medical school). Focus on mammalian physiology and the whole animal (whole organ) approach to classical experimental physiology.
*Prerequisites: 01:146:356. Intended for senior and junior students.*

**01:146:464** *Topics in Cell Biology and Neuroscience (3)*
Directed readings and discussion of selected topics in cell biology and neuroscience.
*Prerequisites: 01:146:245 and 01:146:270. Open to junior or senior students majoring in cell biology and neuroscience.*

**01:146:471** *Advanced Cell Biology Laboratory (3)*
Advanced laboratory methods in cell biology. Emphasis on light and electron microscopy, imaging, immunocytochemical techniques, tissue culture, and methods of identifying and separating macromolecules.
*Prerequisite: 01:146:270 or permission of instructor.*

**01:146:472** *Developmental Biology (3)*
Genetic, molecular and cellular processes that lead from egg to embryo to mature organism.
*Prerequisite: 01:146:270 or 01:447:380 or 01:447:384.*

**01:146:473** *Genetic Regulation in Cell Biology (3)*
Advanced topics in cell biology, focusing on genetic animal models, genomics, chromatin function, gene expression, and RNA biology.
*Prerequisite: 01:146:270.*

**01:146:474** *Immunology (3)*
Fundamental principles of immunology with emphasis on antibody formation, immunoglobulin molecules and genes, hypersensitivity reactions, and the cellular basis for the immune response.
*Prerequisites: 01:119:115-116 and 01:447:380 or 01:447:384. Recommended: 01:447:390.*

**01:146:475** ***Laboratory in Immunology (1)***
Biochemical and molecular analysis of immune cell function. Application of immunological techniques to the examination of normal and diseased states.
***Pre- or corequisite: 01:146:474.***

**01:146:476** ***Honors Immunology (3)***
Introduction to the immune system, with a focus on mammalian organisms (particularly humans). Focus on critical thinking and problem-solving abilities, as well as introduction to primary research addressing contemporary immunological questions. Open only to students enrolled in the Honors College, SAS Honors Program or CBN Honors Program.
***Prerequisites: 01:447:380 or 01:447:384. Credit not given for both this course and Immunology 01:146:474.***

**01:146:481** ***Protein Dynamics in Cell Biology (3)***
Advanced topics in cell biology, focusing on signal transduction (module 1), cell adhesion and protein transport (module 2) and cytoskeletal dynamics controlling cell movement (module 3).
***Prerequisite: 01:146:270.***

Life Sciences (SAS)

# Genetics 447

# GENETICS 447

Department of Genetics, School of Arts and Sciences

**Website:** Here

**Chair:** Tara C. Matise

**Vice-Chair & Undergraduate Director**: Gary A. Heiman

**Distinguished Professors:**

Maureen M. Barr, B.A., Rutgers; Ph.D., Columbia

James A. Knowles, B.S., Michigan; M. Sc., M.D., Ph.D., Albert Einstein Medicine

Tara C. Matise, B.S., Cornell; M.S., Ph.D., Pittsburgh

Jay A. Tischfield, B.S., City University of New York; M.Phil., Ph.D., Yale

Lei Yu, B.S., Jiangnan University (China); M.S., Institute of Genetics, National Academy of Sciences (China); Ph.D., California Institute of Technology

**Professors**:

Gary A. Heiman, B.A., Boston Univ.; M.Sc., Sarah Lawrence; Ph.D., Columbia

Kim S. McKim, B.A., Simon Fraser; Ph.D., British Columbia

Bryce E. Nickels, B.S., Miami; Ph.D., Harvard

Christopher G. Rongo, B.A., University of California, San Diego; Ph.D., Massachusetts Institute of Technology

Gleb P. Shumyatsky, B.A., Moscow State University; Ph.D., Institute of Molecular Biology (Moscow, Russia)

Andrew W. Singson, B.S., University of California, Davis; Ph.D., University of California, San Diego

Karen Schindler, B.S., Loyola; Ph.D., Thomas Jefferson

Michael Verzi, B.A., The College of New Jersey; Ph.D., University of California, San Francisco

Jinchuan Xing, B.S., Nankai (China); Ph.D., Louisiana State

**Associate Professors:**

Chris Ellison, B.A., Lewis and Clark; Ph.D., University of California, Berkeley

Derek Gordon, B.A., Rochester; Ph.D., State University of New York at Stony Brook

**Assistant Professors:**

Christina M. Bergey, B.A., M.A., Ph.D., New York University

Devanshi Jain, B.Sc. Hons., Ph.D., University College, London

Tetsuya Nakamura, B.S., Ph.D., Osaka (Japan)

Srujana Samhita Yadavalli, B. Tech., Anna University (India); Ph.D., Ohio State

Jiekun Yang B.S., Renmin University (China), M.S. UW-Madison, Ph.D. University of Virginia

**Associate Research Professors:**

Juan Wang, B.S., Ph.D., China Agricultural University (Beijing)

**Assistant Research Professors:**

Marco Azaro, B.A., Ph.D., Brown

**Teaching Professor:**

Martha Haviland, B.A. Rutgers; MS, AM, Ph.D. Michigan

**Associate Teaching Professor:**

Jessica Rispoli, B.S., Richmond; M.G.C., Maryland

Christine Seymour, B.S., Scranton; M.S. Arcadia University

**Associate Research Professor:**

Oleg Evgrafov, B.S., Moscow Physical Engineering Institute; M.S., Moscow Physical Engineering Institute; Ph.D,. Institute of General Genetics (Moscow); D.Sc., Research Center for Med. Genetics (Moscow)

**Assistant Teaching Professors:**

Tara P. Cominski, B.S, Saint Peter's; M.S., Seton Hall; Ph.D., Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin; M.S., Kansas State; Ph.D., Wisconsin

Anne Keating, B.S., Ph.D., Rutgers

Haiyang Lu, B.S., Hebei University, China; M.S., Beijing Normal University, China; Ph.D., City University of New York

Shama Khan, B.A., Rutgers University; M.P.H., Tulane; M.S. Epidemiology, Tulane University; M.S. Genetic Counseling, Arcadia University

Mai Soliman, B.S., M.Sc., Montclair State; Ph.D., Rutgers

Zainab Tanvir, B.A. Stonybrook University, M.S. Univ. Delaware, Ph.D., Rutgers

Alexandra Walczak, B.S., Ramapo College of NJ, Ph.D., Rutgers

**Faculty Emeriti:**

David E. Axelrod

Linda Brzustowicz

Terry McGuire

Howard C. Passmore

Amrik S. Sahota

Lee D. Simon

Navin K. Sinha

Ann C. St. John


- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Elective Courses
- Departmental Honors
- Undergraduate Certificate Programs
- Courses

# Learning Goals

# Learning Goals

**Learning Goals:**

The Department of Genetics is committed to teaching science through the way we do science: through the process of doing research. The curriculum of the Department of Genetics is centered around four main goals. These goals shape our innovative courses and provide the basis for lifelong learning.

I. Knowledge specific goals: Know the terms, concepts, and theories of genetics.

II. Integrate the material from multiple courses and research to think holistically and to see the whole as well as the parts.

III. Use genetic information and ideas to critically analyze published research articles in genetics.

IV. At the end of four years, all of our students will be able to design an experiment, carry out the research using the appropriate laboratory techniques, and analyze and interpret their data. They will also be able to communicate their discoveries through a written article appropriate for publication in a peer-reviewed genetics journal, and through talks or posters appropriate for scientific meetings.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in this department must have been enrolled at Rutgers for at least one semester. In addition, students must:

1. Be an SAS student

2. Have a cumulative GPA of at least 2.00, and a GPA of at least 2.8 at the time of taking research for credit.

3. Have earned a C or better in these prerequisite courses or equivalents (25-26 credits):

a. General Biology I 01:119:115

b. General Biology II 01:119:116

c. General Biology Lab 01:119:117

d. General Chemistry I either 01:160:161 or 01:160:163

e. General Chemistry II either 01:160:162 or 01:160:164

f. Calculus I either 01:640:135 or 01:640:151

g. Calculus II or Statistic either 01:640:136, or 01:640:152, or 01:640:192, or 01:960:401, or 01:960:212, or 01:960:379

4. Students with an overall GPA < 3.0 must meet with the UGD before declaring the major.

a. Genetics is a credit-intensive major and has a requirement of a 2.80 GPA at the time of taking research for credit

b. Students entering the major with a GPA of < 3.0 may struggle to complete the major on time

5. Watch a Genetics Major Declaration Video

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The department offers a major with a strong emphasis on research. A minimum of 20 credits of coursework in the life sciences must be completed in residence. Genetics is a credit-intensive major. Excluding the prerequisite courses (25-26 credits) to get into the major (see above), there are between 54-56 credits to complete the major (60-62 for honors). A grade of "C" or better in courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades. Students may not double major in two Division of Life Sciences majors.

The requirements of the major consist of:

**A. Life Science Core Courses (19-21 credits)** - Required for all DLS Majors (Approved AP and Transfer credits may be substituted)

a. Intro to Experimentation 01:160:171

b. Organic Chemistry I 01:160:307 or 01:160:315

c. General Physics I (01:750:203 + 205 lab), or (01:750:271 + 275 lab), or 01:750:193, or 01:750 201
Note: 193 & 201 have integrated lab

d. General Physics II (01:750:204 + 206 lab) or (01:750:272 + 276 lab) or 01:750:194 or 01:750:202
Note: 194 & 202 have integrated lab

**B. Genetics Core (17 credits) -** Required for all Genetics Majors- All below credits must be completed at Rutgers

a. Genetic Analysis I 01:447:384

b. Genetic Analysis II 01:447:385

c. Lab Course Req. 01:447:315, or 01:447:302, or 01:447:203, or 01:447:303, or 01:694:214, or 01:694:215, or 01:694:316

d. Biochemistry for the Life Sciences 01:694:395 or 01:694:407

e. Communications in Genetics 01:447:430 or 01:447:414 + 01:447:415 (Honors, Thesis Writing senior year)

**C. Genetics Independent Scholarship (minimum 6 credits but 12 credits for honors**

Note: 2.8 minimum GPA to register for research

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

**D. Genetics Electives (6 credits)**

Fifty percent must be taken within the Genetics Major (i.e.; 01:447)

a. Genetics Electives See electives table

b. Genetics Electives See electives table

c. Genetics Electives See electives table

**E. Electives OR Independent Scholarship (6 credits)**

Note: Additional Genetics Lab may be used as an elective

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

c. Genetics Electives See electives table below

**Lab Note:** 01:694:214 and 01:694:215 are only offered to first-year students with AP Biology credit and AP General Chemistry credits (or taking General Chemistry concurrently). 01:447:203 is only offered to first-year students in the SAS Honors Program or the Honors College. Students cannot receive credit for both 01:447:203 and 01:447:302.

**Organic Chemistry Note:** If you are planning to pursue a graduate degree in which a full year of organic chemistry is suggested/required (e.g., med/dental school), we strongly recommend taking Organic Chemistry II + lab as an elective (6 credits)

Life Sciences (SAS)

# Elective Courses

# Elective Courses

**Approved Genetics Electives**

(01:160:308 or 01:160:316) and (01:160:311 or 01:160:314-15) Organic Chemistry II + lab (6)

01:198:111 Introduction to Computer Science (4)

01:198:112 Data Structures (4)

01:447:203 Honors Computational Genetics (Honors) (3)

01:447:216 Analysis of Scientific Literature (Honors) (3)

01:447:245 Intro to Cancer (3)

01:447:302 Quantitative Biology and Bioinformatics (3)

01:447:303 Computational Genetics of Big Data (3)

01:447:315 Introduction to Research in Genetics (3)

01:447:354 Social, Legal, and Ethical Implications of the New Genetics (3)

01:447:356 Evolutionary Medicine (3)

01:447:370 Developmental Genetics (3)

01:447:390 General Microbiology (3)

01:447:392 Pathogenic Microbiology (3)

01:447:451 Genomes (3)

01:447:460 Genetics of Compulsive Behavior (3)

01:447:465 Genetic Approaches & Research Analysis (3)

01:447:470 Evolutionary Developmental Biology (3)

01:447:478 Special Topics in Genetics (3)

01:447:479 Special Topics in Genetics (3)

01:447:480 Topics in Molecular Genetics (3)

01:447:484 Behavioral and Neural Genetics (3)

01:694:411 Molecular Pathways and Signal Transduction (3)

01:694:412 Proteomics and Functional Genomics (3)

01:694:413 Chromatin and Epigenomics (3)

01:694:420 Membrane Dynamics in Health and Disease (3)

01:694:421 Spec. Top. Mol. Bio. & Biochem (3)

01:694:492 Gene Regulation in Cancer and Development (3)

11:126:427 Methods and Applications in Molecular Biology (4)

11:126:483 Nucleotide Sequence Analysis (3)

11:126:485 Bioinformatics (3)

11:680:480 Microbial Genetics and Genomics (3)

16:681:535 Human Genetics (3)

Life Sciences (SAS)

# Departmental Honors

# Departmental Honors

**Departmental Honors**

The Department of Genetics recognizes graduating students who have made outstanding academic achievements by awarding **departmental honors**. The department awards two types of departmental honors (see below) and these are awarded at the discretion of the Genetics Honors Committee. To be considered, students must meet all criteria for that type of honors and submit the honors request application by the deadline (April 1st of senior year).

The two types of departmental honors and their criteria are as follows:

**1. GENETICS HONORS- RESEARCH**

a. GPA requirement: a student must have attained, at the end of the junior year, a cumulative GPA of at least 3.4 and a Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete 6 or more credits of Honors in Genetics (01:447:408-409) during senior year

c. Complete a total of 12 or more research credits (including the 6 credits of 01:447:408-409)

d. Complete Honors Thesis and Communication in Genetics 447:414 and 415 during senior year

e. Complete and defend a research thesis before a faculty committee (see Thesis Guidelines)

f. Present at Honors Day

Students can apply to do an Honors thesis by completing the relevant sections of the Independent Scholarship Form. Students must register either for an Honors course sequence in Genetics (01:447: 408 and 409) or for a course sequence in a college Honors Program (See Handbook). These decisions should be discussed with an advisor and approved by the Department Vice Chair. Accepted students are expected to complete at least 12 credits in an independent research project, resulting in a thesis. Students may do research with Rutgers faculty outside of the Department with the approval of their advisor and the Vice Chair. Students will prepare a thesis and present an oral defense to a committee of three faculty. At least one member of the committee must come from the Department of Genetics. Students will present their research at a Departmental Symposium in April. Students contemplating an Honors thesis should refer to the much more detailed instructions and details in Section IX and Section X of the Student Handbook. For information on the thesis, see Thesis Guidelines.

**Level of Honors:** In determining the level of honors, the honors/awards committee takes into consideration multiple factors in aggregate, including but not limited to (1) cumulative GPA, (2) thesis defense committee recommendation, (3) research mentor evaluation, (4) faculty evaluation of presentation at Honors Day, and (5) whether or not the student took the honors versions of Genetic Analysis 1 and/or 2 (i.e., 01:447:384:H1 and/or 01:447:385:H1) and the grades received in those courses.

**2. Genetics Honors - Certificate Program**

a. GPA requirement: A student must have attained, by April 1st of senior year, a cumulative GPA of at least 3.4 and Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete a departmental certification program (i.e.; CompGen, Cancer or Genetic Counseling).

c. By April 1st, the student must formally apply to request consideration for Certificate Honors by completing the Genetics Honors- Certificate Program Form

* *The honors committee may award Honors, High Honors or Highest Honors*

Life Sciences (SAS)

# Undergraduate Certificate Programs

# Undergraduate Certificate Programs

The Department of Genetics offers two certificate programs. Students who complete one of these Certificates are eligible to receive Departmental Honors.

1) Genetic Counseling Certificate Program

The Department of Genetics offers an undergraduate **Genetic Counseling Certificate Program (GCCP).** The GCCP program is intended for a select group of students interested in applying to the masters-level programs in genetic counseling. The goal is to provide students with guidance, coursework, and relevant clinical experience to improve their graduate school applications. This is a highly competitive option and is **only open to declared genetics majors**. Not all applicants will be accepted. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in genetics and does not replace minors. The certificate is NOT in lieu of completing the masters-level programs in genetic counseling. At the end of the program students will:

- understand genetic counseling as a profession ·
- understand application requirements for masters-level programs
- gain experience in talking with people who are in crisis
- gain experience in a clinical genetic counseling clinic

2) Certificate in Computational Genetics

The Department of Genetics offers a Certificate in Computational Genetics (CCG) for Genetics majors. The volume of data being generated in Genetics and related life science fields has been expanding tremendously in recent years, and career opportunities for geneticists with computational and quantitative expertise are simultaneously growing. This certificate program is intended for students who are either interested in applying to graduate-level programs,

or planning careers, in Computational Genetics/Biology, Statistical Genetics, Bioinformatics, or other programs in quantitative biomedical related research. The goal of the CCG is to provide students with guidance, coursework, and relevant data design and analysis experience to prepare them for graduate studies in the field or entry-level informatics jobs. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained competence in genetic data analysis using basic computer programming and statistical analysis.
- Be prepared to apply to M.S. or Ph.D. graduate programs in the areas of Computational Genetics and Bioinformatics.
- Be prepared to apply for career positions in industry, biotech companies, pharmaceutical companies, medical centers, or universities

3) Cancer Research Certificate

The Department of Genetics offers a Certificate in Cancer Research (CCR) for Genetics majors. Completion of the Certificate in Cancer Research will provide an advantage when applying to MD, PhD, and MS programs and facilitate transitions to careers with Cancer-related missions. The goal of the CCR is to provide students with a rigorous and Cancer-specialized curriculum. Students will do at least one year of research in a nation-leading Cancer Research Lab and students will be expected to participate in community engagement and develop skills to build community outside of academia. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained knowledge in Cancer Genetics with an expanded curriculum focused on Cancer biology.
- Have at least one year of experience conducting laboratory research in a Cancer research lab.
- Be prepared to apply to M.S., MD, or Ph.D. graduate programs in the areas of Cancer Genetics or for career positions in industry, biotech companies, pharmaceutical companies, medical centers, policy-driving institutes, or universities.

Life Sciences (SAS)

# Courses

# Courses

**01:447:203** ***Honors Computational Genetics (Honors) (3)***
Honors computational genetics is a computer-based laboratory course that introduces students to the use of computers in biological research. This course is for students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. In the first half of the course, students will receive instruction in introductory computer programming (Python). In the second half of the course, students will practice writing code in Python via in-depth computational projects in genetics and genomics. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on

assignments. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and genomic data analysis. Prior experience with computer programming is neither necessary nor is it expected for students who enroll in this course.

This course is for freshman or sophomore Honors students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major.The course fulfills the laboratory requirement for the Genetics major.
***Prerequisites: Students must be in their first or second year at Rutgers in an approved Honors program (e.g., the Honors College or the SAS Honors Program). General Biology I (01:119:115) and be at least co-registered for General Biology II (01:119:116)) or have placed out of these two courses (e.g., through AP credit or approved transfer credit). Credit not given for both 01:447:203 and 01:447:302.***

**01:447:216** ***Analysis of Scientific Literature (Honors) (3)***
A systematic approach to the reading, analyzing, and understanding of primary literature in genetics; emphasis will be placed on data analysis and experimental design and demystifying the process of reading a scientific journal article.
***Prerequisites: 01:119:115-116. Highly recommended: 01:694:215. Open only to freshmen and sophomores in the SAS or SEBS Honors Program. By permission only.***

**01:447:245** ***Introduction to Cancer (3)***
Introduction to Cancer provides the student with an overview of conventional and state-of-the-art aspects of oncogenesis. Students will become familiar with the process involved in neoplastic transformation to the cancer phenotype through aspects of epidemiology, pathophysiology, virology, in vitro and in vivo cellular transformation and genetics. They will then apply these aspects to the understanding of classic therapeutic modalities and new state-of-the-art rational therapies. This comprehensive course will concentrate on the human disease process by applying clinical aspects of oncogenesis during a series of Grand Rounds discussions that will include recent patient clinical cases and their outcomes.
***Prerequisites: 01:119:115-116. Credit not given for both this course and 01:447:495.***

**01:447:302** ***Quantitative Biology and Bioinformatics (3)***
Introduction to the use of computers and computer programming to develop applications for research in genetics and molecular biology. Application topics will include evolutionary genetics, association analysis and genetics mapping, and structural biology.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill an elective requirement or taken instead of 01:447:315 Introduction to Research in Genetics by students majoring in Genetics. Credit not given for both 01:447:203 and 01:447:302***

**01:447:303** ***Computational Genetics of Big Data (3)***
The main focus of this course is the application of R programming to the analysis of genetic data, particularly big data sets with multiple measurements. The primary data sets considered will contain RNA-seq and/or other expression data for multiple/all genes in a given set of individuals. This course is for junior or senior students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. Students will learn how to acquire such data, format it for R, plot the data, and perform statistical analyses. In addition, students will learn how to simulate data under different hypotheses, and how to perform power and sample size calculations

for different statistical methods applied to real or simulated data. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on assignments. Guest investigators will frequently make short presentations (in person or by skype) to provide illustrations of how programming and informatics is critical for their research. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and data analysis.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course.***

**01:447:315** *Introduction to Research in Genetics (3)*
Basic principles and methods of research with microbial model systems used in the analysis and manipulation of genes, followed by a research project in molecular genetics.
***Prerequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 (or equivalent) or 01:160:163-164, 171. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course. Credit not given for both this course and 01:694:315. Open only to genetics majors***

**01:447:354** *Social, Legal, and Ethical Implications of the New Genetics (3)*
Social, legal, and ethical implications of new modern genetic techniques, for example: genetic screening, stem cells and cloning, forensic genetics, genetic engineering of plants, animals, and humans, genetic enhancement, gene therapy, and the new eugenics.
***Prerequisites: Genetics (01:447:380) or Genetics Analysis (01:447:384)***

**01:447:356** *Evolutionary Medicine (3)*
In this course, we examine human health from an evolutionary perspective, exploring the impact that our evolutionary heritage has on modern human diseases, both chronic and infectious. We will learn how the framework of evolutionary biology and modern genetic tools can inform our understanding of issues relevant to clinical and public health. Rather than focus on the immediate mechanisms underlying disease, we will endeavor to understand the ultimate factors that influence susceptibility, such as past natural selection. The course topics are wide-ranging, but particular attention is paid to emerging infectious diseases, as well as non-communicable diseases that may be exacerbated by facets of modern lifestyles.

Through lectures, critical analysis of the primary literature and popular science news, and class discussions, students will learn how evolutionary principles can be practically applied to medicine. Key readings each session will focus on genetic techniques for understanding evolutionary medicine, while additional readings will incorporate perspectives from diverse fields.

By fully participating in this course, students will be able to appreciate how modern susceptibility to non-communicable and infectious diseases has been influenced by past evolutionary processes; critically evaluate evolutionary hypotheses related to health and medicine, including those found in popular science articles; and know how genetic techniques are applied within an evolutionary framework to understand ultimate reasons for disease.
***Prerequisites: (01:447:380 or 384) AND (01:960:401 or 01:960:212).***

**01:447:370** *Developmental Genetics (3)*
How genes influence the developmental processes of an organism. Topics include gene regulatory networks, signaling pathways, stem cell biology, and the role of developmental genetics in human disease.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:380** *Genetics (4)*
Introduction to the mechanisms of heredity and evolution. Mechanisms of Mendelian inheritance, meiosis, recombination, gene mutation, and mapping, and an introduction to modern biochemical, molecular, and population genetics.
*Lec. 3 hrs., rec. 1 hr. Prerequisites: 01:119:115-116 and 01:160:161-162 or 01:160:163-164. Credit not given for both this course and 01:447:384-385 or 11:067:328 or 11:776:305.*

**01:447:382** *Genetics Laboratory (1)*
Laboratory to accompany 01:447:380. Not accepted for elective credit for Genetics majors.
*Lab. 3 hrs. Pre- or corequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)*

**01:447:384-385** *Genetic Analysis I,II (4,4)*
Experimental methods and concepts in genetics, with emphasis on their application to genetic research. Part I covers transmission genetics and breeding analyses, basic molecular genetics, isolation and characterization of mutations, and chromosome structure and function. Part II covers mathematical genetics, recombinant DNA, genomics, and special topics relevant to modern genetic research.
*Open only to majors in genetics or by permission of instructor. Credit not given for both this course and 01:447:380 or 11:067:328 or 11:776:305. Prerequisites for 01:447:384 are 01:119:115-116 (General Biology I & II) or 01:160:161-162 or 01:160:163-164 (General Chemistry I & II). Prerequisite for 01:447:385 is 01:447:384.*

**01:447:390** *General Microbiology (4 includes laboratory)*
Microorganisms are an essential component of the human environment and are significant not only for the disease they cause, but also for their ecological, agricultural, pharmaceutical, and industrial benefits. This course will introduce students to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms and their applications. The lab component of the course will introduce microscopy and staining techniques, the growth cycle and generation of a standard curve, physiological characteristics of microorganisms, and bacterial transformation. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include: History and Overview of Microbiology, Cell Structure and function, Microbial Growth, Nutrition, culture, and metabolism, Virology, Bacterial genetics, Microbial evolution and systematics, Bacteria and Archaea, Nutrient cycles, Genetic Engineering and Biotechnology, Waste treatment, Anaerobic respiration and Nitrogen fixation, Antibiotics and chemotherapeutic agents, Normal Flora, Virulence, Toxins, Epidemiology, and Microbial Diseases.

This is an upper-level course that focuses on the basic principles of microbiology. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include:
*Prerequisites: General Biology 01:119:115-116-117 or 01:119:101-102 and General Chemistry 01:160:161-162-171 (or higher) and Organic Chemistry 01:160:307. Credit not given for both this course and 11:680:390.*

**01:447:392** *Pathogenic Microbiology (3)*
This course will integrate basic microbiology and infectious diseases. The first quarter of the course will provide the conceptual basis of microbial morphology, metabolism and growth, heredity and variation, pathogenicity and antimicrobial chemotherapy. Then this course will introduce the students to one real life patient case study each week, moving the course toward an understanding of specific human diseases (e.g., pharyngitis, meningitis) as might be expected in a clinical environment. Each case will include a patient history, differential diagnosis, clinical cues, laboratory data, pathogenesis, treatment and prevention, additional points and references. The objective is not to attempt to cover every infectious disease or microorganism, but rather to use examples that would stress the key

principles of microbial pathogenesis, differential diagnosis and appropriate treatment and prevention. This course is intended for Life Science majors or those with a strong background in the Biological Sciences.
***Prerequisites: General Biology (01:119:115-117), General Chemistry (01:160:161-162-171), and Organic Chemistry (01:160:305. and 01:160:315. Systems Physiology is recommended.***

**01:447:406-407** ***Research in Genetics (3)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Permission of department and cumulative grade-point average of 2.8 or better. Open only to students majoring in Genetics.***

**01:447:408-409** ***Honors in Genetics (3-6,3-6)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Open by permission to seniors majoring in genetics who meet the requirements for the departmental honors program. Corequisite: 01:447:414 (fall) and 415 (spring).***

**01:447:410** ***Research in Genetics - Writing Intensive (3)***
Research in Genetics- Writing Intensive is intended to provide you with an opportunity to engage in original laboratory research under the direct supervision of a faculty mentor, usually in the faculty member¿s research laboratory. You are expected to carry out your own research project. NOTE: this research requires a heavy commitment of time and effort and can impact your performance in coursework, especially if you have not yet managed the foundational material for the discipline. Fulfills the writing and communication requirements of the SAS Core Curriculum.
***Prerequisites: 01:447:302, 447:315, or permission of department. Registration is by special permission only. Cumulative grade-point average of 2.8 or better. Declared genetics major.***

**01:447:414** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods, and reference sections of their thesis and outline the results and discussion.
***Corequisites: 01:447:408. For seniors completing departmental honors; by special permission only.***

**01:447:415** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods and reference sections of their thesis and outline the results and discussion.
***Prerequisite: 01:447:408. Corequisite: 01:447:409. For seniors completing departmental honors; by special permission only.***

**01:447:430** ***Effective Communication Skills in Genetics (3)***
Communication is an essential part of science. Whether it is communicating research findings to other scientists or conveying complex concepts to a lay audience, a scientist must be able to effectively communicate their research to succeed. Communication in science is typically through publications, posters, or oral presentations. The goal of this course is to provide students practice in effectively communicating scientific findings. This includes preparing and revising an introduction for scientific papers, writing a research description for general audience, and preparing and

giving presentations (both oral and poster).
***Prerequisites: Declared major in Genetics; must have completed one semester of Research in Genetics, Advanced Independent Study, or Genetic Counseling Rotation. By special permission only.***

**01:447:451** *Genomes (3)*
This course will focus on Genomics, Proteomics and Bioinformatics from a Genetics perspective. Special attention will be given to the organization and functioning of the human genome.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:460** *Genetics of Compulsive Behavior (3)*
Compulsive urge can be channeled toward productive endeavors such as a strong drive to succeed in competitions, schooling, and career. On the other hand, improper handling of compulsive urge may lead to problematic behaviors such as alcoholism, drug use, gambling, and other undesirable behaviors. There are also conditions that are medically defined as disorders, with certain types of compulsive behaviors as part of the diagnostic symptoms, such as OCD and ADD/ADHD. There is evidence that genetics contribute to compulsive behavior in humans, and research in animal models has begun to uncover the molecular factors that underlie the genetic basis of compulsive behavior. Discussion of primary literature and other scientific publications that deal with the molecular and genetic basis of compulsive behavior. Emphasis will be placed on the development of skills for critical thinking and effective writing.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:465** *Genetic Approaches and Research Analysis (3)*
This class will teach students how to read, interpret and analyze research articles. The class will follow an active learning format, where we will discuss seminal and recent research articles in depth: What was the scientific question or problem? What methods and strategies were used to address it? What were the findings and conclusions? What are the alternative interpretations and methods that could have been applied? What questions are remaining?
This class will expose students to a diverse selection of research literature, involving genetic and molecular analyses in model organisms such as mice, worms, flies and yeast. The class series will begin with a research article presented by the teacher. During the majority of the class series, students will be divided into groups of 4-5. Each group will be assigned one research article and be required to work together to a) interpret, b) analyze and c) present the article in the form of an oral presentation to the class. Students will be graded on their ability to perform each of these tasks and on active participation during presentations by other groups. All groups will also be required to complete and be graded on a written discussion summary assignment at the end of each article discussion. This summary assignment may take many forms, e.g., preparation of a graphical abstract, subway advert, or other creative forms of expression.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:470** *Evolutionary Developmental Biology (3)*
Evolutionary origins of the vertebrate body plan are major problems in biology. While paleontology and comparative anatomy have revealed the evolutionary trajectories of the organs, recent genetics, genomics and embryology are becoming powerful tools to answer classical questions. The goals of this course are twofold; 1) obtain fundamental knowledge of anatomy, embryology, and the latest genomics and 2) learn how to integrate genetics, genomics and embryology to answer evolutionary questions through active discussion in the classroom. The training to discover and answer scientific questions in animal diversity will be performed at the American Museum of Natural History.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:478,479** ***Special Topics in Genetics (3,3)***
Directed readings and discussion of selected topics of special interest in genetics. Topics will vary according to semester and/or instructor.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:480** ***Topics in Molecular Genetics (3)***
Current research topics in microbial and molecular genetics. Lectures, discussions, and critical analyses of journal articles.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:484** ***Behavioral and Neural Genetics (3)***
Influence of genetics on the nervous system and behavior of various organisms. Overview of field including experimental analysis of behavior, development of the nervous system, and sensory systems. Emphasis on reading and interpreting original research,
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:488** ***Genetic Counseling Rotation (3)***
The goal of this course is to provide students with an understanding of the genetic counseling career. Students will be placed at a local Genetic Counseling clinic to shadow a genetic counselor for one semester. During the semester, the student is expected to spend 8-9 hours a week at the rotation plus meet weekly with course director (attendance is mandatory). Course grade will be based on 1) Case presentation to Genetic Counseling group 2) ten Genetic Counseling case summary logs, and 3) evaluation by the clinical supervisor.
***Prerequisites: Declared Genetics major, cumulative GPA of 2.8 or greater, and accepted into the undergraduate Genetic Counseling Certificate Program (GCCP).***

**01:447:489,490** ***Advanced Independent Study in Genetics (3,3)***
Advanced independent study in Genetics is an opportunity for students to complete a scholarly project under the direct supervision of a faculty mentor. Projects are varied; e.g. library research on a topic of mutual interest to both the student and the faculty member, computer simulations, informative website design, or development of teaching materials. This course may not used for laboratory research.
***Prerequisites: 01:447:384 and permission of department. Open only to students majoring in Genetics***

Life Sciences (SAS)

# Molecular Biology and Biochemistry 694

# MOLECULAR BIOLOGY AND BIOCHEMISTRY 694

Department of Molecular Biology and Biochemistry, School of Arts and Sciences

**Website:** Here

**Chair:** Barth Grant

**Undergraduate Chair:** Samuel Gunderson

**Professors:**

Gyan Bhanot, B.S., Baroda (India); Ph.D., Cornell

Steven J. Brill, B.S., Maryland; Ph.D., SUNY (Stony Brook)

Monica Driscoll, B.A., Rutgers; Ph.D., Harvard

Isaac Edery, B.S., Ph.D., McGill (Canada)

Barth Grant, B.A., Virginia; Ph.D., Princeton

Kenneth D. Irvine, B.A., Williams College; Ph.D., Stanford

Fumio Matsumura, B.A., Tokyo; Ph.D., Nagoya (Japan)

Konstantin V. Severinov, M.Sc., Moscow State; Ph.D., Russian Academy of Sciences

Ruth Steward, B.S., Ph.D., Basel (Switzerland)

Andrew K. Vershon, B.A., Bennington College; Ph.D., Massachusetts Institute of Technology

Eileen P. White, B.S., Rensselaer Polytechnic Institute; Ph.D., SUNY (Stony Brook)

**Associate Professors:**

Stephen Anderson, A.B., Ph.D., Harvard

Sam Bunting, B.A., Oxford; Ph.D., Cambridge

Guoping (Sam) Gu, B.A., Peking (China); Ph.D., California (Santa Cruz)

Samuel I. Gunderson, B.S., Minnesota; Ph.D., University of Wisconsin, Madison

Mikel Zaratiegui, B.S., Ph.D., Navarra (Spain)

**Assistant Professors:**

Annika Barber, B.S., Bryn Athyn College; Ph.D., Thomas Jefferson

Jia Fei, B.S., Yunnan (China); Ph.D., Zurich (Switzerland)

Tina Liu, B.S. Yale; Ph.D. Harvard

Yang Lyu, B.S. Beijing, China; Ph.D. Guangzhou, China

Kevin Monahan, B.S., Haverford; Ph.D., Harvard

**Assistant Teaching Professor:**

Gabe Villegas B.A., Rutgers; Ph.D., Rutgers


- Learning Goals
- Entry Requirements of the Major
- Major Requirements

- Course Requirement Options
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- Departmental Honors Program
- Courses


Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Molecular Biology and Biochemistry offers a course of study in which traditional and modern biochemistry are integrated with studies in molecular biology. In addition to traditional courses, students are required to carry out undergraduate research work in a Rutgers professor¿s lab who serves as the host and mentor. This course of study prepares students for graduate studies in molecular biology and biochemistry and related fields, entry into professional schools in medicine or other health professions, or employment in industries (e.g., biotechnology, pharmaceuticals) in which molecular biology and biochemistry skills are in demand. The same learning goals are also used for nonmajor students taking molecular biology and biochemistry courses.

*Learning Goals:*

I. Students should demonstrate an understanding of the knowledge that is needed to begin biomedical research and that is required for postgraduate exams and studies.

II. Students should demonstrate the ability to find and evaluate information about specific biological systems or problems.

III. Students should demonstrate the ability to design experiments and critically analyze data.

IV. Students should demonstrate the ability to communicate their research and findings orally through seminar and poster presentations and through written research papers.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

The molecular biology and biochemistry (MBB) major is open to students beyond their first year who have a 2.0 cumulative grade-point average and have received grades of C or better in courses taken toward the major, except by special permission of the department undergraduate chair. The MBB major is also open to first year students with AP credits. In all cases, students interested in the MBB major should contact the Undergraduate Director, Sam Gunderson.  A grade of C or better in all courses credited toward the major is required for graduation and each course may be repeated only once to replace D/F grades.

Departmental approval is required to declare the major in molecular biology and biochemistry. Students who want to register for the MBB major must first meet with the Undergraduate Chair Sam Gunderson, Nelson lab, Room A322/A320 (848-445-1016 gunderson@dls.rutgers.edu) to discuss details about the major.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

A core of courses is required for completion of the major in molecular biology and biochemistry. Students supplement the core with additional required and elective courses in one of three options. Given that molecular biology and biochemistry is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life science courses applied to the major in molecular biology and biochemistry should be taken within 10 years of graduating. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major. Returning students must meet with their adviser to discuss their path to graduation. All students are required to write research reports and present them at a seminar.

***Required Core Courses (58 credits)***

01:119:115-116 General Biology (4,4)*
01:119:117 Biological Research Laboratory (2)*
01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)*
01:160:171 Introduction to Experimentation (1)*
01:160:309 Organic Chemistry Laboratory (2) (recommended)* or 01:160:311 Organic Chemistry Laboratory (2)
01:160:315-316 Principles of Organic Chemistry (4,4) (recommended)* or 01:160:307-308 Organic Chemistry (4,4)
01:447:380 Genetics (4)*
01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4) *(recommended) or 01:640:135-136 Calculus for the Life and Social Sciences I,II (4,4)**
01:694:407 Molecular Biology and Biochemistry (3) or 01:694:395 Biochemistry for the Life Sciences (3)
01:694:315 Introduction to Molecular Biology and Biochemistry Research (3) or 01:694:215 Honors Introduction to Molecular Biology and Biochemistry Research (4) or 01:694:214 Introduction to Molecular Biology Research (3) or 01:694:316 Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)
01:694:408 Molecular Biology and Biochemistry (3)
01:694:383 Molecular Biology and Biochemistry Seminar: Careers in Science (1)
01:694:484 Molecular Biology and Biochemistry Seminar: Research Presentations (1)
01:750:203-204 General Physics (3,3)***

01:750:205-206 General Physics Laboratory (1,1)***

*Life sciences core course
**01:960:401 Basic Statistics for Research (3) or 01:960:211-212 Statistics I,II (3,3) may be substituted for the second semester of calculus.
***01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

Life Sciences (SAS)

# Course Requirement Options

# Course Requirement Options

In addition to the required core courses, the Department of Molecular Biology and Biochemistry (MBB) offers two course options to students to fulfill the requirements for the major. Course option one comprises taking advanced electives and is intended to expose MBB students to different current topics in molecular biology and biochemistry. Course option two is for students interested in biophysical questions and research and comprises taking Physical Chemistry and Multivariable Calculus. Students completing course option two will also receive a minor in chemistry are encouraged to take the physical chemistry courses as they will fulfill the minor requirements. Course option two is intended to expose MBB students to different current topics in molecular biology and biochemistry.

*Course Option One (13 credits)*

Two 3-credit courses offered by the MBB department from the following list: 01:694:230; 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

One 400-level, 3-credit elective course offered by any department in the Division of Life Sciences or approved by the MBB department. See degree navigator or the MBB department website for a list of approved courses.

*Course Option Two (9 credits)*

01:160:341-342 Physical Chemistry: Biochemical Systems (3,3) or 01:160:327-328 Physical Chemistry (3,3) (requires 01:640:251 as a prerequisite). Other combinations of Physical Chemistry are possible so see degree navigator for further details.

01:640:251 Multivariable Calculus (4)

One 3-credit course offered by the MBB department from the following list: 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

*Electives*

Because the list of approved electives is changing, students should discuss their elective options directly with their departmental faculty advisers and with the MBB Undergraduate Director, Sam Gunderson. A list of currently approved electives can be found on the MBB department website. In addition to the undergraduate courses listed, advanced students are encouraged to choose electives from the School of Graduate Studies.

Life Sciences (SAS)

# Research Options

# Research Options

The Department of Molecular Biology and Biochemistry (MBB) offers two laboratory research options (laboratory option one and laboratory option two), as well as a nonlaboratory research option (nonlaboratory option). In all cases, students must take one of the Introduction to Molecular Biology and Biochemistry Research courses (01:694:214, 01:694:215, 01:694:315, or 01:694:316) and 01:694:383, 484 Seminars in Molecular Biology and Biochemistry. Course 01:694:215 is only for first-year honors students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:214 is for first-year students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:315 is for either qualified sophomores or junior students in the major. Course 01:694:316 is for either qualified sophomores or junior honors students in the major.

*Laboratory Option One (>12 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6,2-6)

01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (6,6)

A minimum of 12 credits is required in research courses. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Laboratory Option Two (6 to 11 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6) or 01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (4-6,4-6)

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

A minimum accumulation of 6 credits is required in research courses. Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Note that students applying for honors must complete 4 up to 6 credits of honors coursework per semester for two semesters. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Nonlaboratory Option (9 credits)*

01:694:489,490 Literature Research in Molecular Biology and Biochemistry (3,3). This non-lab option is almost never used and will need approval from the Undergraduate Director, Sam Gunderson

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Students taking this option may not apply for departmental honors.

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have attained, at the end of the junior year, a cumulative grade-point average of at least 3.4 and a grade-point average of 3.4 or better in courses required for the major. Exceptional students not meeting these criteria but wishing to apply for honors research may petition the Department of Molecular Biology and Biochemistry at the beginning of their senior year. Students accepted into the program are expected to complete two semesters (6 credits per semester) of honors coursework. A written honors thesis and an oral thesis presentation are required. Students enrolled in 01:694:495,496 Honors Laboratory Research or any of the various school honors programs are eligible to receive departmental honors at the time of graduation.

Life Sciences (SAS)

# Courses

# Courses

**01:694:214** ***Introduction to Molecular Biology Research (3)***
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities available to undergraduates at the university.
***Prerequisites: For first-year students only who have placed out of General Biology (01:119:115,116, and 117) with AP credits, and 01:160:161 or 01:160:163. Corequisite: 01:160:162 or 164.***

**01:694:215** ***Honors Introduction to Molecular Biology and Biochemistry Research (4)***
Basic principles and methods of research, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisite: Limited only to first-year SAS Honors Program or Honors College students who have placed out of General Biology (01:119:115,116, and 117) with AP credits. Corequisites: 01:160:161 or 01:160:163 (or AP credits) and 01:640:135 or 01:640:151 (or AP credits).***

**01:694:230** ***Analytical Methods in Biology (3)***
Mathematical methods and tools to analyze and interpret biological and biomedical data, including probability theory; Bayes Theorem; the binomial, Poisson, and normal distributions; limit theorems; error analysis; tests of statistical significance; parameter estimation; curve fitting; sampling techniques; random number generation; and Monte Carlo methods. Analysis of sequencing and microarray data, such as sequence alignment, phylogeny inference, population structure, selection, and human migration.
***Prerequisites: 01:119:115-116 and 01:640:135 or 151.***

**01:694:281,282** *Sophomore Laboratory Research (2-6,2-6). 281 is Fall, 282 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Credits in this course cannot be used toward the required research credits for laboratory option. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:283** *01:694:283 Undergraduate Laboratory Research (2-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
Typically for rising Juniors and Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

***Prerequisite: Students must complete a special permission form and have it signed by their research and MBB faculty mentors before they can register of the course.***

**01:694:301** *Introductory Biochemistry and Molecular Biology (3)*
Chemistry and metabolism of proteins, carbohydrates, lipids, nucleic acids, and other biologically important compounds.
***Prerequisite: 01:160:209 or 307. Not for students majoring in molecular biology and biochemistry. Credit not given for both this course and 01:694:407, 11:115:301, or 11:115:403.***

**01:694:313** *Introductory Biochemistry Laboratory (1)*
Techniques used in research, clinical, and food laboratories, including tests of biological materials, methods of separation, and determination of enzyme activities.
***Lab. 3 hrs. Pre- or corequisite: 01:694:301. Not for students majoring in molecular biology and biochemistry.***

**01:694:315** *Introduction to Molecular Biology and Biochemistry Research (3)*
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities at the university available to undergraduates.
***Pre- or corequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 or 01:160:163-164, 171. Credit not given for both this course and 01:447:315, 01:694:214, 215, or 316. Open only to MBB majors.***

**01:694:316** *Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)*
Basic principles and methods of research in molecular biology, biochemistry, and genetics, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisites: 01:119:116 and (01:160:162 or 01:160:164). For MBB or genetics majors only or those planning on being MBB or genetics majors. Special permission required.***

**01:694:381,382** *Undergraduate Laboratory Research (3-6,3-6). 381 is Fall, 382 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:383** *Molecular Biology and Biochemistry Seminar: Careers in Science (1)*
Discussion of career options in the life sciences, finding a research laboratory, performing literature searches, reading a scientific paper, and creating posters and abstracts. This course should be taken in the beginning of the third year.
*Open to MBB majors only.*

**01:694:384** *Undergraduate Laboratory Research (1-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

*For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.*

**01:694:385** *MBB Research and Writing (3)*

Research project in the laboratory of a faculty member. Seminar on science communication. Written and oral reports of research carried out during the semester required.

*Prerequisites: MBB majors only. Students need a GPA of 2.8 or better to enroll in research.*

**01:694:390** *Introductory Computational Biology (3)*
Disciplines of biochemistry and molecular biology and genomics all include collection and analysis of large data sets. Hands on use in a computer lab will permit students to learn and apply computer languages such as Python and R to analyze large data including for example DNA mutations and structural variations (SVs), RNA-seq and ChIP-seq as part of understanding genes and gene regulation.
*Prerequisite: 01:447:380 or 01:447:384*

**01:694:395** *Biochemistry for Life Sciences (3)*
The course is intended for life science majors and takes a holistic approach to Biochemistry. You will learn the basics of proteins, enzymology, nucleic acids and metabolism and use these as foundations to discuss exemplary metabolic pathways for their importance to homeostasis and, when dysregulated, to disease including observable phenotypes and what current strategies are used to treat these disorders. Coursework will consist of quizzes, homework, exams and one graded paper.

*Prerequisites: 01:160:307 or 01:160:315*

**01:694:407** *Biochemistry (3)*
Protein structure and function, structure of lipids, membranes and carbohydrates, catalysis of biochemical reactions, intermediary metabolism, oxidative phosphorylation, membrane transport, lipid metabolism, signal transduction, photosynthesis, protein secretion, targeting and turnover, nitrogen, amino acid, and nucleotide metabolism.
*Pre- or corequisites: 01:160:307-308 or 315-316. Credit not given for both 01:694:407 and 01:694:301, 11:115:301, or 11:115:403.*

**01:694:408** *Molecular Biology and Biochemistry (3)*
Disciplines of biochemistry and molecular biology as interlocking and mutually complementary fields of study. Lectures on structure of DNA, RNA, recombinant DNA approaches, DNA replication, repair and recombination, mobile genetic elements, transcription, gene regulation, RNA splicing, translation, and viral gene expression.
***Prerequisite: 01:694:407 or 01:694:301 or 01:694:395 or 11:115:403. Credit not given for both 01:694:408 and 01:146:478 or 11:126:481.***

**01:694:411** *Molecular Pathways and Signal Transduction (3)*
Lectures and discussion of current research areas of advanced molecular and structural biology: transcription, posttranscriptional regulation, cell cycle, neurobiology, protein folding, macromolecular recognition, and molecular virology.
***Pre- or corequisites: 01:694:407 and 408, or 01:447:384-385 or 11:115:403-404 or 11:126:481.***

**01:694:412** *Proteomics and Functional Genomics (3)*
Survey of modern techniques of protein biochemistry, bioinformatics, proteomics, and functional genomics, including basic concepts of protein structure and function, protein folding, protein characterization and purification, enzyme kinetics, NMR and X-ray crystallography, mass spectrometry, yeast two hybrid, and various techniques and approaches to functional and structural genomics.
***Prerequisites: [(01:694:301 OR 01:694:407 OR 01:694:395) AND (01:447:380) OR (01:447:384)]***

**01:694:413** *Chromatin and Epigenomics (3)*

Introduction to chromatin dynamics, particularly the structural and biochemical modifications of chromatin that underlie epigenetic states and their effects on gene expression and development.

***Pre- or corequisites: Prerequisite: 01:694:408 or 01:146:478 or 01:447:385.***

**01:694:420,421** *Special Topics in Molecular Biology and Biochemistry (3,3)*
Directed reading and discussion of selected topics of special interest in molecular biology and biochemistry. Topics will vary according to semester and/or instructor.
***Pre- or corequisites: [(01:694:301 or 01:694:407) and (01:447:380 or (01:447:384)] or equivalent.***

**01:694:481,482** *Advanced Undergraduate Laboratory Research (BA, BA). 481 is Fall, 482 is Spring.*
Research project in the laboratory of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484.

**01:694:484** *Molecular Biology and Biochemistry Seminar: Research Presentations (1)*
Oral presentation of student's own research results and the research interests of the laboratory with which the student is associated. Presentation at a required poster session.
***Students should take this course in the spring semester of their senior year. MBB majors only.***

**01:694:489,490** *Literature Research in Molecular Biology and Biochemistry (1-3,1-3)*
Literature research projects on a selected subject under the direction of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484. This course is rarely used, therefore contact the Undergraduate Director if you are considering to take this course.
***Prerequisites: 01:694:214, 215 or 315, 407, 408, and 383.***

**01:694:492** ***Gene Regulation: Clocks to Cancer (3)***
Explanation of MBB as an experimental science and how molecular biologists know what they know. Covers all aspects of gene regulation from transcription to protein modification to explain how 25,000 human genes can make millions of different protein isoforms and mRNA and ncRNA. Mechanisms of molecular clocks and cancer addressed in terms of gene regulation complexity,feedback loops and rate-limiting steps with emphasis on the methods, experimental design,
***Prerequisites:(01:694:407 BIOCHEM) OR (01:447:384 GEN ANALY) OR (11:126:481 MOLE GEN) OR (11:115:403 GEN BIOCHEM) OR (01:694:395 BioChem LS)***

**01:694:495,496** ***Honors Laboratory Research (BA)***
Two-semester-long Honors research project in the laboratory of a faculty member. In the Fall semester, 01:694:495 students are required to attend a seminar each week on writing a thesis and preparing an oral thesis presentation. In the Spring semester, students take 01:694:496 where they complete their Honors thesis and give their oral presentation to their honors committee.

# Nursing (SON-U)

## NURSING

The School of Nursing of Rutgers Biomedical and Health Sciences awards a bachelor of science degree in nursing that is offered on both the Rutgers University-Newark and Rutgers University-New Brunswick campuses and at facilities in Blackwood, New Jersey. Specific information about the program and course offerings, admissions criteria, administrative procedures, and academic regulations of the school may be obtained from the School of Nursing website here.

Nursing (SON-U)

# Traditional Baccalaureate Program

## Traditional Baccalaureate Program

**Plan of Study**

**First Year - Fall - 15 Credits**

705:101 Academic and Professional Development* (2)

355:101 Expository Writing (3)

119:127 Anatomy and Physiology II^ (4)

Anthropology/Cultural Studies (3)

General Elective (3)

**First Year - Spring - 13 Credits**

355:201 Research in Disciples (3)

830:101 General Psychology (3)

119:128 Anatomy and Physiology II^ (4)

Humanities (3)

**Second Year - Fall - 16 Credits**

119:131 Microbiology Hlth Sci & (3)

119:132 Micro-Hlth Sci Lab (1)

705:255 Nutrition (3)

960:211 Statistics**# (3)

Literature (3)

General Elective (3)

**Second Year - Spring - 15 credits**

160:128 Chemistry of Life (3)

705:229 Life Span: A Holistic Approach (Dev Psych) (3)

705: 205 Sociocultural Dimensions of Health (3)

History/Political Science/Economics (3)

General Elective (3)

Third Year - Fall - 15 Credits

705:306 Health Assessment Across the Life Span (3)

705:325 Professional Nursing I (3)

705:335 Nursing Care of Healthy Populations (6)

705:350 Pathophysiology & Pharmacotherapeutics: An Integrated Approach I (3)

**Third Year - Spring - 17 Credits**

705:326 Professional Nursing II (2)

705:336 Nursing Care of Adults & Older Adults with Common Health Conditions (6)

705:340 Nursing Care of Childbearing Families (6)

705:351 Pathophysiology & Pharmacotherapeutics: An Integrated Approach II (3)

**Fourth Year - Fall - 15 Credits**

705:412 Nursing Care of Infants, Children, and Adolescents (6)

705:427 Professional Nursing III (3)

705:428 Nursing of Adults & Older Adults with Complex Health Conditions (6)

**Fourth Year - Spring - 16 Credits**

705:414 Nursing Care of Individuals/Populations with Acute & Chronic Mental Health Conditions (6)

705:418 Population Health (3)

705:455 Transition to Professional Practice (4)

Nursing Elective (3)

**Total Credits=122**

Credits may be granted for equivalent general education and science requirements taken at an accredited institution of higher learning provided grades of "C" or better are earned.

The Curriculum for the nursing program on each of the Newark and New Brunswick campus is identical. However, course names and numbers may differ slightly.

*** Required of all first year students. School to School Transfers do not take this course.**

**** Or equivalent descriptive and inferential statistics course.**

**^ Anatomy and Physiology requires special permission from the Biological Sciences Department for non-School of Nursing Students**

**# The prerequisite for Statistics is pre-calculus. School of Nursing students (only) are eligible to have the prerequisite waived.**

Nursing (SON-U)

# Blackwood Campus Prerequisite Courses and Program Schedule

## Blackwood Campus Prerequisite Courses and Program Schedule

**Required Prerequisite Courses**

English Composition I (3)

English Composition II (3)

Anatomy & Physiology I (4)

Anatomy & Physiology II (4)

Basic Psychology (3)

Developmental Psychology (3)

Microbiology (4)

Chemistry I (4)

Chemistry II (4)

Nutrition for the Health Care Prof. (3)

Elements of Statistics I**

HIS/POLI.SCI./ECON ELECTIVE (3)

Biomedical Ethics (3)

Free Elective #1*** (3)

Free Elective #2 (3)

Free Elective #3 (3)

Additional Course Requirements: These two additional courses are required to graduate with a BSN degree from the School of Nursing*

Introduction to Anthropology (3)

Literature Elective (3) (please consult your advisor for course options)

**Rutgers School of Nursing Program Curriculum**

Rutgers - Summer Session - 8 Credits

705:306 Health Assessment Across the Life Span (3)

705:205 Sociocultural Dimensions of Health (3)

705:201 Academic & Professional Development for the 2+2 Student (2)

Rutgers - Junior Year - Fall Semester - 12 Credits

705:325 Professional Nursing I (3)

705:350 Pathophysiology & Pharmacotherapeutics: An Integrated Approach I (3)

705:335 Nursing Care of Healthy Populations (6)

Rutgers - Junior Year - Spring Semester - 17 Credits

705:351 Pathophysiology & Pharmotherapeutics: An Integrated Approach II (3)

705:326 Professional Nursing II (2)

705:340 Nursing Care of Childbearing Families (6)

705:336 Nursing Care of Adults & Older Adults with Common Health Conditions (6)

Rutgers - Senior Year - Fall Semester - 15 Credits

705:412 Nursing Care of Infants, Children, & Adolescents (6)

705:428 Nursing Care of Adults & Older Adults with Complex Health Conditions (6)

705:427 Professional Nursing III

Rutgers - Senior Year - Spring Semester - 16 Credits

705:414 Nursing Care of Individuals/Populations with Acute & Chronic Mental Health Conditions (6)

705:418 Population Health (3)

705:455 Transition to Professional Practice (4)

Nursing Elective (3)

*Note. These are not prerequisites required at the time of application, but students are expected to have coursework completed prior to enrollment whenever possible. Students should speak with their academic advisor for specific course options.

** Students who have taken Statistics I prior to Spring 2015 will need to take Statistics II.

*** Rutgers School of Nursing recommends that students whenever possible enroll in a Medical Terminology course to count towards a Free Elective course in preparations for the BSN program.

Nursing (SON-U)

# Blackwood 2+2 Baccalaureate Program

## Blackwood 2+2 Baccalaureate Program

**Plan of Study**

Rutgers, the State University of New Jersey, School of Nursing, has collaborated with Camden County College in Blackwood, NJ to provide an opportunity to obtain a Bachelor of Science Degree in Nursing after completing an Associate's Degree in Science Pre-Nursing Track. Students applying to the program must have either an Associate of Science degree or sixty (60) undergraduate pre-requisite credits from Camden County College.

This program offers:

- Direct admission into the School of Nursing upper division academic nursing program at Rutgers School of Nursing-Newark & New Brunswick
- The opportunity to complete all coursework on the Camden County College-Blackwood campus
- Clinical experiences in the Southern New Jersey/Greater Philadelphia area

Admissions Criteria:

- Must enroll in the CCC CPR 1 credit course, HPE-181 Basic Life Support (BLS), during your last spring semester.
- Pre-requisite requirement -- can only have once science, Microbiology, or Chemistry II incomplete at the time of application.

# Nutritional Sciences 709 (SEBS)

## NUTRITIONAL SCIENCES 709

**Degree:** B.S.

**Director:** John Worobey (worobey@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

The undergraduate program in nutritional sciences provides students with a strong background in the biological, biochemical, physiological, clinical, behavioral, sociological, and psychological dimensions of human nutrition. Students must maintain a cumulative grade-point average of 2.0 or better in all required courses.

The program offers five options:

***Dietetics.*** The dietetics option is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) as a Didactic Program in Dietetics. Upon completion of this option, students are eligible to apply for an accredited-supervised practice program, including the pre-select route with our MS-DI program at Rutgers-New Brunswick, in preparation for the registration examination for dietitians. Since a master's degree is now required to be eligible to take the RDN exam, students in this option are at an advantage in being able to apply to our accredited Rutgers MS-DI program during their senior year. Completing this option also can lead to work in the food business & industry, positions in cooperative extension, WIC, EFNEP, nutrition education, or clinical research.

***Food Service Administration.*** The option in food service administration emphasizes the managerial aspects of food service operation. Entry-level employment opportunities include food service marketing, or managing food services in schools, hotels, restaurants, industrial cafeterias, corporations, hospitals, and child or long-term care facilities.

***Biomedical Nutrition.*** The option in nutrition emphasizes research and prepares students for graduate study in the life sciences and medical, dental, and veterinary studies, as well as for immediate employment in the biomedical industry.

***Community Nutrition.*** This option addresses the growing need for nutrition professionals to work with youth in structured organizations at the local, state, and national level such as 4-H, WIC, cooperative extension, after-school care, day care, environmental education, and programs for homeless children.

# Learning Goals

# Learning Goals

Through completion of the program in nutritional sciences, graduates will be prepared for supervised practice in dietetics, graduate school, or employment by focusing upon the biological, social science, and community principles of food and nutrition coursework.

For overall nutritional sciences program learning goals as well as learning goals specific to each of the five options, see the program website here.

Nutritional Sciences 709 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

**Nutritional sciences majors** (other than Dietetics) are required to take the following courses before acceptance into an option:

- 01:160:161, 162, 171
- 01:119:115-116, 117
- 11:709:255

A grade-point average (GPA) greater than 2.5 is required in these courses for admission into the dietetics and biomedical nutrition options. Students with a GPA less than 2.5 are eligible for admission into the community nutrition and food service administration options. Students must achieve grades of C or better in all required biological sciences, biochemistry, chemistry, and nutrition courses in order to enter advanced courses in nutritional sciences.

Admission to the **Dietetics Option** requires the following:

- General Chemistry I, II and Lab (01:160:161; 01:160:162; 01:160:171)
- Anatomy and Physiology I and II (01:119:127; 01:119:128)
- Principles of Biology (01:119:103)
- Nutrition and Health (11:709:255)
- GPA of 2.5 or higher in the above courses

Nutritional Sciences 709 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of nutritional sciences major requirements, courses, and course sequences, please refer to the program webpage at https://nutrition.rutgers.edu/undergraduate.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent* [WC] *and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

## Graduation Requirements for the Major (64-88 credits)

**PROFICIENCY IN NUTRITIONAL SCIENCES (22 credits)**

**A. REQUIRED COURSES**

Students are required to have placed at the precalculus level or above to take the required biology and chemistry courses.

01:160:161 General Chemistry I (4) [NS]
01:160:162 General Chemistry II (4)
01:160:171 Introduction to Experimentation (1)
11:709:255 Nutrition and Health (3)
Certain Biological Sciences courses (see options below)

Students must achieve a GPA of 2.5 or better across these courses to be admitted to the Nutrition or Dietetics options.

## B. OPTIONS IN NUTRITIONAL SCIENCES

### 1. Dietetics (74-75)

11:709:102 Careers in Nutrition (1)
11:709:201 Culinary Nutrition (3)
11:709:202 Culinary Nutrition Lab (1)
11:709:255 Nutrition and Health (3)
11:709:301 Food Safety & Sanitation in Food Service (2)
11:709:345 Nutrition through the Lifespan (3)
11:373:341 Organizational Dynamics (3) or equivalent
11:709:400 Advanced Nutrition: Macronutrients (3)
11:709:401 Advanced Nutrition: Energy & Micronutrients (3)
11:709:404 Advanced Nutrition: Clinical Research Practicum (1)
11:709:410 Dietetics Professional Practice (3)
11:709:441 Community Nutrition (3)
11:709:442 Nutrition Education & Communication (3)
11:709:448 Food Production & Management (3) [EL]
11:709:449 Food Service Lab (1) [EL]
11:709:483 Medical Nutrition Therapy I (3)
11:709:484 Nutrition Therapy Lab (1)
11:709:485 Medical Nutrition Therapy II (3)
11:709:489 Experimental Foods (4) or
11:709:493/494 Research in Nutrition (BA)
01:960:401 Basic Statistics for Research or Equivalent (3)
01:119:103 Principles of Biology (4)
01:119:127 Anatomy and Physiology I (4)
01:119:128 Anatomy and Physiology II (4)
01:160:161 General Chemistry I (4)
01:160:162 General Chemistry II (4)
01:160:171 Introduction to Experimentation Lab (1)
01:160:209 Elementary Organic Chemistry (3)
11:115:301 Introduction to Biochemistry (3) or 01:694:301 Introduction to Biochemistry and Molecular Biology (3)

*Many of the science courses have prerequisites. Please see catalog descriptions. Students must achieve a C or better in all required biological sciences, biochemistry, chemistry, and nutrition courses before taking 709:400, 401, and 498.*

### 2. Biomedical Nutrition (53.5-61.5)

11:709:400 Advanced Nutrition I (3)
11:709:401 Advanced Nutrition II (3)
11:709:427 Obesity: Biology, Behavior, and Management (3) or 11:709:443 Methods in Sensory Analysis (3) or 11:709:475 Nutrition and Fitness (3)
11:709:481 Seminar in Nutrition (1.5)
11:709:493 or 494 Research in Nutrition (3) [EL]

11:067:300 Integrative Physiology (4) or 01:146:356, 357 Systems Physiology, Lab (3,1)
01:160:307-308, 311 Organic Chemistry, Lab (4,4,2)
01:119:115-116 General Biology I, II (4,4) [NS]
01:116:117 Biological Research Laboratory (2)
01:447:380 Genetics (4)
01:640:135 Calculus I (4) or equivalent [QQ]
11:115:301 Introductory Biochemistry (3) or 11:694:301 Introductory Biochemistry and Molecular Biology (3) or 11:115:403-404 General Biochemistry (4,4) or 01:694:407-408 Molecular Biology and Biochemistry (3,3)
01:750:193-194 Physics for the Sciences (4,4) or 01:750:203-204 General Physics (3,3) and 01:750:205-206 General Physics Lab (1,1)
01:960:401 Basic Statistics for Research (3) or equivalent [QR]
01:146 3xx/4xx or 01:447:3xx/4xx or 01:694::3xx/4xx or 11:126:3xx/4xx or 11:216:3xx/4xx or other Advanced Life Sciences course (3)

*Many of the science courses have prerequisites. Please see catalog descriptions. Students must achieve a C or better in all required biological sciences, biochemistry, chemistry, and nutrition courses before taking 709:400, 401, and 498.*

**3. Food Service Administration** (29-31)

11:709:201,202 Culinary Nutrition, Lab (3,1)
11:709:302 Food Safety and Sanitation in Food Service (2)
11:709:448 Food Production & Management (3) [EL]
11:709:449 Food Service Lab (1) [EL]
01:640:115 Precalculus or equivalent (4) (QQ)
01:119:115-116 General Biology I, II (4,4) [NS]
01:119:117 Biological Research Laboratory (2)
11:373:121 Principles and Applications of Microeconomics (3) or equivalent [SCL]
11:373:121 Principles and Applications of Macroeconomics (3) or equivalent [SCL]
33:010:272 Introduction to Financial Accounting (3)
11:680:201,202 Introduction to Microbiology, Lab (3,1) or 01:119:131,132 Microbiology for the Health Sciences, Lab (3,1)
11:373:341 Organizational Dynamics (3) or equivalent

*12 Credits selected from:*
11:709:441 Community Nutrition (3)
11:709:442 Nutrition Communication (3)
11:709:443 Methods in Sensory Analysis (3)
01:355:203 Business Writing Essentials (3) [WCD]
11:373:231 Introduction to Marketing (3)
11:373:331 Economics of Food Marketing Systems (3)
11:373:241 Introduction to Management (3)
11:373:371 Food, Health, and Safety Policy (3)
11:375:403 Principles of Epidemiology (3)
11:400:304 Food Analysis (4)
11:400:412 Food Product Development (3)
33:011:201 Introduction to Management for Nonbusiness Majors (3)

33:011:202 Introduction to Marketing for Nonbusiness Majors (3)
33:011:203 Introduction to Finance for Nonbusiness Majors (3)
33:011:204 Principles of Business Law for Nonbusiness Majors (3)

**4. Community Nutrition (51-52)**

11:709:102 Careers in Nutrition (1)
11:709:201 Culinary Nutrition (3)
11:709:202 Culinary Nutrition Lab (1)
11:709:235 or 475 Introduction to Sports Nutrition or Nutrition & Fitness (3)
11:709:245 Food Customs & Nutrition Equity (3)
11:709:255 Nutrition & Health (3)
11:709:301 Food Safety & Sanitation (2)
11:709:448 Food Production & Management, (3) [EL]
11:709:449 Food Service Lab (1) [EL]
11:709:345 Nutrition through the Lifespan (3)
11:709:441 Community Nutrition (3)
11:709:442 Nutrition Education and Communication (3)
11:709:489 Experimental Foods (4)
01:640:115 Precalculus (4) or Calculus
01:119:103 Principles of Bio (4) (or 01:119:115-117)
01:160:161, 101 General Chemistry I & Recitation (4, 1)
01:160:162, 102 General Chemistry II & Recitation (4, 1)
01:160:171 Introduction to Experimentation Lab (1)
01:160:209 Elementary Organic Chemistry (3)
01:119:127-128 Anatomy and Physiology I & II (4, 4) (or 11:067:300 or 01:146:356, 357)
01:960:401 Basic Statistics for Research (3) or equivalent
01:830:101 General Psychology (3)
01:920:272 Sociology of the Family (3)

# Organizational Leadership 713 (SAS)

## ORGANIZATIONAL LEADERSHIP 713

Organizational Leadership Program, School of Arts and Sciences

**Website:** Here

**Program Director:** Arnold G. Hyndman

**Associate Director:** Michelle R. Jefferson

**Program Committee:**

Timothy Grimm, Adjunct Instructor; Ph.D., Temple

Arnold G. Hyndman, Cell Biology and Neuroscience; Ph.D., California (Los Angeles)

Michelle Jefferson, Associate Dean; Ph.D., Seton Hall

Organizational leadership is an innovative and challenging minor open to Rutgers University-New Brunswick undergraduate students. Rutgers has a rich body of courses that provide leadership instruction. The minor in organizational leadership gathers some of these courses into a curriculum designed to prepare students to assume a leadership role in any organization.

Organizational Leadership 713 (SAS)

# Program Goals

# Program Goals

Students who minor in organizational leadership may pursue any major. The minor features both theoretical and practical components. For its theoretical segments, the minor draws from courses offered by the Organizational Leadership Program, the School of Arts and Sciences, departments in the Rutgers Business School: Undergraduate-New Brunswick, and the School of Communication and Information. For its practical components, the minor utilizes Rutgers student organizations and student's connections to the workplace through their jobs or internships, as well as other organizational relationships they have developed. The minor's objectives are to cultivate and enhance student's organizational understanding, interpersonal awareness, and leadership skills.

The minor's theory courses focus on formulating an ethically responsible vision that promotes organizational excellence; understanding change; and how to persuade individuals and groups to work toward a common goal. Students are encouraged to supplement coursework through extracurricular programs that provide an opportunity for the student to interact effectively with their cohorts and to apply their knowledge of organizational leadership.

Organizational Leadership 713 (SAS)

# Learning Goals

# Learning Goals

1. Students will know the leading terms, concepts, theoretical perspectives, and current trends in organizational leadership.

a. Students will be able to relate leadership theory in the context of other academic experiences.

b. Students will demonstrate the ability to integrate and resynthesize leadership approaches and theories.

2. Students will use critical thinking, experiential and collaborative learning, and scholarly inquiry to articulate an understanding related to the organizational processes and the behavior of people in groups.

3. Students will understand the importance of formulating an ethically responsible vision that promotes organizational excellence, and the importance of persuading individuals and groups to work toward a common goal to organizational success.

4. Students will learn to practically apply theory to real-world situations.

5. Students will demonstrate an understanding of basic leadership concepts and theories in written form.

6. Students will demonstrate an understanding of the components of a research paper in the field of leadership.

7. Students will demonstrate an ability to write a research paper in the field of leadership.

Organizational Leadership 713 (SAS)

# Minor Requirements

# Minor Requirements

The minor in organizational leadership consists of 20 credits (9 of which must be at the 300 level or above) divided into three foundation courses, three theory courses, and two applications courses. Students must earn a grade of C or better in all required courses to receive credit.

*Prerequisites*

Students must complete 01:713:202 Introduction to Organizational Leadership with a grade of C or better before they can declare organizational leadership as a minor. Students with 90 credits or more may not enroll in 01:713:202 Introduction to Organizational Leadership.

*Required Courses*

- 01:730:101 Logic, Reason, and Persuasion (3) or 01:730:201 Introduction to Logic (3) or 01:730:202 Introduction to Logic (4) or 01:730:109 Introduction to Formal Reasoning and Decision-Making (4)
- 01:713:202 Introduction to Organizational Leadership (3)
- 01:713:303 Intermediate Organizational Applications (3) (prerequisite 01:713:202)
- 01:713:404 Advanced Organizational Applications with Capstone Seminar (3) (prerequisite 01:713:303)
- One course from Leadership Theory I
- One course from Leadership Theory II
- One course from Leadership Theory III

***Leadership Theory I: Formulating an Ethically Responsible Vision***
All students must select one 3-credit course from the list below:

01:730:105 Current Moral and Social Issues
01:730:107 Introduction to Ethics
01:730:249 Medical Ethics
01:730:441 Ethical Theory
01:730:442 Moral Responsibility
03:691:392 Military Leadership and Ethics
03:691:490 Leadership and Ethics
04:567:480 Media Ethics and the Law
10:652:301 Medical Ethics
10:501:356 Health Care Ethics and the Law
10:832:356 Public Health Law and Ethics

10:833:480 Ethics in Planning and Public Policy
11:115:321 Ethical Issues in Biochemistry Research
11:374:289 Sustainable Food: Politics, Policy, and Ethics
11:607:385 The Ethical Leader
33:522:334 Business Ethics

*Leadership Theory II: Understanding Organizational Change*
All students must select one 3-credit course from the list below:

01:014:353 Black Community Law and Social Change
01:070:201 Evolution and Human Behavior
01:450:363 Geography of Development
01:450:370 Climate Change and Society
01:574:310 Gender and Social Change in Korea
01:713:308 Leadership in a Diverse Workplace
01:790:305 Public Policy Formation
01:790:312 Change in Latin America
01:790:333 Race, Ethnicity, and Politics
01:790:355 Women and Public Policy
01:790:363 Conflict Resolution in World Politics
01:790:386 Political Change in China
01:830:373 Organizational and Personnel Psychology
01:920:370 Global Structures and Change
01:988:103 Knowledge and Power: Issues in Women's Leadership
04:189:352 Self and Society in Virtual Contexts

*Leadership Theory III: Persuading Others to Work for a Common Goal*
All students must select one 3-credit course from the list below:

01:220:441 Industrial Organizations
01:790:292 Introduction to Critical Intelligence Studies
01:790:348 Psychology and Politics
01:830:321 Social Psychology
01:830:364 Motivation and Emotion
04:189:101 Introduction to Communication
04:189:151 Virtual Team Dynamics
04:192:359 Persuasive Communication
04:192:380 Public Speaking
04:192:458 Leadership in Groups and Organizations
04:547:210 Management of Technological Organizations
10:762:361 Managing People and Organizations
10:843:361 Managing People and Organizations
11:607:485 Understanding Group Dynamics and Team Process
37:575:230 People, Work, and Organizations
37:575:318 Leadership in Work Organizations

For a complete list of courses see the program's website.

Organizational Leadership 713 (SAS)

# Courses

# Courses

**01:713:202** ***Introduction to Organizational Leadership (3)***
Examines the nature of leadership, the processes that underpin group decisions, the basic features of organizational culture, and how leaders prepare themselves to meet challenges. Students develop strategies for integrating and sharing knowledge through extracurricular projects.

**01:713:303** ***Intermediate Organizational Applications (3)***
Students assume leadership positions or become active members in a university organization and maintain a log of activities. Students write an 8-to-10-page essay on a topic in organizational leadership.
***Prerequisite: 01:713:202. Open only to students minoring in organizational leadership.***

**01:713:308** ***Leadership in a Diverse Workplace (3)***
Furthers the understanding of multicultural issues by expanding the focus of study from the university to the wider world of work. Exposes students to theory, research, and practice in the ways that cultural diversity is managed in organizations and social institutions. Includes an overview of perspectives on diversity, organizations and diversity, various dimensions of diversity, specific diversity cases, as well as exercises on experiencing diversity.

**01:713:404** ***Advanced Organizational Applications with Capstone Seminar (3)***
Capstone experience integrates what students have learned through critical review of organizational leadership theory, and the analysis of leaders and leadership situations. Students are expected to use theoretical and practical knowledge base of leadership theory and group dynamics in the analysis of readings, class projects, a research paper, and other assignments.
***Prerequisite: 01:713:303. Open only to students minoring in organizational leadership.***

**01:713:495** ***Independent Study in Organizational Leadership (BA)***
Independent study of topic(s) in organizational leadership.
***Prerequisite: 01:713:202.***

# Pharmacy (PHARM)

## PHARMACY

Students who wish to earn a degree in pharmacy (doctor of pharmacy) must be admitted to the Ernest Mario School of Pharmacy. See the Ernest Mario School of Pharmacy section in this catalog for further information. Students enrolled in other units at Rutgers may, with consultation and permission of their adviser in their current school, complete the preprofessional coursework outlined at the website and apply for a school-to-school transfer to the Ernest Mario School of Pharmacy. Such transfers are competitive and only a limited number of spaces are available.

# Philosophy 730 (SAS)

## PHILOSOPHY 730

Department of Philosophy, School of Arts and Sciences

**Website:** Here

**Chair**: Karen Bennett

**Undergraduate Vice-Chair:** Andrew Egan

**Assistant Undergraduate Director:** Alexander Skiles

**Distinguished Professors:**

Derrick Darby, B.A., Colgate; Ph.D., Pittsburgh

Frances Egan, B.A., M.A., Manitoba (Canada); Ph.D., Western Ontario (Canada)

Frances Kamm, B.A., Barnard College; Ph.D., Massachusetts Institute of Technology

Jeffrey King, B.A.; Ph.D., California (San Diego)

Ernest Lepore, B.A., Massachusetts (Amherst); M.A., Ph.D., Minnesota

Barry Loewer, B.A., Amherst College; Ph.D., Stanford

Brian McLaughlin, B.A., Montclair State College; M.A., Ph.D., North Carolina

Paul Pietroski, B.A., Rutgers; Ph.D., Massachusetts Institute of Technology

Jonathan Schaffer, B.A., Kenyon College; Ph.D., Rutgers

Susanna Schellenberg, M.A., J.W. Goethe Universität Frankfurt am Main; Ph.D., Pittsburgh

Ted Sider, B.S., Gordon College; Ph.D., Massachusetts (Amherst)

Ernest Sosa, B.A., Miami; M.A., Ph.D., Pittsburgh

Dean Zimmerman, B.A., Minnesota State (Mankato); M.A., Ph.D., Brown

**Professors:**

Karen Bennett, B.A., Oberlin College; Ph.D., Michigan

Elisabeth Camp, B.A., Michigan; Ph.D., California (Berkeley)

Juan Comesaña , B. A., Buenos Aires; Ph.D., Brown

Andy Egan, B.A., Wisconsin (Madison); M.A., Colorado (Boulder); Ph.D., Massachusetts Institute of Technology

Anthony S. Gillies, B.A., Westminster College; Ph.D., Arizona

Michael Glanzberg , B.A., UPenn; Ph.D., Harvard

Alexander Guerrero, A.B., Harvard; Ph.D., J.D., New York

Brian Leftow, B.A., Grove City College; Ph.D., Yale

Martin Lin, B.A., New York; Ph.D., Chicago

Jill North, B.A., Yale; Ph.D., Rutgers

Michael Ostuka , B.A., Yale, B. Phil, Oxford; D. Phil, Oxford

Carolina Sartorio, B.A., Buenos Aires, Argentina; Ph.D., Massachusetts Institute of Technology

**Assisant Professors:**

Zoe Jenkin, B.A. Williams College; Ph.D., Harvard

Jake Quilty-Dunn, B.A., Brown; Ph.D., CUNY

**Regular Faculty, Partial Appointment**:

Mark Budolfson, B.A.,Northern Arizona; Ph.D., Princeton

Nir Eyal, B.A., Tel Aviv; D. Phil, Oxford

Daniel Hausman, B.A., Cambridge; M. Phil, Ph.D., Columbia

Alec Walen, B.A., Maryland; Ph.D., Pittsburgh, J.D., Harvard

**Assistant Teaching Professors:**

Richard Fry, B.A., Arizona; Ph.D., Georgetown

Justin Kalef, B.A., Victoria (Canada), M.A., Leeds (UK); Ph.D., Victoria (Canada)

Edward McCrossin, B.A., Michigan; Ph.D., Yale

Jerry Piven, B.A., M.A., NYU; MPhil, Ph.D., Syracuse University

Alexander Skiles, B.A., M.A., Georgia; Ph.D., Notre Dame

**Emeritus:**
Martha Brandt Bolton, B.A., Ohio Wesleyan; Ph.D., Michigan

Robert Bolton, A.B., Princeton; B.Lit., Oxford; Ph.D., Michigan

Martin Bunzl, B.A., Ph.D., Minnesota

Alvin Goldman, B.A., Columbia; Ph.D., Princeton

Douglas Husak, B.A., Denison; Ph.D. and J.D., Ohio State

Peter Klein, B.A., Earlham College; M.A., Ph.D., Yale

Robert Matthews, B.S., M.S., Cornell; M.A., Georgetown; Ph.D., Cornell

Howard McGary, Jr., B.A., California (Los Angeles); Ph.D., Minnesota

Holly Smith, B.A. Wellesley College; M.A., Ph.D., Michigan

Stephen Stich, B.A., Pennsylvania; Ph.D., Princeton

Larry S. Temkin, B.A., Wisconsin (Madison); Ph.D., Princeton

Philosophy 730 (SAS)

# Learning Goals

# Learning Goals

Students will be able to employ the critical skills necessary for evaluating ideas and arguments; construct coherent arguments in support of their own views; present views that differ from their own accurately and fairly; and write clearly and in an organized manner.

Minors will in addition grasp philosophical issues in a range of intellectual domains.

Majors will in addition develop an appreciation of fundamental questions concerning reality, knowledge, and value, and the analytical resources necessary to engage these questions; an understanding of historical and contemporary attempts to answer these questions; a competence in formal reasoning techniques; and a broad-based foundation for graduate study in philosophy and for professional disciplines such as law, medicine, business, and government.

Philosophy 730 (SAS)

# Major Requirements

# Major Requirements

Students must pass a minimum of 11 classroom courses of 3 or more credits each in philosophy to earn the major. At least one of these courses must be at the 200 level, excluding 201, 202, 295, and 296. At least six of these courses must be at the 300 or 400 level, excluding 495 and 496. No more than one D grade can be applied toward the major. Among these courses must be the following:

*1. One semester of logic from among the following:*

01:730:109 Introduction to Formal Reasoning and Decision Making (3)

01:730:201 Introduction to Logic (3)

01:730:315 Applied Symbolic Logic (3)

01:730:407 Intermediate Logic I (3)

01:730:408 Intermediate Logic II (3)

*2. One semester of ancient or medieval philosophy from among the following:*

01:190:322 Greek Political Philosophy (3)

01:190:353 Aristotle (3)

01:730:301 Socrates and Plato (3)

01:730:302 Plato and Aristotle (3)

01:730:304 The Origins of Medieval Philosophy (3)

01:730:305 Philosophy in the High Middle Ages (3)

01:730:306 Between Medieval and Modern Philosophy (3)

01:730:311 Classical Jewish Philosophy (3)

01:730:352 Plato (3)

01:730:401 Plato (3)

01:730:402 Aristotle (3)

01:730:403 Ancient Philosophy after Aristotle (3)

*3. One semester of modern philosophy from among the following:*

01:730:307 Descartes, Locke, and the 17th Century (3)

01:730:308 Hume, Kant, and the 18th Century (3)

01:730:309 Nineteenth Century Philosophy (3)

01:730:404 Spinoza (3)

01:730:405 Kant (3)

01:730:406 Nietzsche (3)

01:730:416 Leibniz (3)

01:730:417 Hume (3)

*4. One semester of advanced ethics or political philosophy from among the following:*

01:730:330 Ethics of Harming and Helping (3)

01:730:341 Ethics through History (3)

01:730:342 Social and Political Philosophy through History (3)

01:730:441 Ethical Theory (3)

01:730:442 Moral Responsibility (3)

01:730:445 Topics in Social and Political Philosophy (3)

01:730:450 Topics in Moral Philosophy (3)

01:730:459 Advanced Seminar in Ethics (3)

01:730:470 Ethics and Practical Reason (3)

*5. Two courses from among the following, at least one of which must be at the 400 level:*

01:730:210 Philosophy of Language (3)

01:730:215 Introduction to Metaphysics (3)

01:730:220 Theory of Knowledge (3)

01:730:225 Introduction to the Philosophy of Science (3)

01:730:226 Introduction to the Philosophy of Physics (3)

01:730:256 Rhymes and Reasons: Hip Hop and Philosophy (3)

01:730:303 Metaphilosophy (3)

01:730:319 Philosophy of Mathematics (3)

01:730:320 Speech Acts (3)

01:730:327 Meaning and Numbering (3)

01:730:328 Philosophy of Psychology (3)

01:730:329 Minds, Machines, and Persons (3)

01:730:360 Philosophical Aspects of Cognitive Science (3)

01:730:370 Contemporary Philosophy of Religion (3)

01:730:410 History of Analytic Philosophy (3)

01:730:412 Epistemology (3)

01:730:413 Social Epistemology (3)

01:730:415 Metaphysics (3)

01:730:418 Philosophy of Mind (3)

01:730:419 Philosophy of Perception (3)

01:730:420 Philosophy of Language (3)

01:730:421 Semantics for Natural Languages (3)

01:730:422 Philosophy of Logic (3)

01:730:423 Foundations of Mathematics (3)

01:730:424 Logic of Decision (3)

01:730:425 Philosophy of Science (3)

01:730:426 Philosophy of Physics (3)

01:730:427 Philosophy of Social Sciences (3)

01:730:428 Topics in the Philosophy of Psychology (3)

01:730:429 Philosophy of Biology (3)

01:730:435 Philosophy of History (3)

A student may petition the department to substitute other courses for those on this list to satisfy any of the above requirements.

Philosophy 730 (SAS)

# Minor in Philosophy Requirements

# Minor in Philosophy Requirements

Students must pass a minimum of six philosophy classroom courses of 3 or more credits each to earn a minor. At least three of the courses must be at the 300 or 400 level. No more than two courses from outside of the department can be transferred toward the minor. No more than one D grade can be applied toward the minor.

Philosophy 730 (SAS)

# Minor in Philosophy, Politics, and Economics

# Minor in Philosophy, Politics, and Economics

The minor in philosophy, politics, and economics (PPE) is designed to engage students with the practical problems of organizing and running human society. The minor stands at the confluence of three major fields of study--philosophy, political science, and economics--and combines elements of these into a coherent framework in which to address questions about the nature of citizenship and the role individuals can and must play in making critical decisions facing society.

Students pursuing the PPE minor are expected to develop the ability to read and listen critically, to reason analytically concerning questions of public policy (especially economic policy), to engage in thoughtful moral judgment, and to write and speak clearly. The minor combines the best of the three participating fields: confronting the ethical issues of philosophy, the policy questions of political science, and the quantitative analytical problems of economics.

Generally, students taking the PPE minor will be majoring in one of the three included disciplines: philosophy, political science, or economics, and the courses that can be used toward the PPE minor taken in the student's major department may be used for both the major and the PPE minor. In other words, while the minor requires nine courses (27 credits), students majoring in philosophy, political science, or economics will only need to take six courses (18 credits) outside the major.

**Learning Goals**

At the end of this program students will be able to:

- Identify key factors in evaluating the morality of individual behavior and the legitimacy of regulations about that behavior.
- Explain the process through which the public regulation of individuals and groups occurs.
- Evaluate the economic ability of institutions to provide for the common welfare.
- Critique boundaries between private market forces and their just and efficient public regulation.

**Minor Requirements**

The minor requires students to take 3 courses (9 credits) in each of three fields of study. The course offerings in each field are structured to give students a solid grounding in each field, as well as a taste of what more advanced work in the field involves.

Students are permitted to bring in only 3 credits for each field from outside of Rutgers University-New Brunswick. In other words, at least two of the three classes for each field must be taken at Rutgers University-New Brunswick; only one course in each field can come from transfer credit, AP credit, study abroad, or other Rutgers campuses. Courses that are cross-listed may be used to satisfy only one requirement.

All courses must be completed with a grade of C or better in order to be used for the minor.

Below are the requirements for each field, which must be completed whether the student majors in the field or pursues them as other parts of the minor.

**Requirements for the Economics Component of the PPE Minor (three courses, 9 credits)**

Both of these two introductory courses:

01:220:102 Introduction to Microeconomics
01:220:103 Introduction to Macroeconomics

One course from the following list:

01:220:120 Inequality
01:220:327 History of Economic Thought
01:220:331 Economics of Crime
01:220:390 Choice and Strategy in Politics (Prerequisite: 01:220:102)
01:220:402 Labor Economics (Prerequisites: 01:220:320 and 01:220:322)
01:220:417 Health Economics (Prerequisites: 01:220:320 and 01:220:322)
01:220:432 Environmental Economics (Prerequisites: 01:220:320 and 01:220:322)
01:220:460 Public Economics (Prerequisites: 01:220:320 and 01:220:322)
01:220:463 Economics of Taxation (Prerequisites: 01:220:320 and 01:220:322)
01:220:482 Game Theory and Economics

**Requirements for the Philosophy Component of the PPE Minor (three courses, 9 credits)**

Total of three philosophy courses, no more than one at the 100 level, and two from the following list, at least one of which must be at a 300 level or higher (other courses on a case-by-case basis):

01:730:105/106 Current Moral and Social Issues
01:730:107 Introduction Ethics
01:730:249 Bioethics
01:730:250 Environmental Ethics
01:730:251 Ethics and Business
01:730:255 Introduction to Social and Political Philosophy
01:730:330 Ethics of Harming and Helping
01:730:341 Ethics through History
01:730:342 Social and Political Philosophy through History
01:730:343 Marx and Marxism
01:730:345 Philosophy and the Law
01:730:347 Philosophical Issues in Feminism
01:730:358 Philosophy of Law
01:730:371 Philosophies of Death and Dying
01:730:441 Ethical Theory
01:730:442 Moral Responsibility
01:730:445 Topics in Social and Political Philosophy
01:730:450 Topics in Moral Philosophy
01:730:459 Advanced Seminar in Ethics
01:730:470 Ethics and Practical Reason

**Requirements for the Political Science Component of the PPE Minor (three courses, 9 credits)**

One course in political theory, from the following list:

01:790:101 Nature of Politics
01:790:365 Gender and Political Theory
01:790:371 Western Tradition: Plato to Machiavelli
01:790:372 Western Tradition: Hobbes to Mill
01:790:373 Legal Philosophy Rights and Justice
01:790:374 Democratic Political Philosophy

01:790:375 American Political Thought to 1865
01:790:376 American Political Thought from 1865
01:790:472 Religion and Politics
01:790:473 Critics of Modernity
01:790:477 Critical Theory and Society

Two courses in policy or group relations, from the following list:

01:790:305 Public Policy Formation
01:790:318 Comparative Public Policy
01:790:319 Issues of American Foreign Policy
01:790:320 Politics and Social Policy: Lessons from Europe
01:790:322 Strategy in International Relations
01:790:323 Defense Policy
01:790:330 Interest Groups
01:790:333 Race, Ethnicity, and Politics
01:790:334 Politics of Black America
01:790:335 Women and American Politics
01:790:338 Government and Business
01:790:350 Environmental Policy: U.S. and International
01:790:355 Women and Public Policy
01:790:358 Globalization, Democracy, and Contemporary Capitalism
01:790:360 Gender and Politics and Global Perspective
01:790:363 Conflict Resolution in World Politics
01:790:364 Global Order
01:790:386 Political Change in China
01:790:401 American Constitutional Law I
01:790:404 Politics of Criminal Justice

Philosophy 730 (SAS)

# Minor in Medical Ethics and Health Policy

# Minor in Medical Ethics and Health Policy

The Medical Ethics and Health Policy Minor [21 credits] enables undergraduate students to explore the conceptual foundations of medical ethics as well as develop an appreciation of how they inform contemporary health policy in an era of major scientific innovation, technological advances, and resource constraint. Courses taken in fulfillment of the Medical Ethics and Health Policy minor cannot be double-counted to fulfill the requirements of a major. Not all courses are offered every semester.

Core: 6 credits
10:652:201 or 01:730:248 Foundations of Medical Ethics & Policy
10:652:301 or 01:730:348 Research Ethics (Pre-req: 10:652:201 or 01:730:248)

Ethics: 6 credits
Two of the following courses:
01:730:105 Current Moral and Social Issues
01:730:107 Introduction to Ethics
01:730:249 Bioethics
01:730:250 Environmental Ethics
01:730:371 Philosophies of Death and Dying
(Prereq: One course in philosophy equal to or greater than 01:730:103)
01:730:442 Moral Responsibility
01:512:229 History of Medical Ethics
01:119:154 Genetics, Law, and Social Policy
or
01:447:354 Social, Legal, and Ethical Implications of the New Genetics
(Prereq: 01:447:380 or 01:447:384)

Health Policy: 6 credits
Two of the following courses:
10:501:260 or 10:832:260 Health Care Systems*
10:501:356 Health Care Ethics and Law
10:832:252 Health and Social Justice
10:832 302 Sexual and Reproductive Health Policy
10:832:338 or 10:833:338 Health and Public Policy*
10:832:356 Public Health, Law, & Ethics
10:832:414 Culture and Health

Elective: 3 credits
Any one additional course from either the Ethics or Health Policy lists above.

*Credit issued only once for cross-listed courses.

Philosophy 730 (SAS)

# Departmental Honors

# Departmental Honors

The department offers students the opportunity to graduate in philosophy with departmental honors. The requirements to achieve this distinction are as follows:

1. At the time of graduation, the student must have an overall grade-point average of at least 3.0; a grade-point average within philosophy of at least 3.5; and grades of B+ or better in four 400-level courses, excluding 01:730:495 and 01:730:496.

2. The student must write a senior honors thesis of 25-45 pages (double-spaced, 12 pt. font) in order to be considered for honors.

a. The student must enroll in two semesters of the Senior Honors Thesis course (fall 01:730:495 and spring 01:730:496) in their senior year. At the time of registration for the fall Senior Honors Thesis course, the student must meet the grade-point requirements outlined in item #1, meaning students must have a minimum overall GPA of 3.0 and 3.5 within philosophy.

b. The thesis must be supervised by a tenured or tenure-track faculty member of the department or affiliated member of the department who will approve the topic and work with the student in developing his or her thesis.

c. The thesis may be a new project or based on the student's own prior research or written work for an upper-division philosophy course. If the student chooses to write a thesis based on prior written work, it is expected that the senior honors thesis be a very substantial enhancement of this prior work.

d. The student's thesis adviser will assign a letter grade to the thesis. The thesis grade along with the current GPA at the time of graduation will determine the level of honors.

e. All theses are due, without exception, to the thesis adviser, undergraduate director, and undergraduate program coordinator in electronic form by April 1 (or the last Friday of March if April 1 falls on a weekend) of the graduating year for May graduates, and by the last day of classes of fall semester classes for January graduates.



# Courses

# Courses

Courses at the 300 and 400 levels are not open to first-year students, and courses at the 400 level are not open to sophomores. Any course prerequisite can be waived with the permission of the instructor.

**01:730:101** ***Logic, Reasoning, and Persuasion (3)***
Development of skills in reasoning. Consideration of what an argument is, how arguments go wrong, and what makes an argument valid. Application of techniques for clarifying meaning; evaluating and constructing arguments.

**01:730:103** ***Introduction to Philosophy (3)***
Examination of fundamental philosophical issues such as the meaning and basis of moral judgments, free will and determinism, theism and atheism, knowledge and skepticism, and consciousness and the brain. Note: This course is a three-credit course certified to satisfy Core Curriculum goal AHo, but NOT certified for writing goals WCd and WCr. (Philosophy 104 is a four-credit writing intensive course certified for writing goals.)
***Credit not given for both this course and 01:730:104.***

**01:730:104** ***Introduction to Philosophy - Writing Intensive (4)***
Examination of fundamental philosophical issues such as the meaning and basis of moral judgments, free will and determinism, theism and atheism, knowledge and skepticism, and consciousness and the brain. Note: This course is a four-credit, writing intensive course certified to satisfy Core Curriculum writing goals WCd and WCr. Philosophy 103 is a three-credit course, which is NOT certified to satisfy WCd or WCr.
***Credit not given for both this course and 01:730:103.***

**01:730:105** ***Current Moral and Social Issues (3)***
Application of moral theory to selected contemporary issues. Possible topics include abortion, infanticide, euthanasia, punishment, equality, sexism, racism, affirmative action, privacy, obligations to the world's needy, treatment of animals, drug use, and the meaning of life.

**01:730:106** ***Current Moral and Social Issues (4)***
Same as 01:730:105 with smaller weekly discussion section meetings, enabling students to develop their oral argumentative skills and to pursue issues discussed in lectures.
***Credit not given for both this course and 01:730:105.***

**01:730:107** ***Introduction to Ethics (3)***
Exploration of basic issues in ethical theory and metaethics. Topics may include consequentialism, deontology, virtue theory, constructivism, value relativism, the objectivity of values, value skepticism, free will, and the nature of the values and practical reasons.
***Credit not given for both this course and 01:730:108.***

**01:730:108** ***Introduction to Ethics (4)***
Same as 01:730:107 with smaller weekly discussion section meetings, enabling students to develop their oral argumentative skills and to pursue issues discussed in lectures.
***Credit not given for both this course and 01:730:107.***

**01:730:109** ***Introduction to Formal Reasoning and Decision-Making (3)***
This course aims to introduce students to the fundamentals of logical, probabilistic, and statistical thinking, and, the basic principles of rational decision-making. It will provide basic principles for reasoning their way through the sorts of data & rhetoric encountered daily. Elementary principles of deductive logic & inference; fundamentals of inductive inference, probability, and statistics; and some basic rules for rational decision- making will be discussed & implemented.

**01:730:113** ***Philosophical Questions (1.5)***
Condensed introduction to philosophy and philosophical thinking through focus on core philosophical questions in four areas: epistemology, metaphysics, ethics, and political philosophy.

**01:730:140** ***Chinese Philosophy (3)***
Primary texts from influential thinkers of the pre-Qin period and some documents from the modern period. Topics include: Confucianism, Moism, Daoism, and modern China.

**01:730:150** ***Special Introductory Topics in Philosophy (3)***
Introduction to philosophical thinking and method in the context of a special topic in philosophy.

**01:730:164** ***Introduction to Philosophy through Film (2)***
Film as a stimulus for philosophical reflection. Issues include nature of morality, personal identity, knowledge, skepticism, free will, the problem of evil, and the good life.
***This course is only taught in Winter/Summer Sessions.***

**01:730:201** ***Introduction to Logic (3)***
Introduction to formal logic, covering truth, functional propositional logic, and quantification theory. Emphasis on developing symbolic techniques for representing and evaluating arguments.
***Credit not given for both this course and 01:730:202.***

**01:730:202** ***Introduction to Logic (4)***
Introduction to formal logic, covering truth, functional propositional logic, and quantification theory. Emphasis on developing symbolic techniques for representing and evaluating arguments.
***Credit not given for both this course and 01:730:201.***

**01:730:204** ***Introduction to Classical Greek Philosophy (3)***
Introduction to the major philosophical thinkers of the ancient Greek world with special emphasis on Plato and Aristotle.
***Credit not given for both this course and 01:190:208.***

**01:730:205** ***Introduction to Modern Philosophy (3)***
Study of the formative period of modern philosophy. Readings selected from works of Descartes, Leibniz, Spinoza, Hobbes, Locke, Berkeley, Hume, and Kant.

**01:730:210** ***Philosophy of Language (3)***
Examination of central issues in the philosophy of language concerning questions of meaning and reference.
***Prerequisite: 01:730:201.***

**01:730:215** ***Introduction to Metaphysics (3)***
Examination of central issues in metaphysics, such as free will, personal identity, the nature of time, causality, necessity, and possibility.
***Credit not given if student has already taken 01:730:415.***

**01:730:218** ***Introduction to the Philosophy of Mind (3)***
Investigation of the nature of mind, including such questions as whether minds are or require brains, whether computers can think, and what distinguishes human mentality from that of other creatures.
***Not open to students who have taken 01:730:418.***

**01:730:220** ***Theory of Knowledge (3)***
The nature of belief, perception, certainty, justification, and knowledge.
***Credit not given if student has already taken 01:730:412.***

**01:730:225** ***Introduction to the Philosophy of Science (3)***
Study of scientific methodology using examples from a variety of scientific disciplines. Nature of scientific laws and theories, explanation, confirmation, objectivity, and changes in scientific knowledge.
***Credit not given if student has already taken 01:730:425.***

**01:730:226** ***Introduction to the Philosophy of Physics (3)***
Introduction to the philosophy of physics. Possible topics include Zeno's paradoxes of motion; the truth of the physical laws; determinism of the laws; the existence of forces; the nature and existence of space and time; the structure of spacetime; and the possibility of time travel. Readings will be drawn from both physics and philosophy.
***Prerequisite: 01:750:115 or 01:750:123 or 01:750:161 or 01:750:193 or 01:750:201 or 01:750:203 or 01:750:271.***

**01:730:242** ***Ethics of Artificial Intelligence and Other Technology (3)***
Introduction to the moral, social, and political challenges raised by artificial intelligence systems and how to address them. Discussion of how these challenges fit into more general questions about the complex and often ambivalent role of technology in human life.

**01:730:248** ***Foundations of Medical Ethics and Policy (3)***
Introduction to the conceptual foundations of medical ethics, emphasizing how particular moral traditions and theories have influenced the development of policies and practices in health care and health research over time and in different setting around the world. Combines lectures with small-group casework to encourage students to "think-through" the moral and often practical challenges that arise in the practice of medicine, and health research.
***Credit not given for both this course and 10:652:201.***

**01:730:249** ***Bioethics (3)***
Exploration of moral issues in medicine and medical research. Course will typically focus on issues raised by the creation and termination of life and include topics such as abortion, stem cell research, cloning, prenatal screening for disability, right to medical care, human experimentation, genetic enhancement and eugenics, animal experimentation, the diagnosis of death, and euthanasia. May require some thinking about issues in metaphysics, such as the nature of personal identity.

**01:730:250** ***Environmental Ethics (3)***
Ethical matters concerning the environment; moral justification for coercing individuals and corporations, just distribution of resources, moral rights of animals; study of topical issues such as clean air standards, population control, land use.

**01:730:251** ***Ethics and Business (3)***
Social and moral problems that arise in the context of business: profit motive, corporate social responsibility, use and abuse of corporate power, truth in advertising, consumer rights, strikes, stockholders' rights, preferential hiring.

**01:730:252** ***Eating Right: The Ethics of Food Choices and Food Policy (4)***
Skill development for careful reasoning about difficult issues in life by analyzing food ethics. Includes in-depth arguments based on aesthetic, moral, cultural, or religious values and moral obligations and their consequences in everyday life.

**01:730:253** ***Human Nature and Human Diversity (4)***
Critical analysis of facts, theories, and philosophical issues regarding human diversity in a variety of domains. May include: sex and gender; race; religion; diet; morality and norms; conceptions of the self; perceptions and cognition.
***Credit not given for both this course and 01:185:253.***

**01:730:254** ***The Presocratic Philosophers (3)***
Introductory survey of the Presocratic philosophers. Emphasizes exposure to the teachings of these thinkers through the remaining fragments, while also engaging scholarly writings that introduce and contextualize the sources. All readings are in English.
***Credit not given for both this course and 01:190:254.***

**01:730:255** ***Introduction to Social and Political Philosophy (3)***
Survey of philosophical writings on the origin and nature of the state. Topics include the individual and the state, the social order, nature and limitation of state authority, political obligation, and liberties of citizens.

**01:730:256** ***Rhymes and Reasons: Hip Hop and Philosophy (3)***
Philosophical examination of the persistence and realities of America's dark ghettos, with an emphasis on what can be learned through studying hip hop rhymes and beats. Features lectures, interviews, music clips, and guest speakers including hip hop artists and prominent scholars.

**01:730:258** ***Philosophy and the Black Experience (3)***
Analysis of what constitutes the black experience and analysis of issues in the black experience, such as racial integration, racial separatism, racism, and black values.

**01:730:260** ***Philosophical Ideas in Literature (3)***
Philosophical issues in literary works. Topics such as freedom and determinism, conceptions and reality of the self, the quest for meaning, and the existence of evil.

**01:730:261** ***Philosophical Ideas in Science Fiction (3)***
Philosophical issues in science fiction. Topics such as time travel, personal identity, the mind-body problem, nonhuman rationality, and parallel worlds.

**01:730:263** ***Philosophy and the Arts (3)***
Introduction to the major issues in the philosophy of art. Topics include the definition of art, interpretation, evaluation, and the problem of the standard of taste. Texts selected from the classical period, the 18th century, and recent or contemporary authors.

**01:730:264** ***Philosophical Ideas in Film (3)***
Use of film as a stimulus for philosophical reflection; investigation of film by applying the analytical rigor of philosophy. Issues to be examined include nature of morality, personal identity, knowledge, skepticism, free will, the problem of evil, and the good life.

**01:730:265** ***Introduction to the Philosophy of Religion (3)***
Basic issues in the philosophy of religion, East and West: existence and nature of God; problem of evil; faith versus knowledge; mysticism and its claims; the problem of religious language; and attacks on religion by Hume, Nietzsche, Marx, and Freud.

**01:730:268** ***Introduction to Existentialism (3)***
Study of the works of some recent existentialist philosophers and the ways in which their analysis of human existence affects their views of freedom, choice, and action.

**01:730:295** ***Areté - Part I (1)***
Supervised process of editing of the undergraduate philosophy journal, with review of weekly submissions.
***Prerequisites: At least two courses in philosophy or outstanding performance in a philosophy class.***

**01:730:296** ***Areté - Part II (1)***
Supervised process of editing of the undergraduate philosophy journal, with review of weekly submissions.
***Prerequisites: At least two courses in philosophy or outstanding performance in a philosophy class.***

**01:730:297** ***Sophomore Advanced Seminar (3)***
Intensive study of some classic philosophical text (e.g., Kant's *Critique of Pure Reason)* or central philosophical question (e.g., the mind-body problem). Extensive writing of papers and discussion of reading material.
***Prerequisites: Outstanding performance in at least one course in philosophy and permission of instructor.***

**01:730:298** ***Independent Study for minor in Medical Ethics and Health Policy (3)***
Supervised individual study of selected topics of interest with extensive reading and/or independent research project.
***Prerequisites: Permission of department and (10:652:201 or 01:730:248) and (10:652:401 or 01:730:348). Credit not given for this course and 10:652:298,299.***

**01:730:301** ***Socrates and Plato (3)***
The thought of Socrates and Plato in the Platonic dialogues. The Socratic method; moral theory. Plato's early dialectic, theory of innate knowledge, theory of forms.
***Prerequisite: One course in philosophy equal to or greater than 01:730:103.***

**01:730:302** ***Plato and Aristotle (3)***
Major work of Plato, such as the *Republic;* Aristotle's critical reaction and alternative theories in metaphysics, psychology, logic, ethics, and politics.
***Prerequisite: One course in philosophy equal to or greater than 01:730:103.***

**01:730:303** ***Metaphilosophy (3)***
Examination of various modes of argumentation in the Western philosophical tradition. Specific topics of focus will vary by instructor/semester.
***Prerequisites: 01:730:103 or 104 and 201, and permission of instructor. Not open to first-year students.***

**01:730:304** ***The Origins of Medieval Philosophy (3)***
Emergence of a distinct medieval philosophical style (Philo of Alexandria); the Platonic legacy in Augustine and Boethius; the development of philosophical theology in Christianity, Islam, and Judaism.
***Prerequisite: One course in philosophy equal to or greater than 01:730:103.***

**01:730:305** ***Philosophy in the High Middle Ages (3)***
Impact of Aristotle in the Muslim-Jewish world (Averroës and Maimonides); the development of medieval science; Christian Scholasticism (Thomas Aquinas and Duns Scotus).
***Prerequisite: One course in philosophy.***

**01:730:306** ***Between Medieval and Modern Philosophy (3)***
Critique of Aristotelian philosophy; the emergence of a new or "secular" Aristotle; the revival of Plato in the Italian Renaissance; and the "new science" of Galileo.
***Prerequisite: One course in philosophy equal to or greater than 01:730:103.***

**01:730:307** ***Descartes, Locke, and the 17th Century (3)***
Early development of modern views about the nature of the physical world; relation between the mental and the physical; the nature of one's self; skepticism and certainty. Readings from Descartes, Locke, and others, such as Spinoza, Leibniz, and Hobbes.
***Prerequisite: One course in philosophy.***

**01:730:308** ***Hume, Kant, and the 18th Century (3)***
Some major works of Hume and Kant with some attention to other 18th-century philosophers. Comparison of views on the structure of consciousness, space and time, the limits of knowledge, the foundations of natural sciences, mathematics, and metaphysics.
***Prerequisite: One course in philosophy other than 01:730:101 or 102.***

**01:730:309** ***Nineteenth-Century Philosophy (3)***
A substantive exploration of notable nineteenth-century philosophers and philosophical perspectives and their legacies.
***Prerequisite: One course in philosophy.***

**01:730:310** ***Contemporary Movements in Philosophy (3)***
Major movements in 20th-century philosophy, such as American pragmatism, development of logic, logical positivism, existentialism, phenomenology. Philosophers such as Peirce, James, Frege, Russell, Carnap, Wittgenstein, Sartre, Heidegger, and Husserl.
***Prerequisite: One course in philosophy other than 01:730:101 or 102.***

**01:730:311** ***Classical Jewish Philosophy (3)***
Major trends and figures in medieval Jewish thought; Jewish Platonism (Solomon ibn Gabirol); Jewish Aristotelianism (Maimonides); the critique of philosophy (Hallevi); Jewish philosophy in the Renaissance.
***Credit not given for both this course and 01:563:311.***

**01:730:312** ***Modern Jewish Philosophy (3)***
Thinkers and systems in modern Jewish philosophy, including interpretations of Jewish tradition, Jewish Kantianism (Cohen, Buber), Jewish existentialism and postmodernism (Rosenzweig, Levinas), the Holocaust, and Jewish feminism.
***Credit not given for both this course and 01:563:312.***

**01:730:315** ***Applied Symbolic Logic (3)***
Use of deduction techniques (see 01:730:201) to formalize various subject matters such as modal logic, set theory, formal arithmetic, and relevance logic.
***Prerequisite: 01:730:201.***

**01:730:316** ***German Thought in the 20th Century (3)***
Exploration of the vexing history of German philosophy and thought in the 20th century with a focus on History, Language, and Technology. Taught in English.
***Credit not given for this course and 01:470:355.***

**01:730:319** ***Philosophy of Mathematics (3)***
Introduction to some of the central topics in philosophy of mathematics. Connection between mathematical knowledge and logical knowledge; metaphysics of mathematical objects; connection between mathematics and natural science.
***Prerequisites: 01:730:103 or 104, and 201. Recommended prerequisite: 01:730:215 or 220.***

**01:730:320** ***Speech Acts (3)***
Investigation of philosophical issues surrounding how speakers use language to communicate. What goals do people accomplish by speaking? What resources does a language offer for achieving those goals? How do speakers deploy those linguistic resources to achieve their communicative goals on particular occasions? Readings drawn from philosophy and linguistics, and range from the abstractly theoretical to the applied.
***Prerequisite: Any 01:730 course. Credit not given for this course and 01:615:420.***

**01:730:327** ***Meaning and Numbering (3)***
Central issues in cognitive science and strategies for addressing questions about the contributions of innate endowment and individual experience (a.k.a., nature/nurture) to mature cognition through discussion and comparison of the human capacity to understand linguistic expressions and the apparently more widespread capacity to make numerical comparisons.
***Prerequisite: 01:185:201. Credit not given for both this course and 01:185:330.***

**01:730:328** ***Philosophy of Psychology (3)***
Conceptual and methodological issues about information, mental illness, innate structure, developmental stages, rationality, and deviance. Behaviorism, reductionism, cognitivism, and structuralism.
***Prerequisite: One course in philosophy.***

**01:730:329** ***Minds, Machines, and Persons (3)***
Comparison of the nature of the human mind and that of complex machines. Consequences for questions about the personhood of robots.
***Prerequisite: One course in philosophy other than 01:730:101 or 102.***

**01:730:330** ***Ethics of Harming and Helping (3)***
Investigation of our moral duties to come to the aid of, and refrain from harming, others. Topics may include warfare, self-defense, abortion and physician-assisted dying; effective altruism and charitable giving; the paradox of deontology, the trolley problem, the doctrine of double effect, the non-identity problem; and the ethics of imposing risks of harm; and consequentialist, deontological, and contractualist approaches to the aforementioned.
***Prerequisite: One course in philosophy.***

**01:730:341** ***Ethics through History (3)***
An examination of some of the most important moral theories in the history of philosophy. Possible authors include Plato, Aristotle, Butler, Hume, Kant, Mill, and Nietzsche. Some contemporary philosophers may be discussed as well.
***Prerequisite: One course in philosophy.***

**01:730:342** ***Social and Political Philosophy through History (3)***
An examination of some of the most important social and political theories in the history of philosophy. Possible authors include Plato, Aristotle, Hobbes, Locke, Rousseau, Kant, Mill, and Marx. Some contemporary philosophers may be discussed as well, including Rawls and Nozick.
***Prerequisite: One course in philosophy.***

**01:730:343** ***Marx and Marxism (3)***
Central introduction to Marx's thought. Topics such as materialism; dialectics; analysis of capitalism; class and class struggle; and social revolution, a political program for socialism.

**01:730:344** ***Marx, Nietzsche, Freud (3)***
Exploration of the work of three German writers who revolutionized modern philosophy, theology, psychology, aesthetics, social and political science, gender studies, historiography, literature, and the arts.
***Credit not given for both this course and 01:195:374 or 01:470:371.***

**01:730:345** ***Philosophy and the Law (3)***
Examination of normative problems in law. Topics such as justification of punishment; limits of the law; nature of excuses; negligence; strict liability; and *mens rea* requirement.

**01:730:347** ***Philosophical Issues in Feminism (3)***
Clarification and analysis of feminist thought. Critical study of scientific theories of sex differences. Issues such as the family, abortion, nature of persons, prostitution, discrimination, pornography.
***Prerequisite: One course in philosophy equal to or greater than 01:730:103 or one course in women's studies.***

**01:730:348** ***Research Ethics (3)***
Origins of contemporary research ethics, paradigm studies that contributed to modern day rules and regulations, and case-based discussions of real and fictional cases. Particular attention to ethical issues arising in research involving vulnerable populations and research in international settings.
***Prerequisite: 01:730:248 or 10:652:201. Credit not given for both this course and 10:652:400.***

**01:730:352** ***Plato (3)***
Philosophy of Plato through close readings of selected dialogues supplemented by relevant readings in other ancient and contemporary philosophers.
***Prerequisite: 01:730:203 and any other philosophy course. Credit not given for both this course and 01:190:352 or 01:490:352.***

**01:730:358** ***Philosophy of Law (3)***
Examination of the nature and purpose of law and legal systems; analysis of judicial decision making and the role of discretion.

**01:730:360** ***Philosophical Aspects of Cognitive Science (3)***
Exploration of ways in which research and discoveries in cognitive science influence, and have been influenced by, philosophical theorizing. Topics include consciousness, innate knowledge, mental representation, and the nature of rationality.
***Prerequisite: One course in philosophy.***

**01:730:362** ***Philosophy of Literature (3)***
Consideration of such questions as the definition of literature, the ontology of literary works, the nature of fiction, the emotional reaction of the audience to fiction, the problem of interpretation, the problem of literary value, and the experience of silent reading as opposed to the experience of literature as performance.
***Prerequisite: One course in philosophy.***

**01:730:363** ***Philosophy and Popular Culture (3)***
An in-depth examination of philosophical questions raised by and about a particular topic in popular culture such as comics, games, humor, or specific genres of music, film, and television. Topics vary from semester to semester.

**01:730:364** ***Aesthetics of Film (3)***
Problems in the philosophy of art raised in theory and practice of film. Variety of films screened in conjunction with the course.

**01:730:365** ***Philosophy of Music (3)***
Concept of musical expression; music as language; music and drama; music and representation; the nature of the musical work.

**01:730:366** ***African, Latin American, and Native American Philosophy (3)***
Introduction to philosophy from Africa, Latin America, and the indigenous peoples of North America, covering topics in ethics, metaphysics, epistemology, mind, and social and political philosophy. Considers metaphilosophical issues such as written v. oral traditions, ethnophilosophy v. individualism, and parochialism v. universalism. Typically includes Andean, Aztec/Nahua, Dogon, Igbo, Iroquois, Lakota, Maya, Navajo, Ojibwa, and Yoruba traditions.

**01:730:367** ***American Philosophy (3)***
Study in its historical setting of inquiry into the nature of experience, truth, goodness, and society by American philosophers including James, Peirce, Dewey, Royce, Lewis, and Whitehead.
***Prerequisite: One course in philosophy equal to or greater than 01:730:103.***

**01:730:368** ***Hindu Philosophy (3)***
Upanishads, Patanjali, Bhagavad Gita; theories of matter, energy, states of consciousness; meditation. Yogas of knowledge, action, devotion. Karma. Ethics. Comparison of Hindu and Western cosmology.
***Credit not given for both this course and 01:840:358.***

**01:730:369** ***Buddhist Philosophy (3)***
Interdependence, impermanence, relativity; suffering; path to liberation; meditation; karma as cosmic justice; death and rebirth. Compassion as central ethical value. Theravada, Mahayana, and Tibetan Buddhism.
***Prerequisite: One course in philosophy. Credit not given for both this course and 01:840:369.***

**01:730:370** ***Contemporary Philosophy of Religion (3)***
Modern philosophical discussions of religious language and experience; the possibility of religious knowledge; the nature of religious discourse; mysticism and truth; divine omniscience; religious morality.
***Prerequisite: One course in philosophy equal to or greater than 01:730:103.***

**01:730:371** ***Philosophies of Death and Dying (3)***
Theories of death and dying in different metaphysical systems; Plato; Eastern philosophy; existentialism; thanatology. Extinction versus continuity of consciousness. Attitudes toward death and ethical values.
***Prerequisite: One course in philosophy equal to or greater than 01:730:103. Sophomores by permission only.***

**01:730:374** ***Islamic Philosophy (3)***
Exploration of the main themes of Islamic philosophy, focusing on topics such as wisdom, the good life, and relations between metaphysical, moral, doctrinal, and practical knowledge.
***Credit not given for both this course and 01:685:374 or 01:840:374.***

**01:730:375** ***Topics in Philosophy (3)***
An intensive writing course on a central topic in philosophy. Topics will vary with instructor.
***Prerequisite: One course in philosophy.***

**01:730:397** ***Junior Advanced Seminar (3)***
Intensive study of some classic philosophical text (e.g., Kant's *Critique of Pure Reason*) or central philosophical question (e.g., the mind-body problem). Extensive writing of papers and discussion of reading material.
***Prerequisite: Outstanding performance in at least one course in philosophy. By invitation only.***

**01:730:401** ***Plato (3)***
Intensive study of selected works of Plato, with emphasis upon the later dialogues such as Theaetetus, Sophist, and Philebus.
***Prerequisites: Two courses in philosophy equal to or greater than 01:730:103.***

**01:730:402** ***Aristotle (3)***
Topics in Aristotle's logic, physics, metaphysics, and philosophy of language.
***Prerequisites: Two courses in philosophy equal to or greater than 01:730:103.***

**01:730:403** ***Ancient Philosophy after Aristotle (3)***
Philosophy in the Hellenistic and Roman world. Stoics, Sceptics, and Epicureans; Hellenistic-Jewish philosophy; the revival of Aristotle; and Plotinus and the neo-Platonic tradition.
***Prerequisite: One course in Greek philosophy.***

**01:730:404** ***Spinoza (3)***
Spinoza's theological political treatise: prophecy, miracles, and faith and reason. Spinoza's ethics: God and his attributes, the human mind, and human bondage and freedom.
***Prerequisites: Two courses in philosophy other than 01:730:101 or 102. Recommended: 01:730:205 or 307.***

**01:730:405** ***Kant (3)***
Critical examination of Kant's *Critique of Pure Reason;* emphasis on metaphysical and epistemological views.
***Prerequisites: Two courses in philosophy.***

**01:730:406** ***Nietzsche (3)***
A substantive exploration of Nietzsche's works and perspectives and their legacy. Nietzsche's critical philosophy and its excoriation of Platonism, metaphysics, Western morality, and religion, as well as his positive philosophy, primarily his epistemology. Topics may include the revaluation of values, perspectivism, naturalism, asceticism, time, and the self.
***Prerequisites: Two courses in philosophy other than 01:730:101 or 102.***

**01:730:407** ***Intermediate Logic I (3)***
Metatheory of propositional and first-order predicate logic. Completeness is proved and its consequences are explored.
***Prerequisite: 01:730:201.***

**01:730:408** ***Intermediate Logic II (3)***
Computability and recursiveness; metatheory of first-order theories; incompleteness theorems; special topics as time permits.
***Prerequisite: 01:730:407.***

**01:730:409** ***Wittgenstein (3)***
Detailed study of either *Tractatus Logico-Philosophicus* and its relation to writings of Frege and Russell; or *Philosophical Investigations* and related writings.
***Prerequisites: 01:730:201 and two additional courses in philosophy.***

**01:730:410** ***History of Analytic Philosophy (3)***
Major figures or movements in the development of analytic philosophy. Topics may include: early analytic philosophy, with an emphasis on Frege, Russell, and Moore; development and assessment of logical positivism; and roots of contemporary metaphysics in Quine and Strawson.
***Prerequisites: 01:730:201 and two additional courses in philosophy.***

**01:730:411** ***History of Epistemology (3)***
Historical development of positions on one or more epistemological issues, such as knowledge of empirical and necessary truths, certainty and skepticism, or the scientific method. Authors addressed will include Plato, Aristotle, Descartes, Locke, Hume, and/or Kant.
***Prerequisites: Two courses in philosophy equal to or greater than 01:730:103.***

**01:730:412** ***Epistemology (3)***
Topics such as belief, certainty, justification, knowledge, and skepticism are examined in detail.
***Prerequisites: 01:730:201 and two additional courses in philosophy.***

**01:730:413** ***Social Epistemology (3)***
How groups, communities, and interpersonal practices promote or impede the quest for knowledge and rationality.
***Prerequisites: Two courses in philosophy.***

**01:730:414** ***History of Metaphysics (3)***
Historical development of positions on one or more metaphysical issues such as substance, change, causality, universals, matter, space, time, free will, necessity, possibility, and contingency. Authors addressed will include Plato, Aristotle, Descartes, Locke, Hume, and/or Kant.
***Prerequisites: Two courses in philosophy equal to or greater than 01:730:103.***

**01:730:415** ***Metaphysics (3)***
Topics such as essence, particulars and universals, causation, space, time, and identity. The nature of metaphysical arguments and problems of ontology. Realism and its alternatives.
***Prerequisites: 01:730:201 and one additional course in philosophy.***

**01:730:416** ***Leibniz (3)***
Philosophical works of G.W. Leibniz. Particular attention will be paid to Leibniz's views on modality, substance, truth, free will, causation, the mind-body problem, innate ideas, and his claim that this is the best possible world.
***Prerequisites: Two courses in philosophy. Recommended: 01:730:205, 307, or 308.***

**01:730:417** ***Hume (3)***
Intensive study of Hume's contributions to epistemology, cognitive psychology/philosophy of mind, metaphysics, morals, aesthetics, and political philosophy, both in the Early Modern period and to contemporary thought.
***Prerequisites: Two courses in philosophy.***

**01:730:418** ***Philosophy of Mind (3)***
Mind-body problem and the nature of consciousness; rationality; intentionality; human freedom. Theories of dualism, physicalism, functionalism, and behaviorism.
***Prerequisites: Two courses in philosophy other than 01:730:101 or 102.***

**01:730:419** ***Philosophy of Perception (3)***
Philosophical study of perception and of our access through it to knowledge and reality.
***Prerequisites: Two courses in philosophy.***

**01:730:420** ***Philosophy of Language (3)***
Philosophical study of language and linguistics. Pragmatics, theories of learnability, meaning and reference, formal semantics, truth, indexicality.
***Prerequisites: 01:730:201 and two additional courses in philosophy.***

**01:730:421** ***Semantics of Language (3)***
Philosophical study of natural language semantics: semantics of names, predicates, adverbs, psychological ascriptions, demonstrative and indexical expressions, verbs of change, comparative adjectives.
***Prerequisite: 01:730:201. Credit not given for both this course and 01: 615:325.***

**01:730:422** ***Philosophy of Logic (3)***
Is logic a theory? The status and use of alternative logics. What logics and other mathematical systems can tell us about language and relations among language, belief, and the world.
***Prerequisite: 01:730:315.***

**01:730:423** ***Foundations of Mathematics (3)***
A study of the set-theoretic approach to the foundations of mathematics, and connections to the philosophy of mathematics and logic.
***Prerequisite: 01:730:315 or 01:730:407 or 01:640:300 or by instructor permission. Credit not given for both this course and 01:640:361.***

**01:730:424** ***The Logic of Decision (3)***
Analysis of rational preference and nondeductive inference with special emphasis on the examination of alternative concepts of utility and probability.
***Prerequisite: 01:730:201 or 315 or 407 or 408 or 422.***

**01:730:425** ***Philosophy of Science (3)***
Detailed study of one or more of the following topics: explanation, confirmation, causation, the status of theoretical entities, objectivity, reductionism, unity of science.
***Prerequisite: 01:730:225.***

**01:730:426** ***Philosophy of Physics (3)***
Methodology of the physical sciences. Philosophical problems of space and time, measurement, and causation in modern physics.
***Prerequisite: One course in Philosophy equal to or higher than 01:730:101.***

**01:730:427** ***Philosophy of Social Sciences (3)***
Explanation. Relation to natural sciences. Discussion of debates in areas such as structuralism, functionalism, classical modeling, path analysis, statistical testing, and construct validation.
***Prerequisite: One course in philosophy.***

**01:730:428** ***Topics in the Philosophy of Psychology (3)***
Detailed philosophical study of topics such as psychological explanation; implications of psychotherapy; and theories of cognition, perception, learning, and personality.
***Prerequisites: Two courses in philosophy. Recommended: 01:730:225.***

**01:730:429** ***Philosophy of Biology (3)***
Methodology of the biological sciences. Detailed study of one or more of the following topics: the nature of explanation, laws, and reduction in biology; debates about fitness, units of selection, replicators, and evolutionary theory.
***Prerequisite: One course in philosophy.***

**01:730:435** ***Philosophy of History (3)***
Theories of history and historical explanation; comparison of the methodologies of history and science; problems of historical interpretation.
***Prerequisite: One course in philosophy.***

**01:730:441** ***Ethical Theory (3)***
Examination of contemporary views in normative ethics and metaethics, or both. Possible topics include the nature of reasons and value, the justification of moral judgments, the meaning of moral terms, theories of right action, and competing approaches to moral theory, including skepticism.
***Prerequisites: Two courses in philosophy.***

**01:730:442** ***Moral Responsibility (3)***
Exploration of our responsibility for ourselves and our actions. Possible topics include justification versus excuses for actions; different types of excuses (e.g., ignorance of fact, morality, or law; insanity; alcohol-induced impairment; duress); negligence and risk; moral luck; collective responsibility; free will; and the justification for punishment.
***Prerequisites: Two courses in philosophy.***

**01:730:445** ***Topics in Social and Political Philosophy (3)***
Exploration of important authors or topics in social and political philosophy. Material may range from classical masterpieces to unpublished manuscripts.
***Prerequisites: Two courses in philosophy.***

**01:730:450** ***Topics in Moral Philosophy (3)***
Explores at an advanced level some of the most important authors or topics in moral philosophy. Material may range from classical masterpieces to unpublished manuscripts. Topics will vary by instructor.
***Prerequisites: Two courses in philosophy.***

**01:730:459** ***Advanced Seminar in Ethics (3)***
Examines some of the deepest and most fundamental issues in moral theory and practical reasoning. Topics may include nature of morality, nature of reasons, impartiality, universal laws, Kantianism, consequentialism, contractualism, normativity, attitudes to time, obligations to future generations, the structure of moral ideals, competing conceptions of good, and transitivity.
***Prerequisite: Permission of instructor required.***

**01:730:461** *Topics in Aesthetics (3)*
Generally will discuss three major works in the philosophy of art, each concerning one of the major arts: for example, literature, the visual arts, film, and music. Works by recent or contemporary authors, at the cutting edge of current research, studied in depth.
***Prerequisite: One course in philosophy other than 01:730:101 or 102.***

**01:730:465** *Phenomenology and Existentialism (3)*
Issues in phenomenology and existentialism, selected from Kierkegaard, Nietzsche, Husserl, Heidegger, Sartre, and Merleau-Ponty. Consideration of contemporary philosophical literature.
***Prerequisite: One course in philosophy.***

**01:730:470** *Ethics and Practical Reason (3)*
Investigation of selected topics concerning reasoning about what to do. Possible topics include the nature of reasons, values, normativity, irrationality, agency, intention, free will, moral dilemmas, and problems raised by conflicts among values.
***Prerequisites: Two courses in philosophy.***

**01:730:475** *Advanced Topics in Philosophy (3)*
An intensive writing course on a central topic in philosophy. Topics will vary with instructor.
***Prerequisites: Two courses in philosophy.***

**01:730:480** *Issues in Contemporary Philosophy (3)*
Examination of some central issue(s) in contemporary philosophy. Topics vary from semester to semester.
***Prerequisites: Two courses in philosophy.***

**01:730:492** *Philosophy Writing Tutorial (3)*
Intensive writing tutorial, intended to prepare individual papers for submission to an undergraduate philosophy journal or conference.
***Prerequisite: Permission of instructor. Open to philosophy majors only.***

**01:730:493,494** *Independent Study (1-4,1-4)*
Individual study in some philosophical topic under the direction of a member of the department.
***Open to philosophy majors/minors only.***

**01:730:495,496** *Senior Honors Thesis (BA,BA)*
Thesis research under the direction of a faculty adviser.
***Prerequisite: Eligibility for departmental honors and approval of thesis topic by faculty adviser and director of undergraduate studies.***

# Physics 750 (SAS)

## PHYSICS 750 (INCLUDES ASTRONOMY)

Department of Physics and Astronomy, School of Arts and Sciences

**Website:** Here

**Chair:** John P. Hughes

**Undergraduate Program Director:** Jolie A. Cizewski

**Distinguished Professor and Board of Governors Professor:**

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B. Gabriel Kotliar, B.S., M.S., Hebrew (Israel); Ph.D., Princeton

Karin Rabe, A.B., Princeton; Ph.D., Massachusetts Institute of Technology

David Vanderbilt, B.A., Swarthmore College; Ph.D., Massachusetts Institute of Technology

**Distinguished Professors:**

Natan Andrei, B.S., M.S., Tel Aviv; Ph.D., Princeton

Andrew Baker, A.B., Harvard; Ph.D., California Institute of Technology

Thomas Banks, B.A., Reed College; Ph.D., Massachusetts Institute of Technology

Robert Bartynski, B.A., Cornell; Ph.D., Pennsylvania

Girsh Blumberg, M.S., Tartu (Finland); Ph.D., Estonian Academy of Sciences

Sang-Wook Cheong, B.S., Seoul National; M.S., Ph.D., California (Los Angeles)

Jolie A. Cizewski, B.A., Pennsylvania; M.A., Ph.D., SUNY (Stony Brook)

Piers Coleman, B.A., Cambridge; Ph.D., Princeton

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Ronald Gilman, B.S., Massachusetts Institute of Technology; Ph.D., Pennsylvania

Eva Halkiadakis, B.S., Ph.D., Rutgers

Kristjan Haule, B.S., M.Sc., Ph.D., Ljubljana (Slovenia)

John P. Hughes, A.B., Ph.D., Columbia

Saurabh Jha, A.B., A.M., Ph.D., Harvard

Valery Kiryukhin, M.S., Moscow Institute of Physics and Technology; Ph.D., Princeton

Joel Lebowitz, B.S., M.S., Ph.D., Syracuse

Gregory Moore, A.B., Princeton; Ph.D., Harvard

Herbert Neuberger, B.S., M.S., Ph.D., Tel Aviv

Sunil V. Somalwar, M.S., Indian Institute of Technology; Ph.D., Chicago

Scott Thomas, B.S., Utah State; Ph.D., Texas

**Professors:**

Gyan Bhanot, M.S., Indian Institute of Technology; M.S., SUNY (Stony Brook); Ph.D., Cornell

Jak Chakhalian, B.S., St. Petersburg Technical (Russia); M.S., Ph.D., British Columbia

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Charles Keeton, B.A., Cornell; Ph.D., Harvard

Amitabh Lath, B.S., Ph.D., Massachusetts Institute of Technology

Sergei Lukyanov, M.A., Moscow Engineering Physical Institute; Ph.D., Landau Institute for Theoretical Physics (Russia)

Alexander Morozov, Honors Diploma, Rostov State (Russia); M.S., Ph.D., Washington

Seongshik Oh, B.S., M.S., Seoul National; Ph.D., Illinois

Vitaly Podzorov, B.S., M.S., Moscow Institute of Physics and Technology; Ph.D., Rutgers

Ronald Ransome, B.S., Colorado School of Mines; Ph.D., Texas (Austin)

Sevil Salur, B.A., California (Berkeley); M.S., M.Phil., Ph.D., Yale

Anirvan Sengupta, B.A., Calcutta; Ph.D., Bombay

David Shih, A.B., Harvard; M.Phil., Cambridge; Ph.D., Princeton

Weida Wu, B.S., Science and Technology of China (Heifei); M.S., Northwestern; Ph.D., Princeton

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**Associate Professors:**

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Matthew Buckley, B.A., Kenyon College; M.A., Ph.D., California (Berkeley)

Blakesley Burkhart, B.S. Louisville; M.S. Physics Wisconsin-Madison, M.A. Astronomy, Wisconsin-Madison; Ph.D. Wisconsin-Madison

Sang-Hyuk Lee, B.S., M.S., Korea Advanced Institute of Science and Technology; Ph.D., New York

Andrew Mastbaum , B.S., Lehigh, Ph.D., University of Pennsylvania

Kristen McQuinn, B.S., Lehigh; M.S., Boston; Ph.D., Minnesota

Jedediah Pixley, B.S., California (Santa Cruz); M.S., Ph.D., Rice

Frank Zimmermann, M.S., Ph.D., Cornell

**Assistant Professors:**

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Ananda Roy, M.Sc, Indian Institute of Technology Kanpur, India; M.S., M. Phil, Ph.D., Yale

**Teaching Professor:**

AbdelBaki Brahmia, DES, Annaba (Algeria); Ph.D., Warwick (UK)

**Assistant Teaching Professors:**

Michael Gentile, B.S., The College of New Jersey; M.S., Rutgers

Roy Montalvo, B.S., Stony Brook; M.S., California State (Long Beach); Ph.D., Texas A&M

**Associate Professor of Practice:**

Charles Ruggieri, B.S., The College of New Jersey; Ph.D., Rutgers

**Distinguished Research Professor:**

Philip Batson, B.S., Ph.D., Cornell

**Assistant Research Professor:**

Sylvie Rangan, B.A., Cergy-Pontoise (France); M.S., Ph.D., Pierre and Marie Curie (Paris)

# Learning Goals (unless otherwise specified, "Physics" always means "Physics and Astronomy")

# Learning Goals (unless otherwise specified, "Physics" always means "Physics and Astronomy")

- Our best majors, roughly 25% of total, conduct frontier Physics research with a Physics faculty member and demonstrate high quality of work.
- Top 25 % of our Physics majors demonstrate mastery of basic Physics and the ability to solve essential problems appropriate for beginning graduate study in Physics.
- All Physics majors demonstrate knowledge of fundamental Physics principles and are able to quantitatively analyze a broad spectrum of problems presented in a range of undergraduate Physics courses.
- Students who complete our introductory sequence of Physics courses demonstrate an understanding of Physics principles at a basic level.

Physics 750 (SAS)

# Major Requirements

# Major Requirements

The department offers a major in Physics and a major in Astrophysics. In all astrophysics and physics major options, at least 15 credits of physics courses at the 300 level or higher that are applied toward the major must be completed at Rutgers University-New Brunswick.

School of Engineering students are welcome to complete a second major or minor in Physics or Astrophysics/ Astronomy upon approval by both the SOE and Physics and Astronomy advisors.

**Major in Astrophysics**

**Astrophysics Major Requirements:**

The Astrophysics Major, leading to a Bachelor of Science degree, provides a thorough introduction to the subject. It is suitable for those with an interest in astronomy who aspire to a career in astronomy research, science education, science journalism, technical development, and other professional areas. Prospective majors should consult the Physics and Astronomy Undergraduate Program Director before choosing their courses.

In the astrophysics major, at least 15 credits of physics or astrophysics courses at the 300-level or higher that are applied towards the major must be completed at Rutgers New Brunswick

Required courses and suggested curricula for honors students and other well-prepared students:

- First year: 01:750:271-272, 275-276; 01:640:151-152.
- Second year: 01:750:273, 381-382, 351; 01:750:341, 342; 01:640:251, 244.
- Third year: 01:750:361, 385-386; 345, 346; and 01:640:423 or 421.
- Fourth year: At least two courses out of 01:750:441, 442, 443, 444.

An alternate curriculum is available for students who did not begin with the Honors Physics sequence:

- First year: 01:750:123-124; 01:640:151-152.
- Second year: 01:750:227-228, 229-230, 341, 381-382; 01:640:251, 244.
- Third year: 01:750: 342, 361, 385-386, 351; 01:750:345, 346.
- Fourth year: 01:640:423 or 421 and at least two courses out of 01:750:441, 442, 443, 444.

Students who took 01:750:203-204 (or 201-202) as their introductory physics sequence should consult a departmental adviser to plan an appropriate curriculum for the astrophysics major.
Major in Physics

**Physics Major Requirements ¿ four options:**

For the major in physics there are four options available:

- The Professional Option is a thorough introduction to the subject for all those who expect to make physics an important component of their career. It may lead to careers in research, technical development, or education in physics or related fields. It provides suitable preparation for Ph.D. study in physics.
- The Applied Option is intended for students who wish to work in industry without graduate studies in physics. The required courses give a breadth of knowledge in technical fields rather than specialized preparation for Ph.D studies in physics or astrophysics.
- The General Option is for students who have an interest in physics or astronomy but do not expect to do graduate work in physics or astrophysics. It is suitable preparation for careers in education, medicine, law, and business, and is particularly appropriate in an interdisciplinary course of study. A well-balanced sequence of natural science electives should be chosen in consultation with an adviser in the department.
- The Planetary Physics Option is for students who wish to pursue a career in physics applied to the study of Earth and other planets. Students will receive a firm foundation in physics. They will receive a broad exposure to planetary physics by taking a course in each of the three fields of concentration: geophysics, atmospheric physics, and ocean physics and will take three courses in their area of concentration.

Prospective majors should consult the Physics and Astronomy Undergraduate Program Director before choosing their courses.

**Professional Option (Bachelor of Science)**

Required courses and suggested curricula for honors students and other well-prepared students:

- First year: 01:750:271-272, 275-276; 01:640:151-152.
- Second year: 01:750:273, 326, 327, 381-382, 351; 01:640:251, 244.
- Third year: 01:750:361, 385-386, 387 or 388; 01:640:423 or 421.
- Fourth year: At least three courses out of 01:750:305, 406, 417, 418, 421, 431, 441, 442, 443, 444, 451, 464. At least one of those three courses must be taken from 305, 406, 417, 418.

An alternate curriculum is available for students who did not begin with the Honors Physics sequence:

- First year: 01:750:123-124; 01:640:151-152.
- Second year: 01:750:227-228, 229-230, 381-382; 01:640:251, 244.
- Third year: 01:750:361, 385-386, 326, 327, 351.
- Fourth year: 01:750:387 or 388, 01:640:423 or 421, and at least three courses out of 01:750:305, 406, 417, 418, 421, 441, 442, 443, 444, 451, 464. At least one of those three courses must be taken from 305, 406, 417, 418.

Students who took 01:750:203-204 (or 201-202) as their introductory physics sequence or have AP credit should consult a departmental adviser to plan an appropriate curriculum for the professional physics major.

**Applied Option (Bachelor of Science)**

- Introductory physics sequence: 01:750:123, 124, 227, 228, 229, 230 or 01:750:271, 272, 273, 275, 276
- Calculus: 01:640:CALC1, CALC2, CALC3, CALC4
- Computing: 01:198:107 or 01:198:111 or 14:440:127
- Physics: 01:750:323 or 381, 324 or 385, 326, 327, 305, 351, 313 or 361
- Senior Lab: 01:750:387 or 388 or 389
- Seven credits consisting of courses in engineering, chemistry or another physical science chosen in consultation with a departmental adviser to form a coherent concentration in a physics-related applied area.
- Six credits in natural science electives chosen in consultation with a departmental adviser to form a coherent concentration in a physics-related applied area. With the approval of the department, three of these credits may be for a department-sponsored outside internship.

A grade-point average of at least a C in the courses applied toward the major is required for graduation in the applied option.

Students who took 01:750:203-204 (or 201-202) as their introductory physics sequence or have AP credit should consult a departmental adviser to plan an appropriate curriculum for the professional physics major.

**General Option (Bachelor of Arts)**

- Introductory courses: 01:750:203-204 (or any other equivalent sequence) and laboratory 205-206 (or 229-230 or 275-276).
- Calculus: 01:640:CALC1, CALC2 (01:640:152 preferred.)
- Advanced courses: Six advanced physics courses including 01:750:313, 323, 324; two lab courses either 01:750:326 and 327 or 345 and 346, and one additional 300- or 400-level physics course (except 490-level). It is recommended, but not required, that this course be chosen from the following list: 01:750:301, 305, 341, 342, 397.
- Electives: 18 additional credits with grades of C or better in natural science or mathematics chosen in consultation with a departmental adviser to form a coherent sequence.

At least a C average in the physics and mathematics courses is required for admission, retention, and graduation in the general option. Four of the six advanced physics courses must be taken at Rutgers- New Brunswick.

**Planetary Physics Option (Bachelor of Science)**

- Introductory physics sequence: 01:750:123, 124, 227, 228, 229, 230 or 01:750:271, 272, 273, 275, 276
- Calculus: 01:640:CALC1, CALC2, CALC3, CALC4
- Computing: 01:198:107 or 01:198:111 or 14:440:127
- Physics: 01:750:323, 324; 326 and 327 or 345 and 346; 351; 305 or 342
- Planetary Physics: 01:460:442, 11:628:451, 11:670:323
- Nine credits in a field of concentration (geophysics, atmospheric physics, or ocean physics) chosen in consultation with an advisor in the field of concentration

A grade-point average of at least a C in the courses applied toward the major is required for graduation in the planetary physics option.

Physics 750 (SAS)

# Minor Requirements

# Minor Requirements

The department offers two minors--one in physics and one in astronomy.

**The following courses are required for the Physics Minor:**

- 01:750:203-204 (or equivalent)
- 01:750:205-206 (or 01:750:229-230 or 01:750:275,276)
- Twelve credits of 300- or 400-level physics courses. Recommended courses include 01:750:301, 01:750:305, 01:750:313, 01:750:323-324, 01:750:341, 01:750:342, 01:750:397.

The grade-point average for all courses applied toward the minor must be at least 2.0. Note that 300-level physics courses require 01:640:152 as a pre-requisite. No more than one D grade may be applied toward the minor. Three of the four advanced physics elective courses must be taken at Rutgers University-New Brunswick. No credits may be used from {01:750:491, 01:750:492, 01:750:493, 01:750:494, 01:750:495, 01:750:496, 01:750:497, 01:750:498} in any requirements or conditions.

**The following courses are required for the Astronomy Minor:**

- 01:750:203-204 (or equivalent)
- 01:750:205-206 (or 01:750:229-230 or 01:750:275,276)
- 01:750:341, 01:750:342
- Six credits of 300- or 400-level physics courses. Recommended courses include 01:750:345, 01:750:346, 01:750:441, 01:750:442, 01:750:443, 01:750:444.

The grade-point average for all courses applied toward the minor must be at least 2.0. Note that 300-level physics courses require 01:640:152 as a pre-requisite. No more than one D grade may be applied toward the minor. Three of the four 300-level courses must be taken at Rutgers-New Brunswick.

Physics majors or minors who also wish to minor in astronomy must complete 01:750:341, 01:750:342, 01:750:345, and 01:750:346. These courses may not also be used to satisfy requirements for the major or minor in physics. Astronomy or Astrophysics majors cannot major or minor in Physics.

Physics 750 (SAS)

# Departmental Honors Program

# Departmental Honors Program

The chairperson of the department will invite physics and astrophysics majors who have shown considerable ability by the end of their junior year to participate in the departmental honors program. Candidates for honors take a 2-semester honors research course, write a thesis, and conduct a seminar on a project undertaken in the senior year. Honors are awarded on the basis of the excellence of the honors project, general performance in physics and astronomy courses, and recommendations of the faculty.

More information about the undergraduate program is available at the department's website.

Physics 750 (SAS)

# Courses without Prerequisites

# Courses without Prerequisites

The following courses have no prerequisites in physics or mathematics. Most are relatively non-mathematical

- Concepts of Physics for Humanities and Social Science Students (01:750:106) discusses fundamental concepts of physics from a historical, sociological, and religious point of view.
- Astronomy and Cosmology (01:750:109,110) are descriptive courses designed for nonscientists, requiring only minimal high school mathematics. Either may be taken without taking the other.
- The Greenhouse Effect (01:750:140) is concerned with the scientific aspects of global warming. It is intended for liberal arts majors and is closed to natural science majors.

Physics 750 (SAS)

# Introductory Courses for non-Physics and Astronomy Majors

# Introductory Courses for non-Physics and Astronomy Majors

There are three introductory sequences for majors in the biological sciences (including pre-health professional curricula), computer science, chemistry, and other sciences, as well as for students who desire an elementary but thorough introduction to physics. All three cover basically the same material but utilize different teaching techniques.

- General Physics - 2 semester sequence. 01:750:203-204 (lectures + recitations) 01:750:205-206 (laboratory). Pre-requisite: pre-calculus or calculus. Fulfills all the physics requirements for science majors, as well as admission to health profession schools and graduate schools. Not recommended for BS Physics or Astrophysics majors.
- Extended General Physics - 2 semester sequence. 01:750:201-202 (lectures + recitations + laboratory). Pre-requisite: pre-calculus or calculus. Identical content as General Physics. Intended for science, science teaching, and pre-health profession majors with a nontraditional background or who would benefit from additional support.
- Physics for the Sciences - 2 semester sequence. 01:750:193-194 (integrated lectures + recitations + laboratory) with an emphasis on scientific reasoning and experimental design. Pre-requisite: pre-calculus or calculus.

Elements of Physics - 1 semester course. 01:750:161. Pre-requisite: pre-calculus or calculus. Primarily for School of Pharmacy students; students from other schools should contact the Physics and Astronomy Undergraduate Program Director before registering. Does not meet requirements for SAS or SEBS majors.

Physics 750 (SAS)

# Introductory Courses for Prospective Physics and Astrophysics Majors and School of Engineering

# Introductory Courses for Prospective Physics and Astrophysics Majors and School of Engineering

Analytical Physics sequence:

- Extended Analytical Physics (01:750:115,116) - first 2 semesters of 4-semester sequence with calculus. For students placed in pre-calculus. Primarily for Engineering majors and physics and astrophysics majors with limited high school physics.
- Analytical Physics (01:750:123,124) - first 2 semesters of 4-semester sequence with calculus. For students placed in calculus. Primarily for Engineering majors and physics and astrophysics majors with limited high school physics.
- Analytical Physics 01:75:227,228 and 01:750:229,230 labs. Final 2 semesters of 4 semester sequence with. Pre-requisites: 01:750:116 or 124 and 01:640:152; co-req: 01:640:Calc3.

Honors Physics sequence

- Honors Physics 01:750:271, 272, 273 and 275,276 labs. 3-semester sequence for Honors Engineering students and physics and astrophysics majors with strong high school physics background and permission of the undergraduate program director. Co-requisite in first semester is 01:640:Calc1; students required to progress through the calculus sequence

If there is any doubt about which sequence to take, please contact the Physics and Astronomy Undergraduate Program Director for advising. If a course is taken in one of these sequences, credit cannot also be given for a course (in another sequence) that covers substantially similar topics. Students who wish to switch from one sequence to another should consult the Physics and Astronomy Undergraduate Program Director for advising, as should students who change their major or who have advanced standing.

Physics 750 (SAS)

# Courses

# Courses

**01:750:106** ***Concepts of Physics for Humanities and Social Science Students (3)***
Concepts of physics and astronomy in their scientific, social, historical, and current technological context, with no mathematical problem solving. How the physical universe works, from mechanics and the solar system to relativity, quantum behavior, and the big bang. Contributions of scientists from Aristotle, Galileo, and Newton through Einstein, Bohr, and up to the present time.
***May not be taken for major or minor credit.***

**01:750:109,110** *Astronomy and Cosmology (3,3)*
Predominantly descriptive introduction to current ideas concerning the nature and origin of the earth, the solar system, the galaxy, and the universe; neutron stars and black holes; the big-bang; the possibility of life outside the earth. 109: Development of our understanding of the solar system from the time of the Greeks to the present day. 110: Current understanding of stars, galaxies, and the universe.
*For nonscience majors. No prerequisite. May not be taken for major credit. Courses are independent and may be taken in either order or concurrently.*

**01:750:115-116** *Extended Analytical Physics I (3,3)*
Together with 01:750:227, 228 forms a thorough introductory sequence. First semester: graphs, orders of magnitude, units, dimensions, errors and precision, review of mathematics useful to physics, kinematics, vectors, force, and Newton's laws. Second semester: energy, momentum, rotational motion, oscillations, liquids, and thermal physics, including the laws of thermodynamics and the kinetic theory of gases.
*Lec. 2 hrs., workshop 3 hrs. Corequisites: 01:640:112 or 115 (first semester), 01:640:CALC1 (second semester). Prerequisites: 01:750:115 or 01:750:123 for second semester 01:750:116. Sequence 01:750:115-116 is equivalent to 01:750:123-124, if both 01:750:115 and 116 are taken. Intended for engineering and physics majors who need extra help in preparing for 01:750:227, 228.*

**01:750:120** *Analyzing the X-Ray Universe (3)*
Astrophysical analysis of stellar properties and evolution; hands-on techniques for understanding cosmic x-ray sources, utilizing NASA data archives. Online course. This course is currently not offered.
*Prerequisite: 01:640:112 or higher or placement.*

**01:750:123-124** *Analytical Physics I (2,2)*
Forms a thorough introductory sequence together with 01:750:227, 228. Kinematics, dynamics, energy, momentum, angular momentum, heat, and kinetic theory.
*Lec. 1 hr., rec. 1 hr. Corequisites: 01:640:151-152. Primarily for engineering and physics majors. This course should be followed by 01:750:227, 228 (or 204 if changing major). Prerequisites: 01:750:115 or 01:750:123 for second semester 01:750:124*

**01:750:140** *The Greenhouse Effect (3)*
Physical and chemical bases of the "greenhouse effect" and its global impact: biological, climatic, economic, and political. Reducing the emission of "greenhouse" gases; nuclear energy, and other alternative energy sources.
*For nonscience majors; may not be taken for major or minor credit in science or engineering. Credit not given for both this course and 01:160:140, 01:450:140, or 01:556:140.*

**01:750:155** *Introduction to Research and Research Communities in Physics & Astronomy (1.5)*
Introduction to research and research communities in Rutgers Physics & Astronomy for first year students.

Requires special permission of undergraduate program director. For first-year prospective physics and astrophysics majors.

**01:750:161** *Elements of Physics (4)*
Survey of major topics in physics, such as motion, fluids, waves, electricity, electrical circuits, radioactivity, relativity, and atomic structure, with emphasis on developing laboratory and problem-solving skills.
*Lec. 3 hrs., workshop/lab. 3 hrs. Prerequisite: 01:640:112 or 115. Primarily for pharmacy students*

**01:750:193-194** *Physics for the Sciences and Physics for the Sciences Laboratory (4,4)*
Introduction to physics with biological, ecological, and chemical applications. Selected topics in mechanics, thermodynamics, fluids, waves, electricity, magnetism, optics, and modern physics. Integrated laboratory experiments.
*Lec. 2 hrs., workshop 1.5 hrs., lab. 3 hrs. Prerequisite for 01:750:193: 01:640:112 or 115 or equivalent. Prerequisite for 01:750:194: 750:193. Credit not given for more than one of 01:750:203, 01:750:193, or 01:750:201. Credit not given for more than one of 01:750:204, 01:750:194, or 01:750:202.*

**01:750:201-202** *Extended General Physics and Extended General Physics Laboratory (5,5)*
Elementary but detailed analysis of fundamental topics. First semester: review of mathematical skills useful for physics, vectors, kinematics; Newton's laws including gravitation, conservation laws, fluids, thermal physics. Second semester: electricity and magnetism, geometrical and wave optics, relativity and modern physics.
*Two 80-min. lecs., one 80-min. workshop, lab. 3 hrs. Prerequisites: 01:640:112 or 115. Sequence 01:750:201-202 is an integrated program equivalent to 01:750:203-204 and 01:750:205-206. Intended for science, science teaching, and prehealth profession majors with a nontraditional background or who would benefit from additional support. Credit not given for more than one out of 01:750:203, 01:750:193, or 01:750:201. Credit not given for more than one of 01:750:204, 01:750:194, or 01:750:202.*

**01:750:203-204** *General Physics (3,3)*
Elementary but detailed analysis of fundamental topics: motion, gravitation, momentum, energy, electromagnetism, waves, heat, kinetic theory, quantum effects, and atomic and nuclear structures.
*Lec. 2 hrs., rec. 1 hr. Corequisites: 01:750:205-206. Primarily for students in scientific curricula other than physics. Credit not given for more than one out of 01:750:203, 01:750:193, or 01:750:201. Credit not given for more than one of 01:750:204, 01:750:194, or 01:750:202.*

**01:750:205-206** *General Physics Laboratory (1,1)*
Laboratory to complement 01:750:203-204.
*Corequisites: 01:750:203-204.*

**01:750:227** *Analytical Physics IIA (3)*
Electrostatics, particles in electric and magnetic fields, electromagnetism, circuits, Maxwell's equations, electromagnetic radiation.
*Prerequisites: [(01:750:116 or 01:750:124) and (01:640:152)]. Corequisite: (01:640:251 or 01:640:291) and (01:750:229). Primarily for engineering and physics majors.*

**01:750:228** *Analytical Physics IIB (3)*
Waves and optics, relativity, quantum properties of electrons and photons, wave mechanics, atomic, solid state, nuclear, and elementary particle physics.
*Prerequisite: [(01:750:227 or 204 or 272) and (01:640:152)]. Corequisite: 01:750:230. Primarily for engineering and physics majors.*

**01:750:229-230** *Analytical Physics II Laboratory (1,1)*
Laboratory to complement 01:750:227 and 228.
*Corequisites: 01:750:227 and 228.*

**01:750:271-272** *Honors Physics I,II (3,3)*
Introduction to classical physics, covering mechanics, fluids, thermodynamics, waves, electricity, magnetism, and optics.
*Prerequisites: For 272: 01:640:151 or higher and 750:271. Corequisites: For 271: 01:640:151 or higher and 01:750:275; For 272: 01:640:152 or higher and 01:750:276. Special permission of the SOE Honors Dean or Physics & Astronomy Undergraduate Program Director required.*

**01:750:273** *Honors Physics III (3)*
Relativity, wave, and quantum properties of photons and electrons; the structure of atoms, molecules, and solids; nuclear physics; elementary particles.
*Prerequisites: 01:750:272 and 01:640:152. Special permission of the SOE Honors Dean or Physics & Astronomy Undergraduate Program Director required.*

**01:750:275,276** *Classical Physics Laboratory (1,1)*
Experiments in classical physics.
*Prerequisite: 01:750:275 (for 276). Prerequisite: Enrollment in an honors program or permission of the department. For physics majors and honors students. Corequisites: 01:750:271 (for 275); 01:750:272 (for 276).*

**01:750:301** *Physics of Sound (3)*
Scientific basis of sound: waves, vibrating systems, normal modes, Fourier analysis and synthesis, perception and measurement of sound, noise, musical instruments, room acoustics, sound recording and reproduction, electronic synthesizers, and digital sound.
*Prerequisites: Two semesters of introductory physics and two semesters of calculus. Primarily for science majors.*

**01:750:305** *Modern Optics (3)*
Geometrical optics; electromagnetic waves and the wave equation; superposition, interference, diffraction, polarization, and coherence; holography; multilayer films, Fresnel equations; blackbody radiation, Einstein coefficients, and lasers; waveguides and fiber optics; and optical properties of materials.
*Prerequisites: 01:640:CALC3; 01:750:227 or 272.*

**01:750:313** *Modern Physics (3)*
Relativistic mechanics, wave and quantum properties of photons and electrons; Schrödinger equation and its application to the structure of atoms, molecules, and solids; nuclear physics; elementary particles.
*Prerequisites: 01:640:CALC2; 01:750:202 or 204 or 228.*

**01:750:323-324** *Advanced General Physics (3,3)*
For students in the general physics program and others who wish a course in classical mechanics (323) and a course in electromagnetism (324) beyond the introductory level.
*Prerequisites: 01:750:202 or 204 or 228 and 01:640:CALC2 (for 01;750:323); 01:750:323 or 381 (for 01:750:324).*

**01:750:326** *Computer-Based Experimentation and Physics Computing (4)*
Experiments in mechanics, electromagnetism, and modern physics, emphasizing error analysis. Uses the computer as a laboratory tool for symbolic manipulation, data collection, data analysis, simulation, and report writing.
*Prerequisites: ((01:750:202 or 01:750:204) and 01:750:206) or (01:750:228 and 01:750:230) or (01:750:276).*

**01:750:327** *Modern Instrumentation (3)*
Theory and use of integrated circuits and their interconnection to produce measuring devices, control apparatus, and interfaces for such devices to microcomputers.
*Prerequisites: ((01:750:202 or 01:750:204) and 01:750:206) or (01:750:227 and 01:750:229) or (01:750:272 and 01:750:276) or (01:750:194). Required for physics majors, but also suitable for psychology, biological sciences, and other physical science majors.*

**01:750:341,342** *Principles of Astrophysics (3,3)*
Properties and processes of the solar system, the stars, and the galaxies; origin of the elements; evolution of the stars and the universe; neutron stars and black holes.
*Prerequisites: For 341: ((01:750:201 or 01:750:203 or 01:750:116 or 01:750:124 or 01:750:271) and 01:640:152). For 342: ((01:750:202 or 01:750:204 or 01:750:228 or 01:750:273) and 01:640:152).*

**01:750:345** *Computational Astrophysics (3)*
Introduction to computational astrophysics, including key algorithms, their implementation in code, and their application to current research in astrophysics. Extended projects feature analysis of real data and simulations.
*Prerequisites: 01:750:341 or 342.*

**01:750:346** *Observational Astronomy (3)*
Introduction to the tools and techniques of observational astronomy across the electromagnetic spectrum, and to their application in the context of current research in astrophysics. Extended projects offer each student an opportunity to work with astronomical data from at least two wavelength regimes (among radio, optical/infrared, and X-ray), and in the two core modes of astronomical observations (imaging and spectroscopy).
*Prerequisites: 01:750:345*

**01:750:351** *Thermal Physics (3)*
Principles of thermodynamics with physical and chemical applications: energy, entropy and temperature, the three laws of thermodynamics, cycles, open systems, critical phenomena, chemical equilibrium, ideal gas reactions, phase rule, phase diagrams, kinetic theory, and introduction to statistical mechanics.
*Prerequisites: [(01:640:CALC3 and 01:750:227 or 01:750:272)]*

**01:750:361** *Quantum Mechanics and Atomic Physics (3)*
Introductory quantum mechanics: matter waves, uncertainty principle, stationary states and operators; the Schrödinger equation and its solutions for simple potentials; the hydrogen atom, quantization of angular momentum, spin; complex atoms and molecules.
*Prerequisites: 01:640:CALC4; 01:750:228 or 273.*

**01:750:368** *Physics and Astronomy Junior Seminar (1)*
Development of communication skills needed by professionals in physics and related fields. Oral and written reports, discussions of topics of current interest, and career options.

For physics and astrophysics majors only. May not be taken for major or minor credit.

**01:750:381-382** *Mechanics (3,3)*
Intermediate treatment of Newtonian mechanics, including particle dynamics, rigid body motion, accelerated and rotating reference frames, and Lagrange's and Hamilton's equations.
*For 381: Prerequisites: 01:750:124 or 01:750:203 or 01:750:271; two semesters of calculus. Corequisite: 01:640:CALC3 or permission of instructor. For 382: 01:750:381. A theoretical course, primarily for physics and astrophysics majors.*

**01:750:385-386** *Electromagnetism (3,3)*
Intermediate course for physics majors and others who wish a thorough discussion of the fundamental laws of electromagnetism; electric and magnetic fields; dielectric and magnetic materials; DC and AC circuits; Maxwell's equations; and electromagnetic radiation.
*Prerequisites: For 385: 01:640:CALC3; 01:750:227 or 272 or 324; or permission of instructor. For 386: 01:750:385. A theoretical course, primarily for physics majors.*

**01:750:387-388** *Experimental Modern Physics (3,3)*
Experiments in atomic, nuclear, condensed matter, and surface physics.
*Prerequisites: 01:750:326 and 01:750:327 and (01:750:313 or 01:750:361 or 01:750:417). Credit not given for both 01:750:387 and 01:750:389.*

**01:750:389** *Experimental Applied Physics (3)*
Experiments in classical and modern physics emphasizing techniques useful for applications.
*Prerequisites: 01:750:326, 327. Corequisite: 01:750:313 or 361 or permission of instructor. Credit not given for both 01:750:387-388, and 389.*

**01:750:397** *Physics of Modern Devices (3)*
Physical laws and principles underlying modern devices and processes; examples including motors, generators, refrigerators, vacuum tubes, transistors, radio and television receivers, computers, rockets, nuclear reactors, radiation detectors, lasers, and holograms.
*Prerequisites: Two semesters of introductory physics and a course in calculus.*

**01:750:406** *Introductory Solid State Physics (3)*
Fundamental properties of metals, insulators, and semiconductors; dielectrics; magnetism; and superconductivity.
*Prerequisites: (01:750:361 or 01:750:417) and 01:750:386.*

**01:750:417** *Intermediate Quantum Mechanics (3)*
Vector space formulation, operators, eigenfunctions, bound states, angular momentum, central potentials, approximation methods, scattering.
*Prerequisite: 01:750:361.*

**01:750:418** *Nuclei and Particles (3)*
Nuclear forces and models; classification and interactions of elementary particles.
*Prerequisite: 01:750:361.*

**01:750:421** *Introduction to Quantum Computing (3)*
Introduction to quantum computing including qubits, entanglement, quantum gates, quantum algorithms, applications to quantum chemistry and quantum information theory.
*rerequisites: (01:750:228 or 01:750:273) and (01:640:244 or 01:640:250 or 01:640:252).*

**01:750:431** *Introduction to Computational Biology for Physicists (3)*
Introduction to analytical and computational methods applied to biological data and phenomena. Concepts of biology explained using techniques from physics, such as partition functions, mean field theory, and fixed point theory. Methods such as Bayesian analysis, parametric and nonparametric tests, sequence alignment, phylogenetic analysis, pattern recognition, and neural networks applied to big data to solve problems of current research interest using Matlab programming.
*Prerequisites: (01:750:202 or 01:750:204 or 01:750:227 or 01:750:272) and 01:640:244. Corequisite: 01:750:351.*

**01:750:441** *Stars and Star Formation (3)*
Observed properties of stars. Internal structure of stars, energy generation and transport, neutrinos, solar oscillations. Evolution of isolated and double stars, red giants, white dwarfs, variable stars, supernovae. Challenges presented by formation of stars, importance of magnetic fields. Pre-main sequence stellar evolution.
*Prerequisites: 01:750:342 or (01:750:351 and 01:750:361).*

**01:750:442** *High Energy Astrophysics and Radiative Processes (3)*
Radiation and scattering processes in plasma. Detection of X and gamma rays. Supernovae and remnants, pulsars. Gamma-ray bursts, accretion disks, and binary star outbursts. Quasars and active galactic nuclei, cosmic rays.
*Prerequisites: 01:750:342 or (01:750:361 and 01:790:386).*

**01:750:443** *Galaxies and the Milky Way (3)*
Properties of galaxies: photometry, kinematics, and masses. Disk galaxies: spiral patterns, bars and warps, gas content, star formation rates, chemical evolution. Elliptical galaxies: shapes. Structure of the Milky Way. Nature of dark matter.
*Prerequisites: (01:750:342) or [(01:750:351 and 01:750:361 and 01:750:381)].*

**01:750:444** *Introduction to Cosmology (3)*
Expansion of the universe, techniques for distance estimation. Large-scale structure of the universe. Cosmological models: open, closed, flat, and accelerating universes. Microwave background: observations, properties, and origin. Problems of standard cosmology and preliminary concept of inflation.
*Prerequisites: (01:750:341 and 342) or (01:750:351 and 361).*

**01:750:451** *Physical Oceanography (4)*
Principles of ocean physics. Mass, momentum, heat, and freshwater conservation and atmospheric exchange. Influence of Earth's rotation. The ocean's role in climate. Tides, waves, and currents. Effects of ocean circulation on its biology and chemistry.
*Two 80-min. lecs., one 55-min. rec. Prerequisite: 01:750:204. Credit not given for both this course and 11:628:451 or 16:712:501.*

**01:750:464** *Mathematical Physics (3)*
Physical applications of linear algebra, the exterior calculus, differential forms, complexes and cohomology. Applications include Hamiltonian dynamics, normal mode analysis, Markov processes, thermodynamics, Schrödinger's equation, special relativity, electrostatics, magnetostatics, Maxwell's equations, and wave equations.
*Prerequisite: 01:640:423 or equivalent.*

**01:750:487,488** ***Special Topics in Physics (BA, BA)***
Study of selected areas in physics.
***Special permission of Physics & Astronomy Undergraduate Program Director required. The number of credits will be determined when the course is scheduled.***

**01:750:491,492** ***Research in Physics (BA,BA)***
Independent research supervised by a member of the department.
***Prerequisite: Permission of instructor.***

**01:750:493,494** ***Independent Study in Physics (1-4,1-4)***
Independent study supervised by a member of the department.
***Prerequisite: Permission of instructor.***

**01:750:495,496** ***Honors in Physics (1-4,1-4)***
Supervised independent research or reading in experimental or theoretical physics, culminating in a seminar conducted by the student.
***Prerequisite: Invitation of chair.***

**01:750:497,498** ***Honors in Astronomy (1-6,1-6)***
Supervised independent research or reading in astronomy, culminating in a seminar conducted by the student.
***Prerequisite: Invitation of chair.***

# Life Sciences (SAS)

## LIFE SCIENCES

Division of Life Sciences, School of Arts and Sciences

**Website:** Here

**Dean:** Lori R. Covey

**Director, Office of Undergraduate Instruction:** Martha Haviland

**Chair, Department of Cell Biology and Neuroscience:** Megerditch Kiledjian

**Chair, Department of Genetics:** Tara C. Matise

**Chair, Department of Kinesiology and Health:** Brandon Alderman

**Chair, Department of Molecular Biology and Biochemistry:** Barth Grant

The following majors are available in the Division of Life Sciences:

**Biological Sciences 119**
**Cell Biology and Neuroscience 146**
**Exercise Science 377**

**Genetics 447**
**Molecular Biology and Biochemistry 694**
**Sport Management 955**

Students interested in the life sciences also may consider related tracks within major programs offered by the Department of Chemistry and Chemical Biology (chemical biology option) and the Department of Psychology (specialization in behavioral neuroscience).

The Division of Life Sciences coordinates, fosters, and integrates the instructional and research activities of a broad range of faculty with interests in the biological sciences. The principal units of the division include four departments: Cell Biology and Neuroscience, Genetics, Kinesiology and Health, and Molecular Biology and Biochemistry, as well as two sections, the biological chemistry section of the Department of Chemistry and Chemical Biology, and the biopsychology and behavioral neuroscience section of the Department of Psychology. The division's primary goal is to provide a high caliber of interdisciplinary teaching and research in the life sciences as it trains the next generation of teachers, researchers, and future health professionals.

Instruction in the life sciences has undergone enormous changes over the past 15 to 20 years. These changes reflect the intellectual revolution of the last two decades, as well as technical advances that have expanded greatly the tools available to life scientists. Today, students majoring in the life sciences at Rutgers University-New Brunswick experience an exciting atmosphere of learning that exposes them to the concepts and methods of these intellectual and technological advances. The students have open to them a plethora of learning avenues, ranging from thought-provoking lecture presentations to original and cutting-edge research opportunities in state-of-the-art laboratories. A first-class faculty and modern laboratory equipment reflect the division's commitment to provide its students with the best learning environment.

The division offers a wide spectrum of majors for students interested in the life sciences. These options range from a division-based major in biological sciences, designed to provide a general life sciences education, to department-based majors in cell biology and neuroscience, exercise science, genetics, molecular biology and biochemistry, and sport management aimed at providing specialized training, with a strong emphasis on research. Graduates of the division will be highly competitive for a range of postbaccalaureate opportunities, including graduate education and research, health-professions training, and biomedical and biotechnological research positions, as well as teaching careers in the sciences.

The first two years of the student's tenure at Rutgers is expected to revolve around the life sciences core curriculum, a series of basic offerings designed to provide the general background required for pursuing upper-division courses in any of the individual majors. Regardless of the major chosen, students are encouraged to participate in independent study within a research laboratory in order to take advantage of the rich expertise of the many life sciences faculty in New Brunswick and Piscataway. The exercise science and the sport management majors require an internship experience. The division also has a highly developed advising system, with dedicated and knowledgeable faculty advisers available to work with individual students in their selection of courses, completion of major requirements, and preparation for future careers.

Students may not major in more than one of the following majors in the Division of Life Sciences: Biological Sciences (119), Cell Biology and Neuroscience (146), Exercise Science (377), Genetics (447), Molecular Biology and Biochemistry (694), or Sport Management (955). Furthermore, students majoring in one of these four majors may not minor in Biological Sciences (119). Life science majors or minors may not be combined as double majors or as major/minors with Biomathematics (122), Biochemistry (115), or Microbiology (680).

No more than 16 credits from among the life science courses required for completion of any Division of Life Sciences major may be fulfilled by credits transferred from any school outside of Rutgers-New Brunswick.

For additional information and announcements about the Division of Life Sciences, please visit the division's website.

Life Sciences (SAS)

# Life Sciences Core Curriculum

# Life Sciences Core Curriculum

The life sciences core curriculum is a set of courses that include a series of introductory- and intermediate-level courses in the physical and life sciences forming a foundation of knowledge necessary to understand modern biology and to prepare for the more advanced courses required for each major. Following are core courses:

1. 01:119:115-116 General Biology (4,4)

2. 01:119:117 Biological Research Laboratory (2)

3. 01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)

4. 01:160:171 Introduction to Experimentation (1)

5. 01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)

6. 01:160:311 Organic Chemistry Laboratory (2)

7. 01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics (3,3)*

8. 01:750:205-206 General Physics Laboratory (1,1)*

9. 01:640:135,136 Calculus for the Life and Social Sciences (4,4) or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)**

10. 01:447:380 Genetics (4)***.

*01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

**Basic Statistics for Research (01:960:401, 3 credits), Basic Probability and Statistics (01:960:379, 3 credits), or Statistics I and II (01:960:211 and 212) may be substituted for the second semester of Calculus.

***Students majoring in genetics must take 01:447:384-385 (4,4) instead of 01:447:380

Life Sciences (SAS)

# Biological Sciences 119

# Biological Sciences 119

**Website:** Here

**Director:** Martha Haviland

**Director of Advising:** Anne Carr-Schmid

**Teaching Professor:**

Martha B. Haviland, B.A., Rutgers; M.S., A.M., Ph.D., Michigan[AC1] [SB2]

**Associate Teaching Professor:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Daniel Stern Cardinale, B.S., College of New Jersey; Ph.D., Rutgers

Monica S. Torres, B.S., National University of La Plata (Argentina); M.S., Ghent (Belgium); Ph.D., Rutgers

**Assistant Teaching Professors:**

Christy A. Beal, B.S., Rutgers; M.S., Ph.D., Delaware

Cominski, Tara, B.S., St. Peter's; M.S., Seton Hall; Ph.D. Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin (Stevens Point); M.S., Kansas State; Ph.D., Wisconsin (Madison)
Anne Keating, B.S., M.S., Ph.D., Rutgers

Lu, Haiyang, B.S., Hebei Univ. (China); M.S., Beijing Normal Univ. (China); Ph.D. City Univ. of NY

Nelson, Cassandra, B.S., Marquette; M.S., Indiana University School of Medicine; Ph.D., Marquette

Soliman, Mai, B.S., M.Sc. Montclair State; Ph.D., Rutgers

Gregg Transue, B.S., Pennsylvania State; M.S., Ph.D., Rutgers

Anthony J. Uzwiak, B.A., Ph.D., Rutgers

Villegas, Gabriel, B.A., Ph.D., Rutgers

Walczak, Alexandra, B.S., Ramapo College, Ph.D., Rutgers

Yu, Calvin, B.A. Skidmore; M.A., New York University; Ed.M. Rutgers


- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Minor Requirements

- Independent Study and Research in Biology
- Departmental Honors Program
- Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)
- Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)
- Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)
- Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)
- Courses

Life Sciences (SAS)

# Learning Goals

# Learning Goals

Our overarching goal for educating our students majoring in biological sciences is to inspire them to want to discover and understand the natural world. In the process of achieving this goal, we expect our students to acquire not only facts and concepts, but also skills and perspectives. We hope that our learning goals will both prepare our students for a variety of career objectives and supply them with the tools to become lifelong learners in the ever-evolving world of biological sciences.

*Learning Goals:*

I. To acquire the appropriate factual and conceptual knowledge that provides students with a foundation to further their education and career in the areas of life science or health science. Students will be able to demonstrate basic knowledge (e.g., identify, define, explain, etc.) of the concepts, practices, and principles that comprise the biological sciences.

II. To develop data analysis and statistical reasoning skills that prepare students for a society increasingly reliant on the use of data and information. Students will be able to interpret/evaluate patterns in data presented in tables, figures, and graphs, as well as be able to organize, summarize, and present data.

III. To develop the ability to use scientific reasoning as embodied by the structured process commonly known as the scientific method to empower students with the ability to generate and refine knowledge. Students will be able to evaluate and apply the practice of science.

IV. To develop critical thinking and problem-solving skills necessary to prepare students to evaluate, synthesize, and generate knowledge that provides them with a competitive advantage to adapt to an evolving, global, and knowledge-based society. Students will be able to demonstrate application of higher-order thinking (e.g., classify, diagnose, evaluate, synthesize, hypothesize, etc.). Students will develop an understanding of not only the connections within biology, but also the connections between biology and other scientific disciplines.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in biological sciences must have completed two semesters of General Biology and Biological Research Laboratory with a grade of C or better in each course. Both semesters of General Biology must have been completed at the same institution or on the same campus at Rutgers. No more than two courses with a grade of D may be used to fulfill the requirements of the major. A 2.0 grade-point average must be maintained in the life sciences core and elective courses applied toward the major. Students must meet with an adviser before they can successfully declare their major.

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The program in biological sciences, administered through the Division of Life Sciences Office of Undergraduate Instruction, is intended to provide a broad and comprehensive training in modern biology. This course of study is recommended for those who wish to study biology as part of their liberal arts education, preparing them for a career in one of the health professions, graduate studies in biology, a teaching career in secondary schools (courses in education also are required), as well as employment in various areas of the life sciences. If a student wishes to concentrate his or her studies in a specific area of biology, he or she should consider a major offered by one of the departments in the Division of Life Sciences or in the School of Environmental and Biological Sciences. Faculty advisers are available to assist each student with course selection and program requirements.

A minimum of 20 credits of coursework from among general biology, genetics, and life sciences electives must be completed in residence. In other words, no more than 16 credits in this part of the major requirements may be transferred from any institution outside of Rutgers University-New Brunswick. This rule is intended to assure that students receiving degrees from Rutgers-New Brunswick have taken a minimum number of courses in their major with this faculty. Please keep in mind that although a course may transfer from another institution into one of the Rutgers-New Brunswick schools, it will not necessarily be accepted toward the major in biological sciences. Therefore, all transfer courses must be evaluated and accepted by the advising office of the Office of Undergraduate Instruction in order to count toward the major. As indicated earlier, students must complete both semesters of general biology at the same institution or on the same campus of Rutgers before becoming eligible to declare the biological sciences major. Any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation. Credits for cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major.

The course requirements for the biological sciences major are divided into two sections: the life sciences core courses and the life sciences electives.

*Required Life Sciences Core Courses (47 credits)*

01:119:115-116 General Biology I,II (4,4)
01:119:117 Biological Research Laboratory (2)
01:160:161-162 General Chemistry (4,4) or 01:160:163-164 Honors General Chemistry (4,4) or 01:160:165-166 Extended General Chemistry (4,4)
01:160:171 Introduction to Experimentation (1)
01:160:307-308 Organic Chemistry (4,4) or 01:160:315-316 Honors Organic Chemistry (4,4)*
01:160:311 Organic Chemistry Laboratory (2)
01:750:203-204 General Physics (3,3) or 01:750:271-272 Honors Physics***
01:750:205-206 General Physics Laboratory (1,1)***
01:640:135,~~138~~136 Calculus for the Life and Social Sciences (4,4)** or 01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)
01:447:380 Genetics (4)
* With approval from a Biological Sciences Advisor, 01:160:308/316 may be replaced by another elective course. Please meet with an Advisor to discuss.

**01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).
***Calculus II 01:640:13~~8~~6(4) may be substituted by 01:960:379 Basic Probability and Statistics (3), 01:960:401 Basic Statistics for Research (3), or 01:960:211-212 Statistics I,II (3,3).

*Life Sciences Electives (24 credits)*

It is highly recommended that students meet with a life sciences adviser in the Division of Life Sciences Office of Undergraduate Instruction when planning their elective courses. It is important that the courses taken complement each other as much as possible and are not merely a collection of unrelated topics.

The electives must include at least three laboratory courses, only one of which may be satisfied by research work. Biological Research Laboratory and "library research" do not qualify for this requirement. A minimum of six courses (18 credits) must be at the 300 or 400 level, including at least three separate laboratory courses or three courses with a laboratory component. The laboratory associated with genetics (01:447:382 or equivalent), if taken, may be used to satisfy one of the three laboratory requirements.

No course at the 100 level may be used to satisfy the life sciences elective requirements. A maximum of 6 credits of independent study/research/honors research may be used toward the 24 elective credits. Please keep in mind that a minimum grade-point average of 2.8 is required to enroll in an independent study/research course in biological sciences. Research courses can satisfy only one of the three laboratory requirements, regardless of number of credits. Courses taken on a pass/fail basis may not be used to satisfy requirements for the major in biological sciences. A grade-point average of 2.0 or better in courses credited toward the major is required. No more than two courses with a grade of D may be used to fulfill the requirements of the major.

The elective courses must include at least one course (3 or 4 credits) each from the Departments of Cell Biology and Neuroscience 146, Genetics 447, Molecular Biology and Biochemistry 694, and Ecology, Evolution, and Natural Resources 11:216 at the School of Environmental and Biological Sciences. A list of approved courses in subject areas in addition to those in the Division of Life Sciences (Biological Sciences 119, Cell Biology and Neuroscience 146, Genetics 447, and Molecular Biology and Biochemistry 694) will be published by the advising office of the Office of Undergraduate Instruction. It is strongly recommended that students consult this list, which is available

on the website, prior to registering for their courses. Generally, acceptable courses from other departments on any campus of Rutgers University have a year of general biology as a prerequisite; however, there are exceptions. It is imperative for students to consult the published list and meet with an adviser. Credits from cooperative education and Winter Session courses (exceeding 1 credit) may not be used to satisfy requirements for the major in biological sciences. To be applied to the major, Summer Session courses must be offered over a minimum of five weeks if double majoring with another permitted life sciences major, at least four of the 3-4 credit life science courses applied to the Biology major may not overlap with courses used to fulfill second major requirements. Given that biological sciences is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life sciences courses applied to the major in biological sciences should be taken within 10 years of graduating. Returning students must meet with their adviser to discuss their path to graduation.

Life Sciences (SAS)

# Minor Requirements

# Minor Requirements

The minor requires four courses of at least 3 credits each in life sciences subjects as well as General Biology and Biological Research Laboratory. Both semesters of General Biology must be completed at the same institution or on the same campus at Rutgers. No other course at the 100 level may be used to satisfy the minor. A minimum of 11 credits must be taken at Rutgers University-New Brunswick. A maximum of 3 credits of research in a life sciences subject may be used toward the minor. A minimum of three courses at the 300 level or above is required. If majoring in a permitted life sciences major, no more than two of the four life science courses applied to the minor requirements may overlap with courses used to fulfill major requirements. Only life sciences courses acceptable for the biological sciences major may be used for the minor. Courses in chemistry, mathematics, or physics do not count toward the minor. A grade-point average of 2.0 or better in courses credited toward the minor is required. No more than one course with a grade of D may be used to fulfill the requirements of the minor.

Life Sciences (SAS)

# Independent Study and Research in Biology

# Independent Study and Research in Biology

A minimum cumulative grade-point average of 2.8 is required for a student to register for an independent study/research course in biological sciences. A maximum of 6 credits of laboratory-based independent study, research, or honors projects may be used to fulfill the elective credits requirement in biology. The independent study/research form, available from the advising office of the Office of Undergraduate Instruction, must be completed and signed by the professor in whose laboratory the student will study prior to initiating the research project. Approval of a research proposal by the director of advising and a special permission number from the Office of Undergraduate Instruction is necessary for registration. Students may not earn academic credit for laboratory projects for which they are being paid. Students wishing to apply research credits from other departments toward the major in biological sciences must get approval from the advising office of the Office of Undergraduate Instruction, Division of Life Sciences, prior to beginning their research project.

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# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have a cumulative grade-point average of 3.0 or better and an average of 3.4 or better in life sciences core and elective courses credited toward the biological sciences major at the end of the junior year and previous research experience. At that time, the student should apply formally to the advising office of the Office of Undergraduate Instruction. Accepted students are expected to complete at least 6 credits over two semesters in an independent research project, resulting in a thesis, and to pass an oral examination before a faculty committee in the general field of the student's program of emphasis. If the research is done in a laboratory outside of the Division of Life Sciences, the examination committee must include at least one individual from the Division of Life Sciences faculty. Departmental Honors is completed in the fall and spring of senior year. Students accepted into special programs (e.g. BA/MD) may complete honors during junior year.

Honors students must register either for an honors course sequence in life sciences or for a course sequence in a school honors program. These decisions should be discussed with an adviser. An approval form (available in the advising office) must be completed.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-Robert Wood Johnson Medical School)

**Rutgers Undergraduate/Robert Wood Johnson Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

This program is designed for high-achieving premedical students of Rutgers University who are in their sophomore year. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and Robert Wood Johnson Medical School (RWJMS).

Application to this program is open to all undergraduate students enrolled at Rutgers University, New Brunswick. It is not directly associated with any one school within the university but see below for specific restrictions.

Admission is a two-stage and highly competitive process. In the first stage, undergraduate students are admitted into the program by an executive committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools of Rutgers University who have spent at least a year here. Prospective applicants from Rutgers University-Newark and Rutgers University-Camden must transfer to one of the units in New Brunswick for their sophomore year and complete at least 30 credits here. All applicants must have completed 4 semesters of college with a minimum of 60 credits. Applicants with an Associate¿s Degree, regardless of whether it was earned as a dual degree in high school or as a traditional degree after high school,

are ineligible to apply for the program. Admitted students will need to complete all of the core requirements of their undergraduate unit and major requirements with the exception of Biological Sciences and Cell Biology and Neuroscience majors, who may apply credit from the first professional year toward the major requirements. During the fourth year, students will be full time at the medical school and elective credits will count towards the undergraduate degree. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second stage occurs typically after the fourth year of study. It is the responsibility of the RWJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the RWJMS Admissions Committee. The purpose of this second, noncompetitive review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B (Honors or High Pass) in courses taken at both universities. However, recommendation is not automatic. The final decision rests with the RWJMS Admissions Committee. Upon approval by this admissions committee, the student will be permitted to continue into the fifth year of study and will be matriculated formally as a candidate for the M.D. degree at RWJMS.

Applicants to the B.A./M.D. program must be in their fourth semester at Rutgers University. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers, New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester and sustain it through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers University, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers-New Brunswick (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, two semesters of English, and organic chemistry lab must complete these requirements by the end of the third year of study. Students who did not take the SAT or ACT but who are admitted to the program will be required to take the MCAT by April of the junior year and score competitively with a total score of at least 508 (minimum single sub score of 123). An application form has been developed that allows the student to provide the executive committee with information it deems useful for its deliberations.

The bachelor's degree will be awarded upon completion of the undergraduate college and major requirements, by the end of year four. Upon satisfactory completion of year seven and all RWJMS requirements, the student will receive the medical degree.

Students who wish to pursue a major other than biological sciences must discuss their plans with the appropriate department in order to establish the requirements they need to complete for their major. For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from RWJMS will be applied toward the major (as stipulated below). The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements, usually by the end of year four. The number of credits, however, is not directly translated between the two universities; no more than 4 credits per laboratory course and 3 credits per non-laboratory course taken at RWJMS may be used toward the bachelor's degree at Rutgers.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and Intro to Biochemistry (01:694:301) and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must complete an additional approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick.

Students in the program must meet with advisers at the medical school and at their undergraduate school when planning their elective courses. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers' undergraduate units and RWJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

# Joint B.A./M.D. Program (Rutgers Undergraduate-New Jersey Medical School)

**Rutgers Undergraduate/New Jersey Medical School Joint Bachelor of Arts/Medical Degree (B.A./M.D.) Program**

The Rutgers Undergraduate/New Jersey Medical School joint program started in the fall of 2003. The purpose of the program is to permit students to begin their medical education after their third year or at least 96 degree credits at Rutgers. Specially selected students will obtain bachelor's and medical degrees in a seven-year program of study taken at Rutgers undergraduate units and New Jersey Medical School (NJMS).

This program is only open to students enrolled in Rutgers University-New Brunswick schools.

Admission is a two-phase and highly competitive process. In the first phase, undergraduate students are admitted into the program by the Joint Program Executive Committee consisting of faculty from the appropriate units. Eligible applicants are sophomores at any of the undergraduate schools at the New Brunswick location of Rutgers University who have been enrolled here for at least one year. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the NJMS Admissions Committee to review the credentials of students recommended by the Joint Program Executive Committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for retention in the medical school. It is expected that students will have grades of A or B in courses taken at Rutgers. Students must complete the Medical College Admission Test (MCAT) by January of the junior year before matriculating at NJMS and be required to be in the competitive range of other accepted NJMS students. This second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the NJMS Admissions Committee. However, recommendation is not automatic. The final decision

rests with the Medical School Admissions Committee. Upon approval by the Medical School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the M.D. degree at the New Jersey Medical School.

Applicants for the program must be in their fourth semester at Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at Rutgers a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, one semester of college-level mathematics, and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). Those students who are admitted to the program without having two semesters of physics, organic chemistry lab, and two semesters of English must complete these requirements by the end of the third year of study. An application form has been developed that allows the student to provide the committee with information the committee deems useful for its deliberations.

Students will be admitted at the end of the spring semester of year two and be formal members of the program beginning with year three. Prior to leaving the Rutgers undergraduate unit, students must satisfy all college and major requirements, except for the credits which they will receive from NJMS (please see next paragraph). For a student at Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from NJMS will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the undergraduate college requirements and major requirements by the end of year four. Upon satisfactory completion of year seven or eight, as well as all New Jersey Medical School requirements, the student will receive the medical degree.

A student enrolled in the program completing a major in biological sciences at Rutgers-New Brunswick is required to complete remaining Life Science Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/research course may be applied toward the biological sciences major for students in the B.A./M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and NJMS.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

# Joint B.A./D.M.D. Program (Rutgers School of Arts and Sciences-Rutgers School of Dental Medicine)

**Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine Joint Bachelor of Arts/Doctor of Medicine in Dentistry (B.A./D.M.D.) Program**

Rutgers School of Arts and Sciences/Rutgers School of Dental Medicine joint program started in the spring of 2002. The purpose of the program is to permit students to begin their dental education after their third year or at least 98 credits at Rutgers. Specially selected students will obtain bachelor's and dental degrees in a seven-year program of study taken at Rutgers undergraduate units and Rutgers School of Dental Medicine.

This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick. The program is administered by the Health Professions Office.

Admission is a two-phase and competitive process. In the first phase, undergraduate students are admitted into the program by the Executive Committee of the Joint Program consisting of faculty from the appropriate units. The executive committee reviews applications and selects those students who are deemed most qualified for the program. The second phase occurs typically after the third year of study. It is the responsibility of the Rutgers School of Dental Medicine Admissions Committee to review the credentials of students recommended by the articulated program executive committee. The purpose of this second review is to ascertain that the student has maintained adequate academic and nonacademic qualities appropriate for admission to the dental school. It is expected that students will have grades of A or B in courses taken at Rutgers University. Students must complete the Dental Admissions Test (DAT) and earn scores of 20 or better in Total Science, Academic Average, Organic Chemistry, General Chemistry, and Biology. Students may only take the DAT one time to qualify for this program. The second review is noncompetitive. Students who are deemed to have met the academic and nonacademic standards of the program will be recommended to the Rutgers School of Dental Medicine Admissions Committee. However, recommendation is not automatic. The final decision rests with the Dental School Admissions Committee. Upon approval by the Dental School Admissions Committee, the student will be permitted to continue into the next year of study and will be matriculated formally as a candidate for the Doctor of Medicine in Dentistry (D.M.D.) degree at the Rutgers School of Dental Medicine.

Applicants to the program must be in their fourth semester at the School of Arts and Sciences, Rutgers-New Brunswick. Applications are available in the Health Professions Office after spring break; they are due by the end of May. There is no rolling admissions policy. Decisions are expected to be made in July. By the end of the semester of application, applicants must have completed a minimum of 60 credits of which at least 30 credits must be at Rutgers, and they must have been in attendance at the School of Arts and Sciences, Rutgers-New Brunswick a minimum of one year. Additionally, applicants must have a minimum cumulative and science grade-point average of 3.5 by the end of the third semester, which must be maintained through the end of the fourth. The applicant must have completed, or be in the process of completing by the end of the fourth semester, two semesters of biology with lab, two semesters of general chemistry with lab, two semesters of organic chemistry, two semesters of college-level mathematics (Calc I and either Calc II or an approved Statistics course) and one semester of English. Applicants who have not taken General Biology I and II and lab at Rutgers, either because they have been awarded

advanced placement biology credits or because they have transferred equivalent courses from another institution, must have at least one year of upper-division biology courses at Rutgers (i.e., two courses of at least 3 or more credits each at the 200 level or higher). If AP credit was granted for general chemistry, then organic chemistry I and II and laboratory and a course in biochemistry at Rutgers are required. If AP credit was granted for English, upper level English at Rutgers is required with the same amount of credit work. If AP credit was granted for physics, two approved courses from Physics or Kinesiology & Health at Rutgers are required. Those students who are admitted to the program without having two semesters of physics, biochemistry, organic chemistry lab, and two semesters of English, must complete these requirements by the end of the third year of study.

The B.A./D.M.D. program is a seven-year program with year one being the first undergraduate year. Students will be admitted at the end of the spring semester of year two and be formal members of the articulated program beginning with year three. Prior to leaving the School of Arts and Sciences, Rutgers-New Brunswick, students must satisfy all college and major requirements, except for the credits which they will receive from Rutgers School of Dental Medicine (please see below). For a student at the School of Arts and Sciences, Rutgers-New Brunswick who has elected to major in biological sciences, 15 credits from Rutgers School of Dental Medicine will be applied toward the major.

The baccalaureate degree will be awarded upon completion of the general education and major requirements by end of year four. Upon satisfactory completion of year seven or eight, as well as all Rutgers School of Dental Medicine requirements, the student will receive the dental degree.

A student enrolled in the joint program completing a major in biological sciences at Rutgers-New Brunswick is required to complete any remaining Life Sciences Core Curriculum coursework and three approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. Students who have not taken General Biology I and II at Rutgers-New Brunswick, either because they have been awarded AP biology credit or because they have transferred equivalent courses from another institution, must take Genetics 01:447:380, and four approved life sciences electives (3- or 4-credit courses) at Rutgers-New Brunswick. No more than one independent study/ research course may be applied toward the biological sciences major for students in the B.A./D.M.D. program. Please be sure to meet with a biological sciences adviser when selecting life science elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers-New Brunswick and Rutgers School of Dental Medicine.

For further information on this program, you may contact the Division of Life Sciences, Health Professions Office, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

Life Sciences (SAS)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

# Joint B.A./M.S. Physician Assistant Program (Rutgers School of Arts and Sciences-School of Health Professions)

**Rutgers School of Arts and Sciences/Rutgers School of Health Professions Joint Bachelor of Arts/Master of Science Degree (B.A./M.S.) Physician Assistant Program**

This is a six-year (3+3) program offered jointly by the School of Arts and Sciences and the School of Health Professions (SHP). The program can be looked at as a two-phase program, an undergraduate phase followed by a professional phase. This program is open to students enrolled at the School of Arts and Sciences, Rutgers University-New Brunswick, who are U.S. citizens, permanent residents of the United States, or international individuals currently on a student visa. At a minimum, applicants must be enrolled for one year at Rutgers-New Brunswick earning at least 30 credits.

The first phase of the program includes three years of undergraduate liberal arts and basic science education. Students may apply to the second (professional) phase in April of their second year by applying to the Physician Assistant (PA) program. Personal interviews will be required of those applicants being considered for admission. The interview will serve to determine the applicant's emotional and intellectual maturity, ability to communicate, and the potential to achieve career satisfaction within the physician assistant role. Applicants must have a cumulative and science GPA of 3.2. In cases where individuals may show high potential by improved performance, exceptions to this requirement may be considered. Please note that acceptance by Rutgers University does not guarantee acceptance by the PA program.

Applicants to the program must have completed the following courses with a grade of C or better: at least one semester (3 credits) of English composition, applied statistics or biostatistics (from Psychology, Biology, or Math departments), General Biology I and II with lab (119:115, 116, and 117, or equivalents); General Chemistry I and II with lab (160:161,162 and 171, or equivalents); and General Psychology (830:101, or equivalent). If the student has been granted AP credit by Rutgers for science courses, additional science courses will be required.

All applications must be received by June 1 and final notices of acceptance will be made by August 1. If the applicant is accepted into the program, it will be contingent on maintaining a 3.2 GPA through the end of the third undergraduate year at Rutgers-New Brunswick, and on all requirements for the undergraduate degree being met before the beginning of the fourth year. Students who are accepted into the second phase of the program will begin this phase at the beginning of their senior year. At the end of the senior year, these students will receive a bachelor of arts degree conferred by the School of Arts and Sciences, Rutgers University-New Brunswick. After completion of the remaining two years of the PA program, graduates will receive a master of science degree awarded by Rutgers School of Health Professions.

Before entering the second (professional) phase, a student accepted by this program must also complete for the PA program, Functional Human Anatomy (01:377:223), General Microbiology (01:447:390), Intro to Biochemistry (01:694:301) and Systems Physiology (01:146:356) (waived if Gen Bio II is completed at Rutgers-NB and not AP credit), and 6-8 additional credits of life science electives. Students majoring in biological sciences are required to have completed, in addition to the School of Arts and Sciences core distribution requirements, the Life Sciences Core requirements, Intro to Biochemistry (01:694:301) and General Microbiology (01:447:390) and one (three credit or more) course from the 216 subject area approved electives. Students with AP or transfer credit of General Biology I and II and lab must take an additional life science elective course for 3 or more credits. A maximum of 14 credits from SHP courses will be accepted toward the biological sciences major. Please be sure to meet with a biological sciences adviser when selecting life sciences elective courses because not all course combinations are allowed given overlap in subject matter taught at Rutgers and SHP.

For a complete description of the requirements for the major in biological sciences, please read the appropriate section under the Division of Life Sciences in this catalog.

For more information about this program, you may contact the PA program office at the School of Health Professions, 675 Hoes Lane, Piscataway, NJ 08854, at 732-235-4444; or the Division of Life Sciences, Health Professions Office at Rutgers University, Nelson Biological Laboratories, 604 Allison Road, Piscataway, NJ 08854-8082, at 848-445-5667.

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# Courses

# Courses

With the exception of 01:119:115,116, and 117 General Biology I and II and Biological Research Laboratory, courses numbered at the 100 level may not be used for major credit in any of the majors within the Division of Life Sciences.

**01:119:098** ***Foundations for Biological Science (E2)***
Selected topics in general biology: introduction to cellular organization, metabolism, genetics, reproduction, and organ systems. Development of analytical reasoning and science-oriented study techniques.
***Preparation for college-level general biology.***

**01:119:103** ***Principles of Biology (4)***
Selected topics in general biology, including cell structure, genetics, plant and animal diversity, basic plant and animal biology, ecology, and evolution.
***Lec. 3 hrs., lab. 3 hrs. Designed for students who must take a one-semester laboratory course in introductory biology to meet major requirements. Credit not given for this course if student has already completed 01:119:115. Not for life sciences major credit.***

**01:119:109,110** ***Biology Practice Group (1,1)***
Students will work actively to (1) organize the lecture content, (2) identify what they are expected to do with that content (outcomes), (3) prepare and explain study aids (organizers) to ensure that they correctly understand the week¿s content, and (4) begin the self-evaluation process to gauge exam preparedness. Discussion of the basic methods and principles.
***Corequisite for 109 is 01:119:115; corequisite for 110 is 01:119:116.***

**01:119:111,112** ***Reading in General Biology (1,1)***
Discussion and reading providing extensive and advanced coverage of selected topics.
***Corequisite for 111 is 01:119:115; corequisite for 112 is 01:119:116.***

**01:119:115** ***General Biology I (4)***
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics. Lec. 3 hrs., Wkshp. 80 min.
***Prerequisite has two parts: writing (prerequisite of 01:355:101, 01:355:103, or 01:355:104, or placement into 355:101 or 355:104) and math (prerequisite of 01:640:026 or placement into 640:CMA, 640:PCA, 640:CLG, or 640:CLS).***

**01:119:116** *General Biology II (4)*
Broad principles of cell biology, genetics, and evolution; the diversity of life and its physiology, ecology, and population dynamics.
*Lec. 3 hrs., Wkshp. 80 min. Prerequisite: 01:119:115 with a grade of C or better. Credit not given for both this course and 01:119:102.*

**01:119:117** *Biological Research Laboratory (2)*
Laboratory designed to introduce and explore principles of research in the biological sciences by engaging in semester-long research projects requiring students to analyze data, synthesize new experiments, and evaluate findings.
*Prerequisite: 01:119:115 with a grade of C or better. Corequisite: 01:119:116.*

**01:119:120** *STEM Success Seminar (1.5)*
Increases ability to control academic success and improve transition to the university environment in furtherance of educational and career goals. Reflection on recent and current academic experience and career aspirations. Setting of priorities and alignment of time and effort towards those ends.
*By special permission only.*

**01:119:127-128** *Anatomy and Physiology: Health Sciences (4,4)*
Structure and function of human organ systems. Some microanatomy and biochemical aspects of physiology included.
*Lec. 3 hrs., lab. 3 hrs. For nursing, medical technology, physical therapy, and other professional students. Not for life sciences major credit.*

**01:119:131** *Microbiology for the Health Sciences (3)*
Introduction to microbes with emphasis on the nature and behavior of microorganisms, the interrelationships between microbes and the human host in health and disease, and the principles of prevention and control of infectious disease.
*Not open to students who have taken 01:447:390. For nursing and other professional students. Not for life sciences major credit. Prerequisites: 01:199:115-116 or 01:119:127-128.*

**01:119:132** *Microbiology for the Health Sciences Laboratory (1)*
Laboratory to accompany 01:119:131.
*Lab. 3 hrs. Pre- or corequisite: 01:119:131.*

**01:119:140** *The DNA Revolution (Honors) (3)*
Introduction to fundamentals of molecular genetics, biotechnology, and modern genetics, including a laboratory research project using molecular biology and bioinformatics techniques. Intended primarily for nonscience majors, but may also appeal to prospective chemists, physicists, engineers, and computer scientists.
*Restricted to first-year and sophomore students in the School of Arts and Sciences Honors Program or the Honors College. Credit not given for both this course and 01:119:140 or 01:694:215 or 315, or 01:447:315. Not for life sciences major credit.*

**01:119:148** *Moving Bodies: The Biology of Movement (3)*
Considers fundamental processes that allow humans and other animals to move, including structural basis (bones and muscles), control (brain and nervous system), conversion of food into energy (digestion and nutrition),

movement of food and oxygen to muscles (circulation), and some common and familiar injuries and illnesses and their treatments.
*Credit not given for both this course and 01:119:100, 103, 115-116, or 127-128. Not for life sciences major credit.*

**01:119:150** *Biology, Society, and Biomedical Issues (3)*
Discussion of current topics and issues in human health and medicine from a biological perspective.
*Credit not given for both this course and 11:115:100. Not for life sciences major credit.*

**01:119:154** *Genetics, Law, and Social Policy (3)*
Principles of human and behavioral genetics and their legal, ethical, and social implications. Topics include genetic screening, counseling, and engineering; reproductive regulation; and human behavior genetics.
*Prerequisite: Sophomore standing. Not for life sciences major credit or related major.*

**1:119:155** *Human Genetics (3)*
How our genes influence our development and health, how both normal traits and diseases are transmitted through families, how genetics is used in forensics and personalized medicine, and the genetic tests that are offered directly to consumers.
*Not for life sciences major credit.*

**01:119:156** *Genetics, Evolution, and Human Health (4)*
The human body and human behavior, shaped by more than four billion years of evolutionary processes. Scientific and social implications of current ideas and controversies of evolution and genetics.
*Not for life sciences major credit.*

**01:119:160** *Biology, Society, and Ecological Issues (3)*
Ecological and evolutionary ideas affecting space ecology; population increase, food supply, air and water pollution, war, and nuclear energy.
*Not for life sciences major credit or related major.*

**01:119:182** *Essentials of Human Reproduction (3)*
Anatomical and physiological bases of human sexuality; biological and cultural aspects of sexual differentiation and psychosexual development, contraception, venereal disease, and sexual lifestyles.
*Not for life sciences major credit or related major.*

**01:119:195** *Brain, Mind, and Behavior (3)*
Honors course discussing the interrelationship between the brain, the mind, and behavior.
*Open to students in the School of Arts and Sciences Honors Program or the Honors College. Not for life sciences major credit or related major.*

**01:119:199** *Preparation for General Biology (4)*
For first- and second-year students planning science majors. Enrollment based on placement scores. Selected concepts in biology, proven learning strategies for college science courses, and instruction in the scientific method. Prepares students for success in the General Biology sequence (01:119:115-117).
*Lec./rec. 3 hrs., lab. 3 hrs. Enrollment restricted by placement. Not for life sciences major credit.*

**01:119:201-202** ***Independent Study in Biology (1-3,1-3)***
Independent study under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. May not be used to fulfill a laboratory requirement.***

**01:119:204** ***Outreach in Biology (1)***
Introduction to the basic principles and best practices of outreach in the biological sciences. Emphasis on understanding how to translate technical concepts and techniques to lay audiences incorporating best practices in active learning, public speaking and curriculum development. Recommended for students interested in teaching careers and related positions in science communication.
***Prerequisites: 01:119:115, 01:119:116, and 01:119:117. By special permission.***

**01:119:205** ***Internship in Life Sciences (3)***
Development of experience and knowledge regarding the expectations, qualifications, competencies and responsibilities of professionals working within the life sciences through an internship experience with academic component. Integration of knowledge from life science coursework with the internship experience, development of new skills, and reflection on the learning experience.
***Prerequisites: 01:119:116 and 01:119:117. Open only to 119 Biology Majors.***

**01:119:307-308** ***Research in Biology (1-3,1-3)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to students majoring (or minoring) in biological sciences.***

**01:119:310** ***Communication in Biology (1)***
Effective skills for communicating science to a variety of audiences in a variety of forms including papers, grant proposals, teaching, and presentations to scientists and others. Provides support for students completing the 10-page research paper required for Research in Biology.
***Prerequisites: 01:119:307, 308, 407, or 408. Corequisites: 01:119:307, 308, 407, or 408.***

**01:119:311** ***Current Topics in Life Sciences (1)***
Directed readings and discussion of selected scientific topics and career stories with Rutgers Life Sciences Alumni.
***Junior or senior status and Division of Life Sciences major (subject code: 119, 146, 694, 447).***

**01:119:401** ***Clinical Practicum in the Health Professions (3)***
Development of advanced knowledge of and reflection on the qualifications, competencies, and responsibilities of physician health care providers through an internship experience and academic component integrating knowledge from life science coursework and the health care setting.
***Prerequisites: 3.4 science GPA. By special permission of the Office of Undergraduate Instruction only.***

**01:119:406-407** ***Research in Biology (1-4,1-4)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written report is required.
***Prerequisites: Declared biological sciences major or minor. Permission of the Office of Undergraduate Instruction; cumulative grade-point average of 2.8 or better. Open only to seniors majoring (or minoring) in biological sciences.***

**01:119:408-409** ***Honors in Biology (3-6,3-6)***
Laboratory/field research on an original problem under the direction of a member of the faculty. Written thesis, oral presentation, and defense are required.
***Prerequisites: Declared biological sciences major. Permission of the Office of Undergraduate Instruction. Open only to seniors majoring in biological sciences who meet the requirements for departmental honors.***

**01:119:410** ***Honors Communication in Biological Sciences (1)***
Instruction on effective communication of scientific ideas and findings for both the scientific community as well as the general public. Support in writing honors theses and preparing for oral thesis defenses.
***Prerequisite: 01:119:408. Corequisite: 01:119:409.***



# Cell Biology and Neuroscience 146

# Cell Biology and Neuroscience 146

Department of Cell Biology and Neuroscience, School of Arts and Sciences

**Website:** Here

**Chair:** Megerditch Kiledjian

**Vice Chair and Undergraduate Director:** Gabriella D'Arcangelo

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Megerditch Kiledjian, B.A., Rutgers; Ph.D., University of Pennsylvania

Melitta Schachner, Diploma in Biochemistry, Tübingen (Germany); Ph.D., Max-Planck Institut für Biochemie (Germany)

Wise Young, B.A., Reed; Ph.D., Iowa; M.D., Stanford

**Professors:**

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Gabriella D'Arcangelo, B.S., Bari (Italy); Ph.D., SUNY (Stony Brook)

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Bonnie Firestein, B.S., Michigan; Ph.D., California (San Diego)

Martin Grumet, B.S., Cooper Union; Ph.D., Johns Hopkins

Ronald P. Hart, B.S., Connecticut; Ph.D., Michigan

Arnold G. Hyndman, A.B., Princeton; Ph.D., California (Los Angeles)

Alice Y.-C. Liu, B.S., Chinese University of Hong Kong (China); Ph.D., Mount Sinai School of Medicine

Gary F. Merrill, B.S., Weber State; Ph.D., Michigan State

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Wei Dai, B.S., M.S., Beijing Normal (China); M.S., Texas Health Science Center; Ph.D., Baylor College of Medicine

Dunne Fong, B.S., Massachusetts; M.A., Ph.D., Princeton

Shu-Chan Hsu, B.S., Ph.D., British Columbia

Peng Jiang, B.S., Soochow (China); Ph.D., University of Science and Technology of China

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**Assistant Professors:**

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Santiago Cuesta, B.A., M.S., Ph.D., National University of Rosario (Argentina)

Brian Daniels, B.A., B.S., Southern Wesleyan (Central); Ph.D., Washington (Seattle)

Rafiq Huda, B.A., Carleton College; Ph.D., Northwestern University (Chicago)

Natasha O¿Brown, B.S., Davidson College; Ph.D., Stanford

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Xinfu Jiao, B. S., Xinxiang Medical College (China); M.S., Tongji Medical University (China); Ph.D., Shanghai Institute of Hematology (China)

Patricia Morton, B.S., Northwestern University; M.S., Ph.D., University of Wisconsin

**Assistant Research Professor:**

Dongming Sun, B.S., Beijing Medical University (China); Ph.D., Columbia University

**Assistant Teaching Professors:**

Anne Carr-Schmid, B.S., James Madison; Ph.D., Rutgers

Tara Cominski, B.S. St. Peter's University; Ph.D., Rutgers

Anne Keating, B.S., M.S., Ph.D., Rutgers

- Learning Goals
- Entry Requirements of the Major
- Major Requirements
- Options
- Departmental Honors Program
- Courses

Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Cell Biology and Neuroscience offers a course of study that provides fundamental and comprehensive training in the areas of cell biology and neuroscience. The major objective of this program is to prepare students for graduate studies in cell biology and neuroscience; entry into professional schools in medicine, dentistry, or other health-related fields; or employment in industrial and pharmaceutical companies.

*Learning Goals*

Students will:

I. master factual and conceptual knowledge in cell biology and neuroscience that will provide a solid foundation for success in advanced training and professional careers;

II. develop an ability to summarize, integrate, and organize information; and

III. use scientific reasoning to evaluate the potential for current research and new discoveries to improve our understanding of cell biology and neuroscience and its relevance to human health and to our society.

Life Sciences (SAS)

# Entry Requirements of the Major

# Entry Requirements of the Major

The major in the Department of Cell Biology and Neuroscience is open to students after their first year who have completed Fundamentals of Neurobiology (01:146:245) or Fundamentals of Cell Biology (01:146:270), with a grade of C or better. Departmental approval is required.

A grade of C or better in all courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades.

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# Major Requirements

# Major Requirements

The Department of Cell Biology and Neuroscience offers a program of study from which students can select one of two tracks, depending upon particular interests and career goals: a general track (default) and an honors track. Students can apply to enter the honors track at the beginning of the senior year. This track requires a minimum GPA of 3.4 in courses credited toward the major, and departmental approval. A number of core courses are required of all students in the cell biology and neuroscience major, regardless of the chosen track. No more than 16 credits from among the life science courses required for completion of the cell biology and neuroscience major may be fulfilled by credits transferred from any school outside of Rutgers University-New Brunswick. Any life science courses applied to the major should be taken within 10 years of graduating.

***Required Core Courses (65 or more credits)***

01:119:115-116 General Biology (4,4)

01:119:117 Biological Research Laboratory (2)

01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)

01:160:171 Introduction to Experimentation (1)

01:160:307-308 or 01:160:315-316 Organic Chemistry (4,4)

01:160:311 Organic Chemistry Laboratory (2)

01:750:203-204 General Physics (3,3) or 01:750:193-194 Physics for the Sciences(4,4)*or 01:750:271-272 Honors Physics (3,3)

01:750:205-206 General Physics Laboratory (1,1)

01:640:135,136 or 01:640:151-152 Calculus I and II (4,4) or 01:640:135 and 01:960:401 Basic Stat for Research (3) or 01:960:379 Basic Prob and Stat or 01:640:135 and 01:960:212 Statistics II (3)**

01:447:380 Genetics (4)

01:146:245 Fundamentals of Neurobiology (3)

01:146:270 Fundamentals of Cell Biology (3)

01:694:395 Biochemistry for Life Sciences (3) or 01:694:407 Biochemistry (3)

Advanced Cell Biology and Neuroscience Courses: choose three of the following:

01:146:445 Synapses, Neurons, and Circuits (3)

01:146:447 Clinical Neurobiology (3)

01:146:465 Neurobiology of Pain and Addiction (3)

01:146:472 Developmental Biology (3)

01:146:473¿ Genetic Regulation in Cell Biology¿(3)

01:146:474 Immunology (3) or 01:146:476¿ Honors Immunology (3)

01:146:481 Protein Dynamics in Cell Biology (3)

* with approval from the Undergraduate Director or CBN Advisor 01:160:308 may be replaced by an additional elective course.
** Students who take who take Physics for the Sciences 01:750:193-194 (4,4) do not need an additional Physics laboratory.
*** Students with AP statistics equivalent of 01:960:211, transfer credit for 01:960:211, or who have taken 01:960:211 at Rutgers must take 01:960:212.

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# Options

# Options

*General Track; 4 credits*

This track is for students who, upon graduation, seek immediate employment or plan to attend professional schools in health-related fields. In addition to the required core courses, students must take the following courses:

1. One elective lecture courses at the 300-400 level in the life sciences area (equaling 36 or more credits)
2. One laboratory or research course (1-3 credits). Students can take a lecture course with an associated laboratory component (3-4 credits) to satisfy both requirements, or a stand-alone lecture plus a laboratory or research course.

*Honors Track; 12 credits*

This area of concentration is for students interested in research who, upon graduation, plan to attend graduate school or professional schools in health-related fields. A student must qualify for admission into the honors track. See the departmental honors program page in this catalog for student qualifications. In addition to the required core courses, students must complete the following courses, produce a written research thesis and an oral thesis presentation:

1. One elective lecture course at the 300-400 level in the life sciences area (3 or more credits).
2. 01:146:405 Honors Seminar (3).
3. 01:146:408-409 Honors Research (3,3).

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

Honors in cell biology and neuroscience are awarded to students who have successfully completed the honors track course requirements, submitted a written research thesis, and defended the thesis orally. To qualify for the honors track, a student must have attained a grade-point average of 3.4 or better in courses required for the major. The student should apply formally to the department for acceptance into the honors program by the end of the second semester of the junior year.

Life Sciences (SAS)

# Courses

# Courses

**01:146:201,202** *Independent Study in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. May not be used to fulfill a laboratory requirement. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:245** *Fundamentals of Neurobiology (3)*
Introduction to the biology of the nervous system. Topics covered include nerve cell signaling, sensory and motor systems, and higher brain processes.
***Prerequisites: 01:119:115-116.***

**01:146:270** *Fundamentals of Cell Biology (3)*
Principles of cell biology. Structure, function, and macromolecular organization of cellular organelles.
***Prerequisites: 01:119:115-116.***

**01:146:295** *Essentials of Cell Biology and Neuroscience (3)*
Provides a background in the biology of neural cells and cognition.
***Prerequisites: 01:119:115-116. Not intended for cell biology and neuroscience majors.***

**01:146:307,308** *Research in Cell Biology and Neuroscience (1-3,1-3)*
Laboratory research on an original problem under the direction of a member of the Rutgers faculty.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better. Open only to students majoring or planning to major in cell biology and neuroscience.***

**01:146:322** *Human Histology (4)*
Structure of the tissues and organs of the human body. Lec. 3 hrs., lab. 3 hrs.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:328** ***Human Parasitology (3)***
Cell biology, epidemiology, pathogenesis, and clinical manifestations of human parasitic diseases.
***Prerequisites: 01:119:115-116.***

**01:146:329** ***Human Parasitology Laboratory (1)***
Laboratory to accompany the Human Parasitology lecture course 01:146:328. Lab. 3 hrs.
***Pre- or corequisite: 01:146:328.***

**01:146:340** ***Virology (3)***
Principles of virology including the molecular and cellular events that occur during virus replication, the host cell response, and pathogenesis. Emphasis on animal viruses that impact human health and disease. Strategies for controlling viruses.
***Prerequisite: 01:146:270.***

**01:146:350** ***Introduction to Light Microscopy for the Life Sciences (1, minicourse)***
This course offers a comprehensive exploration of advanced imaging techniques essential for studying tissues, cells, and organelles in the life sciences.
***Prerequisite: 01:146:270 or 01:146:295.***

**01:146:356** ***Systems Physiology (3)***
Comprehensive study of the principal organ systems of laboratory animals and humans.
***Prerequisites: 01:119:115-116 and 01:160:161-162 or 163-164, and 171 Credit not given for both this course and 11:067:300.***

**01:146:357** ***Systems Physiology Laboratory (1)***
Laboratory to accompany the Systems Physiology lecture course 01:146:356. Lab. 3 hrs.
***Pre- or corequisite: 01:146:356.***

**01:146:405** ***Honors Seminar (3)***
This course is intended to help students prepare a written research thesis and practice the oral thesis presentation.
***Requires departmental permission. Open only to senior honors students majoring in cell biology and neuroscience. This course fulfills the SAS WCd core requirement.***

**01:146:406, 407** ***Research in Cell Biology and Neuroscience (1-3,1-3)***
Research under the direction of a Rutgers faculty member.
***Written report required. Permission of department and an instructor willing to sponsor the student, and a cumulative grade-point average of 2.8 or better are required. Open only to students majoring in cell biology and neuroscience.***

**01:146:408-409** ***Honors Research (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member. Written report and oral presentation required. Culminates in a written thesis and oral thesis defense.
***Permission of department and an instructor willing to sponsor the student are required. Open only to seniors majoring in cell biology and neuroscience who meet the requirements for the departmental honors program.***

**01:146:410-411** ***Research Thesis in CBN I and II (3-3)***
Two semester laboratory research sequence under the direction of a Rutgers faculty member and the course coordinator.
***Prerequisites: 01:146:307 or 01:146:308. Requires departmental permission and acceptance by a faculty mentor who will***

*host the student in the laboratory. Requires submission of a written thesis draft (I = Fall semester), and submission of a final written thesis and oral defense (II = Spring semester). Open to senior students majoring in cell biology and neuroscience who are not enrolled in the departmental honors program.*

**01:146:445** *Synapses, Neurons, and Circuits (3)*
Cellular and systems features of neurons and the fundamental unit of signaling in the nervous system, focusing on a small number of advanced topics. Focus on how to test hypotheses related to the topics addressed: intra- and inter- cellular communication; construction of neuronal networks; protein interactions at the synapse; and signal transduction pathways.
*Prerequisites: 01:146:245 and 01:146:270.*

**01:146:447** *Clinical Neurobiology (3)*
Development and function of the nervous system with an emphasis on diseases and disorders. Topics include neurodevelopment, demyelination, tumors, and viral infections; neurological disorders/diseases; injury to the spinal cord and brain and repair; and clinical trials and the future of spinal cord and brain trauma.
*Prerequisites: 01:146:245 and 01:146:270. Intended for senior students majoring in cell biology and neuroscience.*

**01:146:456** *Advanced Physiology (3)*
Preparation for advanced graduate study in physiology and for medical physiology (first-year medical school). Focus on mammalian physiology and the whole animal (whole organ) approach to classical experimental physiology.
*Prerequisites: 01:146:356. Intended for senior and junior students.*

**01:146:464** *Topics in Cell Biology and Neuroscience (3)*
Directed readings and discussion of selected topics in cell biology and neuroscience.
*Prerequisites: 01:146:245 and 01:146:270. Open to junior or senior students majoring in cell biology and neuroscience.*

**01:146:471** *Advanced Cell Biology Laboratory (3)*
Advanced laboratory methods in cell biology. Emphasis on light and electron microscopy, imaging, immunocytochemical techniques, tissue culture, and methods of identifying and separating macromolecules.
*Prerequisite: 01:146:270 or permission of instructor.*

**01:146:472** *Developmental Biology (3)*
Genetic, molecular and cellular processes that lead from egg to embryo to mature organism.
*Prerequisite: 01:146:270 or 01:447:380 or 01:447:384.*

**01:146:473** *Genetic Regulation in Cell Biology (3)*
Advanced topics in cell biology, focusing on genetic animal models, genomics, chromatin function, gene expression, and RNA biology.
*Prerequisite: 01:146:270.*

**01:146:474** *Immunology (3)*
Fundamental principles of immunology with emphasis on antibody formation, immunoglobulin molecules and genes, hypersensitivity reactions, and the cellular basis for the immune response.
*Prerequisites: 01:119:115-116 and 01:447:380 or 01:447:384. Recommended: 01:447:390.*

**01:146:475** ***Laboratory in Immunology (1)***
Biochemical and molecular analysis of immune cell function. Application of immunological techniques to the examination of normal and diseased states.
***Pre- or corequisite: 01:146:474.***

**01:146:476** ***Honors Immunology (3)***
Introduction to the immune system, with a focus on mammalian organisms (particularly humans). Focus on critical thinking and problem-solving abilities, as well as introduction to primary research addressing contemporary immunological questions. Open only to students enrolled in the Honors College, SAS Honors Program or CBN Honors Program.
***Prerequisites: 01:447:380 or 01:447:384. Credit not given for both this course and Immunology 01:146:474.***

**01:146:481** ***Protein Dynamics in Cell Biology (3)***
Advanced topics in cell biology, focusing on signal transduction (module 1), cell adhesion and protein transport (module 2) and cytoskeletal dynamics controlling cell movement (module 3).
***Prerequisite: 01:146:270.***

Life Sciences (SAS)

# Genetics 447

# GENETICS 447

Department of Genetics, School of Arts and Sciences

**Website:** Here

**Chair:** Tara C. Matise

**Vice-Chair & Undergraduate Director**: Gary A. Heiman

**Distinguished Professors:**

Maureen M. Barr, B.A., Rutgers; Ph.D., Columbia

James A. Knowles, B.S., Michigan; M. Sc., M.D., Ph.D., Albert Einstein Medicine

Tara C. Matise, B.S., Cornell; M.S., Ph.D., Pittsburgh

Jay A. Tischfield, B.S., City University of New York; M.Phil., Ph.D., Yale

Lei Yu, B.S., Jiangnan University (China); M.S., Institute of Genetics, National Academy of Sciences (China); Ph.D., California Institute of Technology

**Professors**:

Gary A. Heiman, B.A., Boston Univ.; M.Sc., Sarah Lawrence; Ph.D., Columbia

Kim S. McKim, B.A., Simon Fraser; Ph.D., British Columbia

Bryce E. Nickels, B.S., Miami; Ph.D., Harvard

Christopher G. Rongo, B.A., University of California, San Diego; Ph.D., Massachusetts Institute of Technology

Gleb P. Shumyatsky, B.A., Moscow State University; Ph.D., Institute of Molecular Biology (Moscow, Russia)

Andrew W. Singson, B.S., University of California, Davis; Ph.D., University of California, San Diego

Karen Schindler, B.S., Loyola; Ph.D., Thomas Jefferson

Michael Verzi, B.A., The College of New Jersey; Ph.D., University of California, San Francisco

Jinchuan Xing, B.S., Nankai (China); Ph.D., Louisiana State

**Associate Professors:**

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Derek Gordon, B.A., Rochester; Ph.D., State University of New York at Stony Brook

**Assistant Professors:**

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Devanshi Jain, B.Sc. Hons., Ph.D., University College, London

Tetsuya Nakamura, B.S., Ph.D., Osaka (Japan)

Srujana Samhita Yadavalli, B. Tech., Anna University (India); Ph.D., Ohio State

Jiekun Yang B.S., Renmin University (China), M.S. UW-Madison, Ph.D. University of Virginia

**Associate Research Professors:**

Juan Wang, B.S., Ph.D., China Agricultural University (Beijing)

**Assistant Research Professors:**

Marco Azaro, B.A., Ph.D., Brown

**Teaching Professor:**

Martha Haviland, B.A. Rutgers; MS, AM, Ph.D. Michigan

**Associate Teaching Professor:**

Jessica Rispoli, B.S., Richmond; M.G.C., Maryland

Christine Seymour, B.S., Scranton; M.S. Arcadia University

**Associate Research Professor:**

Oleg Evgrafov, B.S., Moscow Physical Engineering Institute; M.S., Moscow Physical Engineering Institute; Ph.D,. Institute of General Genetics (Moscow); D.Sc., Research Center for Med. Genetics (Moscow)

**Assistant Teaching Professors:**

Tara P. Cominski, B.S, Saint Peter's; M.S., Seton Hall; Ph.D., Rutgers

Doreen R. Glodowski Trotta, B.S., Wisconsin; M.S., Kansas State; Ph.D., Wisconsin

Anne Keating, B.S., Ph.D., Rutgers

Haiyang Lu, B.S., Hebei University, China; M.S., Beijing Normal University, China; Ph.D., City University of New York

Shama Khan, B.A., Rutgers University; M.P.H., Tulane; M.S. Epidemiology, Tulane University; M.S. Genetic Counseling, Arcadia University

Mai Soliman, B.S., M.Sc., Montclair State; Ph.D., Rutgers

Zainab Tanvir, B.A. Stonybrook University, M.S. Univ. Delaware, Ph.D., Rutgers

Alexandra Walczak, B.S., Ramapo College of NJ, Ph.D., Rutgers

**Faculty Emeriti:**

David E. Axelrod

Linda Brzustowicz

Terry McGuire

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Amrik S. Sahota

Lee D. Simon

Navin K. Sinha

Ann C. St. John


- Learning Goals
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# Learning Goals

# Learning Goals

**Learning Goals:**

The Department of Genetics is committed to teaching science through the way we do science: through the process of doing research. The curriculum of the Department of Genetics is centered around four main goals. These goals shape our innovative courses and provide the basis for lifelong learning.

I. Knowledge specific goals: Know the terms, concepts, and theories of genetics.

II. Integrate the material from multiple courses and research to think holistically and to see the whole as well as the parts.

III. Use genetic information and ideas to critically analyze published research articles in genetics.

IV. At the end of four years, all of our students will be able to design an experiment, carry out the research using the appropriate laboratory techniques, and analyze and interpret their data. They will also be able to communicate their discoveries through a written article appropriate for publication in a peer-reviewed genetics journal, and through talks or posters appropriate for scientific meetings.

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# Entry Requirements of the Major

# Entry Requirements of the Major

Students wishing to major in this department must have been enrolled at Rutgers for at least one semester. In addition, students must:

1. Be an SAS student

2. Have a cumulative GPA of at least 2.00, and a GPA of at least 2.8 at the time of taking research for credit.

3. Have earned a C or better in these prerequisite courses or equivalents (25-26 credits):

a. General Biology I 01:119:115

b. General Biology II 01:119:116

c. General Biology Lab 01:119:117

d. General Chemistry I either 01:160:161 or 01:160:163

e. General Chemistry II either 01:160:162 or 01:160:164

f. Calculus I either 01:640:135 or 01:640:151

g. Calculus II or Statistic either 01:640:136, or 01:640:152, or 01:640:192, or 01:960:401, or 01:960:212, or 01:960:379

4. Students with an overall GPA < 3.0 must meet with the UGD before declaring the major.

a. Genetics is a credit-intensive major and has a requirement of a 2.80 GPA at the time of taking research for credit

b. Students entering the major with a GPA of < 3.0 may struggle to complete the major on time

5. Watch a Genetics Major Declaration Video

Life Sciences (SAS)

# Major Requirements

# Major Requirements

The department offers a major with a strong emphasis on research. A minimum of 20 credits of coursework in the life sciences must be completed in residence. Genetics is a credit-intensive major. Excluding the prerequisite courses (25-26 credits) to get into the major (see above), there are between 54-56 credits to complete the major (60-62 for honors). A grade of "C" or better in courses credited toward the major is required for graduation, and each course may be repeated only once to replace D/F grades. Students may not double major in two Division of Life Sciences majors.

The requirements of the major consist of:

**A. Life Science Core Courses (19-21 credits)** - Required for all DLS Majors (Approved AP and Transfer credits may be substituted)

a. Intro to Experimentation 01:160:171

b. Organic Chemistry I 01:160:307 or 01:160:315

c. General Physics I (01:750:203 + 205 lab), or (01:750:271 + 275 lab), or 01:750:193, or 01:750 201
Note: 193 & 201 have integrated lab

d. General Physics II (01:750:204 + 206 lab) or (01:750:272 + 276 lab) or 01:750:194 or 01:750:202
Note: 194 & 202 have integrated lab

**B. Genetics Core (17 credits) -** Required for all Genetics Majors- All below credits must be completed at Rutgers

a. Genetic Analysis I 01:447:384

b. Genetic Analysis II 01:447:385

c. Lab Course Req. 01:447:315, or 01:447:302, or 01:447:203, or 01:447:303, or 01:694:214, or 01:694:215, or 01:694:316

d. Biochemistry for the Life Sciences 01:694:395 or 01:694:407

e. Communications in Genetics 01:447:430 or 01:447:414 + 01:447:415 (Honors, Thesis Writing senior year)

**C. Genetics Independent Scholarship (minimum 6 credits but 12 credits for honors**

Note: 2.8 minimum GPA to register for research

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

**D. Genetics Electives (6 credits)**

Fifty percent must be taken within the Genetics Major (i.e.; 01:447)

a. Genetics Electives See electives table

b. Genetics Electives See electives table

c. Genetics Electives See electives table

**E. Electives OR Independent Scholarship (6 credits)**

Note: Additional Genetics Lab may be used as an elective

a. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

b. Independent Scholarship 01:227:460, 407, 408, 409, 410, 488, 489, 490

c. Genetics Electives See electives table below

**Lab Note:** 01:694:214 and 01:694:215 are only offered to first-year students with AP Biology credit and AP General Chemistry credits (or taking General Chemistry concurrently). 01:447:203 is only offered to first-year students in the SAS Honors Program or the Honors College. Students cannot receive credit for both 01:447:203 and 01:447:302.

**Organic Chemistry Note:** If you are planning to pursue a graduate degree in which a full year of organic chemistry is suggested/required (e.g., med/dental school), we strongly recommend taking Organic Chemistry II + lab as an elective (6 credits)

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# Elective Courses

# Elective Courses

**Approved Genetics Electives**

(01:160:308 or 01:160:316) and (01:160:311 or 01:160:314-15) Organic Chemistry II + lab (6)

01:198:111 Introduction to Computer Science (4)

01:198:112 Data Structures (4)

01:447:203 Honors Computational Genetics (Honors) (3)

01:447:216 Analysis of Scientific Literature (Honors) (3)

01:447:245 Intro to Cancer (3)

01:447:302 Quantitative Biology and Bioinformatics (3)

01:447:303 Computational Genetics of Big Data (3)

01:447:315 Introduction to Research in Genetics (3)

01:447:354 Social, Legal, and Ethical Implications of the New Genetics (3)

01:447:356 Evolutionary Medicine (3)

01:447:370 Developmental Genetics (3)

01:447:390 General Microbiology (3)

01:447:392 Pathogenic Microbiology (3)

01:447:451 Genomes (3)

01:447:460 Genetics of Compulsive Behavior (3)

01:447:465 Genetic Approaches & Research Analysis (3)

01:447:470 Evolutionary Developmental Biology (3)

01:447:478 Special Topics in Genetics (3)

01:447:479 Special Topics in Genetics (3)

01:447:480 Topics in Molecular Genetics (3)

01:447:484 Behavioral and Neural Genetics (3)

01:694:411 Molecular Pathways and Signal Transduction (3)

01:694:412 Proteomics and Functional Genomics (3)

01:694:413 Chromatin and Epigenomics (3)

01:694:420 Membrane Dynamics in Health and Disease (3)

01:694:421 Spec. Top. Mol. Bio. & Biochem (3)

01:694:492 Gene Regulation in Cancer and Development (3)

11:126:427 Methods and Applications in Molecular Biology (4)

11:126:483 Nucleotide Sequence Analysis (3)

11:126:485 Bioinformatics (3)

11:680:480 Microbial Genetics and Genomics (3)

16:681:535 Human Genetics (3)

Life Sciences (SAS)

# Departmental Honors

# Departmental Honors

**Departmental Honors**

The Department of Genetics recognizes graduating students who have made outstanding academic achievements by awarding **departmental honors**. The department awards two types of departmental honors (see below) and these are awarded at the discretion of the Genetics Honors Committee. To be considered, students must meet all criteria for that type of honors and submit the honors request application by the deadline (April 1st of senior year).

The two types of departmental honors and their criteria are as follows:

**1. GENETICS HONORS- RESEARCH**

a. GPA requirement: a student must have attained, at the end of the junior year, a cumulative GPA of at least 3.4 and a Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete 6 or more credits of Honors in Genetics (01:447:408-409) during senior year

c. Complete a total of 12 or more research credits (including the 6 credits of 01:447:408-409)

d. Complete Honors Thesis and Communication in Genetics 447:414 and 415 during senior year

e. Complete and defend a research thesis before a faculty committee (see Thesis Guidelines)

f. Present at Honors Day

Students can apply to do an Honors thesis by completing the relevant sections of the Independent Scholarship Form. Students must register either for an Honors course sequence in Genetics (01:447: 408 and 409) or for a course sequence in a college Honors Program (See Handbook). These decisions should be discussed with an advisor and approved by the Department Vice Chair. Accepted students are expected to complete at least 12 credits in an independent research project, resulting in a thesis. Students may do research with Rutgers faculty outside of the Department with the approval of their advisor and the Vice Chair. Students will prepare a thesis and present an oral defense to a committee of three faculty. At least one member of the committee must come from the Department of Genetics. Students will present their research at a Departmental Symposium in April. Students contemplating an Honors thesis should refer to the much more detailed instructions and details in Section IX and Section X of the Student Handbook. For information on the thesis, see Thesis Guidelines.

**Level of Honors:** In determining the level of honors, the honors/awards committee takes into consideration multiple factors in aggregate, including but not limited to (1) cumulative GPA, (2) thesis defense committee recommendation, (3) research mentor evaluation, (4) faculty evaluation of presentation at Honors Day, and (5) whether or not the student took the honors versions of Genetic Analysis 1 and/or 2 (i.e., 01:447:384:H1 and/or 01:447:385:H1) and the grades received in those courses.

**2. Genetics Honors - Certificate Program**

a. GPA requirement: A student must have attained, by April 1st of senior year, a cumulative GPA of at least 3.4 and Genetics major GPA of at least 3.4 (including prerequisites).

b. Complete a departmental certification program (i.e.; CompGen, Cancer or Genetic Counseling).

c. By April 1st, the student must formally apply to request consideration for Certificate Honors by completing the Genetics Honors- Certificate Program Form

* *The honors committee may award Honors, High Honors or Highest Honors*

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# Undergraduate Certificate Programs

# Undergraduate Certificate Programs

The Department of Genetics offers two certificate programs. Students who complete one of these Certificates are eligible to receive Departmental Honors.

1) Genetic Counseling Certificate Program

The Department of Genetics offers an undergraduate **Genetic Counseling Certificate Program (GCCP).** The GCCP program is intended for a select group of students interested in applying to the masters-level programs in genetic counseling. The goal is to provide students with guidance, coursework, and relevant clinical experience to improve their graduate school applications. This is a highly competitive option and is **only open to declared genetics majors**. Not all applicants will be accepted. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in genetics and does not replace minors. The certificate is NOT in lieu of completing the masters-level programs in genetic counseling. At the end of the program students will:

- understand genetic counseling as a profession ·
- understand application requirements for masters-level programs
- gain experience in talking with people who are in crisis
- gain experience in a clinical genetic counseling clinic

2) Certificate in Computational Genetics

The Department of Genetics offers a Certificate in Computational Genetics (CCG) for Genetics majors. The volume of data being generated in Genetics and related life science fields has been expanding tremendously in recent years, and career opportunities for geneticists with computational and quantitative expertise are simultaneously growing. This certificate program is intended for students who are either interested in applying to graduate-level programs,

or planning careers, in Computational Genetics/Biology, Statistical Genetics, Bioinformatics, or other programs in quantitative biomedical related research. The goal of the CCG is to provide students with guidance, coursework, and relevant data design and analysis experience to prepare them for graduate studies in the field or entry-level informatics jobs. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained competence in genetic data analysis using basic computer programming and statistical analysis.
- Be prepared to apply to M.S. or Ph.D. graduate programs in the areas of Computational Genetics and Bioinformatics.
- Be prepared to apply for career positions in industry, biotech companies, pharmaceutical companies, medical centers, or universities

3) Cancer Research Certificate

The Department of Genetics offers a Certificate in Cancer Research (CCR) for Genetics majors. Completion of the Certificate in Cancer Research will provide an advantage when applying to MD, PhD, and MS programs and facilitate transitions to careers with Cancer-related missions. The goal of the CCR is to provide students with a rigorous and Cancer-specialized curriculum. Students will do at least one year of research in a nation-leading Cancer Research Lab and students will be expected to participate in community engagement and develop skills to build community outside of academia. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained knowledge in Cancer Genetics with an expanded curriculum focused on Cancer biology.
- Have at least one year of experience conducting laboratory research in a Cancer research lab.
- Be prepared to apply to M.S., MD, or Ph.D. graduate programs in the areas of Cancer Genetics or for career positions in industry, biotech companies, pharmaceutical companies, medical centers, policy-driving institutes, or universities.

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# Courses

# Courses

**01:447:203** ***Honors Computational Genetics (Honors) (3)***
Honors computational genetics is a computer-based laboratory course that introduces students to the use of computers in biological research. This course is for students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. In the first half of the course, students will receive instruction in introductory computer programming (Python). In the second half of the course, students will practice writing code in Python via in-depth computational projects in genetics and genomics. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on

assignments. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and genomic data analysis. Prior experience with computer programming is neither necessary nor is it expected for students who enroll in this course.

This course is for freshman or sophomore Honors students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major.The course fulfills the laboratory requirement for the Genetics major.
***Prerequisites: Students must be in their first or second year at Rutgers in an approved Honors program (e.g., the Honors College or the SAS Honors Program). General Biology I (01:119:115) and be at least co-registered for General Biology II (01:119:116)) or have placed out of these two courses (e.g., through AP credit or approved transfer credit). Credit not given for both 01:447:203 and 01:447:302.***

**01:447:216** ***Analysis of Scientific Literature (Honors) (3)***
A systematic approach to the reading, analyzing, and understanding of primary literature in genetics; emphasis will be placed on data analysis and experimental design and demystifying the process of reading a scientific journal article.
***Prerequisites: 01:119:115-116. Highly recommended: 01:694:215. Open only to freshmen and sophomores in the SAS or SEBS Honors Program. By permission only.***

**01:447:245** ***Introduction to Cancer (3)***
Introduction to Cancer provides the student with an overview of conventional and state-of-the-art aspects of oncogenesis. Students will become familiar with the process involved in neoplastic transformation to the cancer phenotype through aspects of epidemiology, pathophysiology, virology, in vitro and in vivo cellular transformation and genetics. They will then apply these aspects to the understanding of classic therapeutic modalities and new state-of-the-art rational therapies. This comprehensive course will concentrate on the human disease process by applying clinical aspects of oncogenesis during a series of Grand Rounds discussions that will include recent patient clinical cases and their outcomes.
***Prerequisites: 01:119:115-116. Credit not given for both this course and 01:447:495.***

**01:447:302** ***Quantitative Biology and Bioinformatics (3)***
Introduction to the use of computers and computer programming to develop applications for research in genetics and molecular biology. Application topics will include evolutionary genetics, association analysis and genetics mapping, and structural biology.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill an elective requirement or taken instead of 01:447:315 Introduction to Research in Genetics by students majoring in Genetics. Credit not given for both 01:447:203 and 01:447:302***

**01:447:303** ***Computational Genetics of Big Data (3)***
The main focus of this course is the application of R programming to the analysis of genetic data, particularly big data sets with multiple measurements. The primary data sets considered will contain RNA-seq and/or other expression data for multiple/all genes in a given set of individuals. This course is for junior or senior students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. Students will learn how to acquire such data, format it for R, plot the data, and perform statistical analyses. In addition, students will learn how to simulate data under different hypotheses, and how to perform power and sample size calculations

for different statistical methods applied to real or simulated data. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on assignments. Guest investigators will frequently make short presentations (in person or by skype) to provide illustrations of how programming and informatics is critical for their research. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and data analysis.
***Prerequisites: 01:447:380 or 01:447:384. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course.***

**01:447:315** *Introduction to Research in Genetics (3)*
Basic principles and methods of research with microbial model systems used in the analysis and manipulation of genes, followed by a research project in molecular genetics.
***Prerequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 (or equivalent) or 01:160:163-164, 171. May be used to fulfill the lab requirement by students majoring in genetics. May be used to fulfill an elective requirement by students majoring in genetics who have already fulfilled the lab requirement with a separate course. Credit not given for both this course and 01:694:315. Open only to genetics majors***

**01:447:354** *Social, Legal, and Ethical Implications of the New Genetics (3)*
Social, legal, and ethical implications of new modern genetic techniques, for example: genetic screening, stem cells and cloning, forensic genetics, genetic engineering of plants, animals, and humans, genetic enhancement, gene therapy, and the new eugenics.
***Prerequisites: Genetics (01:447:380) or Genetics Analysis (01:447:384)***

**01:447:356** *Evolutionary Medicine (3)*
In this course, we examine human health from an evolutionary perspective, exploring the impact that our evolutionary heritage has on modern human diseases, both chronic and infectious. We will learn how the framework of evolutionary biology and modern genetic tools can inform our understanding of issues relevant to clinical and public health. Rather than focus on the immediate mechanisms underlying disease, we will endeavor to understand the ultimate factors that influence susceptibility, such as past natural selection. The course topics are wide-ranging, but particular attention is paid to emerging infectious diseases, as well as non-communicable diseases that may be exacerbated by facets of modern lifestyles.

Through lectures, critical analysis of the primary literature and popular science news, and class discussions, students will learn how evolutionary principles can be practically applied to medicine. Key readings each session will focus on genetic techniques for understanding evolutionary medicine, while additional readings will incorporate perspectives from diverse fields.

By fully participating in this course, students will be able to appreciate how modern susceptibility to non-communicable and infectious diseases has been influenced by past evolutionary processes; critically evaluate evolutionary hypotheses related to health and medicine, including those found in popular science articles; and know how genetic techniques are applied within an evolutionary framework to understand ultimate reasons for disease.
***Prerequisites: (01:447:380 or 384) AND (01:960:401 or 01:960:212).***

**01:447:370** *Developmental Genetics (3)*
How genes influence the developmental processes of an organism. Topics include gene regulatory networks, signaling pathways, stem cell biology, and the role of developmental genetics in human disease.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:380** *Genetics (4)*
Introduction to the mechanisms of heredity and evolution. Mechanisms of Mendelian inheritance, meiosis, recombination, gene mutation, and mapping, and an introduction to modern biochemical, molecular, and population genetics.
*Lec. 3 hrs., rec. 1 hr. Prerequisites: 01:119:115-116 and 01:160:161-162 or 01:160:163-164. Credit not given for both this course and 01:447:384-385 or 11:067:328 or 11:776:305.*

**01:447:382** *Genetics Laboratory (1)*
Laboratory to accompany 01:447:380. Not accepted for elective credit for Genetics majors.
*Lab. 3 hrs. Pre- or corequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)*

**01:447:384-385** *Genetic Analysis I,II (4,4)*
Experimental methods and concepts in genetics, with emphasis on their application to genetic research. Part I covers transmission genetics and breeding analyses, basic molecular genetics, isolation and characterization of mutations, and chromosome structure and function. Part II covers mathematical genetics, recombinant DNA, genomics, and special topics relevant to modern genetic research.
*Open only to majors in genetics or by permission of instructor. Credit not given for both this course and 01:447:380 or 11:067:328 or 11:776:305. Prerequisites for 01:447:384 are 01:119:115-116 (General Biology I & II) or 01:160:161-162 or 01:160:163-164 (General Chemistry I & II). Prerequisite for 01:447:385 is 01:447:384.*

**01:447:390** *General Microbiology (4 includes laboratory)*
Microorganisms are an essential component of the human environment and are significant not only for the disease they cause, but also for their ecological, agricultural, pharmaceutical, and industrial benefits. This course will introduce students to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms and their applications. The lab component of the course will introduce microscopy and staining techniques, the growth cycle and generation of a standard curve, physiological characteristics of microorganisms, and bacterial transformation. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include: History and Overview of Microbiology, Cell Structure and function, Microbial Growth, Nutrition, culture, and metabolism, Virology, Bacterial genetics, Microbial evolution and systematics, Bacteria and Archaea, Nutrient cycles, Genetic Engineering and Biotechnology, Waste treatment, Anaerobic respiration and Nitrogen fixation, Antibiotics and chemotherapeutic agents, Normal Flora, Virulence, Toxins, Epidemiology, and Microbial Diseases.

This is an upper-level course that focuses on the basic principles of microbiology. The course is an introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms. Topics include:
*Prerequisites: General Biology 01:119:115-116-117 or 01:119:101-102 and General Chemistry 01:160:161-162-171 (or higher) and Organic Chemistry 01:160:307. Credit not given for both this course and 11:680:390.*

**01:447:392** *Pathogenic Microbiology (3)*
This course will integrate basic microbiology and infectious diseases. The first quarter of the course will provide the conceptual basis of microbial morphology, metabolism and growth, heredity and variation, pathogenicity and antimicrobial chemotherapy. Then this course will introduce the students to one real life patient case study each week, moving the course toward an understanding of specific human diseases (e.g., pharyngitis, meningitis) as might be expected in a clinical environment. Each case will include a patient history, differential diagnosis, clinical cues, laboratory data, pathogenesis, treatment and prevention, additional points and references. The objective is not to attempt to cover every infectious disease or microorganism, but rather to use examples that would stress the key

principles of microbial pathogenesis, differential diagnosis and appropriate treatment and prevention. This course is intended for Life Science majors or those with a strong background in the Biological Sciences.
***Prerequisites: General Biology (01:119:115-117), General Chemistry (01:160:161-162-171), and Organic Chemistry (01:160:305. and 01:160:315. Systems Physiology is recommended.***

**01:447:406-407** ***Research in Genetics (3)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Permission of department and cumulative grade-point average of 2.8 or better. Open only to students majoring in Genetics.***

**01:447:408-409** ***Honors in Genetics (3-6,3-6)***
Laboratory research on original problem under the direction of a professor. Written thesis, oral presentation, and defense required.
***Prerequisites: Open by permission to seniors majoring in genetics who meet the requirements for the departmental honors program. Corequisite: 01:447:414 (fall) and 415 (spring).***

**01:447:410** ***Research in Genetics - Writing Intensive (3)***
Research in Genetics- Writing Intensive is intended to provide you with an opportunity to engage in original laboratory research under the direct supervision of a faculty mentor, usually in the faculty member¿s research laboratory. You are expected to carry out your own research project. NOTE: this research requires a heavy commitment of time and effort and can impact your performance in coursework, especially if you have not yet managed the foundational material for the discipline. Fulfills the writing and communication requirements of the SAS Core Curriculum.
***Prerequisites: 01:447:302, 447:315, or permission of department. Registration is by special permission only. Cumulative grade-point average of 2.8 or better. Declared genetics major.***

**01:447:414** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods, and reference sections of their thesis and outline the results and discussion.
***Corequisites: 01:447:408. For seniors completing departmental honors; by special permission only.***

**01:447:415** ***Thesis Writing and Communication in Genetics (1.5)***
Assists students with their honors thesis; emphasis will be on library/internet research and thesis writing. Students will be expected to write the introduction, methods and reference sections of their thesis and outline the results and discussion.
***Prerequisite: 01:447:408. Corequisite: 01:447:409. For seniors completing departmental honors; by special permission only.***

**01:447:430** ***Effective Communication Skills in Genetics (3)***
Communication is an essential part of science. Whether it is communicating research findings to other scientists or conveying complex concepts to a lay audience, a scientist must be able to effectively communicate their research to succeed. Communication in science is typically through publications, posters, or oral presentations. The goal of this course is to provide students practice in effectively communicating scientific findings. This includes preparing and revising an introduction for scientific papers, writing a research description for general audience, and preparing and

giving presentations (both oral and poster).
***Prerequisites: Declared major in Genetics; must have completed one semester of Research in Genetics, Advanced Independent Study, or Genetic Counseling Rotation. By special permission only.***

**01:447:451** *Genomes (3)*
This course will focus on Genomics, Proteomics and Bioinformatics from a Genetics perspective. Special attention will be given to the organization and functioning of the human genome.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:460** *Genetics of Compulsive Behavior (3)*
Compulsive urge can be channeled toward productive endeavors such as a strong drive to succeed in competitions, schooling, and career. On the other hand, improper handling of compulsive urge may lead to problematic behaviors such as alcoholism, drug use, gambling, and other undesirable behaviors. There are also conditions that are medically defined as disorders, with certain types of compulsive behaviors as part of the diagnostic symptoms, such as OCD and ADD/ADHD. There is evidence that genetics contribute to compulsive behavior in humans, and research in animal models has begun to uncover the molecular factors that underlie the genetic basis of compulsive behavior. Discussion of primary literature and other scientific publications that deal with the molecular and genetic basis of compulsive behavior. Emphasis will be placed on the development of skills for critical thinking and effective writing.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:465** *Genetic Approaches and Research Analysis (3)*
This class will teach students how to read, interpret and analyze research articles. The class will follow an active learning format, where we will discuss seminal and recent research articles in depth: What was the scientific question or problem? What methods and strategies were used to address it? What were the findings and conclusions? What are the alternative interpretations and methods that could have been applied? What questions are remaining?
This class will expose students to a diverse selection of research literature, involving genetic and molecular analyses in model organisms such as mice, worms, flies and yeast. The class series will begin with a research article presented by the teacher. During the majority of the class series, students will be divided into groups of 4-5. Each group will be assigned one research article and be required to work together to a) interpret, b) analyze and c) present the article in the form of an oral presentation to the class. Students will be graded on their ability to perform each of these tasks and on active participation during presentations by other groups. All groups will also be required to complete and be graded on a written discussion summary assignment at the end of each article discussion. This summary assignment may take many forms, e.g., preparation of a graphical abstract, subway advert, or other creative forms of expression.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:470** *Evolutionary Developmental Biology (3)*
Evolutionary origins of the vertebrate body plan are major problems in biology. While paleontology and comparative anatomy have revealed the evolutionary trajectories of the organs, recent genetics, genomics and embryology are becoming powerful tools to answer classical questions. The goals of this course are twofold; 1) obtain fundamental knowledge of anatomy, embryology, and the latest genomics and 2) learn how to integrate genetics, genomics and embryology to answer evolutionary questions through active discussion in the classroom. The training to discover and answer scientific questions in animal diversity will be performed at the American Museum of Natural History.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:478,479** ***Special Topics in Genetics (3,3)***
Directed readings and discussion of selected topics of special interest in genetics. Topics will vary according to semester and/or instructor.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384)***

**01:447:480** ***Topics in Molecular Genetics (3)***
Current research topics in microbial and molecular genetics. Lectures, discussions, and critical analyses of journal articles.
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:484** ***Behavioral and Neural Genetics (3)***
Influence of genetics on the nervous system and behavior of various organisms. Overview of field including experimental analysis of behavior, development of the nervous system, and sensory systems. Emphasis on reading and interpreting original research,
***Prerequisites: Genetics (01:447:380) or Genetic Analysis (01:447:384).***

**01:447:488** ***Genetic Counseling Rotation (3)***
The goal of this course is to provide students with an understanding of the genetic counseling career. Students will be placed at a local Genetic Counseling clinic to shadow a genetic counselor for one semester. During the semester, the student is expected to spend 8-9 hours a week at the rotation plus meet weekly with course director (attendance is mandatory). Course grade will be based on 1) Case presentation to Genetic Counseling group 2) ten Genetic Counseling case summary logs, and 3) evaluation by the clinical supervisor.
***Prerequisites: Declared Genetics major, cumulative GPA of 2.8 or greater, and accepted into the undergraduate Genetic Counseling Certificate Program (GCCP).***

**01:447:489,490** ***Advanced Independent Study in Genetics (3,3)***
Advanced independent study in Genetics is an opportunity for students to complete a scholarly project under the direct supervision of a faculty mentor. Projects are varied; e.g. library research on a topic of mutual interest to both the student and the faculty member, computer simulations, informative website design, or development of teaching materials. This course may not used for laboratory research.
***Prerequisites: 01:447:384 and permission of department. Open only to students majoring in Genetics***

Life Sciences (SAS)

# Molecular Biology and Biochemistry 694

# MOLECULAR BIOLOGY AND BIOCHEMISTRY 694

Department of Molecular Biology and Biochemistry, School of Arts and Sciences

**Website:** Here

**Chair:** Barth Grant

**Undergraduate Chair:** Samuel Gunderson

**Professors:**

Gyan Bhanot, B.S., Baroda (India); Ph.D., Cornell

Steven J. Brill, B.S., Maryland; Ph.D., SUNY (Stony Brook)

Monica Driscoll, B.A., Rutgers; Ph.D., Harvard

Isaac Edery, B.S., Ph.D., McGill (Canada)

Barth Grant, B.A., Virginia; Ph.D., Princeton

Kenneth D. Irvine, B.A., Williams College; Ph.D., Stanford

Fumio Matsumura, B.A., Tokyo; Ph.D., Nagoya (Japan)

Konstantin V. Severinov, M.Sc., Moscow State; Ph.D., Russian Academy of Sciences

Ruth Steward, B.S., Ph.D., Basel (Switzerland)

Andrew K. Vershon, B.A., Bennington College; Ph.D., Massachusetts Institute of Technology

Eileen P. White, B.S., Rensselaer Polytechnic Institute; Ph.D., SUNY (Stony Brook)

**Associate Professors:**

Stephen Anderson, A.B., Ph.D., Harvard

Sam Bunting, B.A., Oxford; Ph.D., Cambridge

Guoping (Sam) Gu, B.A., Peking (China); Ph.D., California (Santa Cruz)

Samuel I. Gunderson, B.S., Minnesota; Ph.D., University of Wisconsin, Madison

Mikel Zaratiegui, B.S., Ph.D., Navarra (Spain)

**Assistant Professors:**

Annika Barber, B.S., Bryn Athyn College; Ph.D., Thomas Jefferson

Jia Fei, B.S., Yunnan (China); Ph.D., Zurich (Switzerland)

Tina Liu, B.S. Yale; Ph.D. Harvard

Yang Lyu, B.S. Beijing, China; Ph.D. Guangzhou, China

Kevin Monahan, B.S., Haverford; Ph.D., Harvard

**Assistant Teaching Professor:**

Gabe Villegas B.A., Rutgers; Ph.D., Rutgers


- Learning Goals
- Entry Requirements of the Major
- Major Requirements

- Course Requirement Options
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Life Sciences (SAS)

# Learning Goals

# Learning Goals

The Department of Molecular Biology and Biochemistry offers a course of study in which traditional and modern biochemistry are integrated with studies in molecular biology. In addition to traditional courses, students are required to carry out undergraduate research work in a Rutgers professor¿s lab who serves as the host and mentor. This course of study prepares students for graduate studies in molecular biology and biochemistry and related fields, entry into professional schools in medicine or other health professions, or employment in industries (e.g., biotechnology, pharmaceuticals) in which molecular biology and biochemistry skills are in demand. The same learning goals are also used for nonmajor students taking molecular biology and biochemistry courses.

*Learning Goals:*

I. Students should demonstrate an understanding of the knowledge that is needed to begin biomedical research and that is required for postgraduate exams and studies.

II. Students should demonstrate the ability to find and evaluate information about specific biological systems or problems.

III. Students should demonstrate the ability to design experiments and critically analyze data.

IV. Students should demonstrate the ability to communicate their research and findings orally through seminar and poster presentations and through written research papers.

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# Entry Requirements of the Major

# Entry Requirements of the Major

The molecular biology and biochemistry (MBB) major is open to students beyond their first year who have a 2.0 cumulative grade-point average and have received grades of C or better in courses taken toward the major, except by special permission of the department undergraduate chair. The MBB major is also open to first year students with AP credits. In all cases, students interested in the MBB major should contact the Undergraduate Director, Sam Gunderson.  A grade of C or better in all courses credited toward the major is required for graduation and each course may be repeated only once to replace D/F grades.

Departmental approval is required to declare the major in molecular biology and biochemistry. Students who want to register for the MBB major must first meet with the Undergraduate Chair Sam Gunderson, Nelson lab, Room A322/A320 (848-445-1016 gunderson@dls.rutgers.edu) to discuss details about the major.

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# Major Requirements

# Major Requirements

A core of courses is required for completion of the major in molecular biology and biochemistry. Students supplement the core with additional required and elective courses in one of three options. Given that molecular biology and biochemistry is a dynamic and developing field, it is critical that coursework applied to the major must be current. Thus, any life science courses applied to the major in molecular biology and biochemistry should be taken within 10 years of graduating. Online courses will be reviewed on a case-by-case basis to confirm that they meet departmental learning goals before they may be used to satisfy the requirements for the major. Returning students must meet with their adviser to discuss their path to graduation. All students are required to write research reports and present them at a seminar.

***Required Core Courses (58 credits)***

01:119:115-116 General Biology (4,4)*
01:119:117 Biological Research Laboratory (2)*
01:160:161-162 or 01:160:163-164 or 01:160:165-166 General Chemistry (4,4)*
01:160:171 Introduction to Experimentation (1)*
01:160:309 Organic Chemistry Laboratory (2) (recommended)* or 01:160:311 Organic Chemistry Laboratory (2)
01:160:315-316 Principles of Organic Chemistry (4,4) (recommended)* or 01:160:307-308 Organic Chemistry (4,4)
01:447:380 Genetics (4)*
01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4) *(recommended) or 01:640:135-136 Calculus for the Life and Social Sciences I,II (4,4)**
01:694:407 Molecular Biology and Biochemistry (3) or 01:694:395 Biochemistry for the Life Sciences (3)
01:694:315 Introduction to Molecular Biology and Biochemistry Research (3) or 01:694:215 Honors Introduction to Molecular Biology and Biochemistry Research (4) or 01:694:214 Introduction to Molecular Biology Research (3) or 01:694:316 Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)
01:694:408 Molecular Biology and Biochemistry (3)
01:694:383 Molecular Biology and Biochemistry Seminar: Careers in Science (1)
01:694:484 Molecular Biology and Biochemistry Seminar: Research Presentations (1)
01:750:203-204 General Physics (3,3)***

01:750:205-206 General Physics Laboratory (1,1)***

*Life sciences core course
**01:960:401 Basic Statistics for Research (3) or 01:960:211-212 Statistics I,II (3,3) may be substituted for the second semester of calculus.
***01:750:193-194 (4,4) or 01:750:201-202 (5,5) may be substituted for 01:750:203-204 (3,3) plus 01:750:205-206 (1,1).

Life Sciences (SAS)

# Course Requirement Options

# Course Requirement Options

In addition to the required core courses, the Department of Molecular Biology and Biochemistry (MBB) offers two course options to students to fulfill the requirements for the major. Course option one comprises taking advanced electives and is intended to expose MBB students to different current topics in molecular biology and biochemistry. Course option two is for students interested in biophysical questions and research and comprises taking Physical Chemistry and Multivariable Calculus. Students completing course option two will also receive a minor in chemistry are encouraged to take the physical chemistry courses as they will fulfill the minor requirements. Course option two is intended to expose MBB students to different current topics in molecular biology and biochemistry.

*Course Option One (13 credits)*

Two 3-credit courses offered by the MBB department from the following list: 01:694:230; 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

One 400-level, 3-credit elective course offered by any department in the Division of Life Sciences or approved by the MBB department. See degree navigator or the MBB department website for a list of approved courses.

*Course Option Two (9 credits)*

01:160:341-342 Physical Chemistry: Biochemical Systems (3,3) or 01:160:327-328 Physical Chemistry (3,3) (requires 01:640:251 as a prerequisite). Other combinations of Physical Chemistry are possible so see degree navigator for further details.

01:640:251 Multivariable Calculus (4)

One 3-credit course offered by the MBB department from the following list: 01:694:390; 01:694:411; 01:694:412; 01:694:413; 01:694:420/421; 01:694:492

*Electives*

Because the list of approved electives is changing, students should discuss their elective options directly with their departmental faculty advisers and with the MBB Undergraduate Director, Sam Gunderson. A list of currently approved electives can be found on the MBB department website. In addition to the undergraduate courses listed, advanced students are encouraged to choose electives from the School of Graduate Studies.

Life Sciences (SAS)

# Research Options

# Research Options

The Department of Molecular Biology and Biochemistry (MBB) offers two laboratory research options (laboratory option one and laboratory option two), as well as a nonlaboratory research option (nonlaboratory option). In all cases, students must take one of the Introduction to Molecular Biology and Biochemistry Research courses (01:694:214, 01:694:215, 01:694:315, or 01:694:316) and 01:694:383, 484 Seminars in Molecular Biology and Biochemistry. Course 01:694:215 is only for first-year honors students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:214 is for first-year students who have placed out of General Biology (01:119:115,116, and 117) by receiving a score of 4 or 5 on the AP biology exam. Course 01:694:315 is for either qualified sophomores or junior students in the major. Course 01:694:316 is for either qualified sophomores or junior honors students in the major.

*Laboratory Option One (>12 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6,2-6)

01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (6,6)

A minimum of 12 credits is required in research courses. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Laboratory Option Two (6 to 11 credits)*

01:694:381,382, and 283 (Summer) or 384 (Summer) Undergraduate Laboratory Research (2-6) or 01:694:481,482 Advanced Undergraduate Laboratory Research (2-6) or 01:694:495,496 Honors Laboratory Research (4-6,4-6)

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

A minimum accumulation of 6 credits is required in research courses. Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Note that students applying for honors must complete 4 up to 6 credits of honors coursework per semester for two semesters. With the exception of Honors Laboratory Research (01:694:495/496), students who plan to take more than 3 credits of research a semester need approval from the MBB undergraduate chair.

*Nonlaboratory Option (9 credits)*

01:694:489,490 Literature Research in Molecular Biology and Biochemistry (3,3). This non-lab option is almost never used and will need approval from the Undergraduate Director, Sam Gunderson

One 3-credit course offered by the MBB department from the following list: 01:694:230 (3); 01:694:390; 01:694:411 (3); 01:694:412 (3); 01:694:413 (3); 01:694:420/421 (3); 01:694:492 (3).

Students must take at least one MBB elective in addition to the course requirements to satisfy the requirements for this option. Students taking this option may not apply for departmental honors.

Life Sciences (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have attained, at the end of the junior year, a cumulative grade-point average of at least 3.4 and a grade-point average of 3.4 or better in courses required for the major. Exceptional students not meeting these criteria but wishing to apply for honors research may petition the Department of Molecular Biology and Biochemistry at the beginning of their senior year. Students accepted into the program are expected to complete two semesters (6 credits per semester) of honors coursework. A written honors thesis and an oral thesis presentation are required. Students enrolled in 01:694:495,496 Honors Laboratory Research or any of the various school honors programs are eligible to receive departmental honors at the time of graduation.

Life Sciences (SAS)

# Courses

# Courses

**01:694:214** ***Introduction to Molecular Biology Research (3)***
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities available to undergraduates at the university.
***Prerequisites: For first-year students only who have placed out of General Biology (01:119:115,116, and 117) with AP credits, and 01:160:161 or 01:160:163. Corequisite: 01:160:162 or 164.***

**01:694:215** ***Honors Introduction to Molecular Biology and Biochemistry Research (4)***
Basic principles and methods of research, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisite: Limited only to first-year SAS Honors Program or Honors College students who have placed out of General Biology (01:119:115,116, and 117) with AP credits. Corequisites: 01:160:161 or 01:160:163 (or AP credits) and 01:640:135 or 01:640:151 (or AP credits).***

**01:694:230** ***Analytical Methods in Biology (3)***
Mathematical methods and tools to analyze and interpret biological and biomedical data, including probability theory; Bayes Theorem; the binomial, Poisson, and normal distributions; limit theorems; error analysis; tests of statistical significance; parameter estimation; curve fitting; sampling techniques; random number generation; and Monte Carlo methods. Analysis of sequencing and microarray data, such as sequence alignment, phylogeny inference, population structure, selection, and human migration.
***Prerequisites: 01:119:115-116 and 01:640:135 or 151.***

**01:694:281,282** *Sophomore Laboratory Research (2-6,2-6). 281 is Fall, 282 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Credits in this course cannot be used toward the required research credits for laboratory option. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:283** *01:694:283 Undergraduate Laboratory Research (2-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
Typically for rising Juniors and Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

***Prerequisite: Students must complete a special permission form and have it signed by their research and MBB faculty mentors before they can register of the course.***

**01:694:301** *Introductory Biochemistry and Molecular Biology (3)*
Chemistry and metabolism of proteins, carbohydrates, lipids, nucleic acids, and other biologically important compounds.
***Prerequisite: 01:160:209 or 307. Not for students majoring in molecular biology and biochemistry. Credit not given for both this course and 01:694:407, 11:115:301, or 11:115:403.***

**01:694:313** *Introductory Biochemistry Laboratory (1)*
Techniques used in research, clinical, and food laboratories, including tests of biological materials, methods of separation, and determination of enzyme activities.
***Lab. 3 hrs. Pre- or corequisite: 01:694:301. Not for students majoring in molecular biology and biochemistry.***

**01:694:315** *Introduction to Molecular Biology and Biochemistry Research (3)*
Basic principles and methods of research, followed by a research project: analyses of molecular clones from eukaryotic cDNA libraries. Description of research opportunities at the university available to undergraduates.
***Pre- or corequisites: 01:119:115,116, and 117; and 01:160:161-162, 171 or 01:160:163-164, 171. Credit not given for both this course and 01:447:315, 01:694:214, 215, or 316. Open only to MBB majors.***

**01:694:316** *Honors Introduction to Molecular Biology, Biochemistry, Genetics Research (4)*
Basic principles and methods of research in molecular biology, biochemistry, and genetics, followed by a research project: isolation and analyses of transcriptional regulatory mutants in yeast. Description of research opportunities that are available to undergraduates at the university.
***Prerequisites: 01:119:116 and (01:160:162 or 01:160:164). For MBB or genetics majors only or those planning on being MBB or genetics majors. Special permission required.***

**01:694:381,382** *Undergraduate Laboratory Research (3-6,3-6). 381 is Fall, 382 is Spring*
Research project in the laboratory of a faculty member. Written report of research carried out during each semester required. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

**01:694:383** *Molecular Biology and Biochemistry Seminar: Careers in Science (1)*
Discussion of career options in the life sciences, finding a research laboratory, performing literature searches, reading a scientific paper, and creating posters and abstracts. This course should be taken in the beginning of the third year.
*Open to MBB majors only.*

**01:694:384** *Undergraduate Laboratory Research (1-6). Summer semester*
Independent research project in the laboratory of a faculty member. A written report of research carried out during each semester required by the end of each semester.
For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.

*For rising Seniors. Students must complete a special permission form and have it signed by their research advisor and then send the signed form to the Undergraduate Director (Sam Gunderson) before they can register for the course.*

**01:694:385** *MBB Research and Writing (3)*

Research project in the laboratory of a faculty member. Seminar on science communication. Written and oral reports of research carried out during the semester required.

*Prerequisites: MBB majors only. Students need a GPA of 2.8 or better to enroll in research.*

**01:694:390** *Introductory Computational Biology (3)*
Disciplines of biochemistry and molecular biology and genomics all include collection and analysis of large data sets. Hands on use in a computer lab will permit students to learn and apply computer languages such as Python and R to analyze large data including for example DNA mutations and structural variations (SVs), RNA-seq and ChIP-seq as part of understanding genes and gene regulation.
*Prerequisite: 01:447:380 or 01:447:384*

**01:694:395** *Biochemistry for Life Sciences (3)*
The course is intended for life science majors and takes a holistic approach to Biochemistry. You will learn the basics of proteins, enzymology, nucleic acids and metabolism and use these as foundations to discuss exemplary metabolic pathways for their importance to homeostasis and, when dysregulated, to disease including observable phenotypes and what current strategies are used to treat these disorders. Coursework will consist of quizzes, homework, exams and one graded paper.

*Prerequisites: 01:160:307 or 01:160:315*

**01:694:407** *Biochemistry (3)*
Protein structure and function, structure of lipids, membranes and carbohydrates, catalysis of biochemical reactions, intermediary metabolism, oxidative phosphorylation, membrane transport, lipid metabolism, signal transduction, photosynthesis, protein secretion, targeting and turnover, nitrogen, amino acid, and nucleotide metabolism.
*Pre- or corequisites: 01:160:307-308 or 315-316. Credit not given for both 01:694:407 and 01:694:301, 11:115:301, or 11:115:403.*

**01:694:408** *Molecular Biology and Biochemistry (3)*
Disciplines of biochemistry and molecular biology as interlocking and mutually complementary fields of study. Lectures on structure of DNA, RNA, recombinant DNA approaches, DNA replication, repair and recombination, mobile genetic elements, transcription, gene regulation, RNA splicing, translation, and viral gene expression.
***Prerequisite: 01:694:407 or 01:694:301 or 01:694:395 or 11:115:403. Credit not given for both 01:694:408 and 01:146:478 or 11:126:481.***

**01:694:411** *Molecular Pathways and Signal Transduction (3)*
Lectures and discussion of current research areas of advanced molecular and structural biology: transcription, posttranscriptional regulation, cell cycle, neurobiology, protein folding, macromolecular recognition, and molecular virology.
***Pre- or corequisites: 01:694:407 and 408, or 01:447:384-385 or 11:115:403-404 or 11:126:481.***

**01:694:412** *Proteomics and Functional Genomics (3)*
Survey of modern techniques of protein biochemistry, bioinformatics, proteomics, and functional genomics, including basic concepts of protein structure and function, protein folding, protein characterization and purification, enzyme kinetics, NMR and X-ray crystallography, mass spectrometry, yeast two hybrid, and various techniques and approaches to functional and structural genomics.
***Prerequisites: [(01:694:301 OR 01:694:407 OR 01:694:395) AND (01:447:380) OR (01:447:384)]***

**01:694:413** *Chromatin and Epigenomics (3)*

Introduction to chromatin dynamics, particularly the structural and biochemical modifications of chromatin that underlie epigenetic states and their effects on gene expression and development.

***Pre- or corequisites: Prerequisite: 01:694:408 or 01:146:478 or 01:447:385.***

**01:694:420,421** *Special Topics in Molecular Biology and Biochemistry (3,3)*
Directed reading and discussion of selected topics of special interest in molecular biology and biochemistry. Topics will vary according to semester and/or instructor.
***Pre- or corequisites: [(01:694:301 or 01:694:407) and (01:447:380 or (01:447:384)] or equivalent.***

**01:694:481,482** *Advanced Undergraduate Laboratory Research (BA, BA). 481 is Fall, 482 is Spring.*
Research project in the laboratory of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484.

**01:694:484** *Molecular Biology and Biochemistry Seminar: Research Presentations (1)*
Oral presentation of student's own research results and the research interests of the laboratory with which the student is associated. Presentation at a required poster session.
***Students should take this course in the spring semester of their senior year. MBB majors only.***

**01:694:489,490** *Literature Research in Molecular Biology and Biochemistry (1-3,1-3)*
Literature research projects on a selected subject under the direction of a faculty member. A written report of research carried out during each semester is required. Oral presentations of student research are required in 01:694:484. This course is rarely used, therefore contact the Undergraduate Director if you are considering to take this course.
***Prerequisites: 01:694:214, 215 or 315, 407, 408, and 383.***

**01:694:492** *Gene Regulation: Clocks to Cancer (3)*
Explanation of MBB as an experimental science and how molecular biologists know what they know. Covers all aspects of gene regulation from transcription to protein modification to explain how 25,000 human genes can make millions of different protein isoforms and mRNA and ncRNA. Mechanisms of molecular clocks and cancer addressed in terms of gene regulation complexity,feedback loops and rate-limiting steps with emphasis on the methods, experimental design,
*Prerequisites:(01:694:407 BIOCHEM) OR (01:447:384 GEN ANALY) OR (11:126:481 MOLE GEN) OR (11:115:403 GEN BIOCHEM) OR (01:694:395 BioChem LS)*

**01:694:495,496** *Honors Laboratory Research (BA)*
Two-semester-long Honors research project in the laboratory of a faculty member. In the Fall semester, 01:694:495 students are required to attend a seminar each week on writing a thesis and preparing an oral thesis presentation. In the Spring semester, students take 01:694:496 where they complete their Honors thesis and give their oral presentation to their honors committee.

# Planning and Public Policy Major (762, 762D) and Minor (EJB-U)

## PLANNING AND PUBLIC POLICY MAJOR (762, 762D) AND MINOR

### Planning and Public Policy Major (37 credits)

The Planning and Public Policy major (762, 762D) provides students with a foundation in areas such as city dynamics, environmental aspects of cities, community health, urban poverty, public policy, housing issues, social concerns, fiscal matters, and land use planning. Students are prepared for entry-level professional management and planning positions focused on overseeing and improving public programs, such as transportation, housing, planning, the environment, finance, economic development, and urban renewal. These career paths can be found in business, government, education, banking, and nonprofit settings. This program also prepares students for graduate education in public administration, public policy, and urban planning.

Upon completing all degree requirements, the student will receive the bachelor of arts (B.A.) degree.

### Rutgers School of Arts and Sciences and School of Environmental and Biological Sciences Students

This program is designed to accommodate the needs of traditional students at Rutgers University-New Brunswick.

Students in the School of Arts and Sciences (SAS) and students in the School of Environmental and Biological Sciences (SEBS) who wish to remain in their primary unit must apply for admission prior to declaring the major.

SAS students may pursue Planning and Public Policy as their first major and remain within SAS. SEBS students may pursue Planning and Public Policy as a second major to remain within SEBS.

Students can apply for the Planning and Public Policy major during one of our application cycles listed here. Applicants must have a minimum grade of 'C' or better in each of the prerequisite courses and be in good academic standing. The application may be found on the school's website.

Students are advised to declare the Planning and Public Policy major no later than their first semester of junior year to ensure completion of the major by their anticipated graduation date. **A minor program is required for this major.**

Only courses with a 'C' or better may be counted towards the major, and students must complete the core curriculum requirements of their primary school.

The most current information for the Planning and Public Policy major may be found on the Bloustein School website here.

## Transfer Students

This program is designed to accommodate the needs of transfer, adult, and nontraditional students.

Students seeking the Planning and Public Policy major must have at least 30 credits before applying to the Bloustein School. Successful applicants will have completed the prerequisite courses with a grade of 'C' or better, and have achieved an overall GPA of at least 2.5.

Current Rutgers students seeking a school-to-school transfer from another Rutgers unit, or students transferring to Rutgers from another college or university, must apply via the Rutgers Office of Undergraduate Admissions. Contact ugadmissions@ejb.rutgers.edu for more information.

Transfer students from New Jersey community colleges are encouraged to complete lower-division prerequisite courses and the associate's degree to benefit from the NJ Statewide Transfer Agreement.

Only courses with a 'C' or better may be counted towards the major. **A minor program is required for this major.**

For more information about transferring, please see the school's website.

## PLANNING AND PUBLIC POLICY MAJOR REQUIREMENTS (762, 762D)

(37 credits)

*Prerequisite Courses (9-10 credits)*

- 01:355:101 College Writing (3)
- 10:775:205 Basic Statistical Methods (4) or equivalent (3-4)
- 01:220:102 Introduction to Microeconomics (3)

*Major Requirements (762, 762D) (37 credits)*
*Core Courses (16 credits)*

- One of the following (3):
    - 01:220:103 Introduction to Macroeconomics (3)
    - 01:790:104 American Government (3)
    - 10:833:210 Principles of Public Policy (3)
    - 10:971:201 Intro to Urban Planning and Design (3)
- One of the following intensive writing courses (3):
    - 10:775:300 Writing for Professionals (3)
    - 01:355:302 Scientific and Technical Writing (3)
    - 01:355:303 Writing for Business and the Professions (3)
    - 01:355:315 Writing Grant Proposals (3)
- 10:775:395 Research Methods (4) *Open to majors only*
- 10:762:400 Internship with Seminar* (3) *Open to majors only*
- 10:762:499 Senior Seminar* (3) Open to majors only with at least 100 credits **and** no outstanding core requirements

** Students qualifying for departmental honors may replace 10:762:400 and 10:762:499 with 10:762:497, 498 Bloustein Honors Research.*

*Required Electives (21 credits)*

- 21 credits of electives from Bloustein School undergraduate courses, 15 credits of which must be at the 300-level or higher

Students interested in specific career paths should consider clustering their electives and seek advising early in their program of study.

## Joint BA/MCRP or BS/MCRP Program

Exceptional, well-prepared students from any Rutgers University-New Brunswick matriculating unit with a GPA of 3.5 or higher, exceptional GRE scores, a dedication to public service and outstanding recommendations who wish to study urban planning are encouraged to seek advising about the 3-1-1 master of city and regional planning (M.C.R.P.) program. Contact ugadmissions@ejb.rutgers.edu for more information.

## Planning and Public Policy Minor (18 credits)

The Bloustein School welcomes current and prospective Rutgers-New Brunswick students to consider the Planning and Public Policy minor. Students should declare a minor with their matriculating school. They need not apply for minor status with the Bloustein School. Only courses with a grade of 'C' or better can be counted toward the minor program of study.

This minor is well-matched to majors in economics; labor studies & employment relations; political science; geography; sociology; urban planning and design; as well as the pre-law track.

Students seeking the Planning and Public Policy minor must complete three core courses and five elective courses in course code 762, excluding those designated for 'majors only'.

- 10:775:101 Introduction to Planning, Policy and Health (3)
- Five electives selected from all the undergraduate Bloustein courses that are open to non-majors. At least four of the five must be 300 or 400-level.

For the most current configuration of courses for the Planning and Public Policy minor, please see the school's website here.

## Planning and Public Policy Certificate Programs

The Bloustein School currently offers four Planning and Public Policy certificates open to all Rutgers-New Brunswick undergraduates. Certificate programs are open to students in any major and are awarded with, or subsequent to, a bachelor's degree. Only courses with a C or better may be applied toward a certificate program.

*Certificates do not qualify as a minor.* **Students must declare their intention to pursue a certificate program with the Bloustein School before their last semester of study in order to qualify to receive a certificate.** Awarded certificates appear on the student's final transcript.

For the most current configuration of courses for each certificate, please see the school's website here.

- Community Development Certificate (24 credits)
- Community Sustainability Certificate (18 credits)
- Urban Planning Certificate (24 credits)
- Historic Preservation Certificate (15 credits)

# Plant Science 776 (SEBS)

## PLANT SCIENCE 776

**Degree:** B.S.

**Director:** Nrupali Patel (npatel@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

The Plant Science undergraduate program prepares students for careers or further study in areas related to food and plant production, turfgrass, plant pathology and pest management, plant breeding, natural products, and bioenergy.

The curriculum offers three options: *General Plant Science (Research)*, for students intending to pursue careers in research laboratories or graduate study; *Horticulture or Turfgrass Industry*, for students intending to pursue careers in the plant business industries; and *Natural Products*, for students interested in historical and cultural botany, economic botany (the study of the interaction of people and plants), and indigenous and modern medicinal plants.

The curriculum also offers minors in agroecology, horticultural therapy, medicinal and economic botany, and plant science; and certificates in horticultural therapy, medicinal and economic botany, and turfgrass science.

Plant Science 776 (SEBS)

# Learning Goals

# Learning Goals

**Plant Science Major: Program Learning Goals**

Students completing degree requirements will be able to:

1. Describe basic knowledge about plant structure and function, fundamentals of plant growth and physiology, and principles of horticulture [technical proficiency];
2. Summarize broadly the role of plants in agriculture, society, and the environment [context];
3. Communicate, in written and oral forms, plant science knowledge to peers and others in society [communication]; and
4. Critically formulate hypotheses, interpret data, and apply basic principles and practices of plant science to solve fundamental and practical problems [critical thinking].

Plant Science 776 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of plant biology major requirements, courses, and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent* [WC] *and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

## Graduation Requirements for the Major: Proficiency in Plant Science

**A. Plant Science Major Requirements (37-38 credits)**

General Biology and Laboratory (all) (10 credits)1

01:119:115 General Biology I (4)
01:119:116 General Biology II (4)
01:119:117 Biological Research Laboratory (2)

General Chemistry and Laboratory (all) (9 credits)2

01:160:161 General Chemistry (4)
01:160:162 General Chemistry (4)
01:160:171 Introduction to Experimentation (1)

Experienced-Based Education (3 credits).3 *Choose from the following (adviser approved):*

11:776:495,496 Special Problems in Plant Science
11:554:487,488 George H. Cook Scholars Program
11:902:300,301,400 SEBS Internship I,II, Coop
11:550:240 Public Garden Management
11:020:321 Principles and Practice of Small-scale Organic Farming

Study Abroad
SEBS International Summer Study Abroad Program
ARESTY Research Assistant Program

Quantitative Skills (1-2 courses)4

*All students are required to complete one to two math courses, precalculus or higher, depending on option. See option for specific requirements.*

Professional Ethics (3 credits). *Choose from the following:*

01:730:107 Introduction to Ethics (3)5
01:730:249 Bioethics (3)
01:730:250 Environmental Ethics (3)
11:607:385 The Ethical Leader (3)

Soils (3-4 credits). *Choose from the following:*

11:776:102 Soil and Society (3)
11:776:404 Soil Management for Sports and Landscape Applications (3)
11:776:440 Soil Fertility (3)
11:375:360 Soils and Water (4)
11:375:453 Soil Ecology (3)

Plant Science Fundamentals (all) (9 credits)

11:776:210 Principles of Botany (3)
11:776:211 Introduction to Horticulture (3)
11:776:242 Plant Science (3)

**B. Plant Science Option Requirements**
*One of the following three options is required:*

1. General Plant Biology (research focus area) (54-59 credits)
2. Horticulture and Turfgrass Industry (53-55 credits)
3. Natural Products (54-57 credits)

**B1. General Plant Biology Option (54-59 credits)**

Quantitative Methods (all) (7-8 credits)

01:640:135 Calculus I (4) or equivalent
01:640:136 Calculus II (4) or equivalent or 01:960:401 Basic Statistics for Research (3)

Chemistry (all) (15 credits)

01:160:307 Organic Chemistry (4)
01:160:308 Organic Chemistry (4)
11:115:403 General Biochemistry (4)
11:115:404 General Biochemistry (3)

Physics (6-10 credits). *Choose from the following sequences of courses:*

01:750:193 Physics for the Sciences (4)
01:750:194 Physics for the Sciences (4)
or
01:750:201 Extended General Physics (5)
01:750:202 Extended General Physics (5)
or
01:750:203 General Physics (3)
01:750:204 General Physics (3)

Advanced Plant Science (all) (14 credits)

11:776:305 Plant Genetics (4) or 01:447:380 Genetics (4)
11:776:382 Plant Physiology (4)
11:776:452 Plant Tissue Culture and Engineering (3)
11:126:413 Plant Molecular Biology (3) or 11:126:481 Molecular Genetics (3)

Plant Science Electives (12 credits) (if not already used above)

A total of 12 credits from any 11:776:xxx course at the 200 level or above (see here), including:
01:960:401 Basic Statistics for Research (3)
or adviser-approved elective

**B2. Horticulture and Turfgrass Industry Option (53-55 credits)**

Quantitative Methods (4 credits)5

01:640:115 Precalculus (4) OR higher

Business Courses (all) (9 credits)

11:373:121 Principles and Applications of Microeconomics (3)6
11:373:231 Introduction to Marketing (3)
11:373:241 Introduction to Management (3) OR 11:373:341 Management: Human Systems Development (3)

Applied Major Requirements (all) (16-18 credits)

11:776:302 General Plant Pathology (3)
11:776:382 Plant Physiology (4) OR 11:776:202 Applied Physiology of Horticultural Crops (3)
11:776:391 Weeds, Diseases, and Insects of Plants (3)
11:776:406 Plant Breeding (4)
11:776:306 Weed Science Management (3)

Plant Science Electives (24 credits) (if not already used above)

A total of 24 credits from any 11:776:xxx course at the 200 level or above (see here), including
01:960:401 Basic Statistics for Research (3)
or adviser-approved elective

**B3. Natural Products Option (54-57 credits)**
*Students must complete required courses below AND one area of specialization*

Required courses

Quantitative Methods (all) (7-10 credits)5

01:640:115 Precalculus (4) or higher AND
01:960:401 Basic Statistics for Research (3) OR
01:960:211,212 Statistics I, II (3,3) (must take both in series)

Business Courses (3 credits)

11:373:121 Principles and Applications of Microeconomics (3)6

Geography Courses (3 credits). *Choose from the following:*

01:450:211 Environment, Society, and Social Justice (3)
01:450:306 Global Ecosystems and Biodiversity (3)

Major Option Requirements (all) (14 credits)

11:776:205 Introduction to Ethnobotany (3)
11:776:312 Medicinal Plants (3)
11:776:313 Medicinal and Aromatic Plants Laboratory (1)
11:776:382 Plant Physiology (4)
11:776:438 Plants and Human Health (3)

**Areas of Specialization**

*One of the following areas of specialization is required:*

a. Ethnobotany and Global Health (27 credits
b. Production of Medicinal and Aromatic Plants (27 credits)

**a. Ethnobotany and Global Health**

Required (3 credits). *Choose one of the following:*
11:776:390 Hemp and Medical Cannabis (3)
11:776:400 Fungi in the Environment (3)
11:776:410 Plants and Innovative Technologies for Bioenergy (3)

Electives (24 credits). *Choose from the following (if not used above):*
11:776:201 People-Plant Relationships (3)
11:776:221 Principles of Organic Crop Production (3)
11:776:302 General Plant Pathology (3)
11:776:305 Plant Genetics (4)
11:776:390 Hemp and Medical Cannabis (3)
11:776:400 Fungi in the Environment (3)
11:776:406 Plant Breeding (4)
11:776:410 Plants and Innovative Technologies for Bioenergy (3)
11:776:415 Fungi and Human Health (3)
11:776:439 Nursery Crop Production (3)
11:776:442 Agroecology (3)
11:776:495,496 Special Problems in Plant Science (1-3)
11:020:436 Sustainable Agriculture (3)
11:216:217 Principles of Natural Resource Management (4)
11:216:369 Analytical Methods Ecology, Evolution, and Natural Resources (3)
11:216:411 Plant Diversity and Evolution (3)
11:216:412 Plant Diversity and Evolution Lab (1)
11:370:406 Medical and Veterinary Entomology (3)
11:373:362 Natural Resource Economics (3)
11:373:363 Environmental Economics (3)
11:375:201 Biological Principles of Environmental Sciences (3)
11:400:422 Food Safety: Fads, Facts, and Politics (3)
11:709:201 Culinary Nutrition (3)
11:709:255 Nutrition and Health (3)
11:709:363 World Food Customs and Nutrition (3)
or other adviser-approved electives

**b. Production of Medicinal and Aromatic Plants**

Required (3 credits). *Choose one of the following:*
11:776:390 Hemp and Medical Cannabis (3)
11:776:410 Plants and Innovative Technologies for Bioenergy (3)
11:776:439 Nursery Crop Production (3)

Electives (24 credits). *Choose from the following (if not used above)*:
11:776:221 Principles of Organic Crop Production (3)
11:776:302 General Plant Pathology (3)
11:776:305 Plant Genetics (4)
11:776:310 Plant Propagation (3)
11:776:311 General Plant Pathology Laboratory (1)
11:776:321 Greenhouse Systems Management (3)
11:776:341 Fruit Production (3)
11:776:390 Hemp and Medical Cannabis (3)
11:776:406 Plant Breeding (4)
11:776:410 Plants and Innovative Technologies for Bioenergy (3)

11:776:439 Nursery Crop Production (3)
11:776:495,496 Special Problems in Plant Science (1-3)
11:020:215 Applied Practical Applications in Agriculture and Food Systems (3)
11:020:321 Principles and Practices of Small-Scale Organic Farming (3)
11:020:340 Indoor Cultivation of High Value Crops (4)
11:020:442 Entrepreneurial Agriculture (3)
11:216:274 Field Techniques (4)
11:216:332 Plant Ecology (4)
11:216:411 Plant Diversity and Evolution (3)
11:216:412 Plant Diversity and Evolution Lab (1)
11:370:350 Agricultural Entomology and Pest Management (3)
11:373:205 Small Business Essentials (3)
11:400:422 Food Safety: Fads, Facts, and Politics (3)
11:550:235 Herbaceous Plants in the Landscape (3)
or other adviser-approved electives

**Unspecified Electives (2-11 credits)**

In addition to courses meeting the above requirements, students can take other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 120 (matriculated 2018 or later) or 128 (matriculated prior to 2018) required for graduation.

1 Satisfies SEBS Natural Sciences [NS] - Biological Sciences requirement
2 Satisfies SEBS Natural Sciences [NS] - Physical Sciences requirement
3 Satisfies SEBS Experience-Based Education [EBE] requirement
4 Depending on option, satisfies one to two courses of SEBS Quantitative [QQ] and/or Formal Reasoning [QR] requirements
5 11:730:107 Introduction to Ethics satisfies SEBS Arts and Humanities Human Experience [AHo] requirement
6 11:373:121 Principles and Applications of Microeconomics satisfies SEBS Social Analysis [SCL] - Economic Analysis requirement

# Polish 787 (SAS)

## POLISH 787

Department of Germanic, Russian, and East European Languages and Literatures, School of Arts and Sciences

**Website:** Here

**Lecturer:**

Agnieszka Makles, M.A., Jan Dlugocz (Poland); M.A., Michigan State

Note: Refer to section Minor in Slavic and East European Studies 861

# Courses in English

# Courses in English

**01:787:250** ***Contemporary Polish Literature (3)***
Survey of contemporary Polish literature, 1950s-2000s.

**01:787:370** ***Special Topics in Polish Studies (3)***
Topics related to Poland and Polish culture. Specific titles available at time of registration.
***Equivalent to 01:790:383, depending on instructor.***

**01:787:470** ***Advanced Special Topics in Polish Studies (3)***
Intensive study of a particular topic related to Poland and Polish culture. Specific titles available at time of registration.
***Prerequisite: Permission of department.***

Polish 787 (SAS)

# Courses in Polish

# Courses in Polish

**01:787:101,102** ***Elementary Polish (4,4)***
Intended for students with no or minimal prior experience in the language. Polish sound and spelling system; basics of grammar and core vocabulary. Development of proficiency in listening, reading, speaking, and writing; introduction to Polish culture.

**01:787:201,202** ***Intermediate Polish (4,4)***
Contemporary Polish language. Continued development of proficiency in listening, reading, speaking, and writing. Broadened grammatical understanding and vocabulary. Deepening knowledge of Polish history and culture.
***Prerequisite: 01:787:102 or placement.***

**01:787:205, 206** ***Intensive Intermediate Polish Abroad (4,6)***
Intensive intermediate level study of the Polish language. Focus on speaking, listening, reading, writing; intermediate Polish morphology and syntax. Taught in Polish.
***Prerequisite: 01:787:102 or placement. Credit not given for either of these courses and 01:787:201.***

**01:787:301** ***Advanced Polish I (3)***
Advanced work in grammar and stylistics. Discussion based on reading original literature, newspapers, and essays, and on contemporary films.
***Prerequisites: 01:787:202 or placement, and permission of department.***

**01:787:302** ***Advanced Polish II (3)***
Advanced work in grammar, vocabulary, and stylistics. Discussion based on reading original literature, newspapers, and essays, and on contemporary films.
***Prerequisite: 01:787:301 or placement.***

**01:787:305** ***Intensive Advanced Polish Abroad (4)***
Intensive advanced level study of the Polish language. Focus on speaking, listening, reading, writing; intermediate Polish morphology and syntax. Taught in Polish.
***Prerequisite: 01:787:202 or placement.***

**01:787:493,494** ***Independent Study: Polish (3,3)***
***Prerequisite: Permission of instructor.***

# Political Science 790 (SAS)

## POLITICAL SCIENCE 790

(See also History/Political Science Joint Major 514)

Department of Political Science, School of Arts and Sciences

**Website:** Here

**Chair:** Beth L. Leech

**Undergraduate Director:** Christine Cahill

**Faculty academic advisor:** Katherine McCabe

**Distinguished Professors:**

Milton Heumann, B.A., CUNY (Brooklyn College); M.Phil., Ph.D., Yale

Mona L. Krook, B.A., Columbia University; M.A., Ph.D., Stanford University

Jan Kubik, B.A., M.A., Jagiellonian (Poland); Ph.D., Columbia University

Richard R. Lau, B.A., Stanford; M.A., Ph.D., University of California (Los Angeles)

Jack Levy, B.S., Harvey Mudd College; M.A., Ph.D., University of Wisconsin (Madison)

**Professors:**

Saladin Ambar, B.S. Georgetown; M.A. New School; Ph.D. Rutgers University

Nikol Alexander-Floyd, B.A., Southern University and A&M; J.D. Texas School of Law; M.A., Ph.D., Rutgers University

Eric Davis, B.A., SUNY (Binghamton); M.A., Ph.D., University of Chicago

Nathan Kelly, B.A. Wheaton College, M.A., Ph.D., University of North Carolina, Chapell Hill

Susan Lawrence, B.A., Furman; M.A., Ph.D., Johns Hopkins University

Beth L. Leech, B.S.J., Northwestern; Ph.D., Texas A&M

Lisa Miller, B.A., University of Virginia; M.A., Ph.D., University of Washington

Kira Sanbonmatsu, B.A., University of Massachusetts (Amherst); Ph.D., Harvard University

Paru Shah, B.A. University of Michigan, M.A., M.P.H. University of Illinois, Ph.D. Rice University

Aleksandr Zamalin, B.A., Rutgers; Ph.D., City University of New York

**Associate Professors:**

Decker, Jefferson, A.B., Amherst College, PhD., Columbia University

Xian Huang, B.A., M.A., Peking; Ph.D., Columbia University

Yalidy Matos, B.A., Connecticut College; M.A., Ph.D., The Ohio State University

Katherine McCabe, B.A., Harvard University; M.A., Ph.D., Princeton University

Andrey Tomashevskiy, B.A., Kean; M.A., New York; Ph.D., California (San Diego)

**Assistant Professors:**

Elena Gambino, B.A. Oberlin; M.A. Lehigh; Ph.D., University of Minnesota

Stacey Greene, B.S., Loyola University (New Orleans); M.A., Ph.D., University of California (Los Angeles)

Michael Kenwick, B.A., University of Illinois (Urbana-Champaign); Ph.D., Pennsylvania State University

Summer Lindsey, B.A., M.A., M.A., Ph.D., Columbia University

Robert Schub, A.B., Brown University, A.M., PhD., Harvard University

**Professor of Teaching:**

William Field, B.A., Connecticut College; Ph.D., Brandeis University

**Associate Professor of Teaching:**
Christine Cahill, B.A., University of Iowa; Ph.D., University of California (Davis)

Richard Ewan Harrison, B.Sc., Bath (UK); M.Sc., Ph.D., Bristol (UK)Roland Rich, B.A., L.L.B. Sydney; Ph.D., Australian National

Roland Rich, B.A., LL.B. University of Sydney, M.Int.Law, Ph.D Australian National University

**Associate Professor of Professional Practice:**

Ava Majlesi, B.A, M.P.A., J.D., Rutgers University

**Assistant Professors of Teaching:**

Dilafruz Nazarova, B.A. Tajik State National (Tajikistan); L.L.M., University of Essex (UK); Ph.D., Rutgers University

**Teaching Instructor:**

Douglas Cantor, B.A. Rutgers University; M.A. University of Baltimore; PhD University of Illinois (Chicago)

The political science major is designed to engage students with the philosophical and practical problems of political organization, action, and governance and to encourage critical thinking about the nature of citizenship, rights, and duties in the modern world. The undergraduate political science curriculum is divided into three general areas: theoretical approaches to politics, American institutions and politics, and foreign and international politics. While majors may choose to focus their studies on one of these areas, they are required to develop a solid intellectual foundation and understanding that spans all three and to approach the study of political science within the broader context of the social sciences.

Students completing the political science major are expected to develop the ability to read and listen critically, to reason analytically and engage in thoughtful moral judgment, and to write and speak clearly and forcefully. The major emphasizes the enhancement of key intellectual skills and qualities of mind--the habits of questioning, debating, challenging, and shaping coherent and persuasive arguments and interpretation--and seeks to involve undergraduates in the active research life of the department.

Coursework is organized into two general levels. Classes at the 100 and 200 levels are regarded as introductory and are designed to familiarize students with general concepts, basic knowledge, and modes of inquiry, as well as to serve as a foundation for additional coursework. Classes at the 300 and 400 levels focus on more specialized issues, questions, or problems. In general, students should complete appropriate introductory coursework before enrolling in upper-division classes.

Political science majors are strongly encouraged to take advantage of opportunities to engage in experiential learning at Rutgers. These opportunities include the one-semester Washington Internship Program, Rutgers Study Abroad, and internships supervised by the department.

Prior to declaring a major in political science, a student must complete at least two 100-level political science courses with an average grade of C or better. These courses can be counted toward major credit.

Political Science 790 (SAS)

# Learning Goals

# Learning Goals

The undergraduate political science program creates educated members of society capable of organizing information, thinking critically, and communicating effectively. Students who complete a major in our department will be able to consider contemporary political issues in their historical and institutional contexts, evaluate and analyze competing political claims, and explain political phenomena using a variety of empirical methods and interpretive frameworks. We aim to instill skills that encourage critical analysis of the philosophical and practical problems of the world and the polis. We aim further to teach students to synthesize these ideas in arguments about real world issues.

To do this we spur student reflection on civic membership while increasing student understanding of the definitions, theories, and approaches political scientists use to make sense of politics, power dynamics, and policy issues. We strive to create opportunities for students to engage in experiential learning in political, governmental, and related settings.

The end goal of a political science major is to create active, engaged members of society capable of being lifelong learners promoting the public good.

We operationalize these goals through the political science major. Each of the goals listed below matches one of the requirements of the major and connects directly with one or more courses approved for that part of the major.

1. Students will be able to collect, analyze, and synthesize substantive scholarly information relevant to the fundamental areas that comprise political science: political philosophy, American politics, international relations, and comparative politics. Examples of these fundamental questions include the origins of law, dimensions of liberty, processes of political change, the role of institutions, the consequences of cultural and economic differences, and the sources of international conflict. These are the focus of our introductory level classes, 101 Nature of Politics, 102 International Relations, 103 Comparative Politics, 104 American Government, and 106 Law and Politics.
2. Students are required to take at least one course on political science research methods. The research methods courses introduce students a range of tools scientists use to investigate social and political phenomena. Students will be exposed to and understand a range of methodological orientations (quantitative, qualitative, and interpretive) and elements of research processes, including, but not limited to, concept development, building and testing hypotheses, evaluating theories, and data management. In addition to learning foundational theories of power and investigating political norms and institutions, students will be able to understand the mechanisms, complexities and limits of quantifying and assessing human behavior. Students will be equipped to produce and analyze different types of research necessary for addressing critical political questions. This is the focus of our research methods requirement and is found in 300 Political Science Research Methods, 307 Survey Methods, 391 Data Science for Political Science, and 392 Qualitative Research Methods.
3. Students will develop a more in-depth, sophisticated understanding of at least one major topic in each of the following three areas of political science: theories from a diversity of historical contexts and global political traditions, American institutions and politics, and foreign and international politics. This is the primary goal of our upper-level classes.
4. Students finalize their education by developing experience in designing, completing, and defending a research project, which gives students exposure to the process of research and discovery in political science. This is the focus of the 395 Political Science Seminar.
5. Students will dig deeper into material and gain exposure to the range of questions that social scientists pose and the tools and approaches they use to develop answers. This is found in all upper-level courses.

Beyond the general learning goals indicated above, students pursuing the political science minor are expected to acquire:

1. A solid foundational understanding of the critical theoretical issues underlying political life: the individual vs. the community; political obligation vs. civil disobedience, stability, revolution, and change; legitimacy and justice; and freedom and power; and
2. An upper division competence in several areas of political activity, whether that is in comparative institutions, theories of justice, policy making, or something similar.

Those majors electing to complete the Certificate Program in Quantitative Political Science Methods will be able to:

1. Understand the mechanisms, complexities and limits of quantifying human behavior. Students will be equipped to produce and analyze different types of quantitative data necessary for addressing critical political questions; and
2. Put their methodological skills to use as part of a supervised research project.

Those majors electing to complete the Global Politics Certificate should acquire:

1. Competence in a relevant language;
2. First-hand exposure to and understanding of another political system or culture; and
3. A specialized knowledge of foreign and international politics through coursework in political science and in related fields that permits them to apply their language skills and incorporate this first-hand experience in developing an advanced understanding of or appreciation for some specific element of global politics or some particular region of the world.

In addition, students electing to complete the Eagleton Undergraduate Associates Certificate will:

1. Explore applications of political science to the practice and processes of American politics;
2. Connect classroom learning with the experience of working in government, politics, or public affairs;
3. Grasp the complexity of political decision-making amongst voters and elites alike by analyzing the positive and normative dimensions of particular political decisions; and
4. Examine the issues of representation, leadership, campaigning, lobbying, management, and ethics.

Political Science 790 (SAS)

# Major Requirements

# Major Requirements

The Political Science major shall be made up of 13 courses (39 credits). Requirements are as follows:

**R1: Core Requirements**
Any three of the following 3 credit courses:
01:790:101 Nature of Politics
01:790:102 Introduction to International Relations
01:790:103 Comparative Politics
01:790:104 American Government
01:790:106 Law and Politics

**R2: Research Methods**
Any one of the following 3 credit courses:
01:790:300 Political Science Research Methods
01:790:307 Survey Research
01:790:391 Data Science for Political Science
01:790:392 Qualitative Research Methods

**R3: Political Philosophy**
A total of one course from 300- or 400-level courses in political theory

**R4: American Institutions and Politics**
A total of one course from 300- or 400-level courses in American institutions and politics

**R5: International and Comparative Politics**
A total of one course from 300- or 400-level courses in international and comparative politics

**R6: Political Science Seminar**
A total of one course from 395 Political Science seminar or equivalent

**R7: Political Science courses**
A total of 15 credits from Political Science electives, of which

- 12 credits must be 300- of 400- level courses
- No more than 3 credits may be used from 1.5 credit mini courses
- No more than 6 credits may be used from internship, independent study, or senior honors thesis.
- No more than 12 credits may be used from non-Rutgers New Brunswick courses.

You must achieve a minimum grade of C in all courses.

*Joint Major in History/Political Science 514*
This major is administered entirely by the Department of History. For further information, see the heading History/ Political Science Joint Major 514 in this section of the catalog.

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# Minor in Political Science

# Minor in Political Science

Minors must complete six 3-credit courses in political science with a grade of C or better. At least four of these courses must be at the 300 level or above. In addition, no more than 6 credits of independent study or internships or combination of these may be applied toward the minor. No more than two political science courses taken outside the Rutgers University-New Brunswick Department of Political Science may be applied to the minor.

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# Minor in Critical Intelligence Studies 205

# Minor in Critical Intelligence Studies 205

**Minor in Critical Intelligence Studies (18 credits total)**
**(housed in the Department of Political Science)**

The interdisciplinary minor in critical intelligence studies enables students to use a broad range of information to understand potential sources of risk and how to apply their understanding to enhance domestic and global security. The minor consists of a basic element that provides students with essential knowledge related to the field of intelligence studies. A second element emphasizes cybersecurity, policy analysis and implementation, language acquisition, or data control depending on the chosen track, each of which results in a greater understanding of different regions, cultures, and value systems that inform the effective collection and use of intelligence. Course offerings in the first area present a mix of tools for intelligence gathering in a framework that offers a critical evaluation of the use and misuse of intelligence gathering and tensions between security and privacy. Course offerings in the second area cover language expertise, cultural competencies, technical computer skills, and public policy formation.

**Learning Goals**

At the end of this program students will be able to:

- explain the intelligence gathering process in various national and historical contexts;
- write clearly, critically, and analytically about intelligence issues;
- demonstrate intermediate-level language skills or cultural competence skills; and
- make strong arguments that strike a defensible balance between security and privacy in the context of the American constitutional system.

**Tracks**

The minor in critical intelligence studies offers five tracks for completion. Each of these has the same foundational courses: Introduction to Critical Intelligence Studies, Critical Thinking and Analytical Writing, and an experiential course focusing on an internship or an independent research program. Beyond this, most of the tracks require the acquisition of cultural competency, while the technology track exposes the student to issues of artificial intelligence and data science.

In order to declare a minor in critical intelligence studies, students are required to have a minimum cumulative grade-point average of at least 2.0 and to have completed 01:790:292 with at least a C. To fulfill the minor requirements, students must pass an additional five 3-credit courses with a grade of C or better.

The tracks are as follows:

**1. Cyber Track**

*A. Three courses (9 credits) dealing with the theory and practice of critical intelligence studies, including the following:*

01:790:292 Introduction to Critical Intelligence Studies
01:790:483 Seminar: Critical Thinking and Analytic Writing for the Intelligence Community
01:790:484 Research in Critical Intelligence Studies, OR
01:790:485 Intelligence Studies Internship

*B. Cybersecurity (6 credits)*

One course in foundational computer science
One course in computer security

*C. One elective course (language or area studies, 3 credits) to promote awareness of the international context of intelligence work.*

**2. Policy Track**

*A. Three courses (9 credits) dealing with the theory and practice of critical intelligence studies, including the following:*

01:790:292 Introduction to Critical Intelligence Studies
01:790:483 Seminar: Critical Thinking and Analytic Writing for the Intelligence Community
01:790:484 Research in Critical Intelligence Studies, OR
01:790:485 Intelligence Studies Internship

*B: Policy (6 credits)*

Two upper-level courses in American public policy pertaining to general policy making or national security including 01:790:325 National Security Policy

*C. One elective course (language or area studies, 3 credits) to promote awareness of the international context of intelligence work.*

**3. Language Track**

*A. Three courses (9 credits) dealing with the theory and practice of critical intelligence studies, including the following:*

01:790:292 Introduction to Critical Intelligence Studies
01:790:483 Seminar: Critical Thinking and Analytic Writing for the Intelligence Community
01:790:484 Research in Critical Intelligence Studies, OR
01:790:485 Intelligence Studies Internship

*B: Language (6 credits)*

Two language courses in the same language that would count for a major in that language. AP credit can be applied to one of these courses but not both.

*C. Policy (3 credits)*

01:790:366 National Security Policy

**4. Engineering Track**

*A. Three courses (9 credits) dealing the theory and practice of critical intelligence studies, including the following:*

01:790:292 Introduction to Critical Intelligence Studies
01:790:483 Seminar: Critical Thinking and Analytic Writing for the Intelligence Community
01:790:484 Research in Critical Intelligence Studies, OR
01:790:485 Intelligence Studies Internship

*B: Security (6 credits)*

One course in foundational computer science
01:790:366 National Security Policy

*C. One elective course (language or area studies, 3 credits) to promote awareness of the international context of intelligence work.*

**5. Technology Track**

*A. Three courses (9 credits) dealing with the theory and practice of critical intelligence studies, including the following:*

01:790:292 Introduction to Critical Intelligence Studies
01:790:483 Seminar: Critical Thinking and Analytic Writing for the Intelligence Community
01:790:484 Research in Critical Intelligence Studies, OR
01:790:485 Intelligence Studies Internship

*B: Critical technology studies (9 credits)*

One course in artificial intelligence
One course in data science
One course in design and analysis of computer algorithms

This program is administered jointly by the Department of Political Science and the Center for Critical Intelligence Studies. Inquiries should be directed to Ava Mailesi, associate director of the Center for Critical Intelligence Studies, who also serves as an adviser for the minor.

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# Minor in Government and Business 793

# Minor in Government and Business 793

**Minor in Government and Business (18 credits total)**

The minor "Government and Business" is designed to expose students to the practical problems of organizing and running human society with a particular focus on the interactions between government and business. The minor offers students a condensed exploration of the political world with a focus on the relationship between politics and political activity on the one hand and economic activity and social outcomes on the other. Government policy influences business decisions while business decisions and government policy influence individual human development choices and outcomes.

Students pursuing the Government and Business minor are expected to develop the ability to read and listen critically, to reason analytically concerning questions of public policy (especially economic policy), to engage in thoughtful moral judgment, and to write and speak clearly. The minor offers a coherent overview of the field of political science, including theories of human self-government, policy processes, decision-making, and institutional structures. Students completing the minor will have developed a greater understanding of the policy making process and the impact that government and business decisions together have in shaping "who gets what, when, and how".

**Learning Goals:**
At the end of this program students will be able to:

- Identify key theoretical factors in evaluating the moral foundations of individual behavior and the legitimacy of regulations about that behavior.
- Explain the process through which decisions about the public regulation of individual and group behavior are made.
- Critique boundaries between private market forces and public regulation.

The minor comprises 18 credits of course work drawn from the wider political science undergraduate curriculum. Students pursuing this minor may not also pursue a minor in political science and may not pursue a major in political science.

The following courses are required:

- 01:790:101 Nature of Politics
- 01:790:338 Government and Business

Students must take four additional three credit courses, drawn from the following list. No more than one may be at the introductory (100- or 200-) level.
01:790:102 Introduction to International Relations
01:790:103 Comparative Politics
01:790:104 American Government
01:790:106 Law & Politics
01:790:304 Congressional Politics
01:790:305 Public Policy Formation
01:790:306 American Presidency
01:790:308 New Jersey Politics
01:790:318 Comparative Public Policy
01:790:320 Politics and Social Policy: Lessons from Europe
01:790:327 International Political Economy
01:790:330 Interest Groups
01:790:332 Money and Modern America
01:790:335 Women and American Politics
01:790:338 Government and Business
01:790:341 Public Administration: American Bureaucracy
01:790:347 Political Representation
01:790:350 Environmental Politics-United States and International
01:790:356: Organizing for Social Change
01:790:357 Comparative Political Economy
01:790:362 International Law
01:790:481 Internship in Political Science
01:790:482 Internship in Political Science
01:790:488 Field Internships in Political Science

Political Science 790 (SAS)

# Minor in Philosophy, Politics, and Economics 792

# Minor in Philosophy, Politics, and Economics 792

**Minor in Philosophy, Politics, and Economics (27 credits total)**
**(housed in the Department of Philosophy)**

The minor in philosophy, politics, and economics (PPE) is designed to engage students with the practical problems of organizing and running human society. The minor stands at the confluence of three major fields of study--philosophy, political science, and economics--and combines elements of these into a coherent framework in which to address questions about the nature of citizenship and the role individuals can and must play in making critical decisions facing society.

Students pursuing the PPE minor are expected to develop the ability to read and listen critically, to reason analytically concerning questions of public policy (especially economic policy), to engage in thoughtful moral judgment, and to write and speak clearly. The minor combines the best of the three participating fields: confronting the ethical issues of philosophy, the policy questions of political science, and the quantitative analytical problems of economics.

Generally, students taking the PPE minor will be majoring in one of the three included disciplines: philosophy, political science, or economics, and the courses that can be used toward the PPE minor taken in the student's major department may be used for both the major and the PPE minor. In other words, while the minor requires nine courses (27 credits), students majoring in philosophy, political science, or economics will only need to take six courses (18 credits) outside the major.

**Learning Goals**

At the end of this program students will be able to:

- identify key factors in evaluating the morality of individual behavior and the legitimacy of regulations about that behavior;
- explain the process through which the public regulation of individuals and groups occurs;
- evaluate the economic ability of institutions to provide for the common welfare; and
- critique boundaries between private market forces and their just and efficient public regulation.

**Minor Requirements**

The minor requires students to take three courses (9 credits) in each of three fields of study. The course offerings in each field are structured to give students a solid grounding in each field, as well as a taste of what more advanced work in the field involves.

Students are permitted to bring in only 3 credits for each field from outside of Rutgers University-New Brunswick. In other words, at least two of the three classes for each field must be taken at Rutgers University-New Brunswick; only one course in each field can come from transfer credit, AP credit, study abroad, or other Rutgers campuses. Courses that are cross-listed may be used to satisfy only one requirement.

All courses must be completed with a grade of C or better in order to be used for the minor.

Below are the requirements for each field, which must be completed whether the student majors in the field or pursues them as other parts of the minor.

**Requirements for the Philosophy Component of the PPE Minor (three courses, 9 credits)**

Total of three philosophy courses, no more than one at the 100 level, and two from the following list, at least one of which must be at a 300 level or higher (other courses on a case-by-case basis):

01:730:105/106 Current Moral and Social Issues
01:730:107 Introduction Ethics
01:730:249 Bioethics
01:730:250 Environmental Ethics
01:730:251 Ethics and Business
01:730:255 Introduction to Social and Political Philosophy
01:730:330 Ethics of Harming and Helping
01:730:341 Ethics through History
01:730:342 Social and Political Philosophy through History
01:730:343 Marx and Marxism
01:730:345 Philosophy and the Law
01:730:347 Philosophical Issues in Feminism
01:730:358 Philosophy of Law
01:730:371 Philosophies of Death and Dying
01:730:441 Ethical Theory
01:730:442 Moral Responsibility
01:730:445 Topics in Social and Political Philosophy
01:730:450 Topics in Moral Philosophy
01:730:459 Advanced Seminar in Ethics
01:730:470 Ethics and Practical Reason

**Requirements for the Political Science Component of the PPE Minor (three courses, 9 credits)**

One course in political theory, from the following list:

01:790:101 Nature of Politics
01:790:365 Gender and Political Theory
01:790:371 Western Tradition: Plato to Machiavelli
01:790:372 Western Tradition: Hobbes to Mill
01:790:373 Legal Philosophy Rights and Justice
01:790:374 Democratic Political Philosophy
01:790:375 American Political Thought to 1865
01:790:376 American Political Thought from 1865
01:790:472 Religion and Politics
01:790:473 Critics of Modernity
01:790:477 Critical Theory and Society

Two courses in policy or group relations, from the following list:

01:790:305 Public Policy Formation
01:790:318 Comparative Public Policy
01:790:319 Issues of American Foreign Policy
01:790:320 Politics and Social Policy: Lessons from Europe
01:790:322 Strategy in International Relations
01:790:323 Defense Policy
01:790:330 Interest Groups
01:790:333 Race, Ethnicity, and Politics
01:790:334 Politics of Black America
01:790:335 Women and American Politics
01:790:338 Government and Business
01:790:350 Environmental Policy: U.S. and International
01:790:355 Women and Public Policy
01:790:358 Globalization, Democracy, and Contemporary Capitalism
01:790:360 Gender and Politics and Global Perspective
01:790:363 Conflict Resolution in World Politics
01:790:364 Global Order
01:790:386 Political Change in China
01:790:401 American Constitutional Law I
01:790:404 Politics of Criminal Justice

**Requirements for the Economics Component of the PPE Minor (three courses, 9 credits)**

Both of these two introductory courses:

01:220:102 Introduction to Microeconomics
01:220:103 Introduction to Macroeconomics

One course from the following list:

01:220:120 Inequality
01:220:327 History of Economic Thought
01:220:331 Economics of Crime
01:220:390 Choice and Strategy in Politics (Prerequisite: 01:220:102)
01:220:402 Labor Economics (Prerequisites: 01:220:320 and 01:220:322)
01:220:417 Health Economics (Prerequisites: 01:220:320 and 01:220:322)
01:220:432 Environmental Economics (Prerequisites: 01:220:320 and 01:220:322)
01:220:460 Public Economics (Prerequisites: 01:220:320 and 01:220:322)
01:220:463 Economics of Taxation (Prerequisites: 01:220:320 and 01:220:322)
01:220:482 Game Theory and Economics

# Departmental Honors Program

# Departmental Honors Program

The departmental honors program is intended for senior majors in political science. Students who have successfully completed at least 15 credits in political science with a 3.4 grade-point average or better in these courses and a 3.0 overall grade-point average or better are invited to apply. Eligible candidates may pursue honors by either of two courses of study. The first is a 6-credit senior thesis option in which students are expected to conduct original research and prepare an original piece of scholarship as their senior thesis. It involves enrollment in two semesters of Honors in Political Science (01:790:495-496) in the senior year. Both semesters must be completed to receive credit. Individual students are responsible for recruiting an appropriate faculty member to supervise their research and thesis. Interested students should draft a thesis proposal and consult with faculty members whose expertise lies in an appropriate area or with whom the student has taken courses previously. Individual faculty members will indicate their specific requirements for the completion of departmental honors. During the second semester of work, a faculty committee will conduct an oral examination in which the honors candidate will defend his or her findings and will be expected to demonstrate a grasp of the literature in the area encompassed by the research undertaken.

The second way of achieving honors requires completion of an honors thesis in the School of Arts and Sciences. Students who select this option must meet the departmental grade-point average requirements for honors. Successful completion of such an honors thesis under the supervision of a faculty member in the Department of Political Science automatically will result in the award of departmental honors.

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# Certificate Programs

# Certificate Programs

**Certificate Program in Quantitative Political Science Methods**

The certificate program in quantitative political science methods is a program designed to lead to an understanding of how social scientists pose research questions, design tests of hypotheses, and analyze quantifiable information. These are valuable skills for the workforce and graduate school, as well as for informed citizens. A basic understanding of how social science research is conducted can help citizens evaluate the information they read about in the newspapers or hear about on television. Students completing the program will have put their methodological skills to use in their own in-class research projects, as part of their required Political Science Seminar (01:790:395).

*Requirements*

1. This program is only open to declared political science majors, and will be awarded only in conjunction with or subsequent to the awarding of a baccalaureate degree in political science.

2. To participate in the program, students must register by submitting an application, providing name and contact information. Applications are available in the undergraduate political science office, Hickman Hall, Room 509.

3. Students must satisfactorily complete 01:790:300 Introduction to Political Science Methods.

4. Students must satisfactorily complete an approved section of 01:790:395 as their political science seminar.

5. Students must satisfactorily complete any three of the following courses (those courses that satisfy requirements of the political science major may simultaneously be counted for that purpose):

*Political Science*

01:790:307 Survey Research (3)

01:790:392 Applied Research Methods (3)

01:790:481,482 Internship in Political Science (3,3) (with approved statistical or quantitative focus)

*Economics*

01:220:322 Econometrics (3)

01:220:326 Econometric Theory (3)

01:220:401 Advanced Cross-Sectional and Panel Econometrics (3)

01:220:481 Economics of Uncertainty (3)

01:220:482 Game Theory and Economics (3)

01:220:483 Economics of Information (3)

01:220:486 Operations Research I (3)

*Mathematics*

01:640:104 Introduction to Probability (3)

01:640:339 Mathematical Models in the Social Sciences (3)

*Psychology*

01:830:200 Quantitative Methods in Psychology (4)

01:830:300 Research Methods in Psychology (3)

01:830:323 Research Methods in Social Psychology (4)

*Sociology*

01:920:311 Social Research Methods (4)

01:920:312 Introduction to Statistics in Sociology (4)

*Statistics*

Any course in the statistics department

**Eagleton Undergraduate Associates Certificate (Eagleton Institute of Politics)**

Each year 20 to 25 juniors are selected to participate as undergraduate associates of the Eagleton Institute of Politics to study government and politics. Students selected for this program begin during the second semester of their junior year and continue through their senior year. By means of special seminars, a supervised internship, and a series of visits by governmental officials and political practitioners, undergraduate associates explore applications of political science to the practice and processes of American politics.

To complete the program and receive an undergraduate associates certificate from the institute upon graduation, each student must complete 12 credits of designated undergraduate and/or graduate courses in American politics with an average grade of at least a B. During the second semester of their junior year, students are required to take 01:790:428 The Practice of Politics, which focuses on the idea of politics as choice, with students analyzing different political decisions each week. During the spring semester of their senior year, students are required to take 01:790:429 Processes of Politics, which examines representation, leadership, campaigning, lobbying, management, and ethics. The remaining 6 credits must be satisfied by taking 300-level or above political science course(s) in American politics and/or an internship. Members of the faculty participate as guest lecturers in the entry seminar, while the exit course includes participation by political practitioners. Both courses emphasize individual and group participation by students.

The Eagleton undergraduate associates program also offers students the opportunity to connect classroom learning with the experience of working in government, politics, or public affairs through a required internship experience. In recent years, students have been placed in internships in the New Jersey legislature; the governor's Office of Policy and Planning; various state departments; and the public affairs' offices of corporations, public-interest groups, state associations, and lobbying firms.

Students must submit a completed application by the first week in October of their junior year to the director of the institute, along with an unofficial transcript and two letters of recommendation from faculty members, including at least one from a political science professor. For further information, see here.

Note: The Eagleton undergraduate associates certificate is awarded only with or subsequent to the awarding of a baccalaureate degree in an approved major.

**Global Politics Certificate**

This program structures multidisciplinary coursework and overseas educational experiences to offer a course of study for students interested in understanding politics, political structures, and political institutions around the globe. The certificate requires overseas experience as well as language and political science training necessary to make such an experience valuable. It offers the opportunity to build upon the ideas and insights acquired abroad in research and other activities at Rutgers.

While the career interests of students undertaking this certificate program are diverse and there is no expectation that they will pursue any particular career track, the skills and experiences that can be acquired in this program will be valuable for students interested in transnational organizations or institutions; American foreign policy; or graduate study in international affairs, public policy, international business, law or an academic discipline.

*Requirements:*

- This program is open **only** to declared political science majors.
- Students must submit a letter of intent to participate in the certificate program to the Undergraduate Studies Office in the Department of Political Science (Room 509 Hickman on Douglass campus) **before the first semester of their junior year.** This letter should include a description of the student's interests and career aspirations and their plans for meeting the international experience requirement.
- Students must complete with a grade of C or better **all** political science major requirements as supplemented below. This includes a minimum of 13, 3-credit courses in political science, at least nine of which must be at the 300/400 level and one of which must be 01:790:395.
    - Global politics certificate students must complete both 01:790:102 Introduction to International Relations and 01:790:103 Comparative Politics
    - Global politics certificate students must complete a minimum of four 300/400-level courses in foreign and international politics, not including the senior thesis, internship, independent study, or 01:790:395 (Political Science Seminar).
    - Global politics certificate students must complete an international experience, defined as study abroad through Rutgers or another accredited university; a CASE international program through Rutgers; or work with an international or transnational agency. A one-semester experience is the norm; one year is recommended; and one summer is permissible under special circumstances. Arrangements for the international experience must be approved by the department in advance. Academic credit toward major is awarded on a case-by-case basis. Students should begin their search for placement at a foreign university or in an international program by visiting the Rutgers Study Abroad website.
- Global politics certificate students must demonstrate proficiency in a relevant foreign language, defined as qualifying for 300-level courses in that language.
- Global politics certificate students must participate in two extracurricular activities with global, international, or foreign focus that are approved by the advisers for the global politics certificate listed below. Students must provide a summary report for each activity using the forms provided by the department.

To receive the global politics certificate and have it so noted on your transcript, you must submit a Rutgers transcript with study abroad courses listed or a completed international experience plus literature; and four extracurricular activities forms plus literature. Submit all material, including the letter of interest, to Professor Christine Cahill, Undergraduate Advisor, at c.cahill@rutgers.edu

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# Courses

# Courses

**01:790:101** *Nature of Politics (3)*
Crucial issues in politics: individual and community; political obligation and civil disobedience; stability, revolution, and change; legitimacy and justice; freedom and power.

**01:790:102** ***Introduction to International Relations (3)***
Explanations of patterns of behavior in international systems. Topics include the state, sovereignty, war, power, nationalism, imperialism, security dilemmas, interdependence, international regimes, and ethical issues.

**01:790:103** ***Comparative Politics (3)***
Selected political systems considered in a comparative framework. Cases taken from among both more and less economically developed countries. Focuses on governmental processes and institutions.

**01:790:104** ***American Government***
Comprehensive analysis of American political institutions. Issues and problems faced by federal, state, and local governments under the impact of modern conditions. The leading political, economic, and social influences affecting democratic government.

**01:790:106** ***Law and Politics (3)***
Inquiry into a role of law and politics in the federal court system. Focus on interaction between Supreme Court, Congress, and President. Assessment of role of courts in the United States.

**01:790:204** ***Capitalism, Socialism, and Democracy (3)***
Genesis and development of democracies and dictatorship in advanced industrial societies and in the third world. Role of capitalism; revolutionary, conservative, and liberal movements; contemporary forms of imperialism and dependency.

**01:790:220** ***The Civic Community as Theory and Practice (3)***
Critical examination of issues of civil community, citizenship, democracy, and civic responsibility. Includes special activities and discussion of community service performed in conjunction with course. Corequisite: 01:790:400 Independent Study: Civic Engagement and Service Education Partnerships (CESEP) program Community Service Placement (1).

**01:790:237** ***Political Economy and Society (3)***
Introduction to issues raise by the changing role of government toward business and the economy; survey of major politics; introduction to competing schools and political economic though.

**01:790:250, 251, 252, 253** ***Topics in Political Science (1.5)***
Special topics that vary with instructor.

**01:790:254** ***Intro to Research Process: The Literature Review (1.5)***
Intensive examination of social science literature with an eye to understanding the structure of published research and writing a literature review. Topics vary by instructor.

**01:790:264** ***Religion and Reproduction: Jewish and Christian Experiences (3)***
Exploration of the intersection of religion and reproduction the United States and Israel in shaping reproductive practices, norms, and policies. Ethnographic case studies of reproduction among Jews and Christians with some attention to historical analyses and philosophical commentaries. Gender and religion will form the two primary modes of analysis for the study of reproduction. Credit not given for this course and 01:563:264, 01:840:263, or 01:988:220.

**01:790:280** ***Politics of Disability (3)***
Examines the politics behind the creation and implementation of public policy related to disability and the allocation of resources to support such policies. Teaches some basics of political activism.

**01:790:292** ***Introduction to Critical Intelligence Studies (3)***
Provides an intellectual foundation for the study of intelligence, both as it has been practiced through history and as it is currently practiced by different nationals and other entities today. Offers critical assessment of primary American efforts.

**01:790:300** ***Introduction to Political Science Methods (3)***
Logic and techniques of social science research. Topics may include survey research, experiments, content analysis, data processing, and elementary statistics. No special math skills required.

**01:790:301** ***Political Campaigning (3)***
Development of campaign strategy, planning campaign activities, campaign organization, financing, public relations and media use, voter contact, polling, campaign ethics, the impact of campaigns on the American system.

**01:790:302** ***American Party Politics (3)***
Nature and functioning of the two-party system, its causes and effects, Particular attention devoted to the electoral role of parties, including political leadership and organization, nominations, campaigns, finance, and party programs.

**01:790:303** ***Elections and Participation (3)***
Mass political participation in the United States as reflected in voting, electoral politics, and other forms of political participation.

**01:790:304** ***Congressional Politics (3)***
Functions of legislatures; their structure, organization, and procedure; the problems and principles of lawmaking; and the process by which law is created.

**01:790:305** ***Public Policy Formation (3)***
Origin and impact of public policy decisions on society. How specific decisions are made. How these decisions affect the structure of society. Individual cases analyzed.

**01:790:306** ***American Presidency (3)***
Historical and legal evolution of the office of the presidency. Role of the president as party leader, chief legislator, executive, and public spokesman.

**01:790:307** ***Survey Research (3)***
Theory and practice of mass opinion surveys and their use in political science. Sampling theory, questionnaire format, question framing, interviewing, coding, and interpretation of results.

**01:790:308** ***New Jersey Politics (3)***
Examination of various aspects of politics in New Jersey, including elections, governmental institutions, and public policies and the policy making process.

**01:790:309** ***The Politics of Puerto Rican Development (3)***
Analysis of relationship between political and economic development in the 20th century, changing nature of U.S./Puerto Rican relations, formation of the colonial state, and the statehood and independence movements.Credit not given for both this course and 01:595:309.

**01:790:310** ***UK Politics (3)***
Institutions and political practices in the United Kingdom. Emphasis on the functioning of democracy in the changing social, economic, and psychological conditions of the contemporary world.

**01:790:311** ***European Politics (3)***
Analysis of national governments in western Europe and of the European Union (EU). Focus on contemporary issues including economic liberalization, welfare state reform, European law, foreign policy, and enlargement to eastern Europe.

**01:790:312** ***Change in Latin America (3)***
Emerging political and social issues in Latin America: development, democratization, sovereignty, religion, gender, race, migration.

**01:790:313** ***Political Economy of East Asia (3)***
Exploration of the principal states of eastern Asia and the western Pacific through the lens of political economy. Focus on internal politics, trade, and economic development.

**01:790:314** ***Sub-Sahara African Policies (3)***
Patterns of political change and political development in Africa south of the Sahara. Credit not given for both this course and 01:016:314.

**01:790:315** ***Politics and Culture (3)***
Relationship among various aspects of culture, e.g., the role of symbol, myth, ritual, and religion and its relationship to politics.

**01:790:316** ***Politics, Literature, and the Arts (3)***
Discussion and analysis of political elements in selected aesthetic works that vary with the instructor

**01:790:317** ***Globalization and the Non-Western World (3)***
Theoretical understanding of the political, economic, social, and cultural dimensions of globalization. Study of these theories within the context of selected non-Western countries using social science texts, literature, and films. Credit not given for both this course and 01:685:317.

**01:790:318** ***Comparative Public Policy (3)***
Inquiry into a current major area of public policy drawn from the field of comparative politics or international relations. Policy area varies from year to year.

**01:790:319** ***Issues of American Foreign Policy (3)***
Analysis of the major substantive questions facing U.S. foreign policy.

**01:790:320** ***Politics and Social Policy: Lessons from Europe (3)***
European approaches to 21st-century policy challenges in common with the United States, such as health care, climate change, education, a fractured social safety net, an aging population, high unemployment, and growing deficits. Credit not given for both this course and 01:790:290 or 01:360:290 or 01:360:320.

**01:790:321** ***Theories of World Politics (3)***
Alternative theories of world politics with emphasis on basic causal factors affecting global behavior.

**01:790:322** ***Strategy in International Relations (3)***
Examination of the dynamics of contemporary international politics, including strategic and bargaining theory.

**01:790:323** ***Defense Policy (3)***
Formulation of defense policy and doctrine, weapons development, the role of threats. Critical review of current U.S. military decisions.

**01:790:324** ***Causes of War (3)***
Recent scientific research on the emergence of serious disputes, escalation, conflict spirals, arms races, the outbreak of war, consequences of war, and conditions of peace.

**01:790:327** ***International Political Economy (3)***
Interdependence of political and economic structures and processes in the development and management of the modern world economy.

**01:790:328** ***Caribbean Politics and Development (3)***
Politics and development of Caribbean nation-states with special emphasis on internal and regional politics and their relationship with social questions. Party politics, ideologies, economic development, leadership, and political/social movements. Credit not given for both this course and 01:595:328. Not open to first-year students.

**01:790:329** ***Latino Politics in the United States (3)***
Political organization of Latino communities in the Northeast since World War II. Role of Latinos in shaping U.S. domestic and foreign policy; the impact of immigration and language policies on political organization.Credit not given for both this course and 01:595:329.

**01:790:330** ***Interest Groups (3)***
Role interest groups play in the representation of constituent interests, formulation of public policy, and implementation of governmental programs.

**01:790:331** ***Urban Politics (3)***
City politics and public policy. Urban government and major urban problems such as finance, poverty, housing and economic development, education, crime, transportation, and the environment.

**01:790:332** ***Money and Modern America (3)***
Cultures of materialism and ostentatious displays of consumption; the ethics of money, from the meaning of an "honest day's work" to the gray areas of bribery, insider dealing, and profiting from the misery of others; recent financial crises and their impact on American life. Credit not given for both this course and 01:050:318.

**01:790:333** ***Race, Ethnicity, and Politics (3)***
Development of race relations in the United States beginning with slavery. Relationship between the politics of race and the politics of class.

**01:790:334** ***Politics of Black America (3)***
Political perspectives and strategies of black Americans and the responsiveness of the American political system to the interests and demands of the black community.Credit not given for both this course and 01:014:381.

**01:790:335** ***Women and American Politics (3)***
Women's participation in American politics, with emphasis on the attitudes and behavior of women as voters, activists, and officeholders. Credit not given for both this course and 01:988:336.

**01:790:336** ***American Political Movements (3)***
Origins and development of political and social movements in America; theories of their decay, reform, or absorption into the mainstream of American political life.

**01:790:337** ***US Immigration Politics and Policy (3)***
Overview of the major immigration policies in the United States and exploration of relationship between immigration and national identity. Historical and contemporary policies examined, along with their cultural, economic, and political implications.

**01:790:338** ***Government and Business (3)***
Relations between business and government. Assessment of impact of governmental action on business. Analysis of lobbying, business participation in electoral process, public service and public image activities, and legal relations with government.

**01:790:340** ***Law and Society (3)***
Examination of different ways of understanding law and its social, cultural, and political significance. Topics may include the nature of law, crime and punishment, the "adversary ethic," law and morality, law's role in structuring social relationships, civil disputes, and feminism and the law.

**01:790:341** ***Public Administration: American Bureaucracy (3)***
Institutional setting and political relationships in administration; leadership, decision-making, personnel and budgeting functions; administrative law and regulation; the problem of responsibility.

**01:790:342** ***Politics of Authoritarian Regimes (3)***
Exploration of non-democratic government types, their foundations, politics, and policy processes.

**01:790:343** ***Counterterrorism and Democracy (3)***
Explores the problem of developing a long-term strategy to address terrorism through the competing lenses of security and democracy.

**01:790:344** ***Public Opinion (3)***
Theory and research on public opinion in the United States, including uses and abuses of polls, recent trends in political and social opinions, and relationship between public opinion and public policy.

**01:790:345** ***Mass Media and U.S. Democracy (3)***
Theoretical and actual role of mass media in the United States, including the structure of mass media industry, news production, effects on political and social views, and how the media are regulated.

**01:790:346** ***Political Socialization (3)***
Theory and process of the development of political attitudes. The influence of the family, school, media, occupation, personality, and social background.

**01:790:347** ***Political Representation (3)***
Explores dynamics of political representation from multiple angles. Discusses classic concepts and theories, new directions in research, and empirical studies. Draws on work from diverse identity groups, world regions, and time periods.

**01:790:348** ***Psychology and Politics (3)***
Political behavior of individuals and groups. Themes selected from personality and politics, attitude change, leadership, cognitive development, identity, ideology, psychology of oppression, and role theory.

**01:790:349** ***Topics in American Politics (3)***
Special topics in American politics that vary with the instructor.Credit not given for both this course and 01:014:349.

**01:790:350** ***Environmental Politics-United States and International (3)***
Environmental politics and policy from American, comparative, and international perspectives. National styles of regulation, trade-environment conflicts, role of international institutions.

**01:790:351** ***Contemporary Politics in the Middle East (3)***
Contemporary politics of the Middle East through scholarly literature and through documentary-type films dealing with socioeconomic and cultural influences on politics. Credit not given for both this course and 01:563:351 or 01:685:351.

**01:790:352** ***Israeli Politics (3)***
Basic understanding of the historical background of the establishment of the state of Israel; major characteristics of the political culture and institutions and how they have responded to the dynamic sociocultural and political changes that have shaped the society. Credit not given for both this course and 01:563:352 or01:685:352.

**01:790:353** ***Ending Civil War and Building Peace (3)***
Exploration of contemporary civil wars and international efforts to end civil wars using international relations theory and case studies. Peacebuilding through conflict resolution, institutional design, transitional justice, development aid and other methods.

**01:790:354** ***East Asia in World Affairs (3)***
Examination of the major states of East Asia in world affairs with specific reference to big-power diplomacy, the United Nations, regionalism, neutralism, and war.

**01:790:355** ***Women and Public Policy (3)***
Examination of major public policy questions affecting women. Topics, drawn from the United States and other societies, may include reproduction issues, economic equality, violence against women, and political rights.Credit not given for both this course and 01:988:355.

**01:790:356** ***Organizing for Social Change (3)***
Theory and practice of community organizing for social change for labor and community groups; membership building; leadership development; strategy development; community power analysis; campaign planning. Credit not given for both this course and 37:575:359

**01:790:357** ***Comparative Political Economy (3)***
Analysis of different approaches to political economy and the interaction of political, social, and economic forces in historical perspective.

**01:790:358** ***Globalization, Democracy, and Contemporary Capitalism (3)***
Comparison of contemporary market economies in developed and developing countries, how they are affected by integration into global markets, and the implications for democracy.

**01:790:359** ***Women and Politics in the Middle East (3)***
Gender in the Middle East. How social, political, and cultural construction of sexual difference influence the nature and practice of political life in the Middle East. Credit not given for both this course and 01:685:359.

**01:790:360** ***Gender and Politics in Global Perspective (3)***
Central topics in the study of gender and politics, covering such issues as women's participation in political parties and social movements, women as voters and candidates in political elections, feminism and the state, and gender and international politics. Draws on examples from various world regions and time periods to analyze similarities and differences across cases around the globe.

**01:790:361** ***International Organizations (3)***
Review of League of Nations, United Nations, World Court, and specialized agencies.

**01:790:362** ***International Law (3)***
Fundamental rules of international law in its relation to the state and the individual. Discussion of cases, status, treaties.

**01:790:363** ***Conflict Resolution in World Politics (3)***
Nature and management of conflict in world politics, with emphasis on the instruments and limits of national power; sources of international conflict; changing patterns of alliance and alignment; and approaches to peace, reconciliation, and stability.

**01:790:364** ***Global Order (3)***
Considers alternative perspectives on the nature of order in post-Cold War world politics and examines the major developments in international relations since 1989.

**01:790:365** ***Gender and Political Theory (3)***
Role and place of gender in political thought. Readings drawn from major historical theorists and modern feminists. Credit not given for both this course and01:988:365.

**01:790:366** ***Politics of National Security (3)***
The role of intelligence in National Security Policy since World War II with focus on constitutional and legal issues

**01:790:367** ***Islam and Democracy in the Middle East (3)***
The evolving relationship of Islamist political parties and movements to democracy in the Middle East. Cases drawn from regions of the Middle East such as Turkey, Arab countries, and Iran among others. Credit not given for both this course and 01:685:357.

**01:790:369** ***Topics in World Politics (3)***
Intensive examination of a number of significant questions related to world politics. Questions vary with instructor. Prerequisite: Permission of instructor.

**01:790:370** ***Topics in Political Theory (3)***
Examination of major issues in political theory. Topics vary by instructor.

**01:790:371** ***Western Tradition: Plato to Machiavelli (3)***
Relationship of man to society and the political order and the ethical foundations of politics as seen by the major Western political philosophers: Plato to Machiavelli.

**01:790:372** ***Western Tradition: Hobbes to Mill (3)***
Relationship of man to society and the political order and the ethical foundations of politics as seen by the major Western political philosophers: Hobbes and Rousseau to Mill and Marx.

**01:790:373** ***Legal Philosophy, Rights, and Justice (3)***
Place of law in the democratic state. The nature of law, its role in regulating behavior, legal reasoning, rival legal theories; the conflict between positivism and the theory of law; punishment and responsibility; various standards of justice.

**01:790:374** ***Democratic Political Philosophy (3)***
Analysis of the relationship between ethics and politics in contemporary democracy and current challenges to traditional democratic theory. Political obligation, the justification of authority, disobedience and the right of resistance, freedom, social justice, and equality.

**01:790:375** ***American Political Thought to 1865 (3)***
Philosophical and theoretical foundations of the American republic with attention to themes and conflicts in American thought and culture. European background and political thought of the colonial period to the Civil War.

**01:790:376** ***American Political Thought from 1865 (3)***
American political thought and philosophy in the era of industrialism, world power, and mass society. The political thought of political movements since the Civil War.

**01:790:377** ***Marx and Marxist Theory (3)***
Development of Marxist thought from Hegel to the 20th century. Alienation, class consciousness and class struggle, universal human emancipation, the labor theory of value, historical materialism, and the dialectic.

**01:790:378** ***Human Rights Law (3)***
Principles, norms, and legal frameworks that govern the protection and promotion of human rights on a global scale.

**01:790:379** ***Writing with Revision in Political Science (3)***
Promotes development of competence in reading, critical thinking, and writing, with emphasis on the intellectual and practical skills required for the research paper.

*Prerequisite: 01:355:101 or 103 or 104 or equivalent. Open to majors only.*

**01:790:380** *Russian and Central European Political Thought (3)*
Russian and central European Marxism; its origins in the 19th-century political thought of the region; Marx, Engels, Lenin, Stalin, and their intellectual opponents. Intellectual roots of the 1989-1991 revolutions.

**01:790:381** *Politics of Russia and Eastern Europe (3)*
Examination of the politics of Russia, Eastern Europe, and the post-Soviet states. Focus on the interaction between legacies of communism and new institutional designs in Russia and eastern Europe. Major patterns of post communist politics identified, compared, and analyzed. Democratic transition theories explored.

**01:790:382** *Foreign Policy of Russia and the East European States (3)*
Foreign policies of Russia, other Soviet "successor" states, and East European countries since 1989. Includes discussion of main features of foreign policy of former Soviet Union, relations between the Soviet Union and its satellite states, and international ramifications of the collapse of the Soviet bloc.

**01:790:383** *Politics of Postcommunist Economic Reforms (3)*
Specific patterns of interaction between postcommunist politics and economic reforms examined. Brief introduction to political economy of communism and its collapse. Politics of economic reforms. Discussion of neoliberalism, mechanisms of accountability, corruption, and clientelism.

**01:790:384** *Jewish Politics, Jewish Power (3)*
Political relationship of the Jewish community to the Gentile authorities among whom they lived, from Rome in 70 CE to the contemporary period. Continuities and discontinuities of traditional conceptions of Jewish political behavior and rebellion and accommodation to structures of power in varying historical contexts. Credit not given for both this course and 01:563:389 or01:510:389.

**01:790:385** *Arab Politics and Society (3)*
Study of Arab nationalism, civil-military relations, radical Islam, women in politics, and ethnic relations through social science readings and literature in translation.Credit not given for both this course and 01:685:385.

**01:790:386** *Political Change in China (3)*
Changes taking place in China in the 20th century, with particular emphasis on the People's Republic of China. The utility of various types of comparative analysis.

**01:790:388** *Ideologies of the Right (3)*
Centers upon the sociopolitical experience of conservative and often reactionary movements in selected countries. Leading theorists discussed.

**01:790:389** *Topics in Comparative Politics (3)*
Selected topics in comparative politics that vary with the instructor.

**01:790:390** *Choice and Strategy in Politics (3)*
Rational-choice approaches to understanding political behavior and institutions. Spatial models of direct and representative democracy; strategic behavior of political actors; ideal voting systems; selected applications in U.S. and other political systems. Credit not given for both this course and 01:220:390.
*Prerequisite: 01:220:102*

**01:790:391** *Data Science for Political Science (3)*
Explores different ways to use data to understand social science phenomena. Teaches statistical analysis software, research question development, and hypothesis testing.

*Prerequisite: 01:640:026 or placement above Intermediate Algebra.*

**01:790:392** *Qualitative Research Methods (3)*
Principles of research design and to the collection and analysis of qualitative data in the social science

**01:790:393** *New Jersey State Legislature Internship (3)*
Internship with a New Jersey state legislator or in an office of the New Jersey state legislature, arranged through and supervised by the Rutgers Civic Engagementand Service Education Partnerships (CESEP) program. In addition to work in the internship placement, includes regular meetings in seminar or classroom setting and an appropriately designed academic project resulting in a paper.

*Prerequisite: Permission of the department. Open to majors and nonmajors.*

**01:790:394** *Rutgers-Japan Exchange (3)*
Exchange program with Ritsumeikan University in Kyoto Japan focusing on a topic of interest to American and Japanese relations. Sample topics include world politics, collective memory, leadership, social movements, and culture. Spring semester includes visit from Japanese students.

**01:790:395,396** *Political Science Seminar (3,3)*
Seminars involving analysis, discussion, and research of topics in political science. Open to political science majors only.

**01:790:397** *Washington Internship (9)*
Internship in a government or public service agency in Washington, D.C.

*Prerequisites: 12 credits in political science, including 3 credits of advanced American government, or equivalent with permission of department; and junior or senior standing Corequisite: 01:790:494. Graded Pass/No Credit. Field experience: 35 hours per week plus speaker series and group sessions. Residence in Washington, D.C., required.*

**01:790:398** *Washington Summer Internship and Research (9)*
Internship in a government or public policy-related agency/office in Washington, D.C; internship-related classroom activities; and research paper submitted to the department.

*Prerequisites: 12 credits completed in political science, including 3 credits of introductory American government and 3 credits of advanced American government at the 300 level or above; 60 or more total credits completed toward graduation; and permission of the department. Residence in Washington, D.C., required.*

**01:790:399** *Independent Study (1)*
*Prerequisite: Permission of department before registration. Must be taken in conjunction with a 3-credit political science course specified in course list.*

**01:790:400** *Independent Study (1.5)*
*Prerequisite: Permission of department before registration. Must be taken in conjunction with a 3-credit political science course specified in course list.*

**01:790:401** ***American Constitutional Law I (3)***
Exploration of forms of legal reasoning and argumentation through close analysis of U.S. Supreme Court cases. Focus on economic policy, property rights, and substantive due process cases.

**01:790:404** ***Politics of Criminal Justice (3)***
Systematic examination of the relationship between political variables, crime rates, police behavior, court dynamics and sentences, and prison practices and functions.
***Prerequisite: 01:790:201 or 247 or permission of instructor.***

**01:790:406** ***Civil Liberties and Civil Rights (3)***
Political and civil rights and duties, such as freedom of the person; elementary freedoms of speech, press, assembly, and religion; freedom against arbitrary action; discrimination; free interchange of ideas.
***Prerequisite: 01:790:201 or 247 or permission of instructor.***

**01:790:409** ***Courts and Public Policy (3)***
Examines the legitimacy, capacity , and effectiveness of policy making by the judicial branch.

**01:790:410** ***Advanced Studies in Law I (3)***
Intensive seminar on selected public law issues.
***Prerequisite: Permission of instructor.***

**01:790:411** ***Advanced Studies in Law II (3)***
Intensive seminar on selected public law issues.
***Prerequisite: Permission of instructor.***

**01:790:412** ***Advanced Studies in Law III (3)***
Intensive seminar on selected public law issues

***Prerequisite: Permission of instructor.***

**01:790:418** ***Democracy and Markets in Latin America (3)***
Transitions from authoritarian to democratic regimes in Latin America; economic policy challenges faced by new democratic governments; and prospects for the consolidation of democratic regimes.

**01:790:419** ***Research Seminar on Causes of War (3)***
Survey of the leading theories of the causes of war; student research projects on the causes of individual wars; comparison of the causes of different wars.

***Prerequisites: At least one course in international relations or foreign policy and permission of instructor.***

**01:790:423** ***Contemporary Feminist Theory (3)***
Survey of both classic and contemporary texts in feminist theory emphasizing the irrelevance for modern political thought and social praxis. Credit not given for both this course and 01:988:423.

**01:790:424** ***Gender and Political Economy (3)***
Feminist theories of political economy. Effects of economic change on women, political responses of women's movements in the United States and internationally; differences of race, class, sexuality, and nation in shaping such effects and responses. Credit not given for both this course and 01:988:424.

**01:790:426** ***Gender, Public Policy, and Law (3)***
Advanced topics in gender, public policy, and law, focusing on a selected cluster of current issues. Topics may include regulation of sexuality and reproduction, labor organizing and labor politics, politics of welfare and poverty, and issues in health policy and politics.Credit not given for both this course and 01:988:428.

**01:790:428** ***The Practice of Politics (3)***
Emphasizes the interaction of political science theory and literature with the realities of political experience. Required of, and limited to, participants in the Eagleton Undergraduate Associates Certificate Program.

**01:790:429** ***Processes of Politics (3)***
Exploration of significant aspects of the American political system, including representation, leadership, bargaining, advocacy, participation, and achievement. Open only to participants of the Eagleton Undergraduate Associates Certificate Program. Permission of instructor required.

**01:790:430** ***Advanced Studies in Public Policy (3)***
Special topics in public policy that vary with the instructor.

**01:790:437** ***Politics of American Capitalism (3)***
Impact of continuing industrial and technological development on politics in Western society. Impact of multinational corporations on national sovereignty, stagflation, alienation, feminism, race relations, trade unionism, and youth culture.

**01:790:439** ***Advanced Studies in Political Economy (3)***
Selected topics in political economy that vary with the instructor.

**01:790:440** ***Advanced Studies in American Politics (3)***
Selected topics in American politics that vary with the instructor.

**01:790:441** ***Data Science for Political Science Capstone (1)***
Capstone course required of all students pursuing the Data Science minor. Semi-independent, supervised research
***Pre- or corequisite: 01:790:391.***

**01:790:450** ***Advanced Studies in Comparative Politics (3)***
Selected topics in comparative politics that vary with the instructor.

**01:790:451** ***Critical Perspectives on the Middle East (3)***
Promotes critical thinking about the Middle East by analyzing how stereotypes and Western political theories hinder intercultural understanding, and encourages students to think more dynamically about the relationship between the United States and the third world.

***Prerequisite: 01:790:102 or 103 or 351 or permission of instructor. Credit not given for both this course and 01:563:451 or 01:685:451.***

**01:790:452** ***Advanced Topics in Middle Eastern Politics (3)***
Detailed analysis of selected topics including religious radicalism, Israeli-Palestinian conflict, gender politics, the authoritarian state, nationalism, politics of authenticity, and political economy of development.
***Prerequisite: 01:790:102 or 103 or 351 or permission of instructor. Credit not given for both this course and 01:685:452.***

**01:790:453** ***Comparative Political Anthropology (3)***
Development of political anthropology and its relationship to political science. Major approaches and trends in the field; kinship, patron/client relations, social networks, political symbols, myths, rituals, ideology, and their roles in political change.

**01:790:454** ***Political Development of Asia (3)***
Roots of modern nationalism in various Asian nations; emphasis on leaders and ideas.

**01:790:455** ***Culture and Revolution in the Middle East (3)***
Middle Eastern culture and its relationships with revolutionary movements and radical Islam. Major perspectives on current discourses regarding revolution and Middle Eastern culture. Credit not given for both this course and 01:685:455.

**01:790:457** ***Islamic Law and Jurisprudence (3)***
Introduction to Islamic legal theory in its historical and modern political contexts. Contrasts Islamic law and legal theory with Western legal theory and constitutional thought. Credit not given for both this course and 01:685:457.

**01:790:470** ***Advanced Studies in Political Philosophy (3)***
Selected topics in political philosophy that vary with the instructor.

**01:790:471** ***Machiavelli and the Renaissance (3)***
The Prince and other political works of Machiavelli in the context of the Renaissance.

**01:790:472** ***Religion and Politics (3)***
Relationship between religion and political life. Emphasis on the work of religious and political theorists. The place of religion in American political life and discussion of religion in contemporary politics.

**01:790:473** ***Critics of Modernity (3)***
Writings of Alexis de Tocqueville, Karl Marx, Friedrich Nietzsche, Sigmund Freud, and Max Weber and their impact on 20th-century social and political thought.

**01:790:477** ***Critical Theory and Society (3)***
Course emphasizes the development of dialectical thought in the 20th century. Emphasis placed on "Frankfurt School" and its major representatives such as Max Horkhiemer, Theodore Adorno, Walter Benjamin, and Herbert Marcuse.

**01:790:481,482** ***Internship in Political Science (3,3)***
Work in a designated agency; an appropriately designed academic project resulting in a paper.

***Prerequisite: Permission of department before registration.***

**01:790:483** ***Critical Thinking and Analytic Writing for the Intelligence Community (3)***
Offers principles of and skills necessary for writing and briefing for the intelligence community in a seminar format.
***Prerequisites: 01:790:292 and declared minor in critical intelligence studies.***

**01:790:484** ***Research in Critical Intelligence Studies (3)***
One-semester research project dealing with some aspect of intelligence studies under supervision of a faculty member participating in intelligence studies program. Open to juniors and seniors with a minimum cumulative GPA of 2.7 minoring in intelligence studies. May not be used toward the 790 Political Science major.

**01:090:485** ***Intelligence Studies Internship (3)***
Professional, supervised work for a government agency or corporate entity with an emphasis on public safety, acquisition, analysis, and deployment of intelligence, and/or security, and completion of a course paper or project
***Prerequisites: 01:790:292 and a minimum of 6 other credits fulfilling intelligence studies minor requirements. Open only to juniors and seniors with a minimum cumulative GPA of 2.7 in the minor.***

**01:790:488** ***Field Internships in Political Science (3 or 6)***
Internship in a government or public affairs office working 10 to 25 hours per week according to the number of credits elected. Graded on a pass/fail basis.
***Pre-or corequisites: Junior or senior status and permission of department.***

**01:790:491,492** ***Advanced Independent Study and Research (3,3)***
Supervised individual study of selected topics of interest with extensive reading and/or independent research project.
***Prerequisite: Permission of department before registration.***

**01:790:494** ***Washington Research (6)***
Internship-related seminar and research paper submitted to the department.

***Corequisite: 01:790:397. Graded credits.***

**01:790:495-496** ***Honors in Political Science (3,3)***
Independent readings on a specialized topic of interest; completion of research paper and an oral defense. Open only to senior majors with 15 credits in political science and a 3.4 grade-point average or better in political science and a 3.0 or better cumulative grade-point average. Both 01:790:495 and 496 must be completed to receive credit.

**01:790:497-498** ***Thesis in Political Science (6,6)***
***Prerequisite: Permission of department. Both semesters must be completed in order to receive credit. For students writing an honors thesis.***

# Portuguese 810 (SAS)

## PORTUGUESE 810

Department of Spanish and Portuguese, School of Arts and Sciences

**Website:** Here

**Chair:** Nuria Sagarra

**Undergraduate Director:** Joseph V. Casillas

**Assistant Professor:**

Daniel da Silva, B.A., Rutgers; M.A., Ph.D., Columbia

# Learning Goals

# Learning Goals

*Learning Goals for Portuguese Majors and Minors*

Majors in Portuguese should be able to demonstrate proficiency in interpretive, interpersonal, and presentational modes of communication and a basic knowledge of cultural studies. Majors should be able to carry out conversations in which they can describe, compare, and contrast, in all tenses (present, past, and future), with an appropriate breadth of vocabulary and register, and to be understood by a nonsympathetic listener; and to read and write documents written in academic, formal, and/or literary registers of the language.

Majors should be able to conduct research projects according to the methodologies of the humanities, social, or cognitive sciences and demonstrate intercultural awareness and understanding of the Luso-Brazilian world. Honors students will be able to complete independent research, write a thesis, and defend it before a faculty committee.

Portuguese majors will be able to demonstrate knowledge of current issues and perspectives in literary and cultural studies in Portuguese and the fundamental body of works in Luso-Brazilian literature and culture; critically analyze verbal and visual texts; and demonstrate familiarity with a range of cultural works from different time periods and geographical regions within the Portuguese-speaking world and with the historical phenomena and sociocultural issues that these works negotiate.

Minors in Portuguese will be able to demonstrate a level of language proficiency that allows basic conversations on a variety of uncomplicated topics, with basic command of the language and some spontaneous creative ability; and basic familiarity with the main cultural, literary, and linguistic issues of the Luso-Brazilian world.

Portuguese 810 (SAS)

# Major Requirements

# Major Requirements

The requirements for the Portuguese major are:

1.The satisfaction of all the core course requirements, either by placement into a higher course initially or by completing the course.

2.The satisfactory completion of an oral exam in Portuguese in the final year.

3.A total of 36 credits in Portuguese courses, or approved courses from other departments.

- 100 level
    - 810:130 Intermediate Portuguese
    - 810:135 Portuguese for Speakers of Spanish

  200 level
    - 810:201 Portuguese for Native Speakers

- 810:203 Portuguese Conversation & Composition

300 level

- 810:309 Africa and Portugal: An introduction
- 810:310 Brazil: An Introduction
- 810:325 Advanced Grammar and Style
- 810:326 Advanced Composition

4.The completion of at least one 400-level course
5.Electives: Any 810 course at the 200-level or higher

Portuguese 810 (SAS)

# Minor Requirements

# Minor Requirements

A minor in Portuguese consists of 18 credits (six courses) taught in Portuguese with a grade of C or better in each course. Of the 18 credits, nine (9) credits must be in literature. The student's entire course of study must be approved by a departmental advisor.

Portuguese 810 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To be eligible for graduation with departmental honors, majors must maintain a cumulative grade-point average of 3.5 or better in their major courses, and 3.25 or better overall. Students are admitted to the departmental honors program by selection of the honors committee. The honors project is two semesters in duration (3 credits each semester) and may focus on any aspect of Luso/Brazilian/Portuguese language, linguistics, literature, or culture. Prior to beginning the honors project, the student is expected to complete at least two courses at the 300 level. The student must present the honors project for an oral defense before a committee assembled by the project director, in consultation with the candidate. More detailed information is available at the departmental honors website.

Portuguese 810 (SAS)

# Study Abroad

# Study Abroad

We now offer a 3 credit Summer Study Abroad Program for an entire month in Lisbon, Portugal. Classes are taught in English and you will be part of a cohort of students from other universities in the U.S. All new declared Portuguese minors are eligible to apply for funding through the Cátedra Três Marias Grant beginning at $1000 towards Portuguese language learning.

Portuguese 810 (SAS)

# Courses in English

# Courses in English

**01:810:160** ***Portuguese in the World (1.5)***
Current issues in the language, literature, and culture of the Portuguese-speaking world. Analysis of topics such as cultural identity, language contact, major literary authors, or historical implications of colonization.Course taught in English. Not for major or minor credit.

**01:810:240** ***The Luso-Hispanic Dialogue: Multiple Perspectives (3)***
Relationship between the Portuguese-speaking and Spanish-speaking worlds as it manifests itself culturally, linguistically, and historically.
***Credit not given for both this course and 01:940:240. Course taught in English.***

**01:810:241,242** ***The Portuguese-Speaking World: A Literary Introduction for English Speakers (3,3)***
Introduction to literary texts from the Portuguese-speaking world (Portugal, Brazil, and Lusophone Africa).
***Course taught in English. Credit not given for both this course and 01:195:242.***

**01:810:248** ***The Jewish Diaspora in Spanish-Speaking America and Brazil (3)***
Study of Jewish experience in Latin America, both Spanish and Portuguese speaking.
***Course taught in English.***

**01:810:250** ***Cultures of the Portuguese-Speaking Communities in the United States (3)***
Discussion of sociocultural issues concerning the diverse Portuguese-speaking communities of the United States.
***Course taught in English. Course will count for the Portuguese major or minor if all written work is done in Portuguese. Credit not given for both this course and 01:050:250.***

**01:810:330** ***Literature and Culture of Brazil (3)***
Reading and discussion of selected works of fiction and nonfiction with emphasis on their place in the development of Brazilian literature and their relationship to Brazilian culture.
***Course taught in English. Credit not given for both this course and 01:195:330.***

**01:810:335** ***Portugal: The 20th Century and Beyond (3)***
Major writers and movements from symbolism through Fernando Pessoa to the present.
***Course taught in English.***

**01:810:350** ***Literatures and Cultures of Lusophone Africa (3)***
Study of the literatures from African countries whose official language is Portuguese. Emphasis on 20th-century colonial and post-independence literature and theory.
***Texts available in English, and course taught in English. Credit not given for both this course and 01:016:350.***

**01:810:361** ***Brazil and the United States: Comparative Approaches (3)***
Comparative and interdisciplinary study of Brazilian literature and culture as it relates to contemporary issues of race relations, diversity, cultural dependency, and globalization.
***Course taught in English. Credit not given for both this course and 01:195:361.***

**01:810:410** ***Contemporary Brazil (3)***
Interdisciplinary study of contemporary Brazilian society.
***Course taught in English.***

**01:810:491,492** ***Topics in Luso-Brazilian Literature and Culture (3,3)***
Topics vary by semester. Consult department.
***Course taught in English.***

Portuguese 810 (SAS)

# Courses in Portuguese

# Courses in Portuguese

**01:810:101-102** ***Elementary Portuguese (4,4)***
Speaking, reading, and writing; oral, aural, and written exercises.
***Open only to those with no prior knowledge of Portuguese. Not open to speakers of Spanish.***

**01:810:130** ***Intermediate Portuguese (4)***
Study and practice of specific areas of grammar, linguistic structure, and style. Selected reading of modern authors with composition and class discussion.
***Prerequisites: 01:810:101-102, placement exam, or permission of department. Not open to speakers of Spanish or native speakers of Portuguese.***

**01:810:135** ***Portuguese for Speakers of Spanish (4)***
Study of Portuguese as it contrasts to Spanish. Development of speaking and listening skills. Practice in specific areas of grammar, linguistic structure, and style.
***Prerequisite: Permission of department. Open only to speakers of Spanish with no prior knowledge of Portuguese. Not open to native speakers of Portuguese.***

**01:810:136** ***Portuguese for Speakers of Spanish II (4)***
Continuation of study of Portuguese as it contrasts with Spanish. Development of speaking and listening skills. Practice in specific areas of grammar, linguistic structure, and style.
***Only open to speakers of Spanish.***

**01:810:141-142** ***Accelerated Portuguese (4,4)***
Intensive study of Portuguese. Practice of specific areas of grammar, linguistic structure, style, and literary analysis. Selected readings of modern authors with composition and class discussions.
***Open only to those with no prior knowledge of Portuguese. Credit not given for these courses and 01:810:101-102 or 130.***

**01:810:201** ***Portuguese for Native Speakers (4)***
Study of specific areas of grammar and orthography. Development of reading skills and vocabulary building. Practice in oral communication, grammar application, and composition.
***Prerequisite: Placement exam or permission of department.***

**01:810:203** ***Portuguese Conversation and Composition (4)***
Development of oral fluency and writing skills in a variety of contexts. Conversation, vocabulary building, oral reports, and fundamentals of expository writing.
***Prerequisites: 01:810:130 or 135 or 141-142, and permission of department. Not open to native speakers of Portuguese.***

**01:810:248** ***Introduction to the Jewish Diaspora in Spanish-Speaking America and Brazil (3)***
Study of Jewish experience in Latin America (both Spanish and Portuguese speaking).

**01:810:309** ***Africa and Portugal: An Introduction (3)***
Discussion of significant historical, social, and cultural trends in Portugal and Lusophone Africa.
***Prerequisite: 01:810:201 or 203, or placement exam, or permission of department.***

**01:810:310** ***Brazil: An Introduction (3)***
Discussion of significant historical, social, and cultural trends in Brazil.
***Prerequisite: 01:810:201 or 203, or placement exam, or permission of department.***

**01:810:315,316** ***Literatures and Cultures of the Portuguese-Speaking World: An Introduction (3,3)***
Reading and discussion of literary works representative of significant movements and authors of the Portuguese-speaking world.
***Prerequisite: 01:810:201 or 203, or placement exam, or permission of department.***

**01:810:325** ***Advanced Grammar and Style (3)***
Study of Portuguese grammatical forms and structures: vocabulary building, translation, composition.
***Prerequisite: 01:810:201 or 203, or placement exam, or permission of department.***

**01:810:326** ***Advanced Composition (3)***
Development of sophisticated writing skills in Portuguese.
***Prerequisite: 01:810:201 or 203, or placement exam, or permission of department.***

**01:810:340** ***Brazil: The 20th Century and Beyond (3)***
Reading and discussion of representative works of fiction, poetry, and theater from modernism to the present.
***Prerequisite: 01:810:201 or 203, or placement exam, or permission of department.***

**01:810:345** ***Realism in Portuguese Literature (3)***
Readings from the works of Eça de Queiroz, the generation of 1870, and the neorealists.
***Prerequisite: 01:810:201 or 203, or placement exam, or permission of department.***

**01:810:361** ***Brazil and the United States: Comparative Approaches (3)***
Comparative and interdisciplinary study of Brazilian literature and culture as it relates to contemporary issues of race relations, diversity, cultural dependency, and globalization.
***Course taught in English. Credit not given for both this course and 01:195:361.***

**01:810:370** ***Portuguese Translation (3)***
Translation of a range of texts from Portuguese into English; discussion of language register.
***Prerequisite: 01:810:325, or placement exam, or permission of department.***

**01:810:371** ***Portuguese Literary Translation (3)***
Translation of a range of literary texts from Portuguese into English and from English into Portuguese; discussion of language register and translation techniques.

**01:810:417** ***History of the Portuguese Language (3)***
Development of Portuguese from its origins to the present. Settlement history and non-Roman influences in Portugal. Evolution of sounds, forms, sentence structures, and words. Dialectal variations.
***Prerequisite: One semester of 300-level Portuguese or permission of department. Course may be taught in English, but knowledge of Portuguese and/or Spanish is necessary.***

**01:810:420** ***The Brazilian Narrative (3)***
Development of the Brazilian novel and short story from the colonial period to the present. Emphasis on 19th and 20th centuries. Reading and analysis of representative works.
***Prerequisite: One semester of 300-level literature in Portuguese or permission of department.***

**01:810:430** ***Camões (3)***
Epic and lyric poetry of Camões and his contemporaries. Antecedents and repercussions of the Portuguese Renaissance.
***Prerequisite: One semester of 300-level literature in Portuguese or permission of department.***

**01:810:440** ***The Portuguese-Speaking World: Multiple Perspectives (3)***
Main traits of the civilization of the Portuguese-speaking world. Evolution of its social institutions and customs. Representative literary, philosophical, and artistic works.
***Prerequisite: One semester of 300-level literature in Portuguese or permission of department.***

**01:810:493,494** ***Independent Study (BA,BA)***
Independent readings under faculty supervision.
***Prerequisites: One semester of 300-level Portuguese and permission of department and instructor.***

**01:810:497,498** ***Honors in Portuguese (BA,BA)***
Research paper under faculty supervision.
***Prerequisites: Permission of department. Open only to seniors.***

**01:810:499** ***Readings in Portuguese (3)***
Independent readings under faculty supervision.
***Prerequisites: One semester of 400-level literature in Portuguese and permission of department and instructor. May not be taken more than once for credit.***

# Psychology 830 (SAS)

## PSYCHOLOGY 830

Department of Psychology, School of Arts and Sciences

**Website:** Here

**Chair:** Diana Sanchez

**Undergraduate Vice Chair:** Judith A. Hudson

**Associate Undergraduate Vice Chair:** Linnea R. Dickson

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Eileen Kowler, B.A., CUNY (Queens College); Ph.D., Maryland

Tracey J. Shors, B.S., Alabama; Ph.D., Southern California

Juli Wade, B.A., Cornell; PhD University of Texas Austin

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Arnold L. Glass, B.A., SUNY (Buffalo); Ph.D., Stanford

Pernille Hemmer, B.S., Ph.D., California (Irvine)

Judith A. Hudson, B.A., Trinity College; Ph.D., CUNY

Alexander Kusnecov, B.A., Ph.D., Newcastle (New South Wales)

John P. McGann, B.A., Ph.D., Yale

Julien Musolino, B.A., Geneva; M.A., North Wales (UK); Ph.D., Maryland

Laurie A. Rudman, B.A., Ph.D., Minnesota

Diana Sanchez, B.A., Bard College; Ph.D., Michigan

Edward A. Selby, B.A., Wyoming; Ph.D., Florida State

Manish Singh, B.A., Delhi (India); M.A., Ph.D., California (Irvine)

Karin J. Stromswold, A.B., Harvard; Ph.D., Massachusetts Institute of Technology; M.D., Harvard

Elizabeth Torres, B.S., San Jose State; Ph.D., California (San Diego)

David S. Vicario, B.A., New Hampshire; Ph.D., Rockefeller

David Wilder, B.S., Pittsburgh; M.S., Ph.D., Wisconsin

Robert L. Woolfolk, B.A., Ph.D., Texas

**Associate Professors:**

Kasia M. Biezczad, B.S., McGill (Canada); Ph.D., California (Irvine)

Shana L. Cole, B.A., College of New Jersey; Ph.D., New York

Samantha Farris, B.A., Rutgers; Ph.D., Houston

Evan M. Kleiman, B.A., Temple; Ph.D., George Mason

Calvin Lai, B.A., Rutgers University; PhD., University of Virginia

Theresa M. Levro, B.A., Colby College; Ph.D., Vermont

Melchi Michel, B.A., SUNY (Oswego); Ph.D., Rochester

Benjamin Samuels, B.A., Johns Hopkins; Ph.D., Harvard

**Assistant Professors:**

David Barker, B.S., Arizona State; Ph.D., Rutgers

Luis Flores, B.A., University of California Berkeley; PhD., University of Illinois Urbana-Champaign

Jessica Hamilton, B.A., Swarthmore College; Ph.D., Temple

Michelle Hurst, BSc., McMaster University; Ph.D., Boston College

Gandalf Nicholas, B.A., Pontifica Universidad Catolica Madre y Maestra (Dominican Republic); MA, College of William and Mary, PhD, Princeton

Bridget Matikainen-Ankney., B.Eng Stony Brook University; M.S Columbia University., Icahn School of Medicine at Mount Sinai

Philip Parker, B.S., Brown; Ph.D., California (San Francisco)

Jinjing Wang, B.S., Zhejiang University (China); Ph.D., Johns Hopkins

Qiong Zhang, B.S., National University of Singapore; Ph.D., Carnegie Mellon

**Associate Research Professor:**

Mimi L. Phan, B.A., Rutgers; Ph.D., California (Davis)

**Associate Teaching Professors:**

Linnea R. Dickson, B.S., Franklin and Marshall College; Ph.D., Rutgers

Margaret Ingate, B.A., Alabama; Ph.D., Rutgers

Estelle M. Y. Mayhew, B.S., Amsterdam; B.A., Seton Hall; Ph.D., Rutgers

Lyra Stein, B.A., Rutgers; M.S., Einstein College of Medicine, Ph.D., Rutgers

**Assistant Teaching Professors:**

Christopher Albin-Brooks, B.A., The Ohio State University; PhD., Arizona State University

Keiko T. Brynildsen, B.A., Drew; Ph.D., California (Riverside)

Sarah Carton, B.A., Boston; Ph.D., New York

Rob Foels, B.A., Iowa; Ph.D., Syracuse

Marina Gelfand, B.A. Boston; Ph.D., Catholic

Theresa Herman, B.A Saint Vincent University; MA., New York University; PsyD California Southern University

Stephen P. Kilianski, B.A., Ph.D., Rutgers

Psychology 830 (SAS)

# Learning Goals

# Learning Goals

Students will know the leading terms, concepts, theoretical perspectives, empirical findings, and historical trends in psychology. Students will apply basic research methods in psychology, including research design, and data analysis and interpretation, to standard lab problems. Those students pursuing research careers will also be able to design new experiments, use a subset of modern laboratory techniques, analyze information, and communicate their research effectively in reports that follow American Psychology research report style.

Students will use critical thinking, skeptical inquiry, and, when possible, the scientific approach to ask, answer, and understand questions related to behavior and mental processes. Students will apply psychological concepts and content to become engaged citizens. Some students will work in an applied setting under the supervision of trained mental health professionals and be able to integrate academic concepts and ideas with personal observations and provide programmatic and case reports.

Psychology 830 (SAS)

# Major Requirements

# Major Requirements

**Note:** Students who declared the major prior to fall 2017 are under different requirements, which may be found on the departmental website.

The prerequisite for declaring the major in psychology is completion of the following courses with a grade of C or better in each:

01:830:101 General Psychology (3)

01:830:200 Quantitative Methods in Psychology (3)*

The following requirements must be met to complete a major in psychology:

**1. Four Subdiscipline Core Courses.** (A separate course must be selected from each of the following four subdiscipline clusters and must be taken within the 01:830 subject index of the School of Arts and Sciences [SAS] Department of Psychology.)

*Behavioral Neuroscience*
01:830:310 Neuropsychology (3)
01:830:311 Learning Processes (3)
01:830:313 Physiological Psychology (3)
01:830:361 Developmental Psychobiology (3)

*Clinical Psychology*
01:830:310 Neuropsychology (3)
01:830:340 Psychopathology (3)
01:830:346 Atypical Development in Childhood and Adolescence (3)
01:830:394 Community Psychology and Community Mental Health (3)

*Cognitive Psychology*
01:830:301 Sensation and Perception (3)
01:830:303 Memory (3)
01:830:305 Cognition (3)
01:830:351 Psychology of Language (3)

*Social Psychology*
01:830:321 Social Psychology (3)
01:830:338 Personality Psychology (3)
01:830:339 Self and Identity (3)
01:830:377 Health Psychology (3)

**2. One 4-Credit Content Course and Lab Combination.****

**3. Completion of Six Psychology Electives.** (To be selected from the department's complete set of course offerings.)

- These may include any additional courses from the subdiscipline core categories above (i.e., selections beyond those required to meet the subdiscipline distribution requirement), as well as additional 400-level courses.
- No more than 6 credits of nonclassroom courses such as fieldwork, research, or internships may be applied toward the major. The additional credits do, however, apply toward the overall graduation credits and students are encouraged to take additional credits.
- All 400-level psychology electives have the prerequisites of a 4-credit lab course plus at least one core course. Individual courses may have additional prerequisites and instructors may grant special permission to enroll.

- Transfer courses may be applied, but at least one of the six electives must be completed within the SAS Department of Psychology.
- No more than two 200-level courses (7 credits) may be applied.

**4. Completion of One 400-Level Elective.**

*May substitute without replacement by completing one of the following courses with a grade of C or better: 01:830:210 Behavioral Data Analysis; 01:960:212 Statistics II; 01:960:401 Statistics for Research; 01:220:322 Econometrics; 01:377:275 Basic Statistics for Exercise Science (except Winter Session); or an equivalent transfer course.
**Will also apply toward either the core course or psychology elective requirement as indicated above. General Psychology and Quantitative Methods in Psychology are prerequisites.

Psychology 830 (SAS)

# Minor Requirements

# Minor Requirements

***It is not possible to double minor within psychology by completing both minor options. Students must choose between either the (general) psychology minor or the developmental psychology minor.***

**Psychology Minor Requirements**

A psychology minor consists of at least six courses of 3 or more credits, including 01:830:101 General Psychology (3), with a grade of C or better. At least three of the six courses must be taken in the Rutgers University-New Brunswick psychology program (01:830). No more than two 200-level courses may be applied. Courses from nonpsychology departments may not be applied toward the minor. No more than one of the six required courses may be a nonclassroom course such as fieldwork, internship, or research. No School of Arts and Sciences honors courses (except those with the 830 subject code) may count toward this requirement. A combined grade-point average of 2.0 or better is required for all 01:830 courses counting toward the minor.

**Developmental Psychology Minor Requirements**

The developmental psychology minor is intended for students interested in concentrating on content and skills relevant to working with people at all points in the life span. It may be especially useful for students who plan on pursuing careers in the health professions, education, public policy, or law enforcement.

The developmental psychology minor consists of two required courses and four electives for a total of 18 credits.

*Required*

01:830:101 General Psychology (3)
01:830:271 Principles of Developmental Psychology (3)

*Electives:* (four courses from the following):

01:830:331 Infant and Child Development (3)
01:830:333 Adolescent Development (3)
01:830:335 Adult Development and Aging (3)
01:830:346 Atypical Development in Childhood and Adolescence (3)
01:830:361 Developmental Psychobiology (3)
01:830:394 Community Psychology and Community Mental Health (3)
01:830:432 Advanced Topics in Developmental Psychology (3)
01:830:484 Language Acquisition (3)

*One semester of fieldwork can replace one of the four developmental electives:*

01:830:380/381 Fieldwork: Foster Care I/II (3)
01:830:382/383 Fieldwork: Autism I/II (3)
01:830:388/389 Fieldwork: Child Development I/II (3)

Students must receive a grade of C or better in General Psychology and an overall GPA of 2.0 or better is required for all courses counting toward the minor.

At least three of the required six courses must be taken in the Rutgers University-New Brunswick psychology program (01:830).

Psychology 830 (SAS)

# Departmental Honors Major Requirements

# Departmental Honors Major Requirements

Acceptance into the honors major requires a 3.0 overall grade-point average (GPA), a 3.4 GPA in the major, and an approved research proposal. In addition to meeting all of the requirements for the standard major, students must complete a yearlong research project in their final year. Students who successfully complete 01:830:497,498 Honors Research in Psychology (3,3) plus 01:830:490 Honors Research Seminar (3) will be designated Honors Research Scholars in Psychology.

Further details are available here.

Psychology 830 (SAS)

# Psi Chi International Honor Society

# Psi Chi International Honor Society

The department has an active chapter of Psi Chi, the International Honor Society in Psychology. Applicants must have earned a grade-point average of 3.4 or better in the major and 3.3 or better overall, plus meet additional criteria. Further details, can be found here.

Psychology 830 (SAS)

# Transfer Students

# Transfer Students

Transfer students who wish to major in psychology must take at least seven in-class psychology courses at Rutgers University-New Brunswick; minors must take at least three courses at Rutgers-New Brunswick. Fieldwork, research in psychology, internship, and honors courses do not count toward meeting this requirement. No more than two 200-level courses will be applied to the major or minor.

Psychology 830 (SAS)

# Courses

# Courses

**01:830:101** *General Psychology (3)*
Survey of main areas of contemporary psychology.

**01:830:123** *Soul Beliefs: Causes and Consequences (3)*
Exploration of the causes and consequences of various beliefs about the soul. Topics such as the self, mind/body dualism, evolution, culture, death anxiety, afterlife, and religious and political conflict.

**01:830:200** *Quantitative Methods in Psychology (4)*
Quantitative methods used in psychological research. Regular exercises required.
***One semester of college-level mathematics recommended. Prerequisite: 01:640:025 or higher placement in mathematics.***

**01:830:201** *Principles and Issues in Psychological Science (3)*
Introduction to the field of human cognition, surveying methods, concepts, findings; and problems in perception, learning, memory, thinking, problem solving, psycholinguistics, and development.
***Prerequisite: 01:830:101.***

**01:830:210** *Behavioral Data Analysis (1)*
Quantitative methods used in psychological research. Intended for students who have completed an introductory course in quantitative methods that included basic descriptive and inferential statistics, and correlation and regression, but did not include both single-factor and two-factor analysis of variance.
***Special Notation: Students who complete the course with a grade of C or better will be considered to have met the quantitative methods requirement for the major in psychology. Prerequisite: Permission of psychology adviser. May not receive credit for both 01:830:200 and 210.***

**01:830:220** *Psychological Themes and Theories in Modern Films (3)*
Advanced analysis and critical investigation of psychological themes in modern cinema including life span development, stereotypes, personality, memory, learning processes, gender identity, personality disorders, trauma, autism, and clinical practice.
***Prerequisite: 01:830:101.***

**01:830:230** *Media Psychology (3)*
Historical, theoretical, and methodological approaches to the study of media and its effects on cognitive, emotional, and social functioning with an emphasis on "new" media.
*Prerequisite: 01:830:101.*

**01:830:250** *Psychology of Art (3)*
Art as powerful experience and driving force in human beings. Structure of works of art, fundamental principles by which the human mind organizes such works, and importance of art for human survival.
*Prerequisite: 01:830:101 or 24 credits.*

**01:830:271** *Principles of Developmental Psychology (3)*
Survey of life-span human development covering prenatal, infant, child, adolescent, and adult periods.
*Prerequisite: 01:830:101.*

**01:830:301** *Sensation and Perception (3)*
Principles of sensory processes in vision, audition, and other modalities, and of the perception of objects and events.
*Prerequisite: 01:830:101.*

**01:830:302** *Sensation and Perception Laboratory (1)*
Experiments and written reports on a variety of topics in sensation and perception. Training in scientific method with respect to data analysis, experimental methods, and research design.
*Writing intensive. Prerequisite: 01:830:200 or 01:830:210 or 01:960:212 or 01:960:401 or 01:220:322 or 01:377:275. Pre- or corequisite: 01:830:301. Credit not given for both this course and 01:830:306.*

**01:830:303** *Memory (3)*
Principles of acquisition, retention, recall, and forgetting of verbal and nonverbal material.
*Prerequisite: 01:830:101.*

**01:830:304** *Memory Laboratory (1)*
Experiments and written reports on a variety of topics in learning and memory. Stresses training in scientific method with respect to data analysis, experimental methods, and research design.
*Prerequisite: 01:830:200 or 01:830:210 or 01:960:212 or 01:960:401 or 01:220:322 or 01:377:275. Pre- or corequisite: 01:830:303.*

**01:830:305** *Cognition (3)*
Cognitive processes, including thinking, language, and memory, and their development.
*Prerequisite: 01:830:101.*

**01:830:306** *Cognition Laboratory (1)*
Experiments and written reports on cognitive processes, including thinking, language, and memory.
*Writing intensive. Prerequisite: 01:830:200 or 01:830:210 or 01:960:212 or 01:960:401 or 01:220:322 or 01:377:275. Pre- or corequisite: 01:830:305. Credit not given for both this course and 01:830:302.*

**01:830:307** *Perception in Cognitive Science (3)*
Approaches to visual perception that emphasize reasoning about stimulus properties (shading, texture, lines, movement, etc.) that give information about the structure of the environment.
*Prerequisite: 01:830:101.*

**01:830:308** ***Psychosocial Foundations of Health and Medicine (3)***
Conceptual, methodological, and substantive approaches to psychosocial perspectives on health.
***Prerequisite: 01:830:101 or 01:920:101. Credit not given for both this course and 01:920:308.***

**01:830:310** ***Neuropsychology (3)***
Survey of brain damage and plasticity, brain trauma and disease, neuropsychological assessment and testing, cognitive rehabilitation, and current controversies. Provides a basic understanding of brain structure and function along with an appreciation of clinical perspectives.
***Prerequisite: 01:830:101.***

**01:830:311** ***Learning Processes (3)***
Topics include habituation, sensitization, associative learning, and rule and category learning. Data derived from animal and human research.
***Prerequisite: 01:830:101.***

**01:830:312** ***Learning Processes Laboratory (1)***
Learning experiments conducted with animals.
***Writing intensive. Prerequisite: 01:830:200 or 01:830:210 or 01:960:212 or 01:960:401 or 01:220:322 or 01:377:275. Pre- or corequisite: 01:830:311.***

**01:830:313** ***Physiological Psychology (3)***
Physiological determinants and mechanisms of behavior.
***Prerequisite: 01:830:101.***

**01:830:314** ***Physiological Psychology Laboratory (1)***
Experiments with animals demonstrating or testing principles of physiology.
***Writing intensive. Prerequisites: 01:830:200 and permission of instructor. Pre- or corequisite: 01:830:313.***

**01:830:315** ***Comparative Psychology (3)***
Evolution of behavior.
***Prerequisite: 01:830:101.***

**01:830:316** ***Comparative Psychology Laboratory (1)***
Experiments designed and conducted with animals to demonstrate or test principles of comparative psychology.
***Writing intensive. Prerequisite: 01:830:200 or 01:830:210 or 01:960:212 or 01:96:401 or 01:220:322 or 01:377:275. Pre- or corequisite: 01:830:315.***

**01:830:320** ***Forensic Psychology (3)***
Interface of psychology and the law with an emphasis on forensics. Specific topics may include landmark legal cases, police psychology, eyewitness and expert testimony, jury selection, psychopathy, repressed memories, profiling, victimless crimes, the insanity defense, lie detection, and custody evaluations.
***Prerequisite: 01:830:101.***

**01:830:321** ***Social Psychology (3)***
Social aspects of behavior. Topics such as socialization, communication, small-group interaction, attitudes and attitude change, social perception, and social conflict.
***Prerequisite: 01:830:101.***

**01:830:323** *Research Methods in Social Psychology (4)*
Research methods for laboratory and field studies in social psychology. Logic and design of behavioral experiments; analysis and interpretation of data; writing of formal laboratory reports.
***Writing intensive. Prerequisites: 01:830:200, 321. Fulfills laboratory course requirement and also serves as a psychology elective.***

**01:830:325** *The Religious Mind (3)*
Exploration of the way human minds acquire, generate, and transmit religious thoughts and practices. Review of major theoretical and empirical advances pertaining to the nature, origins, and consequences of religious thought.
***Prerequisite: 01:830:101 or by permission.***

**01:830:326** *Small Groups (3)*
Empirical findings and theories drawn from research on small-group behavior, group development, leadership, conformity, deviation, and intergroup relations.
***Prerequisites: 01:830:321 and permission of instructor.***

**01:830:327** *Small Groups Laboratory (1)*
Laboratory and field studies in small-group behavior.
***Writing intensive. Prerequisite: 01:830:200 or 01:830:210 or 01:960:212 or 01:960:401 or 01:220:322 or 01:377:275. Pre- or corequisite: 01:830:326.***

**01:830:331** *Infant and Child Development (3)*
Review of psychological theory and research on perceptual, cognitive, social, and personal growth during infancy and childhood.
***Prerequisite: 01:830:101.***

**01:830:332** *Infant and Child Development Laboratory (1)*
Experiments and written reports based on observations of children in a school setting, interviews, application of research protocols, and existing databases, including videotapes.
***Writing intensive. Prerequisite: 01:830:200 or 01:830:210 or 01:960:212 or 01:960:401 or 01:220:322 or 01:377:275. Pre- or corequisite: 01:830:331.***

**01:830:333** *Adolescent Development (3)*
Review of theory and research on adolescent growth, cognition, personality, and social development.
***Prerequisite: 01:830:101 or permission of instructor.***

**01:830:335** *Adult Development and Aging (3)*
Review of psychological theory and research on cognitive, personality, and interpersonal development.
***Prerequisite: 01:830:101.***

**01:830:338** *Personality Psychology (3)*
Major personality systems. Personality structure, dynamics, development, and assessment.
***Prerequisite: 01:830:101.***

**01:830:339** *Self and Identity (3)*
Personal, relational, and collective levels of how we define our being and present the self to the social world.

***Prerequisite: 01:830:101.***

**01:830:340** *Psychopathology*
Survey of etiology, diagnosis, and treatment of psychopathology.
*Prerequisite: 01:830:101.*

**01:830:341** *Psychopathology Laboratory (1)*
Intensive lab course providing a solid foundation in clinical psychology research.
*Prerequisite:Quantitative Methods in Psychology Pre- or Co-requisite: Psychopathology 01:830:340.01:830:200 Open to psychology majors only; by instructor's permission only*

**01:830:342** *Research in Personality (3)*
Research approaches to major issues in personality psychology.
*Prerequisites: 01:830:101 and 01:830:338. Corequisite: 01:830:342.*

**01:830:343** *Research in Personality Laboratory (1)*
Research projects designed and conducted in personality psychology. Participation in ongoing research programs.
*Writing intensive. Prerequisites: 01:640:112, 115, or placement in Calculus; and 01:830:200 or 01:830:210 or 01:960:212 or 01:960:401 or 01:220:322 or 01:377:275. Pre- or corequisite: 01:830:342.*

**01:830:346** *Atypical Development in Childhood and Adolescence (3)*
Origin, diagnosis, and treatment of deviations from normal physical, intellectual, psychological, and social development.
*Prerequisites: 01:830:101 and one of the following: 01:830:271, 331, 333, or 340.*

**01:830:348** *Psychological Tests and Measurements (3)*
Theoretical, developmental, and methodological bases of psychological assessments. Includes introduction to selected applications in clinical, counseling, educational, forensic, organizational, and research settings.
*Prerequisites: 01:830:101, 200, or permission of instructor. Corequisite: 01:830:349.*

**01:830:349** *Psychological Tests and Measurements Laboratory (1)*
Research projects using various assessment techniques.
*Writing intensive. Prerequisites: 01:830:200 or 01:830:210 or 01:960:212 or 01:960:401 or 01:220:322 or 01:377:275. Pre- or corequisite: 01:830:348.*

**01:830:351** *Psychology of Language (3)*
Production, perception, and acquisition of language at the level of sound (phonology), words (morphology and the lexicon), and grammar (syntax).
*Prerequisite: 01:830:101. Recommended: 01:615:101 or 201. Credit not given for both this course and 01:615:371.*

**01:830:352** *Psychology of Language Laboratory (1)*
Covers phonology and speech perception, morphology, lexical change and access, syntax and sentence processing, language acquisition, neurolinguistics, genetics, and evolution of language.
*Writing intensive. Prerequisite: 01:830:200 or 01:830:210 or 01:960:212 or 01:960:401 or 01:220:322 or 01:377:275. Pre- or corequisite: 01:830:351.*

**01:830:355** *Research Methods in Psychology (3)*
Logic and design of behavioral experiments; interpretation of data.
*Prerequisites: 01:830:200 or equivalent and permission of department. Credit not given for more than one of 01:830:300, 355, or 356.*

**01:830:356** ***Research Methods in Psychology Lab (4)***
Logic and design of behavioral experiments; interpretation of data; writing of formal laboratory reports.
***Prerequisites: 01:830:200 or 01:830:210 or 01:960:212 or 01:960:401 or 01:220:322 or 01:377:275 and permission of department. Credit not given for more than one of 01:830:300, 355, or 356.***

**01:830:358** ***Exploring the Science of Perception and Cognition (3)***
Active learning course designed to explore current research in perception and cognition through projects requiring students to work in teams to design, conduct, analyze, and present their own original research. Introduction to experiment programming software such as PsychoPy.
***Prerequisites: 01:830:200 and 01:830:302 or 01:830:306.***

**01:830:360** ***Drugs and Human Behavior (3)***
Drug classification; contexts of drug usage; effects of various drugs; analysis of drug action in the central nervous system; aspects of "human nature" revealed by drug usage.
***Prerequisite: 01:830:101.***

**01:830:361** ***Developmental Psychobiology (3)***
Growth, maturation, and development of behavior with emphasis on physiological mechanisms and early experience.
***Prerequisite: 01:830:101.***

**01:830:362** ***Psychology of Sex and Gender (3)***
Biological, psychological, and cultural determinants in sex differences in behavior with emphasis on humans. Sexual behavior, aggression, personality, intelligence, and social roles.
***Prerequisite: 01:830:101. Credit not given for both this course and 01:830:381; 01:988:362, 381.***

**01:830:364** ***Motivation and Emotion (3)***
Psychological and physiological aspects of motivation and emotion in human and animal behavior.
***Prerequisite: 01:830:101.***

**01:830:371** ***Group Dynamics (3)***
Basic aspects of group interaction. Participation in experiential group. Focus on a variety of topics related to group interaction, development, and change.
***Prerequisites: 01:830:101 and written permission of instructor.***

**01:830:372** ***Psychological Approaches to Social Problems (3)***
How social problems are defined. Theories and methods used to study social problems such as crowding, poverty, education, and race relations.
***Prerequisite: 01:830:321.***

**01:830:373** ***Organizational and Personnel Psychology (3)***
Social psychological research and theory applied to industrial problems. Personnel selection, job satisfaction and morale, organizational effectiveness, group and intergroup relationships, and communication in work settings.
***Prerequisite: 01:830:101.***

**01:830:375** ***Stereotyping and Prejudice (3)***
Social psychology of development and consequences of stereotypes and attitudes toward outgroups; special emphasis on interactions within the classroom.
***Prerequisites: 01:830:101***

**01:830:377** ***Health Psychology (3)***
Relationships between behavior and health. Stress, personality, and lifestyle as disease causes; modifying high-risk behaviors; coping with serious illness.
***Prerequisite: 01:830:101.***

**01:830:379** ***Psychological Stress and Coping (3)***
Biological, environmental, and psychological aspects of stress. The coping process and stress management. Scientific, personal, and cultural representations of stress and coping.
***Prerequisite: 01:830:101.***

**01:830:380,381** ***Fieldwork: Foster Care (3,3)***
Two-semester course involving weekly seminars and faculty-supervised fieldwork consisting of mentoring and transporting children in the foster care system.
***Prerequisites: 01:830:101, 331, and 340 or 346, and interview with faculty. Open to juniors and seniors.***

**01:830:382** ***Fieldwork: Autism I (3)***
Faculty-supervised placements at the Douglass Developmental Disabilities Center, an on-campus program for people with autism spectrum disorders. Direct work with individuals with autism, supervision by professional teachers, and weekly meetings with classroom teachers. Readings and exam.
***Prerequisites: 01:830:101 and 340 or 346. Open to juniors and seniors.***

**01:830:383** ***Fieldwork: Autism II (3)***
Faculty-supervised placements at the Douglass Developmental Disabilities Center, an on-campus program for people with autism spectrum disorders. Direct work with individuals with autism, supervision by professional teachers, and weekly meetings with classroom teachers. Readings and exam.
***Prerequisite: 01:833:382. Open to juniors and seniors.***

**01:830:388** ***Fieldwork: Child Development I (3)***
Supervised placement in an on-campus child care facility, working as a teacher's assistant. Academic readings, projects, and a final paper required.
***Pre- or Co-requisite: 01:830:331.***

**01:830:389** ***Fieldwork: Child Development II (3)***
Supervised placement in an on-campus child care facility, working as a teacher's assistant. Academic readings, projects, and a final paper required.
***Prerequisite: 01:830:388.***

**01:830:391,392** ***Research in Psychology (BA,BA)***
Supervised research. Written agreement with the supervisor required. May include laboratory/library research. Final written report required.
***Prerequisites: Satisfactory completion of application form and permission of instructor. May be taken more than once.***

**01:830:394** *Community Psychology and Community Mental Health (3)*
Influence of social and community forces on development, treatment, and prevention; applications to community problems.
*Prerequisite: 01:830:321, 323, or 340. Open only to juniors and seniors.*

**01:830:398** *CESEP (2)*
Two-credit optional community service placement in psychology-related field setting. Please see the CESEP website for additional information.
*Corequisite: Must be taken in conjunction with a designated Civic Engagement and Service Education Partnerships (CESEP) course offered in the Department of Psychology.*

**01:830:400** *Advanced Statistical Methods in Psychology (3)*
Reviews and expands on the concepts and computations covered in the Quantitative Methods in Psychology (01:830:200). New topics may include additional aspects of association, power analysis, nonparametric procedures, and repeated measures t- and F-tests. While conceptual understanding will be central, students will also learn computation using SPSS software.
*Prerequisites: Majors only and a grade of B+ or better in 01:830:200, or permission of the instructor.*

**01:830:401** *Advanced Topics in Human Cognition (3)*
Multisectioned course with each section investigating advanced problems and issues in human cognition. Contact department for titles, descriptions, and requirements of sections.
*Prerequisites: Majors only and 01:830:301, 303, 305 or 351. Additional prerequisites may apply for individual sections.*

**01:830:402** *Advanced Topics in Human Cognition (3)*
Multisectioned course with each section investigating advanced problems and issues in human cognition. Contact department for titles, descriptions, and requirements of sections.
*Prerequisites: Majors only and 01:830:301, 303, 305 or 351. Additional prerequisites may apply for individual sections.*

**01:830:403** *Programming for Behavioral Scientists (3)*
Introduction to computer programming focused on the technical skills needed in behavioral research design. Solve problems in experimental psychology, including how to solicit subject responses, visualize experimental data, and perform basic statistical analysis.
*Prerequisite: Majors only or permission of instructor.*

**01:830:408** *Reasoning, Problem Solving, and Decision-Making (3)*
Higher-level cognitive processes including reasoning, problem solving, hypothesis testing, judgment, and decision-making.
*Prerequisites: Majors only; 01:830:200 and 301, 303, 305, or 351.*

**01:830:409** *Reasoning, Problem Solving, and Decision-Making (3)*
Higher-level cognitive processes including reasoning, problem solving, hypothesis testing, judgment, and decision-making.
*Prerequisites: Majors only; 01:830:200 and 301, 303, 305, or 351.*

**01:830:410** *Advanced Topics in Psychobiology (3)*
Multisectioned course with each section investigating advanced problems and issues in psychobiology. Contact department for titles, descriptions, and requirements of sections.
*Prerequisites: Majors only and 01:830:310, 311, or 313. Additional prerequisites may apply for individual sections.*

**01:830:411** *Advanced Topics in Psychobiology (3)*
Multisectioned course with each section investigating advanced problems and issues in psychobiology. Contact department for titles, descriptions, and requirements of sections.
*Prerequisites: Majors only and 01:830:310, 311, or 313. Additional prerequisites may apply for individual sections.*

**01:830:412** *Neuropsychopharmacology (3)*
Effects of drugs on behavior. Emphasis on central nervous system mechanisms and clinical psychopharmacology.
*Prerequisites: Majors only and 01:830:313. Credit not given for both this course and 01:830:414.*

**01:830:413** *Neuropsychopharmacology Laboratory (1)*
Research on the effect of drugs on animal behavior.
*Prerequisite: 01:830:200 or 211 or permission of instructor. Pre- or corequisite: 01:830:412.*

**01:830:414** *Neuropsychopharmacology (3)*
Effects of drugs on behavior. Emphasis on central nervous system mechanisms and clinical psychopharmacology.
*Prerequisites: Majors only and 01:830:313. Credit not given for both this course and 01:830:412.*

**01:830:415** *History of Brain Science (3)*
The discoveries and lives of neuroscientists that shaped how we think the mind functions in the brain and why; a biological perspective of psychology from neurons to circuits to systems and behavior.
*Prerequisite: 01:830:313 or by permission.*

**01:830:421** *Advanced Topics in Social Psychology (3)*
Multisectioned course with each section investigating advanced problems and issues in social psychology. Contact department for titles, descriptions, and requirements of sections.
*Prerequisites: Majors only and 01:830:321, 338, 373 or 377. Additional prerequisites may apply for individual sections.*

**01:830:422** *Advanced Topics in Social Psychology (3)*
Multisectioned course with each section investigating advanced problems and issues in social psychology. Contact department for titles, descriptions, and requirements of sections.
*Prerequisites: Majors only and 01:830:321, 338, 373 or 377. Additional prerequisites may apply for individual sections.*

**01:830:425** *Advanced Topics in Health Psychology (3)*
Multisectioned course with each section investigating advanced problems and issues in health psychology. Contact department for titles, descriptions, and requirements of sections.
*Prerequisite: Majors only and 01:830:308 or 01:830:321 or 01:830:341 or 01:830:377. Additional prerequisites may apply for individual sections.*

**01:830:426** *Advanced Topics in Helath Psychology (3)*
Multisectioned course with each section investigating advanced problems and issues in health psychology. Contact department for titles, descriptions, and requirements of sections.
*Prerequisite: Majors only and 01:830:308 or 01:830:321 or 01:830:341 or 01:830:377. Additional prerequisites may apply for individual sections.*

**01:830:431** *Advanced Topics in Developmental Psychology (3)*
Multisectioned course with each section investigating advanced problems and issues in developmental psychology. Contact department for titles, descriptions, and requirements of sections.

**01:830:432** *Advanced Topics in Developmental Psychology (3)*
Multisectioned course with each section investigating advanced problems and issues in developmental psychology. Contact department for titles, descriptions, and requirements of sections.
***Prerequisites: Majors only and 01:830:331, 333, 335 or 346. Additional prerequisites may apply for individual sections.***

**01:830:441** *Advanced Topics in Personality Psychology (3)*
Multisectioned course with each section investigating advanced problems and issues in personality psychology. Contact department for titles, descriptions, and requirements of sections.
***Prerequisites: Majors only and 01:830:321, 338, 373, or 377. Additional prerequisites may apply for individual sections.***

**01:830:442** *Advanced Topics in Personality Psychology (3)*
Multisectioned course with each section investigating advanced problems and issues in personality psychology. Contact department for titles, descriptions, and requirements of sections.
***Prerequisites: Majors only and 01:830:321, 338, 373, or 377. Additional prerequisites may apply for individual sections.***

**01:830:451** *Advanced Topics in Clinical and Abnormal Psychology (3)*
Multisectioned course with each section investigating advanced problems and issues in clinical and abnormal psychology. Contact department for titles, descriptions, and requirements of sections.
***Prerequisites: Majors only and 01:830:310, 340, 346, 309, or 393. Additional prerequisites may apply for individual sections.***

**01:830:452** *Advanced Topics in Clinical and Abnormal Psychology (3)*
Multisectioned course with each section investigating advanced problems and issues in clinical and abnormal psychology. Contact department for titles, descriptions, and requirements of sections.
***Prerequisites: Majors only and 01:830:310, 340, 346, 309, or 393. Additional prerequisites may apply for individual sections.***

**01:830:453** *Systems of Psychotherapy (3)*
Examination of clinical, empirical, and theoretical foundations of therapeutic intervention.
***Prerequisite: 01:830:340. Credit not given for both this course and 01:830:393.***

**01:830:454** *Systems of Psychotherapy (3)*
Examination of clinical, empirical, and theoretical foundations of therapeutic intervention.
***Prerequisite: 01:830:340. Majors only.***

**01:830:455** *Positive Psychology (3)*
Introduction to positive psychology: positive emotions, positive individual traits, and positive institutions. Course combines didactic instruction and experiential learning in its coverage of each of these three issues central to this field.
***Prerequisites: Majors only and 01:830:321, 330, 331, 333, 335, 338, or 364 and written permission of instructor.***

**01:830:456** *Positive Psychology (3)*
Introduction to positive psychology: positive emotions, positive individual traits, and positive institutions. Course combines didactic instruction and experiential learning in its coverage of each of these three issues central to this field.
***Prerequisites: Majors only and 01:830:321, 330, 331, 333, 335, 338, or 364 and written permission of instructor.***

**01:830:463** *Behavioral Pharmacology (3)*
Effects of drugs on physiological and behavioral mechanisms.
***Prerequisite: 01:830:313.***

**01:830:464** *Behavioral Pharmacology (3)*
Effects of drugs on physiological and behavioral mechanisms.
***Prerequisites: Majors only and 01:830:313.***

**01:830:470** *History of Psychology (3)*
Philosophical and scientific antecedents of modern psychology. Schools of thought in psychology including structuralism, functionalism, behaviorism, Gestalt, and psychoanalysis. Recurrent issues in the history of psychology.
***Prerequisites: Majors only and six courses in psychology. Open only to juniors and seniors.***

**01:830:471** *History of Psychology (3)*
Philosophical and scientific antecedents of modern psychology. Schools of thought in psychology including structuralism, functionalism, behaviorism, Gestalt, and psychoanalysis. Recurrent issues in the history of psychology.
***Prerequisites: Majors only and six courses in psychology. Open only to juniors and seniors.***

**01:830:480** *Advanced Topics in Visual Perception (3)*
Current theories of human visual perception and its physiological correlates. Analogies to auditory perception and parallels with computer vision.
***Prerequisite: Permission of instructor.***

**01:830:481** *Advanced Topics in Visual Perception (3)*
Current theories of human visual perception and its physiological correlates. Analogies to auditory perception and parallels with computer vision.
***Prerequisite: Permission of instructor.***

**01:830:484** *Language Acquisition (3)*
In-depth investigation of the cognitive and neural bases of language acquisition, informed by state-of-the-art research in psychology, cognitive science, linguistics, and neuroscience. Topics covered: phonological, lexical, morphological, syntactic, and pragmatic development; bilingualism, learnability theory, atypical language acquisition, and neurolinguistics.
***Prerequisites: 01:830:351 or two 300-level linguistics (615) courses, or 185:410, or permission of the instructor. Credit not given for both this course and 01:830:353 or 01:830:485.***

**01:830:485** *Language Acquisition (3)*
In-depth investigation of the cognitive and neural bases of language acquisition, informed by state-of-the-art research in psychology, cognitive science, linguistics, and neuroscience. Topics covered: phonological, lexical,

morphological, syntactic, and pragmatic development; bilingualism; learnability theory; atypical language acquisition; and neurolinguistics.
*Prerequisites: 01:830:351 or two 300-level linguistics (615) courses, or 185:410, or permission of the instructor. Credit not given for both this course and 01:830:353 or 01:830:484.*

**01:830:490** *Honors Research Seminar (3)*
An advanced seminar for honors research students on experimental design, data analysis, interpretation and presentation, and thesis writing.
*Prerequisite: Acceptance into psychology honors program. Corequisite: 01:830:497 or 498.*

**01:830:493** *Internship in Applied and Community Psychology (BA)*
Supervised full-time involvement in service settings, providing opportunity to apply knowledge in developmental, community, and clinical psychology; may include service delivery, planning, and evaluation research.
*Prerequisites: At least five courses in psychology and permission of instructor. Corequisite: 01:830:494. Open only to junior and senior psychology majors.*

**01:830:494** *Internship Seminar in Applied and Community Psychology (3)*
With fellow interns, study dynamics of service organizations and forces influencing how professionals function; group and individual supervision around problems and issues arising from internship experiences.
*Corequisite: 01:830:493.*

**01:830:495,496** *Advanced Research in Psychology (BA,BA)*
Supervised research. Written agreement with the supervisor required. May include laboratory/library research. Final written report required.
*Prerequisites: Satisfactory completion of application form and permission of instructor. May be taken more than once.*

**01:830:497,498** *Honors Research in Psychology (3,3)*
Individual research projects to be written as honors thesis.
*Prerequisite: Permission of department. Open only to seniors with 3.4 or better cumulative grade-point average in courses counting toward the major. Honors Research in Psychology (either 01:830:497 or 498) does not count as a laboratory course and does not fulfill the 400-level writing requirement.*

# Public Health 832 (SEBS)

## PUBLIC HEALTH 832

**Degree:** B.S.

**Contact:** Christina Torian, Assistant Dean of Undergraduate Education (christina.torian@rutgers.edu)

Students in the School of Environmental and Biological Sciences (SEBS) may choose the major in public health, which is offered by the Edward J. Bloustein School of Planning and Public Policy. This major leads to a bachelor of science (B.S.) degree issued by both SEBS and the Bloustein School.

The major in Public Health (832) prepares students for entry-level careers in population health and disease prevention. Public health professionals work in a wide range of services including infectious disease control; health problems of children, older adults, and the medically underserved; chronic disease management; health monitoring and surveillance; environmental/occupational health and safety; and emergency preparedness. Students learn about the upstream factors that influence community health, particularly poverty, housing, work and unemployment, social exclusion, food security, transportation, access to health and social services, and evidence-based, data-driven decision-making.

See the Edward J. Bloustein School of Planning and Public Policy section of this catalog or visit here.

Public Health 832 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

**Entry Requirements for the Major**

To declare a major in public health, students must apply to the Edward J. Bloustein School of Planning and Public Policy. To be accepted, a student must have a GPA of 2.00 or higher, and must have completed the following prerequisite courses with grades of C or better in each course:

- 01:355:101 Expository Writing or equivalent (3)
- 10:775:205 Basic Statistical Methods (4) or any 200-level or higher statistics course
- One human biology course (3-4) (see approved human biology courses in Degree Navigator)
- One chemistry course (3-4)
    - 160:127 Impact of Chemistry (3)
    - 160:128 Chemistry of Life (3)
    - 160:161 or 162 General Chemistry I or II (4)

Applications to the Bloustein School are available online from the website: Here.

See the Edward J. Bloustein School of Planning and Public Policy section of this catalog or visit here.

Public Health 832 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

**Major Requirements (58-61 credits)**

The major in public health is offered by the Edward J. Bloustein School of Planning and Public Policy. It involves a total of 12-15 credits in prerequisite courses that students must complete (with grades of C or better in each of them) prior to declaring the major, plus 9 additional required courses (31 credits), plus five public health elective courses (15 credits).

The prerequisite courses for the major are as follows:

- 01:355:101 Expository Writing or equivalent (3)
- 10:775:205 Basic Statistical Methods (4) or any 200-level or higher statistics course
- One human biology course (3-4) (see approved human biology courses in Degree Navigator)
- One chemistry course (3-4)
    - 160:127 Impact of Chemistry (3)
    - 160:128 Chemistry of Life (3)
    - 160:161 or 162 General Chemistry I or II (4)

The major core requirements are as follows:

- 10:832:201 Principles of Public Health (3)
- 10:832:212 Health Disparities (3)
- 10:832:240 Global Health Perspectives (3)
- 10:832:335 Epidemiology (3)
- 10:832:339 Public Health Literature (3) or
  01:355:302 Scientific and Technical Writing (3) or
  01:355:303 Writing for Business and the Professions (3) or
  01:355:315 Writing Grant Proposals (3) or other preapproved writing course
- 10:832:356 Public Health Law & Ethics (3)
- 10:775:395 Research Methods (4)
- 10:775:450 Leadership Seminar (3)
- 10:775:499 Professional Practice Internship (6)

The five elective courses (at least three of which must be at the 300 level or above) must be public health (subject code 832) courses.

For additional information about the major in public health, please refer to the Edward J. Bloustein School section of the catalog.

# Planning and Public Policy Major (762, 762D) and Minor (EJB-U)

## PLANNING AND PUBLIC POLICY MAJOR (762, 762D) AND MINOR

### Planning and Public Policy Major (37 credits)

The Planning and Public Policy major (762, 762D) provides students with a foundation in areas such as city dynamics, environmental aspects of cities, community health, urban poverty, public policy, housing issues, social concerns, fiscal matters, and land use planning. Students are prepared for entry-level professional management

and planning positions focused on overseeing and improving public programs, such as transportation, housing, planning, the environment, finance, economic development, and urban renewal. These career paths can be found in business, government, education, banking, and nonprofit settings. This program also prepares students for graduate education in public administration, public policy, and urban planning.

Upon completing all degree requirements, the student will receive the bachelor of arts (B.A.) degree.

## Rutgers School of Arts and Sciences and School of Environmental and Biological Sciences Students

This program is designed to accommodate the needs of traditional students at Rutgers University-New Brunswick.

Students in the School of Arts and Sciences (SAS) and students in the School of Environmental and Biological Sciences (SEBS) who wish to remain in their primary unit must apply for admission prior to declaring the major.

SAS students may pursue Planning and Public Policy as their first major and remain within SAS. SEBS students may pursue Planning and Public Policy as a second major to remain within SEBS.

Students can apply for the Planning and Public Policy major during one of our application cycles listed here. Applicants must have a minimum grade of 'C' or better in each of the prerequisite courses and be in good academic standing. The application may be found on the school's website.

Students are advised to declare the Planning and Public Policy major no later than their first semester of junior year to ensure completion of the major by their anticipated graduation date. **A minor program is required for this major.**

Only courses with a 'C' or better may be counted towards the major, and students must complete the core curriculum requirements of their primary school.

The most current information for the Planning and Public Policy major may be found on the Bloustein School website here.

## Transfer Students

This program is designed to accommodate the needs of transfer, adult, and nontraditional students.

Students seeking the Planning and Public Policy major must have at least 30 credits before applying to the Bloustein School. Successful applicants will have completed the prerequisite courses with a grade of 'C' or better, and have achieved an overall GPA of at least 2.5.

Current Rutgers students seeking a school-to-school transfer from another Rutgers unit, or students transferring to Rutgers from another college or university, must apply via the Rutgers Office of Undergraduate Admissions. Contact ugadmissions@ejb.rutgers.edu for more information.

Transfer students from New Jersey community colleges are encouraged to complete lower-division prerequisite courses and the associate's degree to benefit from the NJ Statewide Transfer Agreement.

Only courses with a 'C' or better may be counted towards the major. **A minor program is required for this major.**

For more information about transferring, please see the school's website.

## PLANNING AND PUBLIC POLICY MAJOR REQUIREMENTS (762, 762D)

(37 credits)

*Prerequisite Courses (9-10 credits)*

- 01:355:101 College Writing (3)
- 10:775:205 Basic Statistical Methods (4) or equivalent (3-4)
- 01:220:102 Introduction to Microeconomics (3)

***Major Requirements (762, 762D) (37 credits)***
***Core Courses (16 credits)***

- One of the following (3):
    - 01:220:103 Introduction to Macroeconomics (3)
    - 01:790:104 American Government (3)
    - 10:833:210 Principles of Public Policy (3)
    - 10:971:201 Intro to Urban Planning and Design (3)
- One of the following intensive writing courses (3):
    - 10:775:300 Writing for Professionals (3)
    - 01:355:302 Scientific and Technical Writing (3)
    - 01:355:303 Writing for Business and the Professions (3)
    - 01:355:315 Writing Grant Proposals (3)
- 10:775:395 Research Methods (4) *Open to majors only*
- 10:762:400 Internship with Seminar* (3) *Open to majors only*
- 10:762:499 Senior Seminar* (3) Open to majors only with at least 100 credits **and** no outstanding core requirements

** Students qualifying for departmental honors may replace 10:762:400 and 10:762:499 with 10:762:497, 498 Bloustein Honors Research.*

***Required Electives (21 credits)***

- 21 credits of electives from Bloustein School undergraduate courses, 15 credits of which must be at the 300-level or higher

Students interested in specific career paths should consider clustering their electives and seek advising early in their program of study.

## Joint BA/MCRP or BS/MCRP Program

Exceptional, well-prepared students from any Rutgers University-New Brunswick matriculating unit with a GPA of 3.5 or higher, exceptional GRE scores, a dedication to public service and outstanding recommendations who wish to study urban planning are encouraged to seek advising about the 3-1-1 master of city and regional planning (M.C.R.P.) program. Contact ugadmissions@ejb.rutgers.edu for more information.

## Planning and Public Policy Minor (18 credits)

The Bloustein School welcomes current and prospective Rutgers-New Brunswick students to consider the Planning and Public Policy minor. Students should declare a minor with their matriculating school. They need not apply for minor status with the Bloustein School. Only courses with a grade of 'C' or better can be counted toward the minor program of study.

This minor is well-matched to majors in economics; labor studies & employment relations; political science; geography; sociology; urban planning and design; as well as the pre-law track.

Students seeking the Planning and Public Policy minor must complete three core courses and five elective courses in course code 762, excluding those designated for 'majors only'.

- 10:775:101 Introduction to Planning, Policy and Health (3)
- Five electives selected from all the undergraduate Bloustein courses that are open to non-majors. At least four of the five must be 300 or 400-level.

For the most current configuration of courses for the Planning and Public Policy minor, please see the school's website here.

## Planning and Public Policy Certificate Programs

The Bloustein School currently offers four Planning and Public Policy certificates open to all Rutgers-New Brunswick undergraduates. Certificate programs are open to students in any major and are awarded with, or subsequent to, a bachelor's degree. Only courses with a C or better may be applied toward a certificate program.

*Certificates do not qualify as a minor.* **Students must declare their intention to pursue a certificate program with the Bloustein School before their last semester of study in order to qualify to receive a certificate.** Awarded certificates appear on the student's final transcript.

For the most current configuration of courses for each certificate, please see the school's website here.

- Community Development Certificate (24 credits)
- Community Sustainability Certificate (18 credits)

- Urban Planning Certificate (24 credits)
- Historic Preservation Certificate (15 credits)

# Religion 840 (SAS)

## RELIGION 840

Department of Religion, School of Arts and Sciences

**Website:** Here

**Chair:** Jawid Mojaddedi

**Undergraduate Director:** Emma Wasserman

**Professors:**

Edwin F. Bryant, B.A., M.A., Ph.D., Columbia

Charles Häberl, A.B., Brown; A.M., Ph.D., Harvard

Tao Jiang, B.A., M.A., Foreign Affairs College, Beijing; Ph.D., Temple

Jawid Mojaddedi, B.A., Ph.D., Manchester (UK)

Emma Wasserman, A.B., Brown; Ph.D., Yale

**Associate Professors:**

Debra Scoggins Ballentine, B.A., Georgia, M.A., Ph.D., Brown

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D. Christian Lammerts, B.A., Williams College, M.A., London, M.A., Ph.D., Cornell

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Religion 840 (SAS)

# Learning Goals

# Learning Goals

The religion graduate is expected to have an appreciation of the diversity of humanity's religious traditions. No student will recall all the factual information related to a religious tradition, but each should have enough knowledge to form a general picture of the religious traditions she or he has studied. Beyond the content of religious traditions, a religion graduate should be able to identify and coherently discuss the conceptual issues that shape the academic study of religion. There are many such issues, ranging from those usually identified with the humanities (such as philosophy, literature, music, history) to those studied more commonly in the social sciences (such as psychology, sociology, anthropology, political science).

In order to develop a deeper sense of religion as an academic discipline, students should familiarize themselves with the core learning goals that motivate the teaching of religion. These learning goals animate the basic structure and formal requirements of individual courses and underpin the structure of the major and minor in religion. In addition to the goals outlined here, individual courses may have more specific goals about the acquisition of factual information particular to the course. The goals outlined here are applicable to the entire range of departmental offerings and should be understood as working in conjunction with the goals specified for individual courses. The department's broad goals can be divided into three categories: conceptual learning goals that delineate the principles of the discipline; knowledge-based learning goals that relate to the specific features of particular religious traditions; and practical learning goals that define important skills that students can expect to develop by taking courses in religion.

***Conceptual Learning Goals.*** Students who study religion at Rutgers University can expect to develop an understanding of the following concepts:

1. How religions are shaped by their own past and by the past of their society and institutions;

2. How religions continue to shape and be shaped by contemporary social and political structures;

3. How religions have shaped and been shaped by various forms of human expression, from philosophical and theological writing to ritual practices;

4. How the study of religion has developed as an academic discipline that stands outside particular religious traditions and studies religions through the methods and standards accepted in the secular academy;

5. How within the confines of that academic discipline there are many methods scholars use for understanding religion and many debates about and among those methods;

6. How to apply such methods to particular religious questions or situations.

***Knowledge-Based Learning Goals.*** Students who study religion at Rutgers University can expect

1. to gain knowledge of the basic tenets and chronological data of at least one Western religious tradition: e.g., Judaism, Christianity, Islam. This will include knowledge of its primary texts, ritual, theology, ethics, and epistemology; its essential vocabulary; its influence on and the ways it has been influenced by its contexts; and its basic history as it has moved through time and into different places;

2. to gain knowledge of the basic tenets and chronological data of at least one eastern religion: e.g., Buddhism, Confucianism, Taoism, Hinduism. This will include knowledge of its primary texts, ritual, theology, ethics, and epistemology; its essential vocabulary; its influence on and the ways it has been influenced by its contexts; and its basic history as it has moved through time and into different places;

3. to gain knowledge of the universe of meaning internal to at least one particular religious tradition, including its central theological and philosophical questions, as well as the theological and philosophical answers proposed. This includes the ability to examine critically philosophical and other theoretical issues concerning the nature of reality, human experience, knowledge, value, ethics, and/or cultural production.

***Practical Learning Goals.*** Students who study religion at Rutgers University can expect to develop the following practical skills:

1. The ability to read, understand, and discuss a variety of primary sources such as the scriptures of various religions, memoirs, rules for religious practice, theological and philosophical texts, and liturgical instructions;

2. The ability to read and understand analytical studies of religious issues written in academic prose;

3. The ability to conceptualize, research, structure, articulate, and defend an original thesis in both written and oral presentation;

4. The ability to work independently and to conduct independent research.

Religion 840 (SAS)

# Major Requirements

# Major Requirements

There are no prerequisites to declare a major in religion. A major in religion requires a minimum of 12 courses (36 credits) in the field, of which at least seven (21 credits) must be at the 300 level or higher. A maximum of five courses (15 credits) numbered below the 300 level may be counted toward the major. All majors must take 01:840:211, 212 and a seminar course. A minimum grade of C is required for every course that counts toward the major.

Religion majors are required to take the vast majority of their 12 required religion courses in the Department of Religion at Rutgers University-New Brunswick. Students may use approved courses toward their major that are offered by other departments at Rutgers (cognate courses, determined on a case-by-case basis) or by non-Rutgers institutions (transfer courses). But the maximum number of the combination of cognate and transfer courses that can count toward a religion major is two. The department considers transfer courses in such cases based on whether they fit comparable courses in our department and are of a similar methodology, depth, and rigor.

In some cases, the department will refuse to accept transfer courses or only allow them as general electives. Cross-listed courses count toward the major without prior approval as they are treated as regular courses offered by the department.

Religion 840 (SAS)

# Minor Requirements

# Minor Requirements

Students graduating with a minor in religion are required to have taken a minimum of six courses (18 credits) in the department of which at least three (9 credits) must have been at the 300 level or higher. A minimum grade of C is required for every course that counts toward the minor.

Religion minors are required to take the vast majority of their six required religion courses in the Department of Religion at Rutgers University-New Brunswick. Students may use approved courses toward their minor that are offered by other departments at Rutgers (cognate courses, determined on a case-by-case basis) or by non-Rutgers institutions (transfer courses). But the maximum number of the combination of cognate and transfer courses that can count toward the minor is two. The department considers transfer courses in such cases based on whether they fit comparable courses in our department and are of a similar methodology, depth, and rigor. In some cases, the department will refuse to accept transfer courses or only allow them as general electives. Cross-listed courses count toward the minor without prior approval as they are treated as regular courses offered by the department.

Religion 840 (SAS)

# Departmental Honors Program

# Departmental Honors Program

In order to graduate with honors, a student must complete a research thesis and departmental examination with grades of distinction. To qualify for honors in religion, a student must have a cumulative grade-point average of 3.0 or better and an average of 3.4 or better in the major. Qualified students should apply to the chair by March of their junior year. Those whose candidacy is accepted will consult with the department chair, and an adviser will be selected who will guide the student in the selection of an appropriate subject for the research thesis. Those whose candidacy is accepted should also enroll in 01:840:497 (3 credits) in the fall semester and 01:840:498 (3 credits) in the spring semester.

Religion 840 (SAS)

# Courses

# Courses

**01:840:101** ***Gods, Myths, and Religions in a Secular Age (3)***
An introduction to the study of religion that focuses on myth; religious authority; purity and sacred space; ritual practices; and major theories of religion. Varied origins of religion and motifs in its development in different cultures.

**01:840:105** ***Religions Now: 21st-Century Controversies (4)***
The role of religion in shaping major 21st-century events and issues, such as economic inequality, religious fundamentalism, and the roles of religion in politics.

**01:840:111** ***The Hero's Quest: Religion, Mythology, and Harry Potter (3)***
A comparative study of religion focusing on the common theme of the hero's quest found in the mythologies of major world religions.

**01:840:112** ***Death and Afterlife (3)***
Various religious concepts of death, resurrection, reincarnation, and other forms of afterlife; their relevance to this worldly life.
***Open only to first-year students and sophomores.***

**01:840:115** ***The Birth and Death of God from Mesopotamia to Postmodernity (3)***
Explores how long-held conceptions of a cosmos full of many divine beings relate to more recent notions of monotheism and atheism.

**01:840:118** ***Sports & Religion (3)***
Interpret sporting events, fan loyalty, stadium patriotism, and athletes¿ pre-game routines through the lens of ritual and religion. Case studies range from the ancient Near Eastern context, Bible, and ancient Olympics as classical war-related sports, as well as contemporary examples.

**01:840:120** ***Jesus in the Movies (3)***
This course studies representations of Jesus of Nazareth in canonical Christian texts and in film.

**01:840:121** ***Martyrdom: From the Maccabees to ISIS (1.5)***
Martyrdom as a historical, literary, and religious phenomenon. Tools that enable students to decipher martyrdom discourse in other contexts--including in interreligious conflicts (medieval and modern) and in American pop culture.

**01:840:122** ***Saints, Sinners, and Scholars: A History of Christianity (1.5)***
Christian history, beginning with Jesus and the gospels (canonical and noncanonical), weaving through Late Antiquity, the Middle Ages, the Reformation, and the American context before ending with discussions of contemporary issues in Christianity.

**01:840:123** ***The Bible in Aramaic (3)***
Introduction to Aramaic through biblical literature, including Aramaic Bible passages and vernacular translations into various Aramaic dialects, with a focus on Syriac version.
***In English. Credit not given for this course and 01:563:146 or 01:013:111.***

**01:840:125** ***Political Islam: Past and Present (3)***
Introduction to Islamic political thought and practice. Emphasis on how historical knowledge can help us to understand contemporary debates over the place of Islam in the modern world.
***Credit not given for both this course and 01:508:110 or 01:685:110.***

**01:840:132** ***Religion and the Arts (3)***
A survey of the ways the arts are used in religion and religion is used in the arts, with a focus on visual arts, music, dance and drama.

**01:840:201** ***Introduction to the Bible I: Torah and Prose (3)***
Literature of the Bible, focusing on the Torah and the historical material in Joshua through Samuel. Emphasis placed on literary, historical, and theological matters. Special use made of archaeological discoveries. The Bible studied against the backdrop of ancient Near Eastern literature, history, religion, mythology, and law.
***Credit not given for both this course and 01:563:220.***

**01:840:202** ***New Testament (3)***
Historical interpretation of early Christian literature, esp. the letters of Paul and the Gospels. The focus is on the influence of Jesus and Paul and the development of early Jesus-movements
***Credit not given for both this course and 01:563:223.***

**01:840:203** ***Islamic Scriptures: Quran and Hadith (3)***
Introduction to sacred texts of Islam; emphasis on words and deeds of the prophet Muhammad, collectively known as the Hadith or Sunnah. Explores how revelation bridges the gap between the divine and human by examining Islamic scriptures in historical, theological, legal, and mystical contexts.
***Credit not given for both this course and 01:685:233.***

**01:840:204** ***Hindu Scriptures (3)***
Interpretation of basic Hindu scriptures in their historical, literary, and theological contexts to see how they contributed to the development of various traditions and spiritual paths in Hinduism.

**01:840:205** ***Introduction to Buddhism (3)***
Introduction to the diverse cultural, social, and intellectual histories of Buddhism across premodern and modern Asia.

**01:840:206** ***Introduction to the Bible II: Prophets and Poetry (3)***
Literature of the Bible, focusing on the Prophets, the historical backdrop of the prophetic message as revealed mainly through the book of Kings, and other relevant poetic material (Psalms, Job, etc.).
***Credit not given for both this course and 01:563:206.***

**01:840:207** ***Buddhist Literature and Film (3)***
An introduction to the diverse histories and cultures of Buddhism through an exploration of Buddhist literature and film.

**01:840:208** ***Greek and Roman Religions (3)***
Study of Greek and Roman gods and goddesses, cults, and practices of the classical Greek world, Roman Republic, and Roman Empire.
***Credit not given for both this course and 01:190:211.***

**01:840:211** ***Religions in Asia (3)***
Religious beliefs, practices, and sacred writings of Hinduism, Buddhism, Confucianism, Taoism, and Shinto.

**01:840:212** ***Religions of the Western World (3)***
Religious beliefs, practices, and sacred writings of Judaism, Christianity, and Islam.

**01:840:213** ***Christianity: Origins, History, Contemporary Issues (3)***
The Christian faith from its origins to the contemporary world with emphases on the earliest communities, Christians in the Roman Empire, the medieval dominance of the Christian Church, Protestant and Catholic Reformations, Christianity and colonialism, secularism, Christian responses to modernity, Christianity around the world in the 21st century.

**01:840:220** ***Abortion: The Collision of History, Law, Religion, Medicine, and Human Rights in the 20th and 21st Centuries (3)***
Abortion is one of the most socially contested issue of our time. Using a historical and sociological lens, this course seeks to understand the issues in more contextual and less polemic manner. This course will explore the history of abortion, key legal and public health aspects, the anti-abortion social movement, the realities of abortion provision, abortion in popular culture and public opinion, and abortion in the international arena.
***Credit not given for both this course and 01:512:221.***

**01:840:222** ***The Question of God in Modern Culture (3)***
Fundamental issues surrounding the question of God in modern culture.

**01:840:224** ***Hinduism (3)***
Historical development of religious beliefs and practices in the culture of India; syncretism, mysticism, devotion, and personal disciplines.

**01:840:226** ***Islam (3)***
Muhammad and the development of Muslim beliefs and practices; major movements and their effects on historical and current events.
***Credit not given for both this course and 01:840:326, 01:685:226, or 01:685:326.***

**01:840:227** ***Islam in the Modern World (3)***
Survey of Islam from the colonialist period to the present. Examines the ways in which Islamic beliefs, values, and worldviews inform historical, social, and political movements globally. Includes recent phenomena such as the Arab Spring, the role of technology, and contemporary Muslim pop culture.

**01:840:228** ***History of Islamophobia (3)***
This course surveys the history of Western anxiety about Islam from its origins to the present, exploring the theological, political, and cultural forces behind it. It examines how Islamophobia has been institutionalized through discrimination, exclusion and violence against Muslims and those perceived as Muslim. The term 'Islamophobia' is analyzed through engaging with multidisciplinary debates that interrogate the term and its limitations, and its complex relation to religious bias and racism.

*Credit not given for both this course and 01:508:203 or 01:685:241.*

**01:840:229** *Introduction to the Qur'an (3)*
Academic study of the Qur'an including the origin of the Qur'an, its role as a cultural and historical phenomenon; various controversies and disputes that have revolved around the Qur'an; different schools of thought regarding interpretation of the Qur'an; and development interpretative schools over time as the needs and understandings of any given society have developed. Taught in English. No prior knowledge of the Arabic or of the Qur'an is required.
*Credit not given for both this course and 01:013:220.*

**01:840:233** *Religion & Music (3)*
An examination of the ways music is used in religion and religious themes are used in music. Music in the major religions of the world will be addressed, along with a focus on music in Western and American culture, from classical to contemporary forms.

**01:840:240** *Love as Ethic and Idea (3)*
Judeo-Christian religious tradition, viewed through the concept of love as moral and theological ideal, from the biblical period to the present.

**01:840:241** *Introduction to Rabbinic Literature (3)*
Traces the historical developments that led to the establishment and eventual dominance of rabbinic Judaism. Close readings of various rabbinic texts (especially the Mishnah and the Tosefta).
*Credit not given for both this course and 01:563:241. No prior knowledge required; all readings in English.*

**01:840:242** *Introduction to Ancient Judaism (3)*
Historical development of Judaism in ancient times from its origins in c.1200 BCE through the Roman period c.300 CE. Emphasis on the beliefs and practices of ancient Judaism during biblical and postbiblical periods as reflected in the literature of the times (such as the Bible, Dead Sea Scrolls, and Mishna) and in the archaeological record.
*Credit not given for both this course and 01:563:222.*

**01:840:250** *Spirituality and Mysticism in Judaism*
This course offers a historical survey of Jewish mystical traditions from the Bible and early Rabbinic traditions through later medieval works, including the core book of Jewish Kabbalah, the Zohar. The course emphasizes Jewish mystical discussion of the relationship between God and man, the spiritual dimensions of everyday practices, and kabbalistic understanding of God.
*Credit not given for both this course and 01:563:250.*

**01:840:263** *Religion and Reproduction: Jewish and Christian Experiences (3)*
Exploration of the intersection of religion and reproduction the United States and Israel in shaping reproductive practices, norms, and policies. Ethnographic case studies of reproduction among Jews and Christians with some attention to historical analyses and philosophical commentaries. Gender and religion will form the two primary modes of analysis for the study of reproduction.
*Credit not given for this course and 01:790:264, 01:563:264 or 01:988:220.*

**01:840:265** *Women in the Bible (1.5)*
The role of women in the Jewish Bible/Old Testament stories; also addresses the question of the role of women in ancient Israelite society.

**01:840:285** ***Sanskrit I (3)***
Sanskrit grammar instruction and some reading of primary Sanskrit texts. Acceptable for beginning and intermediate students.

**01:840:286** ***Sanskrit II (3)***
Sanskrit grammar instruction and some reading of primary Sanskrit texts. Acceptable for beginning and intermediate students.
***Prerequisite: 01:840:285 or placement.***

**01:840:301** ***Ancient Near Eastern Religions (3)***
Religious patterns in Mesopotamia, Anatolia, Canaan, Israel, and Egypt from texts in translation; their impact on cultural development of the Near East.
***Not open to first-year students. Credit not given for both this course and 01:563:324.***

**01:840:302** ***The Bible and Archaeology (3)***
Analysis of material evidence, such as archaeological remains of monuments and inscriptions, from ancient Israel and Judah, as well as the broader ancient Near East, in order to develop a fuller reconstruction of biblical society and culture.
***Prerequisite: 01:840:201 or 01:563:220 or permission of instructor.***

**01:840:303** ***Hebrew Prophets: Social and Religious Thoughts (3)***
Development and diffusion of Israelite prophetic thought from early associations with divination in Near Eastern culture through the Exile and later decline.
***Prerequisite: 01:840:201 or 01:563:220 or permission of instructor. Not open to first-year students. Credit not given for both this course and 01:563:325.***

**01:840:305** ***Apocalypse Now? Religious Movements and the End of Time (3)***
Compares ancient, medieval, and contemporary apocalyptic movements. Case studies include the Jewish apocalyptic movement associated with the Dead Sea Scrolls and Pauline Christianity, medieval apocalypticism surrounding Joachim of Fiore and the Crusades, and more contemporary movements such as Jonestown and the Left Behind series of Christian thrillers.

**01:840:306** ***Minorities in the Middle East (3)***
Survey of the peoples, languages, and religions found in the contemporary Middle East, with a focus upon underrepresented groups and transnational issues. Emphasizes their histories, their roles in the contemporary Middle East, and their evolving relationships with the dominant groups of the nations in which they are found.
***Credit not given for both this course and 01:013:308 or 01:685:306.***

**01:840:307** ***Jesus (3)***
Career and teaching of Jesus viewed in historical context; development of the Gospel tradition and its effect on later concepts of Christ.

**01:840:308** ***Paul (3)***
Letters of Paul in historical context: his background, conversion, and apostolic mission; the development and influence of his thought on later Christianity.

**01:840:310** ***Jesus the Jew (3)***
Explores the historic figure of Jesus within the context of first-century Palestinian Judaism. Topics include Jesus and the Law, Jesus and the Temple, the problem of religious authority and types of religious leaders, the Sermon on the Mount, and the "Parting of the Ways."
***Credit not given for both this course and 01:563:341.***

**01:840:311** ***Christians, "the Other," and Violence (3)***
History and analysis of Christians as victims and perpetrators of violence, from early Christianity to the early modern period. Includes the study of martyrdom, imperial and medieval Christianity, crusades, and the European Wars of Religion.

**01:840:312** ***Greek Christianity (3)***
Eastern church tradition from the second through the eighth centuries; theological controversies and the development of liturgy, monasticism, and mysticism.

**01:840:313** ***Latin Christianity (3)***
Western church tradition from the third through the 13th centuries; theological controversies and the development of sacraments, papacy, and religious orders.

**01:840:314** ***Origins of Western Morality (3)***
Covers Hellenistic philosophy, the Greek translation of the Hebrew Bible, the letters of Paul, the teaching attributed to Jesus in writings from the end of first century CE, and the development of ascetic practices and ideology. Issues include the variety of ancient options available for thinking about ethical psychology, the concept of porneia and the attack on traditional Mediterranean religion, the family/household and opposition to it, wealth/poverty, slavery, sexual ethics, and gender.

**01:840:315** ***Protestant Reformation (3)***
Reform movements in the Western Christian world from the 14th through 18th centuries; focus on figures who formed Protestant thought, such as Luther, Calvin, Cranmer, Fox, Wesley.

**01:840:316** ***Evangelicalism in the United States (3)***
Explores key developments within contemporary American evangelicalism, focusing especially on evangelicals' varied responses to major political, economic, social, and cultural trends in the United States during the 20th and early 21st centuries.

**01:840:317** ***Catholicism and the Modern World (3)***
Roman Catholicism from the French Revolution to the present; thinkers such as Lammenais, Newman, and Gilson; topics such as liturgy, political rights, theological pluralism.

**01:840:318** ***Contemporary Catholic Theology (3)***
Selected themes in the thought of 20th-century Roman Catholic figures, such as Rahner, Schillebeeckx, Küng.

**01:840:319** ***Religion in American History (3)***
Survey of American religious history, exploring the relationship between religion and trends in such areas as politics, science, technology, gender relations, economy, and immigration.

**01:840:321** ***Yoga: History and Philosophy (3)***
Close reading of the *Yoga Sutras of Patanjali*, with particular attention to premodern commentaries on the text and the traditional understanding of the practice of classical yoga and its goals. History of yoga in India, its expressions in classical traditions of the subcontinent, and its transplantation to the West.

**01:840:323** ***History of Buddhism (3***
***)***Rise of Buddhist theory and practice in the context of Indian culture; encounters with indigenous religions of East and Southeast Asia; development of Theravada, Mahayana, and Vajrayana.
***Credit not given for both this course and 01:925:323.***

**01:840:324** ***Chinese Religions (3)***
Religious concepts and classic texts of Confucianism and Taoism; relation of religion to society and self in China, including role models and paradigms for self-transformation; alchemy and meditation.

**01:840:325** ***Prophet Muhammad (3)***
Muhammad's prophetic career in historical context; mystical and devotional tradition centering on him in Sunni and Shi'i Islam; sociopolitical reform movements based on prophetic model.
***Credit not given for both this course and 01:685:325.***

**01:840:327** ***Encounter of Religions (3)***
Religions in a pluralistic world; concepts of God, man, spirit, freedom as understood in East and West. Interreligious dialogue, religious synthesis, and universalism.

**01:840:328** ***Shi'i Islam (3)***
History, doctrines, rituals, theosophy, and structure of authority of the major schools of Shi'i Islam, with a focus on the Twelver Imami tradition from its beginnings until the present day.

**01:840:330** ***Religion in Latin America (3)***
Exploration of the religious complexity of Latin America, including Christianity, indigenous and syncretic practices, and traditions.
***Credit not given for both this course and 01:590:330.***

**01:840:331** ***Myth and Religion: From Gilgamesh to White Nationalism (3)***
Surveys a range of myths and subtypes, including myths about place and location; creation and recreation (apocalypses); political-religious conquest and domination; common ancestors and ethno-religious identity; and diverse forms of nationalism. Surveys critical academic approaches to the study of myth and mythmaking.

**01:840:333** ***Caribbean Religion (3)***
Examines the history and role of the diverse religious components of the Caribbean Basin from indigenous practices to Catholicism, Protestantism, Judaism, and the emergence of African belief systems such as Vodou, Santeria, and Rastafarianism from the 18th century to the present.
***Credit not given for both this course and 01:595:333.***

**01:840:334** ***Healing: Sacred and Secular (3)***
Examination of healing as a religious process in various cultures; discussion of transition from sacred healing to secular medicine and psychotherapy in the West.

**01:840:335** ***Buddhist Meditation Traditions (3)***
Introduction to Buddhism. Explores meditative techniques/practices for attaining enlightenment, with emphasis on Zen (Ch'an) meditation and roles played by Koan and Zazen in this process of transformation.

**01:840:337** ***Tibetan Religions (3)***
Historical development of Tibetan religious beliefs and practices, with a focus on the four main Buddhist schools, the Bön tradition, and Muslim populations. Other topics include religion and politics, literature, pilgrimage and ritual, monasticism, gender, art and iconography, and global context.

**01:840:339** ***Dead Bodies in Buddhism (3)***
Investigation of the significance of dead bodies in Buddhist history, thought, literature, and practice, across different Asian cultural contexts, from antiquity to the present.

**01:840:340** ***The Dead Sea Scrolls (3)***
Introduction to the history and scholarship surrounding the Dead Sea Scrolls.
***Credit not given for both this course and 01:563:340.***

**01:840:342** ***Religious Experience and Contemporary Culture (3)***
Religion and modern consciousness as investigated by the social sciences; topics such as the function of religion, secularism, and modernity.

**01:840:343** ***Religion and Politics (3)***
Function of religion in initiating social and political changes by envisioning the future, formulating utopian blueprints, and providing transcendent norms for social criticism.
***Not open to first-year students.***

**01:840:345** ***Hindu Gurus in the West (3)***
Lives and teachings of Vivekananda, Aurobindo, Sivananda, Yogananda, Rajneesh, and others. Classical texts and problems of innovations and preservation. Sociological and psychological issues of transplanting the guru-disciple relationship to Western soil.

**01:840:346** ***Sexuality in the Western Religious Traditions (3)***
Ideas and problems in Catholic, Protestant, and Jewish normative traditions on sexuality. Topics include sexuality and human nature, sexual identity/roles, marriage and family.
***Credit not given for this course and 01:888:337.***

**01:840:347** ***War, Peace, and Violence in Western Religious Thought (3)***
Ideas of just war, holy war, and pacifism in Judaism, Christianity, and Islam; their relation to contemporary issues of war and peace.

**01:840:350** ***Women in Eastern Religions (3)***
Images and roles of women in major Asian religions: Hinduism, Buddhism, Confucianism, and Taoism. Women's autobiographical accounts of religious experiences, attitudes toward women expressed in these religious institutions, the feminine as a symbol of the divine, representative great goddesses such as Kuan-yin.

**01:840:351** ***Women and Gender in Western Religions (3)***
Images and roles of women in Judaism, Christianity, and Islam; attitudes toward women expressed in these religious institutions; religious experiences of women mystics and religious practices favored by women; impact of gender roles and expectations on both women and men.
***Credit not given for both this course and 01:988:349.***

**01:840:352** ***Religion and Science (3)***
Theories of religious and scientific knowledge, cosmology and astronomy, life and creation.

**01:840:353** ***Origins of Hell in the Christian West (3)***
Myths about the underworld, the heavens, and post-mortem existence, especially focusing on the emergence of "hell" as a place of punishment in the Christian West.
***Prerequisite: 01:840:212.***

**01:840:356** ***Sufism: Mystical Islam (3)***
Based essentially on primary sources. Examines both Islamic mystical theory and practice, paying particular attention to a range of core Sufi doctrines.
***Credit not given for both this course and 01:685:356.***

**01:840:357** ***Krishna (3)***
Examination of the various faces and theologies of Krishna, one of the most important Hindu deities. Depiction in the Mahabharata, Bhagavad Gita, and Bhagavata Purana with reference to rasa theory, a medieval taxonomy of various moods in which the devotee approaches God as a lover, child, friend, or master.

**01:840:358** ***Bhagavad Gita (3)***
Analysis of this important Hindu scripture. Study of influential commentaries. Attention to Indian and Western appropriations of the text.

**01:840:359** ***Ayurveda--The Traditional Healing System of Ancient India (3)***
Study of Indian medicine through examination and analysis of its history, literature, fundamental concepts, principles, and methods using primary source materials as the chief basis for learning. Attention also given to Ayurveda in modern India along with its adoption by the West.
***Some knowledge of Hinduism strongly recommended.***

**01:840:361** ***Women in the Bible (3)***
Literary readings of biblical stories about women, with special emphasis on their roles, representation, and literary types. All texts in English translation.
***Credit not given for both this course and 01:563:322 or 01:988:314.***

**01:840:362** ***Postmodern Approaches to Sacred Literature (3)***
Postmodern literary analysis of religious texts drawn from Jewish, Christian, and Hindu traditions.
***Credit not given for both this course and 01:359:366 or 01:195:318.***

**01:840:363** ***Women and Islam (3)***
An examination of women's role in Islam through analysis of the primary Islamic texts: the Qur'an, the Hadith, and Tafsir; and the narratives about the historical figures of the Prophet's wives and female relatives. Relevance of this tradition for Muslim women in the 21st century.

**01:840:364** ***Sikhism and North Indian History (3)***
The history of the Sikh religious tradition from the 16th century up to the present day.

**01:840:365** ***Law and Religion in Asian History (3)***
Comparative examination of relationships between religion and law in South, Southeast, and East Asian history. Thematic foci include issues related to class, cosmology, gender, power, jurisprudence, textual practice, legal ritual, secularism, and colonialism.

**01:840:366** ***The Yoga of Devotion: Bhakti (3)***
Overview of some of the main forms Hindu devotion, Bhakti, has taken over the centuries. Attention paid to the main streams of Bhakti focused on Shiva, Vishnu, and the various forms of the Goddess.

**01:840:367** ***Taoist Philosophy (3)***
Focuses on two foundational texts of classical Taoism, the *Dao De Jing (Tao Te Ching)* and the *Zhuangzi (Chuang Tzu)*. Close examination of texts and study of various interpretations, both traditional and contemporary. Brief examination of Taoist influence on the West as well as Western transformation of Taoism.

**01:840:368** ***Hindu Philosophy (3)***
Upanishads, Patanjali, Bhagavad Gita; theories of matter, energy; states of consciousness; meditation. Yogas of knowledge, action, devotion. Karma. Ethics. Comparison of Hindu and Western cosmology.
***Credit not given for both this course and 01:730:368.***

**01:840:369** ***Buddhist Philosophy (3)***
Interdependence, impermanence, relativity; suffering; path to liberation; meditation; karma as cosmic justice; death and rebirth. Compassion as a central ethical value. Theravada, Mahayana, and Tibetan Buddhism.
***Credit not given for both this course and 01:730:369.***

**01:840:370** ***Buddhism, Society, and Politics in South East Asia (3)***
An exploration of the histories of Buddhist social and political culture in Southeast Asia from premodernity to the present.

**01:840:371** ***Alternative Islams (3)***
Diversity of religious thought among Muslims, and their religion's dynamic development from Islam's formative period until the present day. Major schools which offer an alternative vision of Islam such as: Sufis, Twelver Shi'is, Ismailis, Alawites, Alevis, Wahhabis, Salfis, the Ahmadiyya, the Nation of Islam, and Progressive Muslims.

**01:840:372** ***Islamic Mystical Literature (3)***
Examines literary output of mystics in the Islamic world. Focus on mystical teachings; attention also paid to poetry, biography, and the modern novel, all in English translation.
***Credit not given for both this course and 01:013:372.***

**01:840:373** ***Islam in/and America (3)***
Explores the polycultural presence of Islam in the Americas from the early colonial period to the present, issues of gender and sexuality, U.S. foreign policy and its consequences, pre- and post-9/11 racializing practices, and the contemporary terrains of Muslim American culture.
***Credit not given for both this course and 01:050:344.***

**01:840:374** ***Islamic Philosophy (3)***
Exploration of the main themes of Islamic philosophy, focusing on topics such as wisdom, the good life, and relations between metaphysical, moral, doctrinal, and practical knowledge.
***Credit not given for both this course and 01:685:374 or 01:730:374.***

**01:840:375** ***Buddhism and the Family (3)***
Examines the relationship of Buddhism and the family in interdisciplinary and comparative context, across Asia, from antiquity to the present.

**01:840:377** ***Islam and African Literature (3)***
Impact of Islam on African literature, and Islam as a theme of literary expression.
***Credit not given for both this course and 01:013:314.***

**01:840:379** ***Early Chinese Religion and the Origins of Morality in China (3)***
Interconnected worlds of religion, politics, and morality in Confucian, Mohist, and Daoist (Taoist) thought and practice.

**01:840:380** ***Religious Healing in the United States (3)***
History of religious healing in the United States, including major social, cultural, economic, and political trends and relationship with modern medicine.

**01:840:381** ***Religion, Law, and the American Constitution (3)***
A course that studies Religion in American Constitutional Law, focusing especially on Supreme Court cases related to religion from the 19th century to the present. Interpretation of the establishment and free exercise of religion clauses in the First Amendment has been and remains a vital issue for American democracy and civil rights. This course seeks to provide context and analytical tools for understanding religion's role in American law, and vice versa

***Credit not given for both his course and 01:512:222.***

**01:840:383** ***God and the Gods (3)***
Examination of three core issues in the way Judaism and other religious communities conceive of the divine: monotheism versus polytheism, the physical form of God, and God's gender.
***Credit not given for this course and 01:563:313.***

**01:840:385** ***Reading Sanskrit (3)***
Reading of primary texts in the Sanskrit language. Acceptable for advanced intermediate and advanced students.
***Prerequisite: 01:840:286 or placement.***

**01:840:386** ***Sanskrit: Reading Primary Texts II (3)***
Reading of primary texts in the Sanskrit language, continuing the course of study initiated in Sanskrit: Reading Primary Texts I (01:840:385) . Acceptable for advanced intermediate and advanced students.
***Prerequisite: 01:840:385 or placement.***

**01:840:387** ***The English Bible (3)***
The English Bible, its literary variety, and the evolution of its text. Special attention will be given to problems of interpretation and translation and their Hebrew and Greek origins. Prerequisite: 01:355:101 or equivalent.
***Prerequisite: 01:355:101 or 103 or 104 or equivalent. Credit not given for this course and 01:358:398 or 01:563:326.***

**01:840:403** *Seminar on the Vedanta Sutras (3)*
Overview of the main schools of Vedantic thought up to the medieval period--Sankara, Ramanuja, Madhva, Nimbarka, Vallabha, and Baladeva. Attention to some prominent points of agreement as well as contestation among some of these schools. Focus on primary texts.
*Only open to majors in their junior or senior year. Some prior knowledge of Hindu philosophy recommended.*

**01:840:404** *Seminar in Christian Monasticism (3)*
Evolution and ideals of Christian Monasticism from early Christianity to the 17th century; interaction between monks and nuns and the rest of society.
*Only open to majors in their junior or senior year.*

**01:840:405** *Western Encounter with Hinduism (3)*
Overview of representations of India on the Western religious landscape stemming from the earliest interactions between West and East, subsequent cultural and intellectual exchanges, eventual colonization of the subcontinent, and the postcolonial aftermath. Special attention paid to the Orientalist construction of Hinduism during this period.
*Prerequisites: 01:840:211 and 212. Open only to majors in their junior or senior year.*

**01:840:410** *The Evolution of Christian Orthodoxy 300-787 CE (3)*
History, theology, and social context of the formation of Christian orthodoxy from the First Council of Nicea to the Second Council of Nicea.
*Credit not given for both this course and 01:489:314. Open only to majors in their junior or senior year.*

**01:840:420** *Seminar in Religion and Psychology (3)*
Advanced topics in religion and psychology.
*Prerequisites: At least one course in religion and one course in psychology or by permission of instructor. Open only to majors in their junior or senior year.*

**01:840:421** *Seminar in Religion and Society (3)*
Interaction of religion and society in the thought of selected theologians, ethicists, and sociologists of religion.
*Prerequisite: One course in Western religious traditions or permission of instructor. Open only to majors in their junior or senior year.*

**01:840:423** *Seminar in Buddhism (3)*
Builds on a basic knowledge of Buddhism. Psychological implications of central Buddhist teachings--dependent origination, not-self/no-self, and emptiness--as discussed within key Indian Buddhist texts. Critical examination of modern scholars' attempts to interpret and/or appropriate them via modern psychology, especially psychoanalysis.
*Prerequisite: 01:840:211 or 323 or permission of instructor. Open only to majors in their junior or senior year.*

**01:840:424** *Seminar in Religion and Science (3)*
Contemporary topics in the relationship between science and religion. Potential topics include evolution; cosmology and creation; mind, brain, and consciousness; religious and scientific methods. Topics change from year to year.
*Prerequisite: One course in religion or permission of instructor. Open only to majors in their junior or senior year.*

**01:840:425** ***Seminar on Law and Religion (3)***
Examines recent scholarship concerning the relationship between religion and law in comparative historical, ethnographic, and theoretical perspective.

**01:840:428** ***Topics in the Study of Religion (3)***
Topics in the study of religion.

**01:840:430** ***Seminar on Religious Fundamentalisms and Modernisms in the United States (3)***
Assesses scholarly definitions of religious fundamentalisms and modernisms in the United States. Examines the evolution of these traditions as they responded to specific historical trends related to politics, science, technology, gender relations, the economy, and immigration.

**01:840:456** ***Seminar on Rumi (3)***
On the basis of primary sources in English translation, focus on Rumi's didactic writings (poetry and prose) in order to identify his distinctive teachings and their place in the context of the Sufi tradition and Persian mystical literature. ***Prerequisite: 01:840:226 or 356 or 372. Open only to majors in their junior or senior year.***

**01:840:457** ***Seminar in Islamic Spirituality (3)***
Investigates the historical development of Islamic mystical traditions and the most influential theories of mysticism, and the poetry exemplifying it, in relation to Islamic theological dogmas. No knowledge of foreign languages is required.

**01:840:458** ***Seminar on Islamic Thought (3)***
Examines critically the development of Islamic intellectual traditions, from the first writings of the scholastic theological disciplines of theology and jurisprudence to contemporary reformist discourses.

**01:840:497-498** ***Honors in Religion (3,3 or 6,6)***
***Both semesters must be completed to receive credit.***

# Russian 860 (SAS)

## RUSSIAN 860

Department of Germanic, Russian, and East European Languages and Literatures, School of Arts and Sciences

**Website:** Here

**Chair:** Martha Helfer (Acting): Michael Levine

**Undergraduate Director:** Chloë Kitzinger

**Associate Professor:**

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**Lecturers:**

Svetlana Bogomolny, B.A., Hebrew (Israel); Ed.D., Iowa

Lidia Levkovitch, B.S., Drexel; B.A. Ph.D., Rutgers (New Brunswick)

Mi E. Li (Tatiana), M.A., Sakhalin State (Russia); Ph.D., Moscow State Pedagogical (Russia)

Agnieszka Makles, M.A., Jan Dlugocz (Poland); M.A., Michigan State



# Learning Goals

# Learning Goals

Majors in Russian language and literature will:

1) have a solid foundation in the Russian language and a broad introduction to Russian culture, particularly literary culture, during the Imperial, Soviet, and post-Soviet periods;

2) demonstrate a grasp of critical practices, including close readings, and an ability to analyze Russian literature within specific historical, social, and cultural contexts;

3) be able to critically examine how Russian literature constructs a model of reality and a particular set of values;

4) be able to communicate complex ideas effectively in standard written English, and to critically evaluate sources and use the conventions of citation and attribution correctly;

5) be expected to study Russian literature within a broad interdisciplinary perspective in order to analyze and synthesize information and ideas from multiple sources (related fields include comparative literature, Russian history, art history, music, film, and the politics of Soviet and post-Soviet Russia);

6) learn how to effectively use tools (reference works, internet, etc.) and technology appropriate to learning Russian. Using primary sources, they will be able to analyze issues concerning Russia and relate them to other areas in the humanities and social sciences.

7) demonstrate language proficiency at the 300-level or above, i.e., be able to communicate effectively in the language; read a variety of literary and nonliterary texts in the original; achieve intermediate to advanced competency in speaking, reading, and writing; and have basic knowledge of the structure of Russian.

# Major in Russian Language and Literature

# Major in Russian Language and Literature

The major in Russian language and literature aims to provide a solid foundation in the Russian language and a broad introduction to Russian culture, particularly literary culture, during the Imperial, Soviet, and post-Soviet periods. Students are expected to achieve fluency in Russian that will allow them to communicate with native speakers of Russian in both oral and written form and to read a variety of literary and nonliterary texts in the original. The major grounds the study of literature within specific historical, social, and cultural contexts. It includes the study of Russian film, music, and elements of literary and cultural theory. It also fosters a broad interdisciplinary perspective by encouraging students to take additional coursework in Eastern European history, art history, and the culture and politics of eastern Europe and the former contiguous Soviet bloc.

Russian 860 (SAS)

# Major Requirements

# Major Requirements

The major consists of a minimum of 36 credits or 12 courses in Russian language and literature, including at least 18 credits at or above the 200 level. Students must complete all required coursework for the major with grades of C or better. All majors must fulfill the following requirements:

1. six language courses beyond 101. One semester of the Practicum may count toward language credit. Intensive Rutgers summer program 8-credit courses may count as two language courses, assuming adequate progress. Students whose knowledge of Russian places them beyond 01:860:302 are required to substitute other 860 courses to complete a total of 36 credits.
2. two surveys: 01:860:259 Introduction to 19th-Century Russian Literature and 01:860:260 Introduction to 20th-Century Russian Literature
3. 01:860:315 Reading Russian Literature in Russian
4. three electives offered in the department at 200-400 level, at least one of which will be a 400-level course

Up to two electives approved for the Minor in Slavic and East European Studies (861) may be counted toward the Russian major.

Russian 860 (SAS)

# Minor Options

# Minor Options

Students may choose from among three minor options:

**1. Minors in Russian language and literature** will have the ability to analyze works of literature in themselves and in their historical context. They will be able to critically assess sources and use the conventions of attribution and citation correctly. Depending on their entry level, they will have the ability to communicate in Russian and read original texts. All will have a basic understanding of the nature of the Russian language. This minor is fulfilled by successful completion of the following set of six courses with a grade of C or better:

- three language courses beyond 101 or 207
- three literature electives from the 200 or above-level courses offered in the department

**2. Minors in Russian language** will have a solid understanding of the Russian language and be able to communicate effectively in oral and written forms. They will also be able to read literature and other texts in the original. All will have a basic understanding of the nature of the Russian language. This minor is fulfilled by successful completion of the following set of six courses with a grade of C or better:

- five language courses beyond 101 or 207 (one semester of the Practicum may count toward this requirement)
- one literature course with readings in Russian, to be chosen from the following: 315, 401, 402, 403, 404, or 407 (a different course that requires reading texts in Russian, such as 01:860:332 or 01:860:433, may fulfill this requirement upon approval from the program director)

**3. Minors in Russian literature** (an option for students who wish to study Russian literature in translation) will have the ability to analyze works of literature in themselves and their historical context. They will be able to critically assess sources and use the conventions of attribution and citation correctly. Minors are also encouraged to study Russian literature within a larger European and global context by taking courses in comparative literature and other national literatures. This minor is fulfilled by successful completion of the following set of six courses with a grade of C or better:

- two survey courses: 259 and 260
- four electives in Russian literature

Note: Refer to section Minor in Slavic and East European Studies 861

Russian 860 (SAS)

# Transfer Credit Policy

# Transfer Credit Policy

Transfer students wishing to major in Russian language and literature must take at least eight of their 12 courses (above 101) at Rutgers. That is, the program will accept no more than four transfer credit courses toward the Russian major. Exceptions are made only in rare cases and require the permission of the program director.

Transfer students wishing to minor in Russian language, Russian literature, or Russian language and literature must take at least four of their six courses (above 101) at Rutgers. That is, the program will accept no more than two transfer credit courses toward the Russian minor, in any of its three tracks. Exceptions are made only in rare cases and require the permission of the program director.

Russian 860 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To qualify, a student must have a cumulative grade-point average of 3.0 or better and an average of 3.4 or better in the major at the end of the junior year. At that time, the student should make a formal application. During their senior year, in addition to fulfilling major course requirements, candidates who are accepted by the discipline honors committee take 01:860:496-497, in which they complete a major research paper under the direction of an adviser.

Russian 860 (SAS)

# Russian Language Courses

# Russian Language Courses

**01:860:101** ***Elementary Russian I (4)***
Spoken and written contemporary standard Russian, intended for students with no prior experience in the language. Development of proficiency in speaking, reading, listening, and writing, as well as the basics of Russian grammar. Introduction to Russian life, culture, history, geography, and traditions.

**01:860:102** ***Elementary Russian II (4)***
Spoken and written contemporary standard Russian, intended for students with no prior experience in the language. Development of proficiency in speaking, reading, listening, and writing, as well as the basics of Russian grammar. Introduction to Russian life, culture, history, geography, and traditions.
***Prerequisite: 01:860:101 or placement.***

**01:860:103** ***Elementary Russian Conversation I (1)***
A one-hour course to supplement Elementary Russian I, providing extra practice with speaking and listening, pronunciation, and grammar of standard contemporary Russian, while also exposing students to additional products and practices of Russian culture as well as history.
***Corequisite: 01:860:101.***

**01:860:104** ***Elementary Russian Conversation II (1)***
A one-hour course to supplement Elementary Russian II, providing extra practice with speaking and listening, pronunciation, and grammar of standard contemporary Russian, while also exposing students to additional products and practices of Russian culture as well as history.
***Corequisite: 01:860:102.***

**01:860:105** ***Intensive First Year Russian Abroad***
Intensive introduction to fundamentals of the Russian language for beginners. Focus on grammar, phonetics, and conversation. Taught in Russian. After completion, students may still receive credit for 860:102, depending on placement.
***Credit not given for both this course and 01:860:101.***

**01:860:106** ***Intensive First Year Russian Abroad***
Intensive introduction to fundamentals of the Russian language for beginners. Focus on grammar, phonetics, and conversation. Taught in Russian. After completion, students may still receive credit for 860:102, depending on placement.
***Credit not given for both this course and 01:860:101 and 102.***

**01:860:111** ***Russian Conversation I (1)***
Russian Conversation I is a one-credit, mixed-level course to supplement the four-credit language courses Elementary Russian I and Intermediate Russian I. The course provides extra practice with the pronunciation, phonetics, intonation, and grammar of Russian, while also introducing students to additional products and practices of Russian culture and history. The course may be repeated for credit, as the content changes each semester. Suitable for students in 01:860:101 and 01:860:201.

**01:860:112** ***Russian Conversation II (1)***
Russian Conversation II is a one-credit, mixed-level course to supplement the four-credit language courses Elementary Russian II and Intermediate Russian II. The course provides extra practice with the pronunciation, phonetics, intonation, and grammar of Russian, while also introducing students to additional products and practices of Russian culture and history. The course may be repeated for credit, as the content changes each semester. Suitable for students in 01:860:102 and 01:860:202.
***Prerequisite: 01:860:101 or placement.***

**01:860:120** ***Russian for Reading Knowledge (3)***
Grammar and readings of texts from various fields.
***Does not satisfy prerequisite for 01:860:201.***

**01:860:201** ***Intermediate Russian I (4)***
Spoken and written contemporary standard Russian. Develops proficiency in speaking, reading, listening, and writing. Review and expansion of Russian grammar and vocabulary. Deepening of understanding of Russian life, culture, history, geography, and traditions.
***Prerequisite: 01:860:102 or placement.***

**01:860:202** ***Intermediate Russian II (4)***
Spoken and written contemporary standard Russian. Develops proficiency in speaking, reading, listening, and writing. Review and expansion of Russian grammar and vocabulary. Deepening of understanding of Russian life, culture, history, geography, and traditions.
***Prerequisite: 01:860:201 or placement.***

**01:860:203** ***Intermediate Conversation I (1)***
A one-hour course to supplement Intermediate Russian I, providing extra practice with speaking and listening, pronunciation, and grammar of standard contemporary Russian, while also exposing students to additional products and practices of Russian culture as well as history.
***Pre- or corequisite: 01:860:201 or 202.***

**01:860:204** ***Intermediate Conversation II (1)***
A one-hour course to supplement Intermediate Russian II, providing extra practice with speaking and listening, pronunciation, and grammar of standard contemporary Russian, while also exposing students to additional products and practices of Russian culture as well as history.
***Corequisite: 01:860:202.***

**01:860:205** ***Intensive Second Year Russian Abroad (NB)***
Intensive intermediate level study of the Russian language. Focus on grammar, phonetics, conversation. Taught in Russian.
***Credit not given for this course and 01:860:201 or 207.***

**01:860:206** ***Intensive Second Year Russian Abroad***
Intensive intermediate level study of the Russian language. Focus on grammar, phonetics, conversation. Taught in Russian
***Prerequisite: 01:860:102 or placement at equivalent level. Credit not given for both this course and 01:860:201-202 or 207-208.***

**01:860:207** ***Elementary Russian for Russian Speakers (4)***
An elementary course for students who learned to speak Russian in the home or from family members, with little or no formal study or experience with reading or writing Russian. Students will learn the Russian alphabet and how to write in Russian, solidify knowledge of Russian grammar, including case endings and verbal forms, and increase vocabulary. Students are introduced to Russian culture, literature, and history through authentic target-language texts, websites, and media.
***Prerequisite: Placement. Credit not given for both this course and 01:860:201.***

**01:860:208** ***Intermediate Russian for Russian Speakers (4)***
An intermediate course for students who learned Russian at home or from family members, and some formal study, including Russian 207. This course improves grammatical control, and expands active vocabulary for discussing abstract topics. Students improve reading skills through literary and nonliterary texts, and writing skills, to create cohesive and organized texts. Students also increase knowledge of Russian history, culture, geography, and traditions through authentic materials.
***Prerequisite: 01:860:207 or placement. Credit not given for both this course and 01:860:202.***

**01:860:211** ***Russian Conversation I (1)***
Russian Conversation I is a one-credit, mixed-level course to supplement the four-credit language courses Elementary Russian I and Intermediate Russian I. The course provides extra practice with the pronunciation, phonetics, intonation, and grammar of Russian, while also introducing students to additional products and practices of Russian culture and history. The course may be repeated for credit, as the content changes each semester. Suitable for students in 01:860:101 and 01:860:201.
***Prerequisite: 01:860:102 or placement.***

**01:860:212** ***Russian Conversation II (1)***
Russian Conversation II is a one-credit, mixed-level course to supplement the four-credit language courses Elementary Russian II and Intermediate Russian II. The course provides extra practice with the pronunciation, phonetics, intonation, and grammar of Russian, while also introducing students to additional products and practices

of Russian culture and history. The course may be repeated for credit, as the content changes each semester. Suitable for students in 01:860:102 and 01:860:202.
***Prerequisite: 01:860:201 or placement.***

**01:860:301** ***Advanced Russian I (3)***
Spoken and written contemporary standard Russian. Strengthens grammatical control and develops proficiency in speaking, reading, listening, and writing. Development of ability to summarize, develop narration, and use complex grammatical structures and syntactic constructions. Covers many elements of modern Russian life.
***Prerequisite: 01:860:202, 208, or placement.***

**01:860:302** ***Advanced Russian II (3)***
Spoken and written contemporary standard Russian. Strengthens grammatical control and develops proficiency in speaking, reading, listening, and writing. Development of ability to summarize, develop narration, and use complex grammatical structures and syntactic constructions. Covers many elements of modern Russian life.
***Prerequisite: 01:860:301 or placement.***

**01:860:303** ***Advanced Russian Conversation I (1)***
Conversational skills in standard Russian including proper pronunciation and intonation. Engagement with authentic Russian-language materials such as print media and films.
***Prerequisite: 01:860:202 or 208, or placement.***

**01:860:304** ***Advanced Russian Conversation II (1)***
Conversational skills in standard Russian including proper pronunciation and intonation. Engagement with authentic Russian-language materials such as print media and films.
***Prerequisite: 01:860:301, or placement.***

**01:860:305** ***Intensive Third-Year Russian Abroad (6)***
Intensive high intermediate level study of the Russian language. Focus on grammar, conversation, phonetics, reading, and the language of media. Taught in Russian.
***Prerequisite: 01:860:202, 205, 208 or placement. Credit not given for both this course and 01:860:301.***

**01:860:306** ***Intensive Third-Year Russian Abroad (8)***
Intensive high intermediate level study of the Russian language. Focus on grammar, conversation, phonetics, reading, and the language of media. Taught in Russian.
***Prerequisite: 01:860:202, 01:860:208 or placement at equivalent level. Credit not given for both this course and 01:860:301 or 302.***

**01:860:311** ***Advanced Russian Grammar Review I (1)***
Advanced Russian Grammar Review I is a one-credit course, conducted primarily in Russian, which supplements work in Advanced Russian I (01:860:301) and 400-level courses taught in Russian. It provides extra review of topics in Russian grammar and syntax, as well as supplemental speaking and listening practice. The course may be repeated for credit, as the content changes each semester. Suitable for students in 01:860:301 and 400-level courses conducted in Russian.
***Prerequisite: 01:860:202 or 01:860:208 or placement***

**01:860:312** ***Advanced Russian Grammar Review II (1)***
Advanced Russian Grammar Review II is a one-credit course, conducted primarily in Russian, which supplements work in Advanced Russian II (01:860:302) and 400-level courses taught in Russian. It provides extra review of topics in Russian grammar and syntax, as well as supplemental speaking and listening practice. The course may be repeated for credit, as the content changes each semester. Suitable for students in 01:860:302 and 400-level courses conducted in Russian.
***Prerequisite: 01:860:208 or 01:860:301 or placement***

**01:860:351,352** ***Structure of the Russian Language (3,3)***
Advanced course with emphasis on morphology, difficult points of grammar. Theory and extensive drill work.
***Prerequisite: 01:860:202, or permission of instructor.***

**01:860:355** ***Russian Phonetics (3)***
Analysis of the Russian phonetic system, intonation, and transcription; emphasis on reading of texts and dialogues.
***Prerequisite: 01:860:202, or permission of instructor.***

**01:860:401** ***America through Russian Eyes (3)***
Taught primarily in Russian. Fosters advanced language skills of conversational fluency, listening comprehension, writing and composition, expanded vocabulary, recognition of stylistic registers, and advanced syntax. Skills are practiced while exploring the topic of Russian attitudes to America in the course of the last century.
***Prerequisite: 01:860:302 or placement. May be taken out of sequence with 01:860:402, 403, 404, or 407.***

**01:860:402** ***Russian Media and Film (3)***
Taught primarily in Russian, the course fosters advanced language skills of conversational fluency, listening comprehension, writing and composition, expanded vocabulary, recognition of stylistic registers, and advanced syntax. These skills are practiced while exploring the topic of Russian media and film.
***Prerequisite: 01:860:302 or placement. May be taken out of sequence with 01:860:401, 403, 404, or 407.***

**01:860:403** ***Contemporary Russian Culture: From Perestroika to the Present (3)***
Taught primarily in Russian. Fosters advanced language skills of conversational fluency, listening comprehension, writing and composition, and advanced syntax while exploring the changing contemporary culture of Russia through the economic structure, the family structure, domestic politics, foreign policy, and recollections of Perestroika (political reforms of the 1980s).
***Prerequisite: 01:860:302 or 306 or placement. May be taken out of sequence with 01:860:401, 402, 404, or 407.***

**01:860:404** ***Debating Global Issues in Russian (3)***
Taught primarily in Russian. Fosters advanced language skills of conversational fluency, listening comprehension, writing and composition, and advanced syntax while exploring various questions of global importance.
***Prerequisite: 01:860:302 or 306 or placement. May be taken out of sequence with 01:860:401, 402, 403, or 407.***

**01:860:405** ***Intensive Fourth-Year Russian Abroad (6)***
Intensive advanced level study of the Russian language. Focus on advanced points of grammar, stylistics, conversation. Reading of newspapers and Russian literature. Taught in Russian.
***Prerequisite: 01:860:302 or placement.***

**01:860:406** *Intensive Fourth-Year Russian Abroad (8)*
Intensive advanced level study of the Russian language. Focus on advanced points of grammar, stylistics, conversation. Reading of newspapers and Russian literature. Taught in Russian.
***Prerequisite: 01:860:302 or placement.***

**01:860:407** *Contemporary Russian Culture: The Thaw (3)*
Taught primarily in Russian, the course fosters advanced language skills of conversational fluency, listening comprehension, writing and composition, expanded vocabulary, recognition of stylistic registers, and advanced syntax. These skills are practiced while exploring topics in Russian history and culture in the post-Stalin Soviet era.
***Prerequisite: 01:860:302 or placement. May be taken out of sequence with 01:860:401, 402, 403, or 404.***

**01:860:411** *Advanced Russian Grammar Review I (1)*
Advanced Russian Grammar Review I is a one-credit course, conducted primarily in Russian, which supplements work in Advanced Russian I (01:860:301) and 400-level courses taught in Russian. It provides extra review of topics in Russian grammar and syntax, as well as supplemental speaking and listening practice. The course may be repeated for credit, as the content changes each semester. Suitable for students in 01:860:301 and 400-level courses conducted in Russian.
***Prerequisite: 01:860:208 or 01:860:302 or placement.***

**01:860:412** *Advanced Russian Grammar Review II (1)*
Advanced Russian Grammar Review II is a one-credit course, conducted primarily in Russian, which supplements work in Advanced Russian II (01:860:302) and 400-level courses taught in Russian. It provides extra review of topics in Russian grammar and syntax, as well as supplemental speaking and listening practice. The course may be repeated for credit, as the content changes each semester. Suitable for students in 01:860:302 and 400-level courses conducted in Russian.
***Prerequisite: 01:860:208 or 01:860:302 or placement.***

**01:860:452** *Seminar in Slavic Linguistics (3)*
Devoted to specific problems in the area of Slavic linguistics. Variable content, e.g., history of the Russian language, readings in Old Russian, advanced problems of morphology.

**01:860:491,492** *Russian Practicum (3,3)*
Drill methods, techniques of facilitating classroom interaction, error analysis, grammar review, and weekly drill sessions conducted in beginning Russian sections under faculty supervision.
***Prerequisites: 01:860:302 and/or permission of instructor. Corequisites: 01:860:401, 402, if applicable.***

Russian 860 (SAS)

# Courses in Russian Literature (may be taught in English)

# Courses in Russian Literature (may be taught in English)

**01:860:160** *How to Read a Russian Novel (1.5)*
A slow journey through one famous Russian novel. Guides students in the basics of reading a literary text from

a culture different than our own, providing the rudimentary cultural and historical context. Novels will vary by semester.
***All readings and discussions in English.***

**01:860:259** ***Introduction to 19th-Century Russian Literature (3)***
A survey of 19th-century Russian literature in its historical context.
***All readings and discussion in English.***

**01:860:260** ***Introduction to 20th-Century Russian Literature (3)***
A survey of 20th-centutry Russian literature.
***Taught fully in English.***

**01:860:268** ***Art and Power (3)***
Russian art of the Soviet era (1917-1991), especially its intersection with politics. Survey of main trends and media (visual arts, architecture, theater, and film).
***Credit not given for both this course and 01:082:204 or 01:195:265.***

**01:860:270** ***Language and Power Behind the Iron Curtain (3)***
The role of language in empire, national identity and decolonization in Eastern Europe and post-Soviet spaces. Language status and policy in this region from the Middle Ages to the present day.

**01:860:272** ***Russia: Between Empire and Nation (3)***
Study of Russia's imperial culture, history, and politics from the 19th to the 21st century, as a window onto geopolitical shifts in contemporary Russia's relations to the wider world.
***Credit not given for both this course and 01:195:272 or 01:510:277.***

**01:860:289** ***Tolstoy's War and Peace (3)***
Detailed study of Leo Tolstoy's monumental novel *War and Peace* (1869) in its historical, cultural, and critical context. All readings and discussion in English.
***Taught in English.***

**01:860:315** ***Reading Russian Literature in Russian (3)***
Introduction to critical issues involved in reading literary texts in Russian. Stylistic register, how grammar is used to create meaning, historical dimensions of style, and lexicon.
***All readings in Russian. Required of all majors. Prerequisite: 01:860:202 or 207 or permission of instructor.***

**01:860:319** ***Special Topics in Russian Studies (3)***
Variable content. Intensive study of a particular topic related to Russia and Russian culture. Specific topics available at time of registration.

**01:860:320** ***Special Topics in Russian and East European Studies (3)***
Variable content. Intensive study of a particular topic related to Russian and/or other East European culture. Specific topics available at time of registration.
***Readings and discussion in English.***

**01:860:322** ***Love and Death in the Russian Short Story (3)***
Russian short fiction from the 19th to the 21st century. Includes readings in genre theory and the study of critical concepts useful for analyzing fiction.
***All readings and discussion in English.***

**01:860:325** ***St. Petersburg: The City as Monument (3)***
Variable content. Intensive study of a particular topic related to St. Petersburg. Specific topics available at time of registration.
***Corequisites: Language courses during the summer program in St. Petersburg, Russia. All readings and discussion in English. Offered only as part of summer program in St. Petersburg.***

**01:860:326** ***Russian and East European Science Fiction (3)***
This course explores the 19th-21st-century tradition of Russian and East European science fiction in literature and film. The course is organized around the big questions that have driven the genre since its first inception: What does it mean to build utopia? How will new technologies transform moral, social, and political norms in everyday life on Earth? How does scientific exploration challenge, and how does it enrich, our understanding of what it is to be human?
***Credit not given for both this course and 01:195:312.***

**01:860:329** ***The World According to Gogol (3)***
Study of fiction and comedies by Nikolai Gogol (1809-1852), including *The Government Inspector* and *Dead Souls*. Focus on Gogol's idiosyncratic narrative techniques.
***All readings and discussion in English.***

**01:860:330** ***Dostoevsky (3)***
Major works in historical, intellectual, and aesthetic contexts. *The Idiot*, *Crime and Punishment*, *Notes from the Underground*, and short works.
***All readings and discussion in English. Credit not given for both this course and 01:195:311.***

**01:860:331** ***Tolstoy (3)***
Study of Tolstoy's major novel *Anna Karenina* and his short fiction, drama, and excerpts from autobiographical writings.
***All readings and discussion in English.***

**01:860:332** ***Russian Poetry (3)***
Reading, analysis, and discussion of 19th- and 20th-century poetry.
***Prerequisite: 01:860:202 or 207 or 208; or permission of instructor. All readings in Russian.***

**01:860:335** ***Landscapes of the Mind: Country and City in Russian Literature and Art (3)***
Moscow and St. Petersburg; the Russian countryside versus the exotic sublime; the idyll versus the reality of peasant life; the city and modernism; utopia and antiurban impulse.
***Credit not given for both this course and 01:082:356.***

**01:860:337** ***Russian and Soviet Cinema (3)***
Survey of 20th- and 21st-century Russian cinema.
***No knowledge of Russian required.***

**01:860:338,339** ***Zimmerli Museum Internship in Russian Art (3,3)***
Research work related to Dodge and Riabov collections; assisting in development, coordination of special exhibitions, translation, and compiling artists' files.
***Prerequisite: Permission of program director. Credit not given for both these courses and 01:082:359,360. Knowledge of Russian necessary.***

**01:860:340** ***Nabokov (3)***
Study of the literary and autobiographical works by the Russian-American writer Vladimir Nabokov (1899-1977) in their historical, political, and cultural contexts.

**01:860:345** ***Serial Storytelling across Media (3)***
Investigation of serial narrative as a modern mode of storytelling, from serialized novels in 19th-century Britain and Russia through the multimedia serials of our digital age. Exploration of this narrative form's enduring power, in multiple media, to interweave fiction with the course of current events and the rhythms of everyday life, and to bring together international audiences shaped by cultural, social, and geographic differences.
***All readings and discussions in English. Credit not given for both this course and 01:195:345 or 01:359:347.***

**01:860:347** ***Russian Theater (3)***
Reading, analysis, and discussion of major Russian playwrights.

**01:860:348** ***Stories of Russian Life: Memory, Invention, Experience (3)***
Examination of how Russian writers have imagined and represented the self in various kinds of life narratives (such as autobiography, diary, memoir, and semifiction). Memory and invention, history and personality, genre and technique, from the medieval era to the present, with emphasis on the 20th century.
***All readings and discussion in English. Credit not given for both this course and 01:195:348.***

**01:860:349** ***Russia's Wars on Page and Screen (3)***
Interpretation of the Russian experience and memory of World War II through a study of films, short stories, novels, poetry, music, diaries, documentary, and journalistic accounts.
***All readings and discussion in English.***

**01:860:433** ***Pushkin and His Age (3)***
Historical examination of Russian literary scene during the period 1740 to 1841, in Russian.
***Prerequisites: 01:860:301 and at least one 300-level course in Russian literature or permission of instructor. All readings in Russian.***

**01:860:435** ***Gender and Sexuality in Russian Literature (3)***
A study of gender and sexuality in Russian literature and culture in the framework of gender theory. Topics include: erotic utopias; gender, desire, and dystopia; sexuality and morality; same-sex love and cultural taboos; cross-dressing; gender stereotypes and their defiance.
***Credit not given for both this course and 01:988:435.***

**01:860:484** ***Russia after Stalin: Literature, History, Theory (3)***
Recent past of Russian culture and politics. Study of how the Stalinist past influenced late Soviet Russian culture, contributed to the collapse of the USSR, and shaped post-Soviet Russia through examination of powerful fiction

texts and films that defined the post-Stalin era, from 1950s onward, as well as nonfiction and theoretical texts on Stalinism and its aftermath.
*Taught in English. Credit not given for this course and 01:510:484 or 01:195:484.*

**01:860:485** *Russia's Rival Capitals: Moscow and St. Petersburg (3)*
Cultural heritage of Russia's rival capitals, with attention to the interactions between city and text. Topics include evolving cultural myths of St. Petersburg and Moscow; the city as a place for negotiating national identity and history; representations across different genres and media; the city and the imaginary (urban phantasmagoria, dreams, terrors).

**01:860:486** *Seminar in Russian Literature (3)*
Intensive reading and research in one specific aspect of Russian letters. Critical and analytical paper required.
*Prerequisites: 01:860:301 and at least one 300-level course in Russian literature or permission of instructor.*

**01:860:487** *Senior Thesis (3)*
Extended research paper written in close consultation with an instructor.
*Prerequisite: 01:860:486.*

**01:860:488** *Seminar: Dostoevsky's The Brothers Karamazov (3)*
Intensive reading of Dostoevsky's last novel in the context of other classic writings on science, religion, and faith: Freud, Nietzsche, the Bible, Kierkegaard, and others.
*All readings and discussion in English.*

**01:860:493,494** *Independent Study: Russian (BA, BA)*
*Prerequisite: Permission of instructor.*

**01:860:496-497** *Honors in Russian (3,3)*
Preparation for research paper and oral examination under direction of a faculty adviser.
*Prerequisite: Permission of honors committee. Both semesters must be completed to receive credit.*

# Sexualities Studies 888 (SAS)

## SEXUALITIES STUDIES 888

Department of Women's, Gender, and Sexuality Studies, School of Arts and Sciences

**Website:** Here

The 18-credit critical sexualities minor introduces students to pioneering thinking on sex, sexuality, queer studies, global and ethno-racial issues, health, activism, and social justice. Two required courses (Introduction to Critical Sexualities Studies and Research on Sexualities) introduce students to the politics and challenges related to research and activism around sexuality. The four elective courses can be drawn from a broad range of historical and cross-cultural perspectives related to the central themes of the minor.

# Minor Requirements

# Minor Requirements

Students are required to complete six 3-credit courses (with a grade of C or better) in the minor, for a total of 18 credits.

01:888:290 Introduction to Critical Sexualities Studies (3)

01:888:339 Research on Sexualities (3)

Four (4) electives from the approved list:

*American Studies*
01:050:325 Women on the Fringe: Perceptions of Women as Social and Sex-Role Deviants in American Civilization
01:050:342 American Sexuality

*Anthropology*
01:070:222 Sexuality and Eroticism in Global Perspective
01:070:371 The Politics of Culture
01:070:372 Body Politics
01:070:389 Ethnography of Gender in South Asia

*Comparative Literature*
01:195:308 Gender, Race, and Textual Imagination
01:195:326 Sexuality and Literary Studies

*Criminal Justice*
01:202:327 Sex, Crime, and Justice

*English*
01:351:348 Literature and Sexuality
01:353:346 Theories of Gender and Sexuality

*Jewish Studies*
01:563:323 Women in the Bible
01:563:335 Jewish-American Women: Contested Lives

*Latino and Caribbean Studies*
01:595:326 Gender, Sexualities, and the Caribbean
01:595:327 Gender, Sexualities, and Representation in U.S. Latina/o Communities

*Psychology*
01:830:362 Psychology of Sex and Gender

*Russian*
01:860:435 Gender and Sexuality in Russian Literature

*Sociology*
01:920:440 Sexuality and Society

*Women's, Gender, and Sexuality Studies*
01:888:215 Introduction to Transgender Studies
01:888:285 Lesbians and Gay Men and Society
01:888:291 Francophilia: Literature and Sexuality in Modern France
01:988:318 The Gendered Body
01:888:321 Queer Contexts
01:988:331 Theorizing Gender and Sexuality
01:988:332 The Color of AIDS: The Politics of Race during the AIDS Crisis
01:888:338 Transnational Sexualities
01:988:392 Thinking Bodies
01:988:398 Freud and Feminism: The Unconscious



# Courses

# Courses

**01:888:215** ***Introduction to Transgender Studies (3)***
Survey of key themes in transgender studies. Explores the category across medicine, history, anthropology, and women's and gender studies; transgender practices as embedded in race, class, sexuality, nationality, and ability.

**01:888:285** ***Lesbians and Gay Men and Society (3)***
Introduction to various disciplines' contributions to understanding the relationship of homosexuality, particularly lesbianism, to society. Includes a section on the political organization and recent theory coming out of the gay movement.

**01:888:290** ***Introduction to Critical Sexualities Studies (3)***
Introduction to the study of sexuality as well as sexual and gendered identity from multidisciplinary and historical perspectives. Includes U.S. and European approaches to sexology, legal regulation of sexual practices, and family formation.

**01:888:291** ***Francophilia: Literature and Sexuality in Modern France (3)***
Explores cultural representations of nonconforming sexualities in France from the late-19th century to the present. The approach combines writing exercises with close reading and analytical discussion of literature, theory, and film within evolving historical context.
***Credit not given for both this course and 01:420:271. Taught in English.***

**01:888:321** ***Queer Contexts: Same-Sex Desire, Culture, and Representation (3)***
Cultural construction and representation of same-sex desire in Western societies. Debates about identity, subjectivity, and the uses of experience included.

**01:888:338** ***Transnational Sexualities (3)***
Considers how globalization alters conceptualizations of sexuality and its relationship to gender. Issues include global, diasporic, and postcolonial gay, lesbian, bisexual, and transgender activism; tourism and travel; HIV/AIDS organizing; "sexual rights" discourses; sex work; and asylum based on gender and sexual orientation.
***Prerequisite: 01:988:101 or 190 or 201 or 202 or 235.***

**01:888:339** ***Research on Sexualities (3)***
Historical, cross-cultural, and multidisciplinary approaches to sexuality research. Social, moral, and political meanings of sexuality in U.S. and transnational contexts. Current issues and debates around sexual norms.
***Prerequisite: 01:988:280 or 01:888:290.***

# Slavic and East European Studies Minor 861 (SAS)

## SLAVIC AND EAST EUROPEAN STUDIES MINOR 861

Website: https://seell.rutgers.edu/academics/undergraduate/minor

Director: Chloë Kitzinger

Note: The director of the Russian & East European Program will also always be the director for the minor.

The primary objective of the minor is to serve students who are studying a relevant regional language and have interest in the history, culture, and politics of eastern Europe and the former contiguous Soviet bloc. Minors in Slavic and East European Studies will demonstrate: a basic competency in Russian or Polish (or by special arrangement, a different relevant regional language that we do not offer at Rutgers, via BTAA course share); historical, cultural, and/or policy-related knowledge of eastern Europe; and a synthesis of this knowledge in at least one substantial written assignment (for any elective taken within the minor) focused on a region of eastern Europe or the former contiguous Soviet bloc, preferably a region where the language that has been the student¿s focus in the minor is widely used. This minor is fulfilled by successful completion of the following set of six courses with a grade of C or better:

- 3 or 4 courses in Polish or Russian language. Note: Courses in other Slavic or regional languages (Ukrainian, Czech, Bosnian/Serbian/Croatian, etc.), offered via Course Share or through Study Abroad, may be substituted by special arrangement with the REELL Program Director.

- RUSSIAN: 860:101, 102, 201, 202, 207, 208, or other courses depending on placement.

- POLISH: 787:101, 102, 201, 202, or higher level courses through study abroad or Course Share.

- 2 or 3 electives approved for the minor. Electives are drawn from all departments with relevant offerings, including (but not limited to) REELL, European Studies, History, Jewish Studies, Political Science, Anthropology, Geography, Art History, and comparative Literature. For a list of pre-approved classes, see: https://reell.rutgers.edu/academics/undergraduate/minor/288-pre-approved-elective-courses-for-the-minor-in-slavic-east-european-studies.

# Social Justice 904 (SAS)

## SOCIAL JUSTICE 904

Department of Women's, Gender, and Sexuality Studies, School of Arts and Sciences

**Website:** Here

**Social Justice Minor**

The social justice minor is designed to introduce students to the complexity of social justice issues, cultivate their capacity to identify key determinants of structural inequities, familiarize them with various social justice practices and strategies, and prepare them for advocacy and activism to address these pressing issues.

The social justice minor draws upon resources in multiple academic units, disciplines, and interdisciplinary programs to involve students in ongoing struggles to define and achieve social justice locally and globally. Through individual courses that incorporate service learning, as well as internships, study abroad, and alternative spring break experiences, students are encouraged to recognize injustice and work to eradicate it. Among the manifold dimensions of injustice, the social justice minor pays particular attention to modes of exploitation, marginalization, structural and physical violence, and cultural imperialism that produce systems of advantage and disadvantage.

Students who complete the 18-credit program will learn to think analytically; integrate social justice theory and practice; identify structural constraints and trace their operation across social, economic, political, cultural, and environmental terrains; understand the effects of various social and economic policies on the scope and intensification of inequality; and grasp the complex interrelation of local and global justice issues. Students are required to achieve a grade of C or better in all courses that count for the minor.

Social Justice 904 (SAS)

# Minor Requirements

# Minor Requirements

**Required Courses**

Students are required to complete six 3-credit courses (with a grade of C or better) in the minor, for a total of 18 credits; 9 credits must be in required 904 courses and 9 credits must be in courses that fulfill at least two of the learning goals listed below.

01:904:201 Introduction to Social Justice (3)
01:904:202 Practicing Social Justice (3)

01:904:399/400 Social Justice Internship (1.5-3, 1.5-3)
or
01:904:401/402 Social Justice Capstone Seminar (3,3)
or
01:988:422 CLASP Seminar/Internship in Women's and Gender Studies

**Elective Courses (9 credits)**

Choice of three electives from the approved listed. To qualify as a social justice elective, a course must fulfill at least two of the following learning goals:

- Critically engage histories and geographies of domination
- Critically engage particular population's experiences of oppression
- Explore theories of justice in relation to reduction of social inequalities
- Examine policy alternatives that foster collective action or redistributive effects

**NOTE:** *Students my count, at most, one course toward both their major and their social justice minor electives.*

Social Justice 904 (SAS)

# Courses

# Courses

**01:904:201** ***Introduction to Social Justice (3)***
Through case studies of pressing social justice issues, examines dynamics of oppression, linking competing theories of social justice to hierarchies grounded in race, ethnicity, nationality, gender, class, and sexuality, and to particular strategies for social transformation.

**01:904:202** ***Practicing Social Justice (3)***
Introduces students to diverse practices of social justice activism including grassroots organizing, labor organizing, political organizing, and transnational organizing. Readings about social change efforts are combined with student participation in community mobilizations, labor organizing efforts, political campaigns, and transnational social movement and nongovernmental organization (NGO) activism.

**01:904:309** ***Justice and Violence (3)***
Justice, violence, and the law are entangled in complex ways. While we may think that following the law will always ensure a just outcome, justice inevitably exceeds the boundaries of legal stipulations. In fact, it is quite uncertain whether and how it is possible to make a just decision, to act or speak justly. While the law is never fully able to represent justice, it is also fundamentally reliant on violence. But how is legal violence different from the unrestrained violence of lawlessness?
Taught in English. Credit not given for both this course and 01:195:373 or 01:470:309.

**01:904:391,392** *Topics in Social Justice (1.5,1.5)*
Intensive investigation of particular social justice issues such as environmental justice, outsourcing of reproductive labor, the informal economy, the prison-industrial complex. Topic varies each semester. Designed for social justice living-learning communities.

**01:904:399,400** *Social Justice Internship (1.5-3,1.5-3)*
Interns work in social justice organizations. Supervision by assigned staff at the placement site. Seminar, student journal, paper, and assessment of work experience required.
***Prerequisites: 01:904:201 and 202. Designed for social justice minors. Permission of social justice faculty adviser required.***

**01:904:401,402** *Social Justice Capstone Seminar (3,3)*
In-depth exploration of a particular social justice issue such as globalizing inequality, gendered migration, war and displacement, refugee camps, militarization, the color of AIDS, asylum seeking, the prison-industrial complex. Topic varies with instructor.

**01:904:493,494** *Social Justice Independent Study (3,3)*
Supervised individual study of selected topics of interest with extensive reading and a research paper.
***Reserved for social justice minors.***

# Social Work 910 (SSW-U)

## SOCIAL WORK 910

Baccalaureate Social Work Program, School of Social Work

**Website:** Here

**Dean:** George Leibowitz, Dean and Distinguished Professor; M.S.W., Denver; Ph.D., Denver

**Assistant Dean of Undergraduate Education, Teaching Professor, and Director of B.A. in Social Work Program, New Brunswick:** V. DuWayne Battle, B.A., Barton College; M.Div., D.Min., Southeastern Theological Seminary; M.S.W., Ph.D., Rutgers

The major in social work is accredited by the Council on Social Work Education. Students who successfully complete the program receive a Bachelor of Arts degree from the School of Arts and Sciences. The program prepares students for beginning-level generalist social work practice. The focus for practice addresses work with special populations including the poor, the oppressed, and other at-risk groups. Participants are expected to acquire the knowledge base, professional ethics, values, and skills to work effectively within individual, family, group, organizational, and community levels of practice. The program also prepares students for graduate study in social work and related fields.

Students apply to the major in the spring semester of their sophomore year, as they near the completion of approximately 60 credits of coursework. If accepted, students are admitted to begin the major courses in the fall semester at the beginning of their junior year. A cumulative grade-point average of 3.0 is required for acceptance into the program. Information and the application can be found here.

Following acceptance into the program, all social work majors are assigned a faculty advisor within the School of Social Work. To continue in this major, students must maintain a 3.0 grade-point average in social work courses. In order to graduate, students must have grades of C or better with a cumulative grade-point average of 3.0 in all social work core-content courses and a 2.0 cumulative grade-point average in the courses making up the liberal arts foundation.

Social Work 910 (SSW-U)

# Major Requirements

# Major Requirements

**Prerequisites**

Students should complete the following courses prior to enrollment in the social work program:

01:119:150 Biology, Society, and Biomedical Issues (3); or 01:119:154 Genetics, Law, and Social Policy (3); or 01:119:160 Biology, Society, and Ecological Issues (3); or 01:119:182 Human Sexuality (3); (Other biology courses may be considered)

01:830:101 General Psychology (3)

01:920:101 Introduction to Sociology (3)

01:960:211 Statistics (3) or 01:960:212 Statistics II or 01:830:200 Quantitative Methods in Psychology (4) or 01:920:312 Introduction to Statistics in Sociology (3) or 10:775:205 Basic Statistical Methods

Two additional courses, one from each of two of the following areas: anthropology, art, communication, history, literature, music, philosophy, political science, religion, and theater.

**Course Sequence**

The required courses and their recommended sequence are as follows:

**Junior Year**

*Fall Semester*

09:910:220 Introduction to Social Work and Social Justice (3) **[This course is open to all Rutgers undergraduate students as an elective and meets a SAS core requirement . Required for Social Work major.]**

09:910:311 Social Welfare Policy and Services I (3) **[Required for Social Work major.]**

09:910:402 Human Behavior I and the Social Environment I (3) **[Required for Social Work major.]**

*Social Work Electives (3 credits) open to Juniors & Seniors (check semester offered)*

09:910:222 Confronting Anti-Black Racism (3) **[This course is open to all Rutgers undergraduate students as an elective and meets a SAS core requirement.]**

09:910:223 Aging & Society (3) **[This course is open to all Rutgers undergraduate students as an elective.]**

09:910:224 Housing Inequality & Homelessness (3) **[This course is open to all Rutgers undergraduate students as an elective and meets a SAS core requirement.]**

09:910:226 Childhood Inequalities (3) **[This course is open to all Rutgers undergraduate students as an elective and meets a SAS core requirement.]**

09:910:227 Global Social Work (3) **[This course is open to all Rutgers undergraduate students as an elective.]**

09:910:228 Understanding Violence: Causes, Consequences, and Social Justice Change (3) **[This course is open to all Rutgers undergraduate students as an elective and meets a SAS core requirement.]**

09:910:476 Child Welfare Services and Practices (3) **[required of Baccalaureate Child Welfare Education Program (BCWEP) students and elective for other students in the major]**

*Spring Semester*

09:910:312 Social Welfare Policy and Services II (3) **[Required for Social Work major.]**

09:910:332 Foundations of Professional Development (3) **[Required for Social Work major.]**

09:910:403 Human Behavior and the Social Environment II (3) **[Required for Social Work major.]**

09:910:405 Methods of Social Work Research I (3)**[Required for Social Work major.]**

*Social Work Electives (3 credits) open to Juniors & Seniors (check semester offered).*

**Senior Year**

**Fall Semester**

09:910:406 Diversity & Oppression (3) **[Required for Social Work major.]**

09:910:471 Practicum I (6) **[Required for Social Work major.]**

09:910:472 Generalist Practice I (3) **[Required for Social Work major.]**

*Social Work Electives (3 credits) open to Juniors & Seniors (check semester offered).*

*Spring Semester*

09:910:473 Practicum II (6) **[Required for Social Work major.]**

09:910:474 Generalist Practice II (3) **[Required for Social Work major.]**

09:910:475 Integration Seminar (3) **[Required for Social Work major.]**

09:910:476 Child Welfare Services and Practices (3) **[required of Baccalaureate Child Welfare Education Program (BCWEP) students and elective for other students in the major]**

*Social Work Electives (3 credits) (if needed) open to Juniors & Seniors (check semester offered).*

Social Work 910 (SSW-U)

# Study Abroad

# Study Abroad

Welcome to the Office of Global Social Work Programs at Rutgers School of Social Work. Our mission is to promote global citizenship and professional action among social work students, alumni, faculty and staff, and practitioners. We achieve this through education, advocacy, research, and community service locally and globally.

- Meditation and Social Work, Taiwan 01:959:446
- Empowerment Through Community Engagement in the Yucatan, Mexico 01:959:396
- Romania's [R]Evolution: Investing in Children and Families Across the Life Cycle 01:959:396

Social Work 910 (SSW-U)

# BA in Social Work Program Goals

# BA in Social Work Program Goals

Create an environment that prepares students to utilize a liberatory consciousness framework with an emphasis on one's responsibility to disrupt and dismantle racism and oppression based in an anti-racist pedagogy.

Prepare students for foundation level practice within a variety of agency and community settings and with diverse populations, including minoritized groups, in the State of New Jersey and elsewhere.

Prepare entry-level social work practitioners who serve effectively in a variety of capacities,from rural settings to complex metropolitan contexts of social work practice in New Jersey.

Develop practitioners sensitive to the diverse racial, ethnic, and cultural composition of the State and the region who work with a range of client systems to meet the needs of citizens and communities.

Provide a high-quality educational experience through a curriculum grounded in a liberal arts perspective, metacognitive skills,and centered on the professional foundation content designed to prepare entry-level professionals for beginning social work practice with client systems of various size and types.

Educate students to understand and use social work knowledge, values, skills, cognitive and affective processes, and behaviors throughout their professional practice.
Support students preparation to continue their professional education, including pursuit of master's degree programs in social work.

Social Work 910 (SSW-U)

# Courses

# Courses

**09:910:220** ***Introduction to Social Work and Social Justice (3)***
Overview of social work values, ethics, arenas of practice, and social problems through a social justice lens, which focuses on equal rights, opportunities, and treatment by analyzing unbalanced social power systems. Includes a twenty-hour (20) experiential learning (volunteer placement or civic engagement) within a social service agency that promotes social justice by analyzing contemporary social justice issues and unbalanced social power systems. Understanding that social justice is at the core of social work, everything done in this course will focus on social, economic, racial, and environmental justice by analyzing diversity and differences, privilege and oppression that shape individual and group experiences of, and perspectives on, contemporary issues.
***Required for social work major. Should be taken by premajors by the sophomore year. This course is open to all Rutgers undergraduate students as an elective. This course is CORE certified.***

**09:910:222** ***Confronting Anti-Black Racism (3)***
"Black lives matter. Black thought matters. Black writing matters. Black writing about Black lives matters. Black thought matters. Black scholarship, criticism, and research matter. Black memory matters" Louis-Chude Sokei, 2020 in 'What Was Black Studies?' Blackness is not a monolith. Racism does not require the actions nor the intent of individuals. In understanding Anti-Black Racism, we must also understand the nuance within 'Black' as a culture, race, and lived experience. In this course, reading, critical thinking, and skills building to confront Anti-Black racism are our main concern. This class will delve into the varied experiences, thoughts, and scholarship of Black and African writers. The readings should make you question your beliefs, positionality, actions, and as social justice advocates, inactions. Using Black writers from various disciplines, including social work, we will explore ways to actively and daily disrupt Anti-Black racism. Guided by the authors, and those who came before us, as a class we will choose a social action to take that will aid in the movement to eliminate Anti-Black racism. This class will create opportunities for metacognition (thinking about your thinking), introspection, and reflection. These opportunities will be elicited and integrated throughout the semester as you engage in vulnerability and critically reflect in writings and discussion posts with your classmates. Let us get used to the sound of your voice, words, and thought 'because it matters and is part of the journey to understanding Anti-Black racism. We will approach reading as a personal transaction between you and the text. What did the book(s) make you think of, feel, remember, wonder about? Are you uncomfortable yet? Good, that means we are doing this right.
***This course is open to all Rutgers undergraduate students as an elective. This course is CORE certified.***

**09:910:223** ***Aging & Society (3)***
The purpose of this course is to help students learn about different experiences that can occur during mid and older adulthood and prepare them for engaging with older members of society in their personal and professional roles. Systems that impact the aging experience during mid and older adulthood will be reviewed and analyzed. Students will be encouraged to reimagine their understanding about older members of society and identify anti-oppressive approaches for supporting this subpopulation.
***This course is open to all Rutgers undergraduate students as an elective.***

**09:910:228** ***Understanding Violence: Causes, Consequences, and Social Justice Change (3)***
This course provides an overview of the contemporary challenge of interpersonal violence through the lens of social justice, which is a foundation of the field of social work. It describes the causes and consequences of child

maltreatment, peer violence, intimate partner violence, and sexual assault. Students will discuss research/science informed prevention and response solutions in schools, health care, and community settings from a multidisciplinary perspective.
*This course is open to all Rutgers undergraduate students as an elective.This course is CORE certified.*

**09:910:224** *Housing Inequality & Homelessness (3)*
This course provides an overview of housing inequality in the United States, and homelessness as a product of this type of inequity. It uses theory, first-person accounts from people experiencing housing insecurity, and a social justice/equity lens to examine whether homelessness is an intractable social issue or a solvable policy problem. Students will reflect on their own perceptions of homelessness, explore causes and consequences of housing inequity, and learn about programmatic and advocacy efforts to address this issue in the United States.
*This course is open to all Rutgers undergraduate students as an elective. This course is CORE certified.*

**09:910:226** *Childhood Inequalities (3)*
This course focuses on understanding, and analyzing childhood (birth through 18) in the United States context, examine the multiple social systems that children/youth come into contact with and consider how these systems perpetuate inequitable outcomes. These include: the school system, child welfare and juvenile justice system, the health system and the immigration system. The course will use developmental theories and a social justice/equity lens to examine childhood and explore how race, gender and social class may influence inequality within these systems. Theory application in regards to social justice will also be explored. Particular consideration will be given to theories of change, culturally responsive practice, and privilege.
*This course is open to all Rutgers undergraduate students as an elective. This course is CORE certified.*

**09:910:311** *Social Welfare Policy and Services I (3)*
In historical perspective, exploration of social welfare, social policy, and the emergence of the social work profession. Philosophical, political, and practical bases of social policies and programs.
*Restricted to Social Work majors.*

**09:910:312** *Social Welfare Policy and Services II (3)*
Process of social policy development and theoretic frameworks for the analysis of social policy. Emphasis on policies addressing problems of poverty, mental health, child welfare, and vulnerable groups such as the elderly, gays/lesbians, women, and persons of color.
*Restricted to Social Work majors.*

**09:910:332** *Foundations of Professional Development (3)*
Professional skills necessary for baccalaureate-level generalist practitioners. Emphasizes development of a professional social work identity and skills needed to work within an organizational context.
*Restricted to Social Work majors.*

**09:910:352** *Groups at Risk in Contemporary Society (3)*
Analysis of the relationship between institutionalized practices and the functioning level of key high-risk groups within our society: aged, veterans, people with disabilities, refugees, women, ethnic and racial minorities, and participants in alternative lifestyles. Obstacles impeding the functioning of these groups explored.
*This course is open to all Rutgers undergraduate students as an elective.*

**09:910:471** ***Practicum I (6)***
Participation in a supervised practicum applying the tenets of generalist practice. Gain greater understanding of the goals, organization, and delivery system of the practicum setting and the application of social work methods, values, ethics, and skills.
***Requires two days per week of supervised field instruction in a social service agency. Restricted to Social Work majors. Corequisite: 09:910:472.***

**09:910:472** ***Generalist Practice I (3)***
Beginning preparation for generalist practice with client systems of all sizes and levels. Essential skills, values, concepts, and ethical considerations as they pertain to generalist practice.
***Restricted to Social Work majors. Corequisite 09:910:471.***

**09:910:473** ***Practicum II (6)***
Development and enhancement of essential values, skills, use of self, and use of supervision in interventive work with individuals, families, groups, organizations, and communities.
***Requires two days per week of supervised field instruction in a social service agency. Restricted to Social Work majors. Corequisite: 09:910:474.***

**09:910:474** ***Generalist Practice II (3)***
Basic concepts and skills, including ethnic, racial, and gender-sensitive practice. Application of problem-solving model to micro- and macro-level intervention.
***Restricted to Social Work majors. Corequisite: 09:910:473.***

**09:910:475** ***Integration Seminar (3)***
This seminar course integrates all areas of prior and current coursework learning as it applies to "real-life" field situations. Critical thinking skills and use of the social work profession's knowledge base will be emphasized.
***Restricted to Social Work majors.***

**09:910:476** ***Child Welfare Services and Practices (3)***
Focus is on child maltreatment, the development and evolution of child protective services in the United States, and emerging practices in the treatment and prevention of child neglect and abuse. Students look at different models of child maltreatment; the development of skills in recognition; assessment; use of authority; provision of continuing services; risk factors, such as substance abuse, mental illness, and domestic violence; substitute care; and professional issues.
***Course is required for the concentration in child welfare and will usually be taken in conjunction with a supervised internship in an agency addressing the needs of children and families.***

**09:910:402** ***Human Behavior in the Social Environment I (3)***
Theories, themes, and issues concerning the ongoing interaction between people as they grow, change, and develop over the life course and the social context in which this occurs. Assumptions about human behavior that may interfere with recognition of diversity in the ongoing interaction between individual, family, and group identity, social context, and social life. Content about values and ethical issues related to biopsychosocial development highlighted.
***Restricted to social work majors.***

**09:910:403** ***Human Behavior in the Social Environment II (3)***
Theories and knowledge of action groups, organizations, and communities as the context for micro and macro social practice. Ways in which systems promote or deter people in the maintenance or attainment of optimal health and well-being. Evaluation and application of theory to client situations to understand how macro systems affect client benefit.
***Restricted to social work majors.***

**09:910:405** ***Methods of Social Work Research I (3)***
Introduction to scientific, analytic approach to building knowledge and skills, including: role of concepts and theory, hypothesis formulation, operationalization, research design, data collection, data processing, statistical analysis, introductory computer skills, and report writing.
***Restricted to social work majors.***

**09:910:227** ***Global Social Work***
This course explores global social work, past and present, and the application of social work to vulnerable groups around the globe. Students will learn about different applications of social work and social services delivery systems around the globe. Students will apply social work values, knowledge and skills to address global problems. Student will explore the peer-reviewed literature, grey literature, and databases on international development applied to a selected country and specialized field of practice of the student¿s choice. Students will explore their international career goals through the focused exploration of a specific development issue within a country or region of the globe.
***This course is open to all Rutgers undergraduate students as an elective.***

# Sociology 920 (SAS)

## SOCIOLOGY 920

Department of Sociology, School of Arts and Sciences

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**Director of Undergraduate Studies:** Jeffrey Dowd

**Distinguished Professor:**

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Jacquelyn Litt, B.A., William Smith College; M.A., Ph.D., Pennsylvania

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Richard Williams

Eviatar Zerubavel

Sociology 920 (SAS)

# Learning Goals

# Learning Goals

1. *Students will understand* the sociological perspective, a distinctive analysis of the ways people think, feel, and behave that focuses on how they are situated in historically, culturally, and socially specific environments.

2. *Students will understand* key questions addressed by the discipline and the ways in which social structure and social interaction shape human behavior.

3. *Students will develop* the skills necessary to read and evaluate social science research in an intelligent and critical manner.

4. *Students will understand* the role of theory in the construction of sociological inquiry. Majors will demonstrate a solid grasp of the central ideas of major classical and contemporary theorists.

5. *Students will understand* sociological methods of research. Majors will achieve a solid understanding of the full research process including conceptualization, operationalization, data collection, analysis, consideration of ethical issues, and presentation of results. Sociology honors students will demonstrate their understanding of the research process via completion of a senior thesis.

Sociology 920 (SAS)

# Major Requirements

# Major Requirements

The major in sociology consists of 11 courses totaling 36 credits. Grades of C or better are required in each of the courses

Of these eleven courses, five are required courses and six are electives.

Prior to declaring the major in sociology, students must complete Introduction to Sociology (01:920:101) and one of the following courses: 01:920:215, 01:920:311, 01:920:312, 01:920:316.
Only courses with a C grade or higher may be counted toward the major.

11 Total Courses
5 Required Courses

01:920:101 Introduction to Sociology (3 credits)
01:920:215 Six Great Reads: Explorations in Sociology (3 credits)
01:920:311 Social Research Methods (4 credits)
01:920:312 Introduction to Statistics in Sociology (4 credits)
01:920:316 Social Theory (4 credits)

6 Sociology Elective Courses:

3 Courses - any level (each in a different thematic - see checklist)
3 Courses - 300-level or higher (in any thematic)

*Sociology Elective Internship*

Sociology undergraduates can earn up to three academic credits by working at an internship (01:920:482). Students who participate in an internship for credit must have a GPA of 3.0 or higher and have junior or senior class standing. The internship must be approved by the department undergraduate director.

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# Minor Requirements

# Minor Requirements

The minor in sociology consists of at least six courses totaling 19 credits. Grades of C or better are required in each of the courses.

Courses required for the minor are 01:920:101 Introduction to Sociology and any one of three courses:
01:920:311 Social Research Methods
01:920:312 Introduction to Statistics in Sociology
01:920:316 Social Theory

Of the four elective courses, at least two must be at the 300 to 400 level (does not include 311, 312, or 316).
1 course - any level
1 course - 200-level or higher
1 course - 300-level or higher
1 course - numbered 315 or higher

The course 01:920:222 (Criminology) cannot be counted toward the sociology minor by criminal justice majors. Furthermore, no more than three courses may be counted jointly for the criminal justice major and the sociology minor. No more than 6 credits at the 100 level and no more than 3 credits of Field Study (01:920:385,386) or Civic Engagement and Service Education Partnerships (CESEP) (01:920:399) may be applied toward the minor.

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# Departmental Honors Program

# Departmental Honors Program

Students who by the end of their junior year have earned 18 credits in sociology and have obtained a 3.5 grade-point average or better in these courses and a 3.0 cumulative grade-point average are eligible for the departmental honors program. Admission is competitive and by permission of the department. In their senior year, honors students take two semesters of honors research, which include participation in an honors seminar and the completion of a major research project. An oral presentation on their research is made to the department in the spring.

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# Transfer Students

# Transfer Students

Students majoring in sociology must complete at least six courses (21 credits) at Rutgers University-New Brunswick. Each of the three 300-level core courses must be completed in New Brunswick.

Sociology minors must complete at least three courses (10 credits) at Rutgers-New Brunswick.

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# Recommended Course Clusters

# Recommended Course Clusters

For the convenience of both majors and nonmajors, the department suggests the following groupings of 01:920 courses that may be relevant to different student interests and career plans:

*Business and Organizational Structures*: 218, 315, 331, 353, 375, 378

*Crime and Social Control:* 222, 304, 349, 361

*Culture and Community:* 205, 220, 318, 319

*Gender and Sexuality:* 216, 272, 324, 340

*Global Perspectives:* 227, 270, 273, 354, 370, 380

*Health and Society:* 115, 210, 226, 232, 303, 307, 308, 335

*Race, Ethnicity, and Immigration:* 108, 225, 301, 306, 435

*Social Justice:* 103, 111, 241, 280, 281, 290, 332, 362

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# Independent Study

# Independent Study

Students wishing to conduct an independent study in sociology must apply to the department in writing. Majors and minors must have a 3.0 grade-point average in sociology courses and have taken two of 311, 312, or 316. All applications will be evaluated on a case-by-case basis.

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# Courses

# Courses

*Course Prerequisites*

In the following course list, the "Introductory Sociology" prerequisite may be fulfilled with 01:920:101 or any other 920 course at the 100 or 200 level and permission of the instructor. The prerequisite for courses numbered between 315 and 399 is any one of 01:920:311, 312 or 316. For courses numbered 400 or higher, the prerequisite is any two of 01:920:311, 312 or 316.

**01:920:101** *Introduction to Sociology (3)*
Introduction to the systematic study of society and social behavior.
***Not open to majors in their senior year.***

**01:920:103** *Sociological Analysis of Social Problems (3)*
Understanding the major social problems of our times through the application of sociological principles and methods.
***Not open to majors in their senior year.***

**01:920:108** *Minority Groups in American Society (3)*
Historical experiences of racial and ethnic groups in American society. Contemporary movements of minorities for greater power in the society, including the young, women, and senior citizens.
***Not open to majors in their senior year.***

**01:920:111** *Social Class (3)*
Development of classes in Western society. Relation of class to race and ethnicity. Relevance of class to understanding modern society.
***Not open to majors in their senior year.***

**01:920:115** *The Color of Health: How Does Inequality Get Under the Skin? (4)*
Nature of racial/ethnic structural inequalities in the United States. How these inequities manifest into poor health outcomes among people of color. Sociological imagination employed to understand how social and health inequities based on race, ethnicity, and immigration status are a function of structural inequalities.

**01:920:205** *Mass Communication in Modern Society (3)*
Who says what, to whom, with what kinds of interests, within which media, and with what kinds of outcomes. The historical forerunners, development, ownership, and interests of the mass media.

**01:920:210** *Sociology of Medicine and Health Care (3)*
Dynamics of health behavior. Social organization and development of health care institutions and professions. Issues of cost and quality of health care.

**01:920:215** *Six Great Reads: Explorations in Sociology (3)*
Engages with six award-winning books written by sociologists that explore a variety of topics. In-depth discussion and debate around specific works of sociology. Larger public conversations around controversial topics as well as how sociologists makes claims about society.

**01:920:216** *Sociology of Women (3)*
Overview of contemporary issues affecting women's lives: family, health, employment, discrimination, poverty. The women's movement and the antimovement backlash.
***Credit not given for both this course and 01:988:216.***

**01:920:218** ***Sociology of Education (3)***
Focus on elementary and secondary education. Education and class systems; education and social change; alternative schools.
***Credit not given for both this course 01:920:218 and 01:920:345.***

**01:920:220** ***Sociology of Culture (3)***
An introduction to the concept of culture from a sociological standpoint. Introduces different cultural explanations for social behavior, examines the production of culture as objects, and outlines cultural perspectives on diverse aspects of social life.

**01:920:222** ***Criminology (3)***
Crime and the criminal in modern society. Theories regarding causes of crime, methods of treatment, and preventive programs.
***May not be counted by criminal justice majors as an elective toward the sociology minor.***

**01:920:225** ***Immigration and Society (3)***
Provides a sociological perspective and comparative lens on international migration by looking at the causes and consequences of immigration for the United States, Canada, France, Germany, and the United Kingdom. Explores why people migrate, examines different modes of assimilation, and compares immigration policies.
***Credit not given for this course and 01:595:224***

**01:920:226** ***Health, Culture, and Society (3)***
Integrates perspectives from sociology, history, public health, medicine, and the humanities to define health; understand the diverse ways scholars study health; and identify factors that influence the prevalence, distribution, and experience of four health conditions: obesity, depression, cancer, and HIV/AIDS. Implications of research for medical practice, ethics, and policies to enhance health worldwide.
***Credit not given for both this course and 01:506:227.***

**01:920:227** ***Population and Society (3)***
Study of population dynamics: causes and consequences of population explosions; societal factors such as baby bust, aging, migration, family (abortion, teenage pregnancy), residential segregation, income distribution.

**01:920:232** ***Sociology of Food and Eating (3)***
Draws upon a variety of perspectives to examine the social processes that shape how food is produced, prepared, and consumed in the United States. Topics include farm labor, food security, the politics of nutrition advice, dieting, and the rise of alternative food movements.

**01:920:241** ***Technology and Society (3)***
Considers how the adoption of new technologies (such as the refrigerator, the telephone, the electric car, Twitter, and the nanochip) introduces both solutions and challenges for addressing current social problems and the future.

**01:920:248** ***Sociology of Sports (3)***
Sociological perspective on sports. Topics include mobility through sports, stratification in sports, deviance and violence within sports, and racial and gender inequalities in sports. Examples illustrate common sociological concepts.

**01:920:270** ***Global Inequalities (3)***
Examination of the persistence of cultural, political, and economic inequalities between industrialized nations and nations in the Global South. Linkages between historical forms of global domination (imperialism, colonialism, dependent development) and neoliberal globalization. Gender, ethnicity, and religion as bases of social change and social protest in the contemporary world.

**01:920:272** ***Sociology of the Family (3)***
Family as a social institution: family formation and dissolution; life in families; varieties of family experiences; and the future of the family.
***Credit not given for both this course and 01:988:272.***

**01:920:273** ***War: Critical Perspectives (3)***
Critical examination of the nature, functions, and effects of war with particular attention to racialized and gendered dynamics of militarization, terrorism, counterterrorism, and genocide.
***Credit not given for both this course and 01:988:270.***

**01:920:280** ***Collective Behavior and Social Movements (3)***
Analysis of spontaneous and organized efforts to promote or resist social change. Cases from movements such as temperance, civil rights, religious cults, youth, and women's movements.

**01:920:287** ***Caribbean Societies (3)***
This course examines Caribbean societies through the perspective of social development. The course surveys the social, economic, political, and cultural realities in contemporary Caribbean societies with an eye to the policy interventions devised to address them. The course is divided in two parts. In the first part, students are introduced to the central policy areas for social and economic development in the Caribbean, the definition of a social problem, and the history and theory behind ideas of development. In the second part, students examine a number of social development areas in order to assess the policies utilized to address them and begin to think about alternative social policy directions.

Credit not given for both this course and 01:595:297

**01:920:290** ***Political Sociology (3)***
Bases and structure of power in modern societies: political socialization, ideology, political parties, movement organizations. Forms of participation linked to social change.

**01:920:291,292** ***Topics in Sociology (3,3)***
Special topics in sociology, to be determined each time the courses are offered.

**01:920:301** ***Latinos and Race (3)***
Various ways in which race is constituted and how dominant racial identities create a framework for Latino identity in the United States. How notions of white people, white culture, and whiteness are understood by populations racialized as the Other, particularly Latinos.

Not open to first-year students. Credit not given for this course and 01:595:301.
***Prerequisite: 01:920:101 or 21:920:201 or 50:920:207***

**01:920:303** *Social Gerontology (3)*
Social aspects of aging and old age. Analysis of public policy, social roles, and population characteristics of the elderly, including variations by sex, class, and race.
*Prerequisite: 01:920:101 or 21:920:201 or 50:920:207*

**01:920:304** *Sociology of Deviant Behavior (3)*
Major forms of social deviance, theories accounting for them, and societal responses to them.
*Prerequisite: Prerequisite: 01:920:101 or 21:920:201 or 50:920:207*

**01:920:306** *Race Relations (3)*
Dynamics of U.S. race relations seen in theoretical and historical perspectives; significance of racial domination/subordination in world context; current issues.
*Prerequisite: Prerequisite: 01:920:101 or 21:920:201 or 50:920:207*

**01:920:307** *Mental Illness (3)*
Social and cultural variations in the definitions, causes, and treatment of mental illness. Analysis of institutions and professions dealing with mental illness.
*Prerequisite: 01:920:101 or 21:920:201 or 50:920:207.*

**01:920:308** *Psychosocial Foundations of Health and Medicine (3)*
Conceptual, methodological, and substantive approaches to psychosocial perspectives on health.
*Prerequisite: 01:830:101 or 01:920:101 or 21:920:201 or 50:920:207. Credit not given for both this course and 01:830:308.*

**01:920:311** *Social Research Methods (4)*
Major methods and techniques of social research: various types of research design; sampling; methods of data gathering; analysis and interpretation of research findings.
*Prerequisite: 01:920:101 or 21:920:201 or 50:920:207 or permission of instructor.*

**01:920:312** *Introduction to Statistics in Sociology (4)*
Introduction for social science majors to computer data processing and analysis. Individually designed projects. Emphasis on logical, nonmathematical explanations of techniques and procedures.
*Prerequisite: 01:920:101 or 21:920:201 or 50:920:207 or permission of instructor.*

**01:920:315** *How Organizations Work (3)*
Sociological analysis of public and private organizations and bureaucracies in the modern world, with attention to formal and informal structures, power, careers, status systems, and organizational change. Case materials from government, universities, business.
*Prerequisite: One of 01:920:311, 312, 316*

**01:920:316** *Social Theory (4)*
Study of theory in sociology from the sociological classics of the 19th- and early 20th-century theorists as Marx, Durkheim, and Weber to later theorists like Polanyi, Gramsci, and Habermas. Application to contemporary social issues.
*Prerequisite: 01:920:101 or 21:920:201 or 50:920:207 or permission of instructor.*

**01:920:318** *Sociology of Trauma and Collective Memory (3)*
Considers how social scientists make sense of the social and emotional impact of catastrophic disruptions such as genocide, terrorism, slavery, sexual abuse, AIDS, and natural disaster. Explores how membership in different groups (religious, ethnic, gender) shapes the ways people remember, forget, and deny traumatic events.
***Prerequisite: One of 01:920:311, 312, 316***

**01:920:319** *Sociological Approaches to Social Psychology (3)*
Topics include interpersonal exchange, cognitive consistency, conceptions of justice, small groups, friendship networks, social support networks, and techniques for analyzing networks. Topics vary each semester; consult department.
***Prerequisite: One of 01:920:311, 312, 316***

**01:920:321** *Urban Development and Community Change (3)*
Historical development of the contemporary community form. Emergence of modern patterns of urban life.
***Prerequisite: One of 01:920:311, 312, 316***

**01:920:323** *Sociology of Childhood and Adolescence (3)*
Study of social interaction during childhood and adolescence; emphasis on social interaction in various types of families and peer groups.
***Prerequisite: One of 01:920:311, 312, 316***

**01:920:324** *Sociology of Gender (3)*
Study of sources, maintenance, consequences, and change of men's and women's roles in society. Cultural, social, political, economic, and psychological perspectives.
***Prerequisite: One of 01:920:311, 312, 316. Credit not given for both this course and 01:988:324.***

**01:920:326** *Sociology of Communities (3)*
Study of villages, towns, cities, suburbs, and metropolitan areas. Their social problems, organization, and change.
***Prerequisite: One of 01:920:311, 312, 316***

**01:920:332** *Social Inequalities (3)*
Facts and theories of unequal distribution of income, honor, prestige, life chances, opportunities, social mobility, status attainment. Implications for social integration and conflict.
***Prerequisite: One of 01:920:311, 312, 316***

**01:920:335** *Health and Inequality (3)*
Social disparities in health outcomes and inequalities in the provision of health care, examined from a sociological perspective. Health inequality pertaining in the United States and important challenges in global public health.
***Prerequisite: One of 01:920:210, 311, 312, 316.***

**01:920:340** *Sociology of Sexuality (3)*
Examines the social dimensions of, and social influences on, the expression of human sexuality. Includes analysis of topics such as hook-up culture, sexual double standards, same-sex marriage, virtual sex, and contemporary sexual politics.
***Prerequisite: One of 01:920:311, 312, 316.***

**01:920:345** *Education and Society (3)*
Organization and functions of school systems; differential opportunities and stratification; educational developments as effects and causes of social change; community conflict; internal organization of schools.
*Prerequisite: One of 01:920:311, 312, 316. Credit not given for both this course and 01:920:218 and 01:920:345.*

**01:920:349** *Law and Society (3)*
How social forces affect law and how law affects society. The relationships among legal and other institutions in society. The roles of lawyers, judges, and juries.
*Prerequisite: One of 01:920:311, 312, 316.*

**01:920:353** *Sociology of Housing and the Built Environment (3)*
Social and cultural influence on housing and urban design and the reciprocal impact of the built environment on social organization, interaction, and personality.
*Prerequisite: One of 01:920:311, 312, 316.*

**01:920:354** *Global Gender Issues (3)*
Comparative analysis of objective conditions and subjective experiences of women in Africa, Asia, Latin America, and of disadvantaged women in the United States and other industrialized nations. Exploration of new forms of women's empowerment.
*Prerequisite: One of 01:920:311, 312, 316. Credit not given for both this course and 01:988:354.*

**01:920:357** *Labor and Climate Migration from Africa to Europe - Study Abroad (3)*
International migration and refugee flows; poverty, political violence, and the violence of climate change; differential risks and opportunities of crossing the Morocco-Spain border; backlashes against migrants; the impact of the climate crisis; the politics of South-to-North migration; includes practical exercises in fieldwork and analysis.

Credit not given for both this course and 01:070:357.

**01:920:359** *Environmental Sociology (3)*
Interaction between people and the environment, with emphasis on such problems as air and water quality, energy, and land use.
*Prerequisite: One of 01:920:311, 312, 316.*

**01:920:360** *Computational Social Science (3)*
Analysis of social data using a range of techniques including natural language processing, machine learning, and agent-based modeling. Ethical implications of big data and artificial intelligence. Coding in the R programming language to analyze several different datasets.
*Prerequisite: 01:198:142.*

**01:920:361** *Sociology of Drug Use (3)*
Causes and extent of illegal drug use, nature and effectiveness of law enforcement, treatment-oriented efforts to control drugs, and the criminalization and decriminalization of drugs.
*Prerequisite: One of 01:920:311, 312, 316.*

**01:920:362** ***Interventions and Social Change (3)***
Examines intentional attempts to change large-scale social behavior in a sustained or chronic way, especially in areas such as poverty relief, education, politics, health, and financial reform. Explores the use of coercion, incentives, information, social norms, and social networks to engineer change.
***Prerequisite: One of 01:920:311, 312, 316.***

**01:920:363** ***Sociology of Work and Occupations (3)***
Meaning of work; occupational development and socialization; occupations and careers; social control of work; occupational cultures and lifestyles; relations between occupations.
***Prerequisite: One of 01:920:311, 312, 316.***

**01:920:370** ***Global Structures and Change (3)***
Explores transformations of global structures during the roughly 500-year history of world capitalism and explores today's global structures and their potential for change. Some focus on the European Union as an engine and illustration of global change.
***Prerequisite: One of 01:920:311, 312, 316.***

**01:920:375** ***Economic Sociology (3)***
Analysis of economic institutions from a sociological perspective. Historical and contemporary viewpoints drawing on material from developed and underdeveloped, capitalist, and state socialist societies.
***Prerequisite: One of 01:920:311, 312, 316.***

**01:920:378** ***Social Network Analysis (3)***
Introduction to social network analysis as a paradigm for understanding social structure and social relations. Concepts, methods, and software for describing and analyzing networks. Concrete applications of network methods in diverse settings, such as friendship networks, corporate interlocks, disease diffusion, internet-based interaction, and social movement mobilization.
***Prerequisite: One of 01:920:311, 312, 316.***

**01:920:380** ***Global Health: Sociological Perspectives (3)***
Sociological introduction to the field of global health, focusing on the disease burden in developing countries. Focus on how poverty, inequality, culture, socioeconomic development, globalization, and health systems are related to health. Using existing statistics and literature, we will explore the economic, social, environmental, and institutional determinants of various diseases across population groups.
***Prerequisite: One of 01:920:311, 312, 316.***

**01:920:393** ***Topics for Sociological Analysis (3)***
Topics vary each semester. Consult department.
***Prerequisite: One of 01:920:311, 312, 316.***

**01:920:399** ***CESEP (1)***
One-credit community service placement in sociology.
***Prerequisite: One of 01:920:311, 312, 316. Corequisite: Must be taken in conjunction with a designated CESEP (Civic Engagement and Service Education Partnerships) course offered in the sociology department.***

**01:920:406** ***Sociology of Religion (3)***
Orientations to the superempirical; the interaction of religious beliefs and institutions with secular society. Classical and contemporary theories and data.
***Prerequisite: Two of 01:920:311, 312, 316.***

**01:920:410** ***Alcohol Problems (3)***
Social, social-psychological, and physiological functions of alcohol; relations to institutional values; efforts at social control.
***Prerequisite: Two of 01:920:311, 312, 316.***

**01:920:433** ***Race, Science, and Medicine (3)***
History of race in science and medicine. Contemporary research of race and health disparities. Significance of race in scientific claims about difference.
***Prerequisite: Two of 01:920:311, 312, 316; permission of department.***

**01:920:434** ***Social Science and Public Policy (3)***
Federal government and policy making; roles of foundations, private agencies, and policy sciences. Data bank and social indicators in the study of policy. Game theory and policy making.
***Prerequisite: Two of 01:920:311, 312, 316.***

**01:920:435** ***Immigrant Minorities in the United States (3)***
Study of migrations to the United States and their impact; detailed consideration of pluralist versus assimilationist hypotheses about the effects of immigration; effects of ethnicity on U.S. culture. Case study materials on various ethnic Americans.
***Prerequisite: Two of 01:920:311, 312, 316.***

**01:920:438** ***Sociology of Age (3)***
Age stratification and society; conflict and cooperation among young, middle-aged, and old; aging, succession of generations, and social change. Implications for public policy and professional practice.
***Prerequisite: Two of 01:920:311, 312, 316.***

**01:920:440** ***Sexuality and Society (3)***
Description of sexual conduct and variation; patterns of sexual behavior and attitudes analyzed in terms of social, historical, and cross-cultural antecedents and consequences.
***Prerequisite: Two of 01:920:311, 312, 316. Credit not given for both this course and 01:988:440.***

**01:920:442** ***Mass Media and Popular Culture (3)***
Analysis of popular culture, with stress on propaganda techniques and myth dissemination. Touches on such topics as romantic love, pop music, and sports.
***Prerequisite: Two of 01:920:311, 312, 316.***

**01:920:461,462** ***Sociology of Selected Institutions (3,3)***
Intensive analysis of such institutions as prisons, hospitals, mental hospitals, schools. Different institutions considered in different semesters.
***Prerequisite: Two of 01:920:311, 312, 316.***

**01:920:482** ***Sociology Elective Internship (1.5 or 3)***
Sociology undergraduates can earn up to three academic credits by working at an internship. Students who participate in an internship program for credit must have a GPA of 3.0 or higher and have junior or senior class standing. All internships for academic credit must be approved by the internship director and are by special permission only. Students can receive 1.5 or 3 credits, which would count as a 315-level elective for the major.

**01:920:491,492** ***Advanced Seminar in Sociology (3,3)***
Topics vary by section.
***Prerequisite: Two of 01:920:311, 312, 316. Open only to advanced undergraduates by permission of instructor.***

**01:920:493,494** ***Independent Study in Sociology (BA,BA)***
Faculty-guided research on a project of the faculty member's devising.
***Prerequisite: Two of 01:920:311, 312, 316; or permission of department.***

**01:920:495, 496** ***Research in Sociology (BA, BA)***
Faculty-guided research on a project of the faculty member's devising.
***Prerequisite: Two of 01:920:311, 312, 316; or permission of department.***

**01:920:497,498** ***Honors in Sociology (3,3)***
***Prerequisite: Two of 01:920:311, 312, 316; permission of department.***

# South Asian Studies 925 (SAS)

## SOUTH ASIAN STUDIES 925

South Asian Studies Program, School of Arts and Sciences

**Website:** Here

**Program Director:** Johan Mathew

**Program Faculty:**

Sadia Abbas, English (Newark); Ph.D., Brown

Sarada Balagopalan, Childhood Studies (Camden); Ph.D., NYU

Radhika Balakrishnan, Women's, Gender, and Sexuality Studies; Ph.D., Rutgers

Sanjib Bhuyan, Agricultural, Food, and Resource Economics; Ph.D., Connecticut

Ethel Brooks, Women's, Gender, and Sexuality Studies, and Sociology; Ph.D., New York

Edwin F. Bryant, Religion; Ph.D., Columbia

Ali Chaudhary, Sociology; Ph.D. California (Davis)

Karishma Desai, Education; Ed.D. Columbia Teachers College

Danielle Falzon, Sociology; Ph.D. Brown

Sunanda Gaur, Robert Wood Johnson Medical School; M.D., King George Medical College (India)

Parvis Ghassem-Fachandi, Anthropology; Ph.D., Cornell

Asher Ghertner, Geography; Ph.D., California (Berkeley)

Ramu Govindsamy, Agricultural, Food, and Resource Economics; Ph.D., Iowa State

Chie Ikeya, History; Ph.D., Cornell

Arpana Inman, Applied and Professional Psychology; Ph.D., Temple

Kevin Kolben, Business (Newark); J.D., Michigan

Triveni Kuchi, Research and Instructional Services (Libraries); M.L.S., Rutgers

Mukti Lakhi-Mangharam, English; Ph.D., Cornell

D. Christian Lammerts, Religion; Ph.D. Cornell

Preetha Mani, AMESALL; Ph.D., California (Berkeley)

Johan Mathew, History; Ph.D., Harvard

Jawid Mojaddedi, Religion; Ph.D., Manchester

Anjali Nerlekar, AMESALL; Ph.D., Kansas

Shaheen Parveen, AMESALL; Ph.D. Lucknow

Tamara Sears, Art History; Ph.D., Pennsylvania

Meheli Sen, AMESALL; Ph.D., Emory

Julia Stephens, History; Ph.D., Harvard

Audrey Trushke, History (Newark); Ph.D., Columbia

Simon Wikhamsmith, Writing Program; Ph.D., Washington

Janet Walker, Comparative Literature; Ph.D., Harvard

# Learning Goals

# Learning Goals

Minors will be able to demonstrate a strong grounding in the interdisciplinary study of South Asia and/or diasporic South Asian communities. Through coursework in at least three different disciplines, they will become familiar with the languages, cultures, religions, and histories of South Asia and the South Asian diaspora.

South Asian Studies 925 (SAS)

# Minor Program

# Minor Program

The interdisciplinary minor consists of a minimum of six courses (totaling at least 18 credits) from the following list of approved courses. One of these courses must be a South Asian history survey course or equivalent. Not more than three of the six courses can come from any one discipline. Cross-listed courses can be counted only once, but may be considered as being in either of the departments in which they are listed. Courses taken as part of university-approved study abroad programs in South Asia may be included in the six, subject to the approval of a faculty adviser. Consult the program for a list of courses.

**Survey Courses**

01:195:243 Introduction to the Literatures of South Asia (3)

01:195:249 Modern Literatures of South Asia (3)

01:450:341 South Asia (3)

01:508:230 The Making of Modern India and Pakistan (3)

**Elective Courses (five courses required)**

01:013:160 Elementary Hindi I (4) (hybrid online) (fall & spring)

01:013:161 Elementary Hindi II (4) (hybrid online) (spring)

01:013:162 Elementary Urdu I (4) (fall)

01:013:163 Elementary Urdu II (4) (spring)

01:013:176 or 01:723:176 Elementary Persian I (4) (hybrid online) (fall)

01:013:177 Elementary Persian II (4) (hybrid online) (spring)

01:013:201 Crossroads: Classical Literatures of Africa, the Middle East, and South Asia (3)

01:013:231 Introduction to the Literatures of South Asia (3)

01:013:232 Women Writers of South Asia (3)

01:013:260 Intermediate Hindi I (4) (hybrid online) (fall)

01:013:261 Intermediate Hindi II (4) (hybrid online) (spring) AHq

01:013:276 or 01:723:276 Intermediate Persian I (4) (hybrid online) (fall)

01:013:304 Introduction to Translation Studies (3) (spring) CCD

01:013:307 Introduction to Postcolonial Literatures and Theories (3) (spring) CCO, CCD, AHo or AHp

01:013:331 Modern Literatures of South Asia (3) (fall) AHo or AHp

01:013:337 Film and Literature in South Asia (3) (spring)

01:013:360 Advanced Hindi I (3) (hybrid online) (fall)

01:013:361 Advanced Hindi II (3) (hybrid online) (spring)

01:013:365 Bollywood (3)

01:013:376 or 01:723:376 Advanced Persian (3)

01:013:430 Gender Nation and Literature in South Asia (3) (fall) WCD

01:013:433 Modern Urdu Literature and Popular Culture (3)

01:070:244 South Asian Ethnography (3)

01:082:205 Introduction to Asian Art (3)

01:082:206 Art of India (3)

01:098:321 Interdisciplinary Topics in South Asia (3)

01:195:232 Women Writers of South Asia (3)

01:195:243 Introduction to the Literatures of South Asia (3)

01:195:249 Modern Literatures of South Asia (3)

01:450:341 South Asia (3)

01:508:110 Political Islam: Present and Past (3) HST, CCO

01:508:230 The Making of Modern India and Pakistan (3)

01:508:337 Pirates, Pilgrims, and Poets: Globalization in Indian Ocean History (3)

01:730:368 Hindu Philosophy (3)

01:730:369 Buddhist Philosophy (3)

01:730:374 Islamic Philosophy and Mysticism (3)

01:840:203 Islamic Scriptures (3)

01:840:204 Hindu Scriptures (3)

01:840:205 Introduction to Buddhism (3)

01:840:211 Religion in Asia (3)

01:840:224 Hinduism (3)

01:840:321 Yoga: History and Philosophy (3)

01:840:323 Buddhism (3)

01:840:326 Islam (3)

01:840:345 Hindu Gurus in the West (3)

01:840:357 Krishna (3)

01:840:358 Bhagvad Gita (3)

01:840:359 Ayurveda: The Traditional Healing System of Ancient India (3)

01:840:364 Sikhism and North Indian History (3)

01:840:366 Yoga of Devotion: Bhakti (3)

01:840:368 Hindu Philosophy (3)

01:840:369 Buddhist Philosophy (3)

01:840:403 Seminar on the Vedanta Sutras (3)

01:840:405 Western Encounter with Hinduism (3)

01:988:310 South Asian Feminisms (3)

The following courses vary in their South Asian component. Students should discuss course content with the instructor and obtain prior permission from Johan Mathew, director, South Asian studies program (johan.mathew@rutgers.edu), in order for these courses to count toward the minor in South Asian studies.

01:013:301 Cinemas of Africa and Asia (3)

01:070:220 Politics of Food and Sex (3)

01:070:293,294,295 Issues in Cultural and Linguistic Anthropology (3,3,3)

01:070:308 Anthropology of Religion (3)

01:070:320 Diaspora, Race, and Ethnicity in the United States (3)

01:790:315 Politics and Culture (3)

01:790:424 Gender and Political Economy (3)

01:840:294 Topics: Study of Religion (3)

01:840:356 Sufism: Mystical Islam (3)

01:840:423 Seminar in Buddhism (3)

# Spanish 940 (SAS)

## SPANISH 940

Department of Spanish and Portuguese, School of Arts and Sciences

**Website:** Here

**Chair**: Nuria Sagarra

**Undergraduate Director**: Joseph V. Casillas

**Graduate Director:** Yeon Soo Kim

**Assistant Graduate Director:** Thomas Stephens

**Professors:**

Miguel A. Jiménez, Licenciatura, Ph.D., Granada (Spain)

Jorge Marcone, B.A., Pontificia Universidad Católica del Perú; M.A., Ph.D., Texas

Susan Martin-Márquez, B.A., M.A., Chicago; Ph.D., Pennsylvania

Marcy Schwartz, B.A., Syracuse; M.A., Ph.D., Johns Hopkins

Thomas M. Stephens, B.A., M.A., South Carolina; Ph.D., Michigan

Camilla Stevens, B.A., Tulane; M.A., New Mexico; Ph.D., Kansas

Nuria Sagarra, B.A., M.A., Universitat de Barcelona (Spain); Ph.D. Illinois (Urbana-Champaign)

**Associate Professors:**

Karen E. Bishop, B.A., M.A., Ph.D., California (Santa Barbara)

Joseph Casillas, B.A., Western Washington University; M.A. Middlebury; M.A., Ph.D., Arizona

Yeon-Soo Kim, B.A., M.A., SUNY (Binghamton); M.A., M.Phil., Ph.D., Yale

Dámaris Otero-Torres, B.A., M.A., Syracuse; Ph.D., University California (San Diego)

**Assistant Professors:**

Daniel de Silva, B.A., Rutgers; M.A., Ph.D., Columbia

Kendra Dickinson, B.A., University of Illinois Urbana-Champaign; M.A., Boston; M.A., Ph.D., Ohio State

**Assistant Teaching Professors:**

Laura Ramirez Polo, B.A., Universitat Politécnica de València; Ph.D., Universitat de Valencia

Sara Saez Fajardo, B.A., M.A., University of Salamanca; Ph.D., University of Illinois Urbana-Champaign

Spanish 940 (SAS)

# Learning Goals

# Learning Goals

**Goals for Spanish Majors and Minors**

*Majors* in all areas will be able to demonstrate proficiency in interpretive, interpersonal, and presentational modes of communication and basic knowledge of linguistics, cultural studies, or translation as disciplines. The top 75 percent of Spanish or Portuguese majors will be able to carry out conversations in which they can describe, compare, contrast, in all tenses (present, past, and future), with an appropriate breadth of vocabulary and register, and to be understood by a nonsympathetic listener; and to read and write documents written in academic, formal, and/or literary registers of language. Majors will be able to conduct research projects according to the methodologies of the humanities, social, or cognitive sciences and demonstrate intercultural awareness and understanding of the Hispanic or Luso-Brazilian world. Honors students (top 15 percent) will be able to complete independent research, write a thesis, and defend it before a faculty committee.

Spanish majors who choose electives in linguistics will also be able to demonstrate familiarity with basic concepts of linguistics, in particular with issues related to language contact and bilingualism and bilingual education, and be able to design and implement a research project.

*Spanish majors* who choose electives in translation/interpreting will also be able to demonstrate proficiency at the levels required by preprofessional and professional training for employment in legal, medical, and commercial translation and in other areas; and for further study in law, medicine, editing/journalism, and business, as well as graduate studies in both linguistics and literature.

*Spanish majors* who choose electives in literature and culture will also be able to demonstrate knowledge of current issues and perspectives in literary and cultural studies in Spanish and the basic body of works in Spanish literature and culture; critically analyze verbal and visual texts; demonstrate familiarity with a range of cultural works from different time periods and geographical regions within the Spanish-speaking world and with the historical phenomena and sociocultural issues that these works negotiate. The top 15 percent of majors will be prepared for acceptance to graduate programs in Spanish.

*Portuguese majors* will also be able to demonstrate knowledge of current issues and perspectives in literary and cultural studies in Portuguese and the basic body of works in Luso-Brazilian literature and culture; critically analyze verbal and visual texts; demonstrate familiarity with a range of cultural works from different time periods and geographical regions within the Portuguese-speaking world and with the historical phenomena and sociocultural issues that these works negotiate. The top 15 percent of majors will be prepared for acceptance to graduate programs in Portuguese.

*Minors in Spanish or Portuguese* will be able to demonstrate a level of language proficiency that allows basic conversations on a variety of uncomplicated topics, with basic command of the language, and some spontaneous creative ability; and basic familiarity with the main cultural, literary, and linguistic issues of the Hispanic or Luso-Brazilian world.

Spanish 940 (SAS)

# Introductory Courses and Placement

# Introductory Courses and Placement

Students who have had two or more years of high school Spanish are not eligible to take Elementary Spanish (101 or 102) and must take a placement test.

Students who have grown up in Spanish-speaking homes and/or who have received any formal education in Spanish must also take the placement test, and they may not take elementary (101-102), intermediate (131-132), or conversation courses (203-204); they should instead take the sequence of language courses designated for native speakers, which is specially tailored to their needs, or upper-level courses, in accordance with their placement test results.

The only students who are not required to take the placement test are non-native speakers who have had less than two years of high school Spanish. Please note, however, that if you have had fewer than two years of high school Spanish and choose to take the placement test, you must enroll in the level in which you are placed.

The department encourages students to reach out to the Undergraduate Director with any questions or concerns about placement level.

Spanish 940 (SAS)

# Major Requirements

# Major Requirements

The Spanish major consists of a minimum of 38 credits at the 200-400 level completed with a grade of C or better in each course.

At the 200 level, Spanish majors are required to take 940:215 and 940:261. At the 300 level, majors are required to take 940:325, 3 credits in literature (940:331, 940:332, 940:333, 940:334, 940:335, or 940:336), 3 credits in linguistics (940:362, 940:363, 940:364, 940:365, or 940:366, 940:367), and 1 oral proficiency credit (940:389). At the 400 level, majors are required to take two 3-credit courses and 1 oral proficiency credit (940:499). To complete the 38-credit minimum, students are required to take electives at the 200-400 level.

Please note: 1) The first course to count towards the major is SPA 203 (SPA 201 for heritage speakers) not including SPA 205, 206, 207, or 225; 2) no more than 15 credits may be taken at the 200 level; 3) only juniors and seniors in Spanish may register for 940:389 and 940:499; 4) students may count up to 6 elective credits in Portuguese (810) at the 200-400 level toward the Spanish major; and 5) in some cases, up to 6 credits of courses taught in another discipline may count for the Spanish major if the courses are preapproved with partial work completed in Spanish and approval by the undergraduate director. Students are responsible for consulting the catalog course listing for a description of prerequisites and special conditions prior to registration of classes. All major programs must be reviewed and approved by a departmental adviser. Majors in Spanish must take both 389 and 499 to successfully complete the major. Students must take the OPI once both courses have been completed. Students who have taken the OPI exam without taking 389 and 499 will not be certified. Exceptions will not be made.

Spanish 940 (SAS)

# Minor Requirements

# Minor Requirements

A minor in Spanish consists of a minimum of 18 credits of courses given in Spanish (940) completed with a grade of C or better in each course. Of the 18 credits, 9 credits must be at the 300 level or above. The first course to count towards the minor is 940:132 (940:139 for heritage speakers) not including 205, 205, 207, or 225. No more than 3 credits may be taken in courses not taught in the Spanish language.

Spanish 940 (SAS)

# Departmental Honors Program

# Departmental Honors Program

To be eligible for graduation with departmental honors, majors must maintain a cumulative grade-point average of 3.5 or better in their major courses, and 3.25 or better overall. Students are admitted to the departmental honors program by selection of the honors committee. The honors project is two semesters in duration (3 credits each semester), and may focus on any aspect of Luso/Brazilian/Portuguese language, linguistics, literature, or culture. Prior to beginning the honors project, the student is expected to complete at least two courses at the 300 level. The student must present the honors project for an oral defense before a committee assembled by the project director, in consultation with the candidate. More detailed information is available at the departmental honors website.

Spanish 940 (SAS)

# Study Abroad

# Study Abroad

Rutgers University sponsors a Junior Year in Argentina, Brazil, Chile, Mexico, and Spain; and a Departmental Program for Summer Study in Spain and Peru. Information on these and other study abroad opportunities is available in the department office and the Center for Global Education office.

Spanish 940 (SAS)

# Certificate of Proficiency in Spanish-English and English-Spanish Translation

# Certificate of Proficiency in Spanish-English and English-Spanish Translation

Spanish 940 (SAS)

# Certificate of Proficiency in Spanish-English Translation/ Interpreting

# Certificate of Proficiency in Spanish-English Translation/ Interpreting

This certificate is offered to students who complete 19-21 credits in the following courses: 01:940:363 (or 419), 364, 401, 402, 471, 475, 476, 477, 478 (or 479), 486, and 487. The three courses in interpreting (475, 477, and 487) are required. A 3.5 or better cumulative grade-point average for the entire 19-21 credit sequence is required, with a minimum grade of B in all courses except 01:940:401 and 402, which require a B+ or better. For further information, contact the department.

Spanish 940 (SAS)

# Spanish Language House

# Spanish Language House

The Casa Hispánica on the Douglass campus is open to qualified students. For additional information, visit the Global Village website.

Spanish 940 (SAS)

# Courses in English

# Courses in English

**01:940:160** ***Spanish in the World (1.5)***
Current issues in the language, literature, and culture of the Spanish-speaking world. Analysis of topics such as cultural identity, language contact, major literary authors, or historical implications of colonization.
***Taught in English. Not for major or minor credit.***

**01:940:240** ***The Luso-Hispanic Dialogue: Multiple Perspectives (3)***
Relationship between the Portuguese-speaking and Spanish-speaking worlds as it manifests itself culturally, linguistically, and historically.
***Credit not given for both this course and 01:810:240. Course taught in English, but knowledge of Spanish and/or Portuguese is necessary. Course will count for the Spanish major or minor if all written work is done in Spanish.***

**01:940:241,242** ***Masterpieces of Hispanic Literature in Translation (3,3)***
Reading and interpretation of outstanding Hispanic writers.
***Credit not given for both these courses and 01:195:231. Prerequisite: 01:940:201, 202, 203, or 204. Only open to students who wish to count this course for the Spanish major or minor, and if all written work is done in Spanish.***

**01:940:250** ***Sports in Latin America and the Caribbean (3)***
Sports and games in Latin American and Caribbean cultures. Analysis of their contexts and evolution. Topics may include Maya ballgame, capoeira, soccer fever, baseball, recreation and education, women in sports, sport management, and resources.
***Credit not given for both this course and 01:590:250 or 01:595:250. Taught in English. Course will count for the Spanish major or minor if all written work is done in Spanish.***

**01:940:270** ***Introduction to Caribbean Literature (3)***
Reading and discussion of poetry, prose, and drama by major literary figures representative of different histories and cultures of the Caribbean and its diaspora.
***Credit not given for both this course and 01:595:270 or 01:195:260.***

**01:940:303** ***Language and U.S. Latino/a Culture (3)***
Interrelation of diverse linguistic traits and practices in the production of U.S. Latino/a culture. Emphasis on Chicano/a, Mexican-American, Nuyorican/Puerto Rican, Dominican-American, Cuban, and Cuban-American contributions, in the context of historical and political processes.
***Credit not given for both this course and 01:595:303. Taught in English. Course will count for the Spanish major or minor if all written work is done in Spanish.***

**01:940:345** ***Spanish Film-English (3)***
Topics in Spanish-language cinema. Emphasis on close analysis and contextual understanding of individual films. Course may count for the Spanish major if student has: 1) already taken one semester of 300-level literature in Spanish, 2) done all written work in Spanish, and 3) obtained approval from the Undergraduate Director.
***Credit not given for both this course and 01:940:346.***

**01:940:347** ***Latin American Cinema-English (3)***
Topics in Spanish-language and Portuguese-language cinema. Analysis and contextual understanding of films and documentaries as a major expression of Latin American cultures. Course may count for the Spanish major if student has: 1) already taken one semester of 300-level literature in Spanish; 2) done all written work in Spanish; and 3) obtained approval from the Undergraduate Director.
***Credit not given for both this course and 01:940:348.***

**01:940:351** ***Women Writers of the Hispanic World-English (3)***
Reading and discussion of works by women writers, visual artists, and performance artists of the Spanish-speaking world.
***Taught in English. Credit not given for both this course and 01:988:351 or 01:940:342 or 01:988:342.***

**01:940:368** ***The Bilingual Mind (3)***
Cognitive mechanisms underlying the bilingual mind. Selective attention and memory, models of bilingual representation and processing, cognitive and linguistic effects of bilingualism.
***Student will receive credit for the Spanish major or minor if all written work completed in Spanish. Prerequisite: 01:940:261 or 01:830:101.***

**01:940:445** ***Cervantes in Translation (3)***
Critical study of Cervantes. *Don Quixote*, selected *Exemplary Novels*, and the *Interludes*.

**01:940:446** ***Contemporary Latin American Literature in Translation (3)***
Selected major authors of present-day Spanish America including Borges, Carpentier, Fuentes, Paz, and García Márquez.

**01:940:452** ***Readings in U.S. Latino/a Literature and Culture (3)***
Study of recent texts produced by and about Latino/as in the United States. Examination of issues of exile, integration and assimilation, political presence, and nationalism.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department. When taught in English, course will count for the Spanish major or minor if all written work is done in Spanish.***

Spanish 940 (SAS)

# Courses in Spanish

# Courses in Spanish

**01:940:101-102** ***Elementary Spanish (4,4)***
For students with little or no previous study of Spanish. Designed to develop basic skills in speaking, understanding, reading, and writing. Integrated laboratory sessions.
***Not open to students who have had two or more years of secondary school Spanish. Credit not given for both these courses 101:940:111 and 01:940:100.***

**01:940:110** ***Introduction to Heritage Cultural Studies (3)***
Hybrid online course. Analyze and understand cognitive, social, and cultural aspects related to bilingual speakers of a minority language in a majority-language society.

**01:940:121** *Spanish Review and Continuation (3)*
Review of basic structures and further development of Spanish language skills.
*Not open to students who have taken 01:940:100 or 01:940:101-102. Open only by placement exam or permission of department to students who have had two or more years of secondary school Spanish.*

**01:940:131-132** *Intermediate Spanish (4,4)*
Study and practice of specific areas of grammar, linguistic structure, and style. Selected readings of modern authors, with composition and class discussion.
*Prerequisites: For 01:940:131: 01:940:100 or 101-102 or 121, or permission of department. For 01:940:132: 01:940:131, or permission of department. Credit not given for both these courses and 01:940:130 or 01:940:139.*

**01:940:139** *Spanish for Heritage Speakers I (3)*
Study of specific areas of grammar and orthography. Practice in oral communication and grammar application.
*Prerequisite: Placement exam or permission of department. Credit not given for both this course and 01:940:130 or 131-132.*

**01:940:201** *Spanish for Heritage Speakers II (3)*
Continued study of specific areas of Spanish grammar through translation and compositions. Development of reading skills and vocabulary building through newspapers and magazines.
*Prerequisite: 01:940:139 or equivalent or placement exam. Credit not given for both this course and 01:940:203.*

**01:940:202** *Culture and Composition for Heritage Speakers (3)*
Development of communicative skills in Spanish with emphasis on cultural, technological, and communicative competencies related to Hispanic culture of both the past and the present.
*Prerequisite: 01:940:201, placement exam or permission of department. Credit not given for both this course and 01:940:204.*

**01:940:203** *Spanish Conversation and Composition (3)*
Designed to develop oral fluency and writing skills in a variety of contexts. Conversation, vocabulary building, oral reports, fundamentals of expository writing.
*Prerequisites: 01:940:131-132, placement exam or equivalent. Not open to native speakers or other students already conversant in the language.*

**01:940:204** *Culture and Composition (3)*
Introduction to culture and civilization in the Hispanic world from prehistoric times to the present. Development of reading skills and expository writing abilities.
*Prerequisite: 01:940:203 or permission of department. Not open to native speakers or other students already conversant in the language.*

**01:940:205** *Spanish for the Health Professions (3)*
Online course for those working in the medical field. Designed for students with a basic knowledge of Spanish (native and heritage speakers or those with at least one year of college-level Spanish). Begins with a review of basic Spanish grammar.
*Prerequisite: Placement, 01:940:132 or equivalent, or permission of the department. No credit given for minor or major in Spanish*

**01:940:206** ***Spanish for Business I (3)***
Survey of interpretive, cultural, interpersonal, and presentational situations necessary for conducting and managing projects in Spanish through the acquisition of vocabulary and knowledge of the Spanish-speaking business world, use of appropriate grammar, and interpersonal communication.
***Prerequisite: 01:940:132 level proficiency. No credit given for minor or major in Spanish.***

**01:940:207** ***Spanish for Social Work (3)***
Survey of interpretive, cultural, interpersonal and presentational situations in Spanish related to Social Work through the acquisition of vocabulary and knowledge, use of appropriate grammar and interpersonal communication.
***Prerequisite: 01:940:132 level proficiency. No credit given for minor or major in Spanish.***

**01:940:215** ***Introduction to Hispanic Literature (3)***
Introduction to the fundamental concepts of the study of Hispanic literature. Emphasis on genre and textual analysis of selected works.
***Prerequisite: 01:940:202 or 204; FSH placement, or permission of department. Credit not given for both this course and 01:940:217.***

**01:940:220** ***Literature and Activism on the US-Mexico Border (3)***
Analysis and contextual understanding of literature and performance that explore the geopolitical space of the U.S.-Mexico border, with a special emphasis on the intersections of activism and the humanities. Taught in English.

Credit not given for this course and 01:595:220.

**01:940:225** ***Spanish for the Health Professions II (3)***
Online course for those working in the medical field. Designed for students with a basic knowledge of Spanish (native and heritage speakers or those with at least one year of college-level Spanish). Begins with a review of basic Spanish grammar.
***No credit given for minor or major in Spanish.***

**01:940:230** ***Food for Thought: Food Culture in the Spanish-speaking World (3)***
This course examines how food shapes our identity, gender, race, and ethnicity by exploring its cultural and historical significance in Spain and Latin America. We will analyze how food has been instrumentalized to reinforce dominant ideologies by regulating its distribution, classifying it by gender and race, and producing it in abundance.

***Prerequisite: 01:940:215.***

**01:940:261** ***Introduction to the Study of Language (3)***
Review of the different aspects of language from the point of view of its internal organization, relationship with cognitive sciences, and relationship to the world.
***Prerequisites: 01:940:202, 204; FSH placement, or permission of department.***

**01:940:280** ***Spanish Civil War and Political Struggles for Equality and Diversity (3)***
This course explores the Spanish Civil War (1936-1939) as a crucial historical and cultural event rooted in divergent discussions on modernity in the 19th century. Despite the tragic ending of the war, which resulted in thirty-six years of dictatorship and political repression, Spain has emerged as one of the most progressive European countries in recent times.
***Prerequisite: 01:940:215.***

**01:940:289** ***Culture of Ladino: An Introduction (3)***
Introduction to Ladino literature and culture. Ladino is the language of the Sephardic Jews ¿ Jews whose ancestors came from Spain and Portugal. Traces Ladino literary and cultural history in proverbs, folktales, ballads, popular songs, satirical creations, journalistic writings, selections from modern fiction and historical accounts. Course taught in English.
***Credit not given for both this course and 01:013:289, 01:563:289, or 01:617:289.***

**01:940:313** ***Advanced Spanish Conversation and Contemporary Issues (3)***
Intensive class discussions, oral reports, and debates based on cultural materials taken from newspapers, journals, radio, television, and films.
***Prerequisite: 01:940:215, 261, 325, or permission of department. Credit not given for both this course and 01:195:334.***

**01:940:325** ***Advanced Grammar and Composition (3)***
Intensive grammatical study of selected Spanish forms and structures; vocabulary building and composition.
***Prerequisite: 01:940:202 or 204, FSH placement, or permission of department.***

**01:940:326** ***Advanced Composition and Introduction to Translation Studies (3)***
Continued development of reading and writing skills and oral proficiency. Detailed rhetorical analysis and discussion of writing techniques using texts taken from various fields. Introduction to basic principles of translation studies and practice in translation.
***Prerequisite: 01:940:202 or 01:940:204 or by placement.***

**01:940:331,332** ***Literature and Culture of the Hispanic Caribbean (3,3)***
Reading and discussion of representative works from the Hispanic Caribbean with emphasis on their cultural content and elements reflecting literary periodization.
***Prerequisite: 01:940:215 or 217 or permission of department. Credit not given for these courses and 01:595:266.***

**01:940:333** ***Power and Nation-Building in Spanish America (3)***
Study of Spanish-American texts from European expansion, colonialism, and independence through Modernismo from the 15th through the 19th centuries.
***Prerequisite: 01:940:215 or 217 or permission of department.***

**01:940:334** ***Modernity and New Identities in Spanish America (3)***
Exploration of avant-garde through contemporary literary and cultural movements in Spanish America from the 20th century to the present.
***Prerequisite: 01:940:215 or 217 or permission of department.***

**01:940:335,336** ***Literature and Culture of Spain (3,3)***
Reading and discussion of representative works from Spain with emphasis on their cultural content and elements reflecting literary periodization.
***Prerequisite: 01:940:215 or 217 or permission of department.***

**01:940:342** ***Women Writers of the Hispanic World (3)***
Reading and discussion of works by women writers, visual artists, and performance artists of the Spanish-speaking world.
***Prerequisite: 01:940:215 or 217 or permission of department. Credit not given for this course and 01:940:351 or 01:988:342 or 01:988:351.***

**01:940:346** ***Spanish Film (3)***
Topics in Spanish-language cinema. Emphasis on close analysis and contextual understanding of individual films.
***Prerequisite: One semester of 300-level literature in Spanish. Credit not given for both this course and 01:940:345.***

**01:940:348** ***Latin American Cinema (3)***
Topics in Spanish-language and Portuguese-language cinema. Analysis and contextual understanding of films and documentaries as a major expression of Latin American cultures.
***Prerequisite: One semester of 300-level literature in Spanish. Credit not given for both this course and 01:940:347.***

**01:940:353** ***Spanish for Community Engagement (3)***
Exploring the challenges and posing critical questions relevant to the building of Spanish-speaking communities in the United States through examining issues related to housing, education, business, health, law, and environment.
***Prerequisite: 01:940:215 or 261 or 325.***

**01:940:360** ***Spanish for Commerce (3)***
Fundamental principles governing commercial organization in Spanish-speaking countries. Advertising strategies used to reach Spanish-speaking clients, including localization of webpages.
***Prerequisite: 01:940:325 or equivalent or permission of department.***

**01:940:362** ***Spanish Phonetics and Phonology (3)***
Study of Spanish phonetics in theory and practice. Exercises in transcription. Contrastive analysis of the English and Spanish sound systems.
***Prerequisite: 01:940:261 or equivalent.***

**01:940:363** ***Bilingualism in the Spanish-Speaking World (3)***
History and theory of Spanish-English bilingualism in the United States and its application in the field. Bilingualism in Spanish America and Spain. Social issues raised by theories of bilingualism.
***Prerequisite: 01:940:261.***

**01:940:364** ***Contrastive Analysis in Spanish and English (3)***
Study of basic notions of morphosyntactic structures (internal structure of words and sentences). Emphasis on differences between Spanish and English.
***Prerequisite: 01:940:261 or equivalent.***

**01:940:365** ***Research Methods in Spanish Linguistics (3)***
Foundations in research methodology in various linguistic disciplines. Development of skills in tool selection, collection and analysis of data, and ethical concerns.
***Prerequisite: 01:940:261 or equivalent or permission of department.***

**01:940:366** ***Methods of Teaching Spanish (K-12) (3)***
Introduction to communicative methods of language teaching and New Jersey standards for world language teaching. Creative approaches to assessment.
***Prerequisite: 01:940:261 or equivalent or permission of department.***

**01:940:367** ***Sociolinguistics in the Spanish-Speaking World (3)***
How language is shaped by society. Student fieldwork examining Spanish usage by heritage and nonheritage speakers required.
***Prerequisite: 01:940:261 or permission of department.***

**01:940:368** ***The Bilingual Mind (3)***
Cognitive mechanisms underlying the bilingual mind. Selective attention and memory, models of bilingual representation and processing, cognitive and linguistic effects of bilingualism.
***Prerequisite: 01:940:261 or 01:830:101 (psychology).***

**01:940:388, 389** ***Spanish Lab for Oral Proficiency I (1)***
Online. Designed to provide oral practice and to improve language skills. Activities are tailored to respond to specific linguistic background. Students will have the opportunity to practice their language skills by completing weekly assignments. All students are expected to understand their level of oral proficiency in order to improve their language skills. In all tasks students will be exposed to topics, real-life situations, role plays, and linguistic functions expected at this level. This course requires three mandatory meetings during the semester.
***Open only to majors in Spanish in their junior or senior year. Not open to heritage speakers.***

**01:940:390** ***Topics in Hispanic Literature and Culture (3)***
Study of a specific topic in the field of Hispanic literature, film, or culture. Topics vary from semester to semester.
***Prerequisite: 01:940:215 or 217 or permission of department.***

**01:940:399** ***Service Learning Internship (1)***
Community-service placement in Spanish-related field setting.
***Corequisite: In conjunction with a designated unit in civic engagement and service education in the Department of Spanish. No more than 3 credits of 01:940:399 may be counted toward the major; none may be counted toward the minor.***

**01:940:401** ***Advanced Translation I (3)***
Introduction to the theory of translation and guidance in the use of materials essential to the translation process. Intensive practice in the translation of short texts in various fields from Spanish into English and English into Spanish.
***Prerequisites: It is recommended that students enrolled in this class have a B+ or better in the following classes: 01:940:325, 326, and 01:355:101 or 103 or 104 or equivalent. Students with a minimum of B in each of these three courses may be required to submit a writing sample. Not open to first-year students or sophomores.***

**01:940:402** ***Introduction to Translation of Specialized Texts (3)***
Advanced theoretical and practical training in translation in specialized areas such as scientific, legal, institutional, medical, or technical. Introduction to specialized language and specialized terminology research. Intensive individual and group practice in the translation of texts in various specialized fields from Spanish into English and English into Spanish.
***Prerequisite: 01:940:401 or permission of the department.***

**01:940:403,404** ***Civilization of Spanish America (3,3)***
Main traits of the civilization of Spanish America. Evolution of its social institutions and customs. Representative literary, philosophical, and artistic works.
***Prerequisite: One semester of 300-level Spanish or permission of department. Credit not given for both these courses and 01:590:401, 402.***

**01:940:405,406** ***Civilization of Spain (3,3)***
Main traits of the civilization of Spain. Evolution of its social institutions and customs. Representative literary, philosophical, and artistic works.
***Prerequisite: One semester of 300-level Spanish or permission of department.***

**01:940:411** ***Creative Writing (3)***
General practice in the writing of essay, verse, and narrative in the Spanish language.
***Prerequisites: One semester of 300-level literature in Spanish and permission of the department. Departmental permission subject to the approval of a writing sample.***

**01:940:415** ***Medieval Spanish Literature (3)***
Study of selected works from the medieval period including the various types of poetry and the development of prose, with emphasis on *El Cid*, *El Libro de Buen Amor*, and *La Celestina*.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:416** ***Field Methods in Spanish Linguistics (3)***
Methods and techniques of data collection (observational and experimental). Introduction to electronic compilation of data.
***Prerequisite: 01:940:261 or equivalent or permission of department.***

**01:940:417** ***History of the Spanish Language (3)***
Development of Spanish from its origins to the present. Settlement history and non-Roman influences in Spain. Evolution of sounds, forms, sentence structures, and words.
***Prerequisite: 01:940:261 or 01:940:362 or 01:615:201, or permission of department.***

**01:940:418** ***The Spanish Language in Social Contexts (3)***
Social and linguistic issues and their theoretical concepts of Spanish throughout its sphere of influence; contact areas; language and gender, identity, and politics; neologisms and variation.
***Prerequisite: 01:940:261 or 363 or permission of department.***

**01:940:419** ***Dialectology of the Spanish-Speaking World (3)***
Study of major dialects in the Spanish-speaking world. Theories of dialectology, geolinguistics, and social dialects as applied to Spanish. Survey of defining phonological, morphological, syntactic, and lexical features of modern dialects in Spain, Spanish America, and the United States.
***Prerequisite: 01:940:261 or 362 or permission of department.***

**01:940:420** ***Current Issues in Second Language Acquisition (3)***
Theory and research in second language acquisition and second language development. Research as linguistic knowledge, as cognitive skill, and as a social and personality mediated process.
***Prerequisite: 01:940:261 or permission of department.***

**01:940:421** ***Spanish Syntax (3)***
Analysis of Spanish syntactic structures using foundations of generative grammar. Development of reasoning and analytical skills. Testing and argument of hypotheses.
***Prerequisite: 01:940:364 or equivalent or permission of department.***

**01:940:422** ***Spanish Semantics (3)***
Formal theories of semantics applied to Spanish. Compositional and contextual meaning, conceptual prototypes, metaphors, and representation of lexical meaning.
***Prerequisite: 01:940:364 or equivalent or permission of department.***

**01:940:423** ***Poetry of the Golden Age (3)***
Spanish poetry of the Renaissance and baroque periods. Garcilaso and the Italianate School; San Juan de la Cruz and the conceptismo and culteranismo.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:424** ***Drama of the Golden Age (3)***
Spanish drama from its early manifestations through the baroque period. Reading and discussion of dramatists such as Lope de Vega, Tirso de Molina, Ruiz de Alarcón, and Calderón de la Barca.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:425** ***Prose of the Golden Age (3)***
Study of representative works with emphasis on the picaresque novel and Cervantes' novelas ejemplares.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:426** ***Don Quixote (3)***
Critical study of Cervantes' masterpiece within its Golden Age context.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:434,435** ***Nineteenth-Century Spanish Literature (3,3)***
Reading and discussion of representative works from the neoclassic, romantic, realistic, and naturalistic periods.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:437,438** ***Twentieth-Century Spanish Literature (3,3)***
Representative works by authors from the Generation of 98, the Generation of 27, and the post-civil war period.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:440** ***Colonial Spanish-American Literature (3)***
Study of colonial Spanish-American literature. Reading and analysis of representative works.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:441** ***Nineteenth-Century Spanish-American Literature (3)***
Reading and discussion of representative works from the main literary movements since the wars of independence through the early 1900s (romanticism, regionalism, naturalism, and modernism).
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:443** ***Spanish-American Short Story (3)***
Study of the Spanish-American short story since modernism. Reading and analysis of representative works.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:444** ***Spanish-American Poetry (3)***
Study of Spanish-American poetry since modernism. Reading and analysis of representative works.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:447** ***Spanish-American Novel I (3)***
Study of the Spanish-American novel from modernism through the boom. Reading and analysis of representative works.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:448** ***Spanish-American Novel II (3)***
Study of the Spanish-American novel; covers post-boom literature. Reading and analysis of representative works.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:449** ***Spanish-American Essay (3)***
Study of the Spanish-American essay since modernism. Reading and analysis of representative works.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:450** ***Spanish-American Theater and Social Change (3)***
Analysis and contextual understanding of the intersections of theater and social change in Spanish America from the twentieth century to the present day. Taught in Spanish.
***Prerequisite: Any 01:940:300 course or higher or permission of department***

**01:940:451** ***Literature of Latin American Exile and Displacement (3)***
Study of works concerning geographical displacement; focus on political exile from Cuba, the Southern Cone, and other displaced Hispanic communities in the United States.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:452** ***Readings in U.S. Latino/a Literature and Culture (3)***
Study of recent texts produced by and about Latino/as in the United States. Examination of issues of exile, integration and assimilation, political presence, and nationalism.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department. When taught in English, course will count for the Spanish major or minor if all written work is done in Spanish.***

**01:940:460** ***Race, Class, and Ethnicity in Latin America (3)***
Investigation of ethnic conflicts and racial formation and renegotiation in Latin America through literary and nonliterary sources. Consideration of class, racism, miscegenation, marginalization, and ethnonym.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department. Credit not given for both this course and 01:590:460.***

**01:940:461** ***Literacy and Orality in Hispanic Literature and Culture (3)***
Study of the relationship of writing to speech, oral tradition, and/or oral history in the context of Spanish, Spanish American, and/or U.S. Latino/a cultures.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:462** ***Environment and Literature in Hispanic Culture (3)***
Study of the relationship of literature to space, place, and landscape. Focus on ideas of nature and/or the city chosen each semester.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:465** ***Spain in Africa/Africa in Spain: Cultural Representations and Historical Legacy (3)***
Examination of the historical and cultural representation between Spain and Africa in a wide range of literary, artistic, and cinematographic texts.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:471** ***Internship in Translation/Interpreting (1-3)***
Supervised training in a business firm, social service agency, or government office. Weekly discussions of specific texts and problems arising from the fieldwork experience. Supplementary written and laboratory assignments.
***Rec. 1 hr., fieldwork 2 hrs. per credit. Maximum of 3 credits. Prerequisite: 01:940:401 with a grade of B+ or better. Pre- or corequisite: 01:940:402 or 475 or permission of department.***

**01:940:475** ***Community and Introduction to Simultaneous Interpreting (3)***
Introduction to theory and practice of community interpreting and all its related modalities: liaison, consecutive, sight. Introduction to simultaneous interpreting. Spanish-English and English-Spanish. Intensive classroom and language laboratory exercises. Ethics and principles of practice.
***Prerequisite: 01:940:401.***

**01:940:476** ***Legal Translation (1.5)***
Practice in sight and written translation of legal documents, court records, and language of courtroom procedures. Spanish-English and English-Spanish.
***Pre- or corequisites: 01:940:401, 475.***

**01:940:477** ***Court Interpreting (3)***
Intensive practice in interpreting courtroom and other legal procedures. Development of bilingual legal glossary. Review of New Jersey and federal standards for interpreters.
***Pre- or corequisites: 01:940:401, 475.***

**01:940:478** ***Theory and Practice in Translation (3)***
Introduction to translation studies. Application of linguistic theory and computer technology to translation. Intensive practice in nonliterary and literary translation, including narrative and theater.
***Prerequisites: 01:940:401, 402 with a grade of B+ or better, or permission of department.***

**01:940:479** ***Translation, Media, and Technology (3)***
Intensive workshop practice in advanced translation, Spanish to English and English to Spanish. Translation of audiovisual, digital, multimedia, and technical texts. Introduction to translation technologies, CAT tools, and subtitling technologies. Theoretical discussions on audiovisual, translation technologies, and translation localization and globalization. Individual and group projects, with emphasis on translation into the native tongue.
***Prerequisite: 01:940:401.***

**01:940:486** ***Medical/Technical Translation (1.5)***
Practice in translation in such areas as medical, pharmaceutical, communications, computers, and science textbooks. Development of specialized glossaries. Spanish-English and English-Spanish.
***Pre- or corequisite: 01:940:401 or permission of department.***

**01:940:487** ***Hospital/Community Interpreting (1.5)***
Theory and practice of hospital, medical, and other sensitive community interpreting roles. Development of specialized glossaries. Field assignments in area hospitals and clinics.
***Prerequisites: 01:940:203 or 01:940:205 or 01:940:313, or placement, or permission of department.***

**01:940:488** ***Topics in Spanish Linguistics (3)***
In-depth study of specific themes in Spanish linguistics. Topics may include language contact phenomena, pidgin and Creole, language acquisition, and historical linguistics.
***Prerequisite: 01:940:261 or permission of department.***

**01:940:489,490,491,492** ***Topics in Hispanic Literature and Culture (3,3,3,3)***
Specific topic chosen each semester.
***Prerequisite: One semester of 300-level literature in Spanish or permission of department.***

**01:940:493,494** ***Independent Study (BA,BA)***
Independent readings under faculty supervision. Project must not be one already treated in a formal course.
***Prerequisites: Minimum of one semester of 400-level Spanish and permission of department and instructor.***

**01:940:497,498** ***Honors in Spanish (BA,BA)***
Research paper prepared under faculty supervision.
***Prerequisite: Permission of department. Open only to seniors.***

**01:940:499** ***Oral Proficiency Interview (1)***
Online. Instructor-guided practice sessions in advance of the Oral Proficiency Interview (OPI). OPI scheduled through Language Lab.
***Open only to junior and senior majors in Spanish. Prerequisite: 01:940:389.***

# Sport Management 955 (SAS)

## SPORT MANAGEMENT 955

Department of Kinesiology and Health, School of Arts and Sciences

**Website:** Here

**Chair:** Brandon Alderman

**Vice Chair, Education and Administration:** Joanne Hunt

**Vice Chair, Research:** Marsha Bates

**Undergraduate Academic Director:** Andrea Spaeth

**Distinguished Professors:**
Marsha Bates, B.A., Indiana (Pennsylvania); M.S., Ph.D., Rutgers

Labros Sidossis, B.S., Thessaloniki (Greece); M.S., CUNY (Queens College); M.A., Texas (Austin); Ph.D., Texas Medical Branch (Galveston)

**Professors:**
Peter Kokkinos, B.S., Bowie; M.A., Ph.D., Maryland

Jennifer Buckman, B.A., Rutgers; M.S., Ph.D., Oregon Health and Science; M.B.A., Rutgers

**Associate Professors:**
Brandon Alderman, B.S., B.A., M.S., Wyoming; Ph.D., Arizona State

Sara Campbell, B.S., M.S., Bloomsburg; Ph.D., Florida State

Steven K. Malin, B.S., King's College; M.S., Delaware; PhD., Massachusetts Amherst

Andrea Spaeth, B.A., Elon; M.A., William and Mary; M.A., Ph.D., Pennsylvania

**Assistant Professor:**

Ryan Dougherty, B.S. Wisconsin, M.S. Wisconsin, Ph.D. Wisconsin

Erik Hummer, B.S. Pacific Lutheran, M.S., Western Washington, Ph.D. Tennessee

**Assistant Teaching Professors:**
Anthony Delli Paoli, B.S. Rutgers; M.S. Michigan State; Ph.D. Michigan State

Jason Henderson, B.S., Rutgers; M.M.S., Duke University; J.D., Rutgers

Joanne Hunt, B.S., Pennsylvania State; M.A., New York

Nicole Nagle, B.S., Rutgers; D.P.T., New York Medical College

Javier Robles, B.A., Rutgers, J.D. Seton Hall Law

Lisa Rossman-Murphy, B.A., Rutgers; B.S., M.S., CUNY (Staten Island); D.P.T., Arcadia

Latisha Forster Scott, B. A. Hofstra; M.S. Brooklyn College (CUNY); Ph.D., Temple

**Teaching Instructors:**
Jaime Hecht-Cosloy, B.S., Rutgers, J.D., Baltimore

Adam DiVine, B.S., Rutgers

Reubinedde Malamug, B.S., Rutgers, M.H.A., Drexel

Morgan Murray B.S., Rutgers, M.S., Rutgers

Nadyne Venturin-Trindade: M.Sc., Federal University of Paraná

Sport Management 955 (SAS)

# Learning Goals

# Learning Goals

The Sport Management major is designed to inspire students to make a meaningful impact in the sport industry. The curriculum allows students to learn and apply their skills in areas such as sustainability and diversity, coaching and athlete development, sport marketing & finance, sport analytics, administration, facilities and event management,

and legal issues. Students who graduate majoring in sport management leave with the knowledge and skills to become successful professionals in the ever-evolving world of sport. Our strategically designed curriculum empowers students to:

I. Analyze legal issues in sport.

Students start with a foundational understanding of risk assessments and sports governance structures, essential for navigating the complexities of sport law. They analyze sport law and ethical standards to manage rights and draft sport contracts, including sponsorship agreements. Students develop negotiation plans and strategies for arbitration and dispute resolution. This enables them to handle detailed contract terms and navigate complex negotiations.

II.Organize, administer and manage sport organizations and events.

Students develop expertise in organizing and managing sports organizations and events, starting with the creation of strategic visions that align sport programs with organizational goals. They evaluate organizational performance and design management strategies for sport programs to coordinate and evaluate event logistics. Furthermore, they build skills in recruiting and professional development. This comprehensive approach implements best practices in organizational management to boost revenue and operational efficiency.

III. Conduct sport business analyses and communication.

Students acquire skills in effective communication, professional writing, and presentations. This emphasizes the use and visualization of data to enhance sport business communications. They develop analytical skills to inform decision-making. Proficiency in software and the application of theoretical concepts and frameworks further empower students to transform raw data into actionable sports business strategies.

IV. Implement effective marketing, sales and finance strategies.

Students develop and implement marketing and sales strategies based on consumer behavior and modern marketing concepts. Students learn to use financial statement analysis and budgeting methods to manage operations effectively. Their training covers comprehensive financial planning and the nuances of management and funding differences between public and private sports entities, preparing them for diverse fiscal environments in the sports industry.

V. Evaluate human behavior in the field of sport.

Students gain insights into the behavior of sport personnel across different levels and demographics by studying psychological and sociological aspects of sport. This prepares students to successfully collaborate with and inspire others in performance contexts. They learn to conduct ethical decision-making, resolve ethical dilemmas, and implement effective leadership techniques. Students also develop strategies to create accessible sport organizations and programs that ensure high quality sport experiences for all.

VI. Contextualize the historical and cultural significance of sports.

Students analyze the impact of sports on individuals, communities, and societies to understand their historical and cultural significance. This knowledge informs their decisions in event and product design, organizational management, and broader business practices. They also examine contemporary issues in sports, emphasizing the importance of staying informed about ongoing and emerging developments.¿

The 18-credit sport management minor is designed to give students majoring in other disciplines such as business, communications, labor relations, and psychology an opportunity to learn about the sport industry. Students will be exposed to such areas as marketing, administration, law, psychology, and sociology as they relate to the business of sport.

Sport Management 955 (SAS)

# Major and Minor Requirements

# Major and Minor Requirements

**Declaring the Major**

Students who wish to declare a major in sport management must:

1. Have completed a minimum of one semester at Rutgers University with a minimum overall grade-point average of 2.0
OR
Have transferred into Rutgers University with a minimum of 15 credits

2. Attend a department declaration meeting

Meetings for declaring a major are scheduled throughout the fall and spring semesters. At the start of each semester, the link to register for a declaration meeting will be available and posted on here.

Students in the School of Arts and Sciences (SAS) will use the MyMajor system to submit the major declaration request. The declaration request will be approved after the student attends the department declaration meeting.

Students from other schools within Rutgers University can declare a major in sport management only with approval of the dean of their school and attendance at a declaration meeting.

**Major Requirements**

To graduate with a degree in sport management, students must have at least a 2.0 grade-point average from the required courses.

*The following courses are required for the sport management major:*

01:198:170 Computer Applications for Business (3)

01:220:102 Introduction to Microeconomics (3) or 11:373:121 Principles and Applications of Microeconomics (3)

01:220:103 Introduction to Macroeconomics (3) or 11:373:122 Principles and Applications of Macroeconomics (3)

01:355:203 Business Writing Essentials (3) or 01:355:303 Writing for Business and the Professions (3)

01:377:140 Foundations of Kinesiology and Health (1.5)

01:830:101 General Psychology (3)

01:920:101 Introduction to Sociology (3)

01:955:203 Sport and the Law (1.5)

01:955:204 Risk Management in Sport (1.5)

01:955:276 Basic Statistics for Sport Management (3)

01:955:305 Sport Sociology (3)

01:955:311 Sport Marketing (3)

01:955:330 Organizational Behavior in Sport Management (3) or 01:955:332 Leadership Development in Sport (3)

01:955:355 Professional Presentations in Sport Management (3)

01:955:406 Administration in Sport Management (3)

01:955:485 Sport Informatics and Analytics

01:955:490 Internship in Sport Management (6)

33:010:272 Introduction to Financial Accounting (3)

***Concentration Requirement- Must select one and complete 9 credits within that selection***

Sport Marketing & Revenue

01:955:306 Finance in Sport (3)

01:220:312 Economics of College and Professional Sports (3) or 11:373:403 Innovation and Entrepreneurship (3)

01:955:412 Advanced Sport Marketing (3)

Coaching

01:955:226 Coaching Theory and Technique (3)

01:955:308 Teaching and Coaching Individual and Team Sports (3)

01:377:301 Psychology of Sport and Exercise (3)

Administration & Events

01:955:312 Facilities Planning and Design (1.5)

01:955:318 Organization & Administration of College Recreational Sports (1.5)

01:955:333 Event Management and Sponsorship in Sport (3)

01:955:316 Fitness Management (3)

*Elective Requirement - Must complete 6 credits of electives*

The sport management major requires 6 credits of electives. Students should consult the university online catalog, Degree Navigator, or speak to an academic adviser to determine if any of the courses have prerequisites or restrictions.

A minimum of 3 elective credits must be within the department (377 or 955 subject code). At least 3 elective credits must be at the 300+ level. A maximum of 3 elective credits can be at the 200 or lower level.

**Minor Requirements**

Students from any school within Rutgers University can choose to minor in sport management. Students in the School of Arts and Sciences or the School of Environmental and Biological Sciences will use the MyMajor system to submit the minor declaration request. Students from other schools within Rutgers can declare a minor in sport management only with approval of the dean of their school.

The following course are required for a minor in sport management (18 credits):

01:955:203 Sport and the Law (1.5)

01:955:204 Risk Management in Sport (1.5)

01:955:311 Sport Marketing (3)

01:955:330 Organizational Behavior in Sport Management (3) or 01:955:332 Leadership Development in Sport (3)

01:955:355 Professional Presentations in Sport Management (3)

*Elective Requirement - Must complete 6 credits of electives*

The sport management minor requires 6 credits of electives. Students should consult the university online catalog, Degree Navigator, or speak to an academic adviser to determine if any of the courses have prerequisites or restrictions. All 6 credits must be within the department in sport management (955 subject code). Note: Only one course (maximum of 3 credits) may overlap between a minor and the major for credit.

Sport Management 955 (SAS)

# Internship Program

# Internship Program

Students in the sport management major must complete a 6-credit internship 01:955:490 (252 hours) during their senior year. The internship provides the students with the opportunity to practice and/or apply knowledge and skills in various professional environments.

To qualify for the senior internship, students must satisfy the following criteria:

1. Complete a minimum of 90 credits, with a minimum of 20 credits in the major.
2. Overall GPA must be at least 2.0.
3. Major GPA must be at least 2.0.
4. Meet all deadlines for submission of the application document.
5. Attend the mandatory pre-internship meeting as well as a course meeting prior to the start of their internship hours.

Sport Management 955 (SAS)

# Departmental Honors Program

# Departmental Honors Program

There are three categories of honors in sport management: honors, high honors, and highest honors. The criteria for achieving honors is based on academic performance, as evidenced by the student's major grade-point average (GPA).

**Honors Criteria**

***Honors:*** 3.600 major GPA

***High Honors:*** 3.800 major GPA

***Highest Honors:*** 4.000 major GPA

Sport Management 955 (SAS)

# Courses

# Courses

**01:955:111** ***Foundations in Sport Management (3)***
Foundations of Sport Management is an introductory course designed to prepare aspiring professionals in the field of sport management. This course offers a comprehensive overview, providing students with foundational knowledge and a broad understanding of various aspects critical to the sport industry. This includes sport-related legal issues, management, business communication, marketing, leadership and history.

**01:955:203** ***Sport and the Law (1.5)***
Legal issues affecting sport, recreation, and physical education. Topics include equal opportunity legislation, tort liability, product liability, participant liability, and legal rights of supervisors and participants.

**01:955:204** ***Risk Management in Sport (1.5)***
In-depth study of factors essential to the safe and effective delivery of exercise programs and sport activities and events.

**01:955:226** ***Coaching Theory and Technique (3)***
Basic philosophical, psychological, and physiological aspects of coaching.

**01:955:276** ***Basic Statistics for Sports Management (3)***
Introduction to applied descriptive and inferential statistics for sport management.
***Prerequisite: 01:640:026 or above. Credit not given for both this course and 01:377:275.***

**01:955:282** ***Current Topics in Kinesiology and Health (1.5)***
Current issues within the fields of Kinesiology and Health. Contact the department for titles, descriptions, and requirements of each section offered.

**01:955:305** ***Sport Sociology (3)***
Examination of organized sport in modern-day North America. Analysis of sport roles and sport functions. Sport viewed as a major societal institution.
***Prerequisite: 01:830:101 or 01:920:101.***

**01:955:306** ***Finance in Sport (3)***
Examination of finance issues and successful approaches to fiscal management applied to the fields of sport management and exercise science. Topics include diversification of revenues, financial accountability, purchasing, sales operations, fundraising, grants and sponsorship, and fiscal challenges that confront sport and fitness organizations.
***Prerequisite: 01:640:111 or 01:640:115.***

**01:955:308** ***Teaching and Coaching Individual and Team Sports (3)***
This course explores the challenges facing sport coaches in developing advanced athletes within individual, dual and team sports. The course will explore skill instruction, ethical issues, disciplinary situations, relationship building, team management, recruiting plans, competition analysis, and equipment needs. The course uses the coaching education framework established by the International Council for Coaching Excellence (ICCE).

**01:955:311** ***Sport Marketing (3)***
Principles of marketing applied to sport. Examines sport industry trends that heighten the need for scientific, professional approaches to sport marketing. Examines consumer behavior, marketing research, pricing, distribution, and promotion of goods and services.

**01:955:312** ***Facilities Planning and Design (1.5)***
Basic study of facilities planning and design. Planning, financing, safety, and maintenance issues important in the development of sport, recreation, and fitness indoor and outdoor facilities.

**01:955:316** ***Fitness Management (3)***
Management theories and operational methods for running health and fitness programs. Topics may include fitness programming, building and events management, staffing, facility design, customer service, budgeting, sales, and promotions as they relate to the fitness industry.
***Prerequisite: 01:377:140.***

**01:955:317** ***Ethics and Values in Sport (1.5)***
Examination of contemporary issues regarding the integrity of sport, which present moral and ethical challenges to the sport manager.

**01:955:318** ***Organization and Administration of College Recreational Sports (1.5)***
Philosophical and practical approach to the development and implementation of recreational sports and activities promoted within the confines of an educational institution.

**01:955:321** ***The Business of Personal Training (1.5)***
The purpose of this course is to examine the fundamental occupational and entrepreneurship principles of owning or managing a personal training business.
***Prerequisite: 01:955:311 or 01:955:316***

**01:955:330** ***Organizational Behavior in Sport Management (3)***
Organization and personnel behavior theory applied to contemporary sports organizations. Issues in industrial, professional, collegiate, and scholastic contexts examined.

**01:955:331** ***Gender Issues in Sport (1.5)***
Examination of impact of gender on attitudes, practices, and challenges confronting the contemporary sport manager. Open only to juniors and seniors.

**01:955:332** ***Leadership Development in Sport (3)***
Examination of leadership theories and processes and their application for effective sport management.
***Open only to juniors and seniors.***

**01:955:333** ***Event Management and Sponsorship in Sport (3)***
Organizational event structure and sponsorship in the sport industry. History, needs assessment, planning process, networking, scope of services available, and associated career opportunities.

**01:955:342** ***Independent Study in Sport Management (3)***
Supervised individual research or study in the field of sport. Open only to junior and senior majors by permission of department.

**01:955:355** ***Professional Presentations in Sport Management (3)***
Development and presentation of public addresses emphasizing command of the English language and electronic delivery systems for both small and large group presentations.

**01:955:406** ***Administration in Sport Management (3)***
Concepts of administrative processes, systems, and styles with application to various sport environments. Includes program, facility, fiscal, and personnel management.
***Open only to senior majors. Must have 90 credits.***

**01:955:412** ***Advanced Sport Marketing (3)***
Sport marketing strategy, design, and management. Concepts and methods essential to identifying and analyzing marketing threats and opportunities and developing and evaluating marketing strategies. Develops an understanding of the nature and role of marketing in the sport organization.
***Prerequisite: 01:955:311.***

**01:955:485** ***Sport Informatics and Analytics (3)***
In this course, you will learn key skills in data analysis, data management and infrastructure, client-server application development, and ethical and professional management of data projects. This applies to competencies in sports sales, the management of large, high-throughput data sources, and cloud computing.
***Prerequisite: 01:955:276.***

**01:955:490** ***Internship in Sport Management (6)***
Supervised individual fieldwork in sport management. Prerequisites: Permission of department via its application process, 90 credits, and a 2.0 cumulative grade-point average both overall and in the major.
***Open only to sport management majors.***

**01:955:497** ***Internship 2 in Sport Management (3)***
Additional supervised individual fieldwork.
***Prerequisites: 01:955:490, with a C or higher. Permission of department via its application process, and 2.0 cumulative and major grade-point averages.***

# Statistics 960 (SAS)

## STATISTICS 960

Department of Statistics, School of Arts and Sciences

**Website**: Here

**Chair:** Rong Chen

**Undergraduate Codirectors**:

Steve Buyske, Harold Sackrowitz

**University Professor and Board of Governors Professor:**

Glenn Shafer , A.B, Ph.D., Princeton

**Distinguished Professors:**

Rong Chen, B.S., Peking; M.S., Ph.D., Carnegie Mellon

John Kolassa, B.S., Ph.D., Chicago

Regina Y. Liu, Ph.D., Columbia

Harold B. Sackrowitz, B.S., CUNY (Brooklyn College); Ph.D., Columbia

Michael L. Stein, B.S., MIT; M.S., Ph.D., Stanford

Zhiqiang Tan, B.S., Tsinghua (China); Ph.D., Chicago

David E. Tyler, B.A., Indiana (Pennsylvania); M.A., Massachusetts (Amherst); M.A., Ph.D., Princeton

Minge Xie, B.S., University of Science and Technology of China; M.S., Ph.D., Illinois (Urbana-Champaign)

Cun-Hui Zhang, B.A., Huainan Mining Institute (China) ; M.S., Ph.D., Columbia

**Professors:**

Javier Cabrera, B.A., Madrid; M.A., Ph.D., Princeton

Harry Crane, B.S., Pennsylvania; Ph.D., Chicago

Tirthankar Dasgupta, B.S., Calcutta; M.S., Indian Statistical Institute; Ph.D., Georgia Institute of Technology

Donald R. Hoover, B.A., California (San Diego); M.P.H., California (Los Angeles); Ph.D., Stanford

Ying Hung, B.A., National Taiwan (Taiwan); M.S., National Tsing Hua (Taiwan); Ph.D., Georgia Institute of Technology

Sijian Wang, B.S., Tsinghua (China); M.S., Ph.D., Michigan

Han Xiao, B.S., Peking; M.S., National (Singapore); Ph.D., Chicago

**Associate Professors:**

Pierre Bellec, Dipl. d'Ingénieur, Ecole Polytechnique; Part III (MASt), Cambridge (UK); Ph.D., ENSAE Paris Tech

Steven Buyske, B.A., Haverford College; Sc.M., Ph.D., Brown; Ph.D., Rutgers

Roubin Gong, B.Sc., Toronto; A.M, Harvard; Ph.D., Harvard

Zijian Guo, B.S., Chinese University of Hong Kong; Ph.D., Pennsylvania

Qiyang Han, B.S., Fudan; Ph.D., Washington

Linjun Zhang, PhD., The Wharton School, University of Pennsylvania

**Assistant Professors:**

Matteo Bonvini, PhD., Carnegie Mellon University

Yaqing Chen, B.S., Peking; Ph.D., California (Davis)

Koulik Khamaru, B.S., M.S., Indian Statistical Institute; Ph.D., California (Berkeley)

Gemma Moran, PhD., University of Pennsylvania

Nicole Pashley, B.S., Queen's (Kingston); M.A., Ph.D., Harvard

Guanyang Wang, B.S, Science and Technology (China); Ph.D., Stanford

Min Xu, B.S., California (Berkeley); Ph.D., Carnegie Mellon

**Faculty Emeriti:**

Robert Berk, Ph.D., Harvard

Joseph I. Naus, B.B.A., CUNY (City College); M.A., Ph.D., Harvard

Richard Trout , Ph.D, Rutgers

The department offers a statistics major and a joint statistics/mathematics major in cooperation with the mathematics department. The joint statistics/mathematics major provides a stronger preparation for graduate study in statistics. Students who are most interested in applying statistics in industry, government, or in applied areas of graduate study can take the statistics major. The department encourages interdisciplinary study, and students should consult with departmental advisers to plan their program.

Statistics 960 (SAS)

# Learning Goals

# Learning Goals

Students will think statistically and probabilistically, developing an understanding of the value of critical analysis of data; understand the language of statistics and probability used in the news, advertisements, government releases, survey reports, and research studies to make informed decisions about health, voting, and societal needs; interpret statistical research results; and continue in their chosen discipline with the foundation needed for the statistical and probabilistic skills required.

*Majors* will also recognize basic situations relative to analysis in the areas covered by our program; critically discuss the appropriateness of a wide variety of fundamental statistical methodology used in published articles, reports, and research; interpret the meaning of the results; see connections between the different methodologies covered in different courses and discuss their pros and cons; understand the theoretical criteria used in the development of statistical procedures; and use the SAS or R statistical computer packages to do data analysis. At least 50 percent of our seniors will be well positioned to enter a master's program, and the mathematically strongest will be capable of pursuing a doctoral program.

*Minors* will also recognize basic situations relative to analysis in the areas covered by our program; discuss the appropriateness of many of the fundamental statistical methods used in published articles, reports, etc.; and interpret the meaning of the results.

Statistics 960 (SAS)

# Major Requirements

# Major Requirements

***Statistics***

To declare the major an overall C average or above, based on all times they were taken, must be achieved in Calculus I and II combined (01:640:151-152).

Grades of C or better must be earned in all courses counted toward the major.

A total of 46 credits is required: 18 credits in mathematics, 25 credits in statistics, and 3 credits in computer science, as follows:

1. Computer Science 01:198:107, 110, 111, or 170
2. Mathematics 01:640:151, 152, 250, 251
3. Statistics 01:960:381, *382*, 384, 295 or 390, 463, 486, 490
4. Two courses chosen from 01:960:365, 467, 476, 483
5. Three credits in mathematics electives (01:640:252 or a course at the 300 level or above, but not 01:640:477 or 01:640:481)

*01:640:477 and 01:640:481 may be taken instead of 01:960:381, 382. Credit is not given for both 01:640:477 and 01:960:381, nor for both 01:640:481 and 01:960:382.

*Statistics/Mathematics*

To declare the major an overall C average or above, based on all times they were taken, must be achieved in Calculus I and II combined (01:640:151-152).

Grades of C or better must be earned in all courses counted toward the major.

A total of 56 credits is required: 28 credits in mathematics, 25 credits in statistics, and 3 credits in computer science, as follows:

1. Computer Science 01:198:107, 110, 111, or 170
2. Mathematics 01:640:151, 152, 250, 251, 252, 300, 311, 478
3. Statistics 01:960:381, *382*, 384, 295 or 390, 463, 486, 490
4. Two courses chosen from 01:960:365, 467, 476, 483

*01:640:477 and 01:640:481 may be taken instead of 01:960:381, 382. Credit is not given for both 01:640:477 and 01:960:381, nor for both 01:640:481 and 01:960:382.

Statistics 960 (SAS)

# Sequence of Courses for Nonmajors

# Sequence of Courses for Nonmajors

Statistics 960 (SAS)

# Minor Requirements

# Minor Requirements

A minor in statistics consists of 960:390 or 960:295 and six additional courses in the Department of Statistics (or 01:198:142, 01:640:477, or 01:640:481), of which at least three of which must be from 01:960:365, 381, 382, 463, 467, 476, 483, 486, 490, 01:640:477, or 01:640:481. No one course can be used to fulfill two requirements. At most two grades of D can be counted towards the Statistics minor.

Statistics 960 (SAS)

# Courses

# Courses

In the following course list, the Level II Statistics prerequisite may be fulfilled with 01:960:212 or 291 or 384 or 401 or 484 or equivalent. Credit is not given for more than one course fulfilling the Level II Statistics prerequisite.

**01:960:142** *Data 101 (3)*
Topics in data literacy for students not majoring in computer science or statistics.
***Prerequisite: 01:640:025 or placement into Intermediate Algebra or higher. Credit not given for both this course and 01:198:142.***

**01:960:211** *Statistics I (3)*
Principles and methods of statistics, including probability distributions, sampling, estimation, hypothesis testing, regression and correlation analysis.
***Prerequisite: Any course equal to or greater than 01:640:112.***

**01:960:212** *Statistics II (3)*
Application of statistical techniques to the analysis of data, tests of significance, correlation and regression analysis, confidence intervals, analysis of variance and some design of experiments, analysis of cross-classified data, chi-square tests.
***Prerequisite 01:960:211 or 01:960:285. See Level II Statistics restrictions. Credit not given for both this course and either 01:960:384 or 484. Credit not given for both this course and 01:960:401 unless 401 is being used, with permission of the department, as a prerequisite for this course.***

**01:960:285** *Introductory Statistics for Business (3)*
Topics include descriptive statistics, probability, random variables, sampling distributions, principles of hypothesis testing, and one- and two-sample t-tests.
***Prerequisite: Any course equal to or greater than 01:640:112. Credit not given for more than one of 01:960:201, 211, 285, or 401.***

**01:960:291** *Statistical Inference for Data Science (3)*
Introduction to probability and statistics underlying data science. Topics include regression, resampling, confidence intervals, hypothesis testing, and related probability distributions.
***Prerequisites: 01:640:115 and (01:198:142 or 01:960:142).***

**01:960:295** *Data Management and Wrangling with R (3)*
An introduction to the tools and principles to retrieve, tidy, clean, and visualize data in preparation for statistical analysis. The R statistical environment is used but no prior knowledge is required. Interactions with databases will be included.
***Prerequisite:01:198:142 or 01:960:142, or 01:960:291, or 01:960:212, or 01:960:384, or 01:960:401***

**01:960:365** *Introduction to Bayesian Data Analysis (3)*
Principles of Bayesian data analysis and application of them to varied data analysis problems. Topics include: Bayes Theorem, linear and nonlinear models, hierarchical models, and the use of Markov chain Monte Carlo methods.
***Prerequisites: 01:640:152 and (01:960:212 or 01:960:384 or 01:960:401 or 01:960:484 or 01:960:291).***

**01:960:379** *Basic Probability and Statistics (3)*
Methods of presenting data; basic statistical measures of location; frequency distributions; elementary probability theory; probability distributions; the binomial, Poisson, and normal distributions; basic sampling theory.
***Prerequisite: One semester of calculus.***

**01:960:381** *Theory of Probability (3)*
Probability distributions; the binomial, geometric, exponential, Poisson, and normal distributions; moment-generating functions; sampling distributions; applications of probability theory.
***Prerequisites: Three semesters of calculus.***

**01:960:382** *Theory of Statistics (3)*
Statistical inference methods, point and interval estimation, maximum likelihood estimators, information inequality, hypothesis testing, Neyman-Pearson lemma, linear models.
***Prerequisite: 01:960:381 or equivalent.***

**01:960:384** *Intermediate Statistical Analysis (3)*
Application of statistical techniques to the analysis of data, tests of significance, correlation and regression analysis, confidence intervals, analysis of variance, and some design of experiments; analysis of cross-classified data, chi-square tests.
***Prerequisite: One of the following courses: 01:960:201, 211, 285, 379, 381, or permission of instructor. Credit not given for both this course and 01:960:212 or 484. Credit not given for both this course and 01:960:401 unless 401 is being used, with permission of the department, as a prerequisite for this course.***

**01:960:390** *Introductory Computing for Statistics (1)*
Introduction to the use of statistics computer packages with main focus on the SAS system. Includes generating random samples, estimation, testing hypothesis, ANOVA.
***Five-week course; 3 hrs. lec. and lab. Prerequisite: Level II Statistics. Graded on a Pass/Fail (undergraduate) and S/U (graduate) basis.***

**01:960:391,392** *Honors Seminars in Probability/Statistics (3,3)*
Real-life examples or case studies on statistics and probability theory and their ramifications. Topics may vary each semester. Extensive data analysis required.
***Prerequisite: Calculus 1 or permission of department. Corequisite: Calculus 2. Open to students in school honors programs.***

**01:960:401** *Basic Statistics for Research (3)*
As applied in fields other than statistics; treats research projects dependent on the use of observed data from planned experiments. Includes inference methods in estimation and hypothesis testing and general linear models.
***Prerequisite: Any course equal to or greater than 01:640:112. Credit not given for both this course and 01:960:211, 212, 384, and/or 484. Students who have already taken 01:960:401 and wish to take any of these courses should consult with the department.***

**01:960:425** *Lessons for Probability and Statistics from their History (3)*
What is the difference between statistics and data science? How should we choose between confidence intervals and posterior probabilities? Can you prove causality from observational data? This course looks at the history of these questions, from 13th-century calculations for dice to 21st-century developments in data science. Students will learn to use, discuss, and criticize statistical methods in a way that is both mathematically sound and historically informed.
***Prerequisites: (01:960:212 or 01:960:291 or 01:960:384 or 01:960:401 or 01:960:484) and (01:640:135 or 01:640:151)***

**01:960:435** *Seminar in Probability and Statistical Inference (3)*
Examines statistical theory, including topics such as Bayesian inference, confidence intervals, and maximum likelihood, to prepare students to use, discuss, and criticize statistical methods in a way that is both mathematically sound and historically informed.
***Prerequisite: 01:960:382 or equivalent or permission of instructor.***

**01:960:463** *Regression Methods (3)*
Multiple and nonlinear correlation and regression techniques for analysis of events in time and space: analysis of variance and covariance, related multivariate techniques, response surface approaches.
***Prerequisite: Level II***

**01:960:467** *Applied Multivariate Analysis (3)*
Introduction to the methodology of multivariate analysis. Multiple linear regression, discriminant analysis, profile analysis, canonical correlation, principal components, and factor analysis.
***Prerequisite: Level II-Statistics.***

**01:960:476** *Introduction to Sampling (3)*
Principles of sampling applied for economical procurement or assessment of data. Current techniques for area sampling, sampling of accounts, large-scale surveys, stratification, cluster sampling, systematic sampling, two-stage sampling, and construction of estimates.
***Prerequisites: Level II Statistics and 01:960:379 or 381 or equivalent with a grade of C or better, or permission of department.***

**01:960:482** *Advanced Issues in Probability and Statistics (3)*
Focus on understanding both the power and limitations of statistical techniques and principles as applied in real-world settings. Includes projects involving the collection of data to be analyzed and discussed.
***Prerequisites: 01:960:382 and permission of instructor.***

**01:960:483** ***Statistical Quality Control (3)***
Statistical measures; histogram analysis; construction and analysis of control charts for variables and attributes; use of Dodge-Romig and Military Standards acceptance sampling plans; statistical aspects of tolerances.
***Prerequisite: Level II Statistics or 33:623:385.***

**01:960:484** ***Basic Applied Statistics (3)***
Confidence estimation, hypothesis testing, chi-square methods, correlation and regression analysis, basis of design of experiments.
***Prerequisite: One of the following courses: 01:960:201, 211, 285, 379, 381, or permission of instructor. Credit not given for both this course and 01:960:212 or 384 or 401.***

**01:960:486** ***Applied Statistical Learning (3)***
Introduction to machine learning methods from a statistical perspective. Both traditional methods such as logistic regression, naive Bayes classification, and discriminant analysis as well as more recent statistical methods such as regularization, boosting, and random forests will be applied to datasets of varying size. The emphasis will not be on programming the techniques from scratch but on understanding and applying the methods using a high level language such as R. Prerequisites: Level II Statistics.
***Prerequisite: Level II Statistics.***

**01:960:490** ***Introduction to Experimental Design (3)***
Basic concept and principles of designs. Nature and analysis of various designs; randomized blocks, Latin squares, factorial designs. Applications to specific problems.
***Prerequisite: Level II Statistics.***

**01:960:491** ***Reliability-Quality Control (3)***
Survey of current theory and practice in this field.
***Prerequisites: 01:640:251 and Level II Statistics.***

**01:960:492** ***Special Topics in Statistics and Probability (3)***
Readings and presentations related to the development of probability and statistics.
***Prerequisite: Permission of instructor.***

**01:960:495** ***Independent Studies in Statistics (3)***
***Prerequisite: Permission of department.***

# Statistics 960 (SAS)

## STATISTICS 960

Department of Statistics, School of Arts and Sciences

**Website**: Here

**Chair:** Rong Chen

**Undergraduate Codirectors**:

Steve Buyske, Harold Sackrowitz

**University Professor and Board of Governors Professor:**

Glenn Shafer , A.B, Ph.D., Princeton

**Distinguished Professors:**

Rong Chen, B.S., Peking; M.S., Ph.D., Carnegie Mellon

John Kolassa, B.S., Ph.D., Chicago

Regina Y. Liu, Ph.D., Columbia

Harold B. Sackrowitz, B.S., CUNY (Brooklyn College); Ph.D., Columbia

Michael L. Stein, B.S., MIT; M.S., Ph.D., Stanford

Zhiqiang Tan, B.S., Tsinghua (China); Ph.D., Chicago

David E. Tyler, B.A., Indiana (Pennsylvania); M.A., Massachusetts (Amherst); M.A., Ph.D., Princeton

Minge Xie, B.S., University of Science and Technology of China; M.S., Ph.D., Illinois (Urbana-Champaign)

Cun-Hui Zhang, B.A., Huainan Mining Institute (China) ; M.S., Ph.D., Columbia

**Professors:**

Javier Cabrera, B.A., Madrid; M.A., Ph.D., Princeton

Harry Crane, B.S., Pennsylvania; Ph.D., Chicago

Tirthankar Dasgupta, B.S., Calcutta; M.S., Indian Statistical Institute; Ph.D., Georgia Institute of Technology

Donald R. Hoover, B.A., California (San Diego); M.P.H., California (Los Angeles); Ph.D., Stanford

Ying Hung, B.A., National Taiwan (Taiwan); M.S., National Tsing Hua (Taiwan); Ph.D., Georgia Institute of Technology

Sijian Wang, B.S., Tsinghua (China); M.S., Ph.D., Michigan

Han Xiao, B.S., Peking; M.S., National (Singapore); Ph.D., Chicago

**Associate Professors:**

Pierre Bellec, Dipl. d'Ingénieur, Ecole Polytechnique; Part III (MASt), Cambridge (UK); Ph.D., ENSAE Paris Tech

Steven Buyske, B.A., Haverford College; Sc.M., Ph.D., Brown; Ph.D., Rutgers

Roubin Gong, B.Sc., Toronto; A.M, Harvard; Ph.D., Harvard

Zijian Guo, B.S., Chinese University of Hong Kong; Ph.D., Pennsylvania

Qiyang Han, B.S., Fudan; Ph.D., Washington

Linjun Zhang, PhD., The Wharton School, University of Pennsylvania

**Assistant Professors:**

Matteo Bonvini, PhD., Carnegie Mellon University

Yaqing Chen, B.S., Peking; Ph.D., California (Davis)

Koulik Khamaru, B.S., M.S., Indian Statistical Institute; Ph.D., California (Berkeley)

Gemma Moran, PhD., University of Pennsylvania

Nicole Pashley, B.S., Queen's (Kingston); M.A., Ph.D., Harvard

Guanyang Wang, B.S, Science and Technology (China); Ph.D., Stanford

Min Xu, B.S., California (Berkeley); Ph.D., Carnegie Mellon

**Faculty Emeriti:**

Robert Berk, Ph.D., Harvard

Joseph I. Naus, B.B.A., CUNY (City College); M.A., Ph.D., Harvard

Richard Trout , Ph.D, Rutgers

The department offers a statistics major and a joint statistics/mathematics major in cooperation with the mathematics department. The joint statistics/mathematics major provides a stronger preparation for graduate study in statistics. Students who are most interested in applying statistics in industry, government, or in applied areas of graduate study can take the statistics major. The department encourages interdisciplinary study, and students should consult with departmental advisers to plan their program.

Statistics 960 (SAS)

# Learning Goals

# Learning Goals

Students will think statistically and probabilistically, developing an understanding of the value of critical analysis of data; understand the language of statistics and probability used in the news, advertisements, government releases, survey reports, and research studies to make informed decisions about health, voting, and societal needs; interpret statistical research results; and continue in their chosen discipline with the foundation needed for the statistical and probabilistic skills required.

*Majors* will also recognize basic situations relative to analysis in the areas covered by our program; critically discuss the appropriateness of a wide variety of fundamental statistical methodology used in published articles, reports, and research; interpret the meaning of the results; see connections between the different methodologies covered in different courses and discuss their pros and cons; understand the theoretical criteria used in the development of

statistical procedures; and use the SAS or R statistical computer packages to do data analysis. At least 50 percent of our seniors will be well positioned to enter a master's program, and the mathematically strongest will be capable of pursuing a doctoral program.

*Minors* will also recognize basic situations relative to analysis in the areas covered by our program; discuss the appropriateness of many of the fundamental statistical methods used in published articles, reports, etc.; and interpret the meaning of the results.

Statistics 960 (SAS)

# Major Requirements

# Major Requirements

*Statistics*

To declare the major an overall C average or above, based on all times they were taken, must be achieved in Calculus I and II combined (01:640:151-152).

Grades of C or better must be earned in all courses counted toward the major.

A total of 46 credits is required: 18 credits in mathematics, 25 credits in statistics, and 3 credits in computer science, as follows:

1. Computer Science 01:198:107, 110, 111, or 170
2. Mathematics 01:640:151, 152, 250, 251
3. Statistics 01:960:381, *382*, 384, 295 or 390, 463, 486, 490
4. Two courses chosen from 01:960:365, 467, 476, 483
5. Three credits in mathematics electives (01:640:252 or a course at the 300 level or above, but not 01:640:477 or 01:640:481)

*01:640:477 and 01:640:481 may be taken instead of 01:960:381, 382. Credit is not given for both 01:640:477 and 01:960:381, nor for both 01:640:481 and 01:960:382.

*Statistics/Mathematics*

To declare the major an overall C average or above, based on all times they were taken, must be achieved in Calculus I and II combined (01:640:151-152).

Grades of C or better must be earned in all courses counted toward the major.

A total of 56 credits is required: 28 credits in mathematics, 25 credits in statistics, and 3 credits in computer science, as follows:

1. Computer Science 01:198:107, 110, 111, or 170

2. Mathematics 01:640:151, 152, 250, 251, 252, 300, 311, 478
3. Statistics 01:960:381, *382*, 384, 295 or 390, 463, 486, 490
4. Two courses chosen from 01:960:365, 467, 476, 483

*01:640:477 and 01:640:481 may be taken instead of 01:960:381, 382. Credit is not given for both 01:640:477 and 01:960:381, nor for both 01:640:481 and 01:960:382.

Statistics 960 (SAS)

# Sequence of Courses for Nonmajors

# Sequence of Courses for Nonmajors

Statistics 960 (SAS)

# Minor Requirements

# Minor Requirements

A minor in statistics consists of 960:390 or 960:295 and six additional courses in the Department of Statistics (or 01:198:142, 01:640:477, or 01:640:481), of which at least three of which must be from 01:960:365, 381, 382, 463, 467, 476, 483, 486, 490, 01:640:477, or 01:640:481. No one course can be used to fulfill two requirements. At most two grades of D can be counted towards the Statistics minor.

Statistics 960 (SAS)

# Courses

# Courses

In the following course list, the Level II Statistics prerequisite may be fulfilled with 01:960:212 or 291 or 384 or 401 or 484 or equivalent. Credit is not given for more than one course fulfilling the Level II Statistics prerequisite.

**01:960:142** ***Data 101 (3)***
Topics in data literacy for students not majoring in computer science or statistics.
***Prerequisite: 01:640:025 or placement into Intermediate Algebra or higher. Credit not given for both this course and 01:198:142.***

**01:960:211** ***Statistics I (3)***
Principles and methods of statistics, including probability distributions, sampling, estimation, hypothesis testing, regression and correlation analysis.
***Prerequisite: Any course equal to or greater than 01:640:112.***

**01:960:212** *Statistics II (3)*
Application of statistical techniques to the analysis of data, tests of significance, correlation and regression analysis, confidence intervals, analysis of variance and some design of experiments, analysis of cross-classified data, chi-square tests.
***Prerequisite 01:960:211 or 01:960:285. See Level II Statistics restrictions. Credit not given for both this course and either 01:960:384 or 484. Credit not given for both this course and 01:960:401 unless 401 is being used, with permission of the department, as a prerequisite for this course.***

**01:960:285** *Introductory Statistics for Business (3)*
Topics include descriptive statistics, probability, random variables, sampling distributions, principles of hypothesis testing, and one- and two-sample t-tests.
***Prerequisite: Any course equal to or greater than 01:640:112. Credit not given for more than one of 01:960:201, 211, 285, or 401.***

**01:960:291** *Statistical Inference for Data Science (3)*
Introduction to probability and statistics underlying data science. Topics include regression, resampling, confidence intervals, hypothesis testing, and related probability distributions.
***Prerequisites: 01:640:115 and (01:198:142 or 01:960:142).***

**01:960:295** *Data Management and Wrangling with R (3)*
An introduction to the tools and principles to retrieve, tidy, clean, and visualize data in preparation for statistical analysis. The R statistical environment is used but no prior knowledge is required. Interactions with databases will be included.
***Prerequisite:01:198:142 or 01:960:142, or 01:960:291, or 01:960:212, or 01:960:384, or 01:960:401***

**01:960:365** *Introduction to Bayesian Data Analysis (3)*
Principles of Bayesian data analysis and application of them to varied data analysis problems. Topics include: Bayes Theorem, linear and nonlinear models, hierarchical models, and the use of Markov chain Monte Carlo methods.
***Prerequisites: 01:640:152 and (01:960:212 or 01:960:384 or 01:960:401 or 01:960:484 or 01:960:291).***

**01:960:379** *Basic Probability and Statistics (3)*
Methods of presenting data; basic statistical measures of location; frequency distributions; elementary probability theory; probability distributions; the binomial, Poisson, and normal distributions; basic sampling theory.
***Prerequisite: One semester of calculus.***

**01:960:381** *Theory of Probability (3)*
Probability distributions; the binomial, geometric, exponential, Poisson, and normal distributions; moment-generating functions; sampling distributions; applications of probability theory.
***Prerequisites: Three semesters of calculus.***

**01:960:382** *Theory of Statistics (3)*
Statistical inference methods, point and interval estimation, maximum likelihood estimators, information inequality, hypothesis testing, Neyman-Pearson lemma, linear models.
***Prerequisite: 01:960:381 or equivalent.***

**01:960:384** *Intermediate Statistical Analysis (3)*
Application of statistical techniques to the analysis of data, tests of significance, correlation and regression analysis, confidence intervals, analysis of variance, and some design of experiments; analysis of cross-classified data, chi-square tests.
***Prerequisite: One of the following courses: 01:960:201, 211, 285, 379, 381, or permission of instructor. Credit not given for both this course and 01:960:212 or 484. Credit not given for both this course and 01:960:401 unless 401 is being used, with permission of the department, as a prerequisite for this course.***

**01:960:390** *Introductory Computing for Statistics (1)*
Introduction to the use of statistics computer packages with main focus on the SAS system. Includes generating random samples, estimation, testing hypothesis, ANOVA.
***Five-week course; 3 hrs. lec. and lab. Prerequisite: Level II Statistics. Graded on a Pass/Fail (undergraduate) and S/U (graduate) basis.***

**01:960:391,392** *Honors Seminars in Probability/Statistics (3,3)*
Real-life examples or case studies on statistics and probability theory and their ramifications. Topics may vary each semester. Extensive data analysis required.
***Prerequisite: Calculus 1 or permission of department. Corequisite: Calculus 2. Open to students in school honors programs.***

**01:960:401** *Basic Statistics for Research (3)*
As applied in fields other than statistics; treats research projects dependent on the use of observed data from planned experiments. Includes inference methods in estimation and hypothesis testing and general linear models.
***Prerequisite: Any course equal to or greater than 01:640:112. Credit not given for both this course and 01:960:211, 212, 384, and/or 484. Students who have already taken 01:960:401 and wish to take any of these courses should consult with the department.***

**01:960:425** *Lessons for Probability and Statistics from their History (3)*
What is the difference between statistics and data science? How should we choose between confidence intervals and posterior probabilities? Can you prove causality from observational data? This course looks at the history of these questions, from 13th-century calculations for dice to 21st-century developments in data science. Students will learn to use, discuss, and criticize statistical methods in a way that is both mathematically sound and historically informed.
***Prerequisites: (01:960:212 or 01:960:291 or 01:960:384 or 01:960:401 or 01:960:484) and (01:640:135 or 01:640:151)***

**01:960:435** *Seminar in Probability and Statistical Inference (3)*
Examines statistical theory, including topics such as Bayesian inference, confidence intervals, and maximum likelihood, to prepare students to use, discuss, and criticize statistical methods in a way that is both mathematically sound and historically informed.
***Prerequisite: 01:960:382 or equivalent or permission of instructor.***

**01:960:463** *Regression Methods (3)*
Multiple and nonlinear correlation and regression techniques for analysis of events in time and space: analysis of variance and covariance, related multivariate techniques, response surface approaches.
***Prerequisite: Level II***

**01:960:467** ***Applied Multivariate Analysis (3)***
Introduction to the methodology of multivariate analysis. Multiple linear regression, discriminant analysis, profile analysis, canonical correlation, principal components, and factor analysis.
***Prerequisite: Level II-Statistics.***

**01:960:476** ***Introduction to Sampling (3)***
Principles of sampling applied for economical procurement or assessment of data. Current techniques for area sampling, sampling of accounts, large-scale surveys, stratification, cluster sampling, systematic sampling, two-stage sampling, and construction of estimates.
***Prerequisites: Level II Statistics and 01:960:379 or 381 or equivalent with a grade of C or better, or permission of department.***

**01:960:482** ***Advanced Issues in Probability and Statistics (3)***
Focus on understanding both the power and limitations of statistical techniques and principles as applied in real-world settings. Includes projects involving the collection of data to be analyzed and discussed.
***Prerequisites: 01:960:382 and permission of instructor.***

**01:960:483** ***Statistical Quality Control (3)***
Statistical measures; histogram analysis; construction and analysis of control charts for variables and attributes; use of Dodge-Romig and Military Standards acceptance sampling plans; statistical aspects of tolerances.
***Prerequisite: Level II Statistics or 33:623:385.***

**01:960:484** ***Basic Applied Statistics (3)***
Confidence estimation, hypothesis testing, chi-square methods, correlation and regression analysis, basis of design of experiments.
***Prerequisite: One of the following courses: 01:960:201, 211, 285, 379, 381, or permission of instructor. Credit not given for both this course and 01:960:212 or 384 or 401.***

**01:960:486** ***Applied Statistical Learning (3)***
Introduction to machine learning methods from a statistical perspective. Both traditional methods such as logistic regression, naive Bayes classification, and discriminant analysis as well as more recent statistical methods such as regularization, boosting, and random forests will be applied to datasets of varying size. The emphasis will not be on programming the techniques from scratch but on understanding and applying the methods using a high level language such as R. Prerequisites: Level II Statistics.
***Prerequisite: Level II Statistics.***

**01:960:490** ***Introduction to Experimental Design (3)***
Basic concept and principles of designs. Nature and analysis of various designs; randomized blocks, Latin squares, factorial designs. Applications to specific problems.
***Prerequisite: Level II Statistics.***

**01:960:491** ***Reliability-Quality Control (3)***
Survey of current theory and practice in this field.
***Prerequisites: 01:640:251 and Level II Statistics.***

**01:960:492** ***Special Topics in Statistics and Probability (3)***
Readings and presentations related to the development of probability and statistics.
***Prerequisite: Permission of instructor.***

**01:960:495** ***Independent Studies in Statistics (3)***
***Prerequisite: Permission of department.***

# Study Abroad 959 (SAS)

## STUDY ABROAD 959

Rutgers offers over 180 study abroad and service-learning abroad programs in more than 50 countries around the world. Students can study overseas for a full year, a single semester, or a Summer or Winter Session. The majority of study abroad programs are offered in English and are open to students of any major.

Interested students should contact the Center for Global Education, Rutgers, The State University of New Jersey, 102 College Avenue, New Brunswick, NJ 08901-8543, or visit the website.

Students wishing to study abroad with programs other than those hosted by Rutgers may contact other American colleges or may seek admission directly from a foreign university. Students making these arrangements should speak with their academic dean about the acceptability of the program and the transfer of credit.



## Courses

## Courses

**01:959:191,192,193,194** ***Study Abroad - Honors (1)***
Field experience course, either embedded in an existing honors course or a free-standing honors experience.
***Graded Pass/No Credit.***

**01:959:200** ***Study Abroad - Nursing (BA)***

**01:959:210** ***Study Abroad - SEBS (BA)***

**01:959:220** ***Study Abroad in Journalism and Media Studies (BA)***
Students will explore issues such as war, corruption, family, food, the arts, and the influence of the sea.

**01:959:300** ***Study Abroad in Guatemala (BA)***

**01:959:301,302** ***Study Abroad in Argentina (BA,BA)***
Study for a year or a semester in Buenos Aires at the CIEE Study Center at the Facultad Latinoamericana de Ciencias Sociales (FLACSO).

**01:959:304,305** ***Study Abroad in Australia (BA,BA)***
Study for a year or a semester at the University of Melbourne, the University of Queensland, or Macquarie University.

**01:959:307,308** ***Study Abroad in Barbados (BA,BA)***
Study for a year or a semester at the University of West Indies at Cave Hill.

**01:959:310,311,312** ***Study Abroad in Belgium (BA,BA,BA)***
Study for a year, semester, or Summer Session in Brussels at Vesalius College.

**01:959:315** ***Study Abroad in Bolivia (BA)***
Study for a Summer Session in Cochabamba and environs in the Rutgers Latin American Studies Program/ Department of Anthropology's International Service Learning Program.

**01:959:316,317** ***Study Abroad in Brazil (BA,BA)***
Study for a year or a semester in either Saõ Paulo at the University of Saõ Paulo (USP), or the USP Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ), or in Rio de Janeiro at the Universidade Estadual do Norte Fluminense Darcy Ribeiro.

**01:959:320,321** ***Study Abroad in the Cayman Islands (BA,BA)***
Study for either a Winter or Summer Session on Little Cayman Island at the Central Caribbean Marine Institute.

**01:959:322,323** ***Study Abroad in Chile (BA,BA)***
Study for a year or a semester in Santiago at the CIEE Study Center at the Pontificia Universidad Católica de Chile and the Universidad de Chile.

**01:959:325,326,327** ***Study Abroad in China (BA,BA,BA)***
Study for a year or a semester at Jilin University, or for a Summer Session in Jilin in the Rutgers Asian Languages and Cultures Department's intensive Chinese program, or the School of Social Work's summer program in Beijing.

**01:959:328,329,330** ***Study Abroad in Costa Rica (BA,BA,BA)***
Study for a year or a semester in San José at the Universidad de Costa Rica.

**01:959:331,332** ***Study Abroad in the Dominican Republic (BA,BA)***
Study for a year or a semester in Santiago at the CIEE Study Center at the Facultad Latinoamericana de Ciencias Sociales (FLACSO-Dominican Republic).

**01:959:334,335** ***Study Abroad in Egypt (BA,BA)***
Study for a year or a semester in Dokki, near Cairo, at the AMIDEAST Semester/Academic Year in Cairo Program.

**01:959:337,338,339** ***Study Abroad in France (BA,BA,BA)***
Study for a year or a semester either in Tours, at the Université François Rabelais; Paris variously at fourteen locations (Paris I, III, IV, VI, VII, VIII, X, XI, XII, XIII; Université d'Évry Val-d'Essonne; Institut Catholique de Paris; Université Paris-Est Marne-la-Vallée; and Université de Versailles St. Quentin-en-Yvellines); or at Sciences Politique, or for a Summer Session either in Paris, in the Rutgers Art History Department's Summer Institute in Art History; or Cluny in the Rutgers School of Environmental and Biological Sciences Department of Biochemistry and Microbiology's Science of Wine and Cheese course.

**01:959:340,341,342** ***Study Abroad in Germany (BA,BA,BA)***
Study for a year or a semester either in Constance at the Universität Konstanz, or Berlin at the Freie Universität (direct enroll or FU-BEST), or Munich in the Technische Universität München, or Östrich-Winkel at the European Business School (EBS); or for a Summer Session in EBS's intensive summer seminar, or Rutgers landscape architecture program in Berlin and Munich.

**01:959:343,344,345** ***Study Abroad in Ghana (BA,BA,BA)***
Study for a year or a semester in Accra at the University of Ghana, or for a Summer Session in the Rutgers Center for African Studies/Department of Women's, Gender, and Sexuality Studies International Service Learning in Ghana program.

**01:959:346,347,348** ***Study Abroad in Greece (BA,BA,BA)***
Study for a year or a semester in Athens at College Year in Athens (CYA), or in Thessaloniki at the American College of Thessaloniki (ACT), or for a Summer Session in Athens in CYA's various programs, or in Thessaloniki at Aristotle University's intensive modern Greek program, or throughout Greece in the Rutgers Department of Classics' Summer Semester in Greece Program, or in Athens in the Rutgers Department of Art History's Cultural Heritage Preservation Program.

**01:959:349,350** ***Study Abroad in Hungary (BA,BA)***
Study for a year or a semester in Budapest at the University of California's Central European Studies Center.

**01:959:352,353** ***Study Abroad in India (BA,BA)***
Study for a year or a semester in Delhi either at St. Stephen's College or Ramjas College.

**01:959:355,356** ***Study Abroad in Ireland (BA,BA)***
Study for a year or a semester either at University College Dublin, University College Cork, or the Limerick Institute of Technology.

**01:959:358,359** ***Study Abroad in Israel (BA,BA)***
Study for a year or a semester at the University of Haifa, in Beer Sheva at Ben-Gurion University, or at the Hebrew University of Jerusalem.

**01:959:361,362,363** ***Study Abroad in Italy (BA,BA,BA)***
Study for a year or a semester in Rome at John Cabot University (JCU), or in Ferrara through CIEE's programs in language and culture and liberal arts; or for a Summer Session in Rome in JCU's various programs, or the Rutgers Summer Art History program in Rome.

**01:959:364,365,366** ***Study Abroad in Japan (BA,BA,BA)***
Study for a year or a semester either in Kyoto at Ritsumeikan University, Beppo at Ritsumeikan Asia Pacific University, or International Christian University in Tokyo; or for a Summer Session in Kyoto in the Rutgers Department of Political Science's course on Japanese international relations.

**01:959:367,368** ***Study Abroad in Jordan (BA,BA)***
Study for a year or a semester at the AMIDEAST Semester/Academic Year in Amman Program.

**01:959:371** ***Study Abroad in Kenya (BA)***
Study for a Summer Session throughout Kenya in the Rutgers Department of Anthropology's program on primatology (Laikippia Plateau region).

**01:959:372** ***Study Abroad in Kenya (BA)***
Study for a Summer Session throughout Kenya in the Rutgers Department of Anthropology's program on palaeoanthropolgy (Koobi Fora).

**01:959:373,374,375** ***Study Abroad in Mexico (BA,BA,BA)***
Study for a year or a semester in Merida at the Universidad Autónoma de Yucatán, or for a Winter Session throughout the Yucatan in the Rutgers School of Environmental and Biological Sciences (SEBS) Department of Landscape Architecture's course on Cities and Monuments of the Yucatan, or for a Summer Session at Oaxaca in the Rutgers Latin American Studies Program/SEBS Department of Human Ecology International Service Learning Program.

**01:959:378** ***Study Abroad in Morocco (BA)***
Study for a Summer Session in Rabat at the AMIDEAST intensive modern Arabic program.

**01:959:379,380** ***Study Abroad in the Netherlands (BA,BA)***
Study for a year or a semester at the University of Leiden.

**01:959:382,383** ***Study Abroad in New Zealand (BA,BA)***
Study for a year or a semester at the University of Auckland.

**01:959:385,386** ***Study Abroad in Norway (BA,BA)***
Study for a year or a semester at the University of Oslo.

**01:959:388,389** ***Study Abroad in Peru (BA,BA)***
Study for a year or a semester in Cusco and environs in the ProWorld International Service Learning Semester Program.

**01:959:396** ***Study Abroad in Romania (BA)***
Study for a Summer Session in Cluj and environs in the Rutgers School of Social Work's International Service Learning Program.

**01:959:397** ***Study Abroad in Uruguay (BA)***

**01:959:398,399** ***Study Abroad in Russia (BA,BA)***
Study for the spring semester at the European University at St. Petersburg, or for a Summer Session in the Rutgers Russian language and literature program's intensive Russian courses.

**01:959:400,401** ***Study Abroad in South Africa (BA,BA)***
Study for a year or a semester in Pietermaritzburg at the University of Kwazulu Natal, or through CIEE's programs in arts and sciences or service learning in Cape Town at the University of Cape Town, or at the University of Stellenbosch.

**01:959:402** ***Study Abroad CIEE Open Campus LA (BA)***

**01:959:403,404,405** ***Study Abroad in South Korea (BA,BA,BA)***
Study for a year, a semester, or a Summer Session in one of various programs in Seoul at Ewha Woman's University.

**01:959:406,407,408** ***Study Abroad in Spain (BA,BA,BA)***
Study for a year or a semester in Valencia at the Universitat de València.

**01:959:409,410** ***Study Abroad in Thailand (BA,BA)***
Study for a year or a semester in Bangkok and environs in the ProWorld International Service Learning Semester Program.

**01:959:412,413** ***Study Abroad in Turkey (BA,BA)***
Study for a year or a semester in Istanbul at Koç University or Ankara at Bilkent University.

**01:959:415,416,417** ***Study Abroad in the United Kingdom (BA,BA,BA)***
Study for a year or a semester variously in 10 locations (Bristol University, Cardiff University, City University London, University College London, University of East Anglia, University of Exeter, University of Manchester, University of Reading, University of Sussex, and University of York), or for a Summer Session in Sussex either at the University of Sussex in various courses or in the Rutgers creative writing program.

**01:959:418,419** ***Study Abroad on Euroscholars Program (BA,BA)***
Study for a year or a semester on a research project in one of 12 major European universities.

**01:959:421,422,423** ***Field Experience (BA,BA,BA)***
Various service learning projects supplementing enrollment in semester/year-length study abroad programs.

**01:959:424,425,426** ***Supplemental Language Study (BA,BA,BA)***
Elementary language instruction supplementing Rutgers faculty-led summer programs.

**01:959:427** ***Study Abroad in Austria (BA)***
Study for a summer at Graz University of Technology and the University of Graz, Austria.

**01:959:428,429** ***Study Abroad in Austria (BA, BA)***
Study for a semester or year at Graz University of Technology and the University of Graz, Austria.

**01:959:431** ***Study Abroad in the Czech Republic (BA)***
Study for a summer on the Council for International Educational Exchange's Program in Central European Studies in Prague.

**01:959:432,433** ***Study Abroad in the Czech Republic (BA,BA)***
Study for a semester or year on the Council for International Educational Exchange's Program in Central European Studies in Prague.

**01:959:434,435** ***Study Abroad in Hong Kong (BA,BA)***
Study for a semester or year at the Hong Kong University of Science and Technology.

**01:959:437,438** ***Study Abroad in Portugal (BA,BA)***
Study for a semester or year on the Council for International Educational Exchange's Language and Culture Program at the School of Social Sciences and Humanities, Universidade Nova de Lisboa.

**01:959:440,441** ***Study Abroad in Sweden (BA,BA)***
Study for a semester or year at the Royal Institute of Technology in Stockholm.

**01:959:442** ***Study Abroad in Poland (BA)***
Study cultural heritage and preservation studies in Krakow, Poland, and Prague, Czech Republic.

**01:959:446** ***Study Abroad in Taiwan (BA)***
Study for a semester or a year at the College of Management, National Taiwan University, Taiwan.

**01:959:447** ***Study Abroad in Taiwan (BA)***
Study for a semester or a year at the College of Management, National Taiwan University, Taiwan.

**01:959:448** ***Study Abroad in Bonaire (BA)***
Study chemistry and marine biology in Bonaire during the summer.

**01:959:449** ***Study Abroad in South Africa (BA)***
Study for a Summer Session in South Africa.

**01:959:450** ***Study Abroad in Cuba (BA)***
Study comparative health care systems in Cuba in the summer.

**01:959:451** ***Study Abroad in Indonesia (BA)***
Study primates, ecology, and conservation in Indonesia in the summer.

**01:959:454** ***Study Abroad in Senegal (BA)***
Study in Senegal in the summer.

**01:959:457** ***Study Abroad at the UN (BA)***
Study the UN and visit UN headquarters in the summer.

**01:959:460** ***Study Abroad in Iceland (BA)***
Study renewable energy in Iceland in the summer.

**01:959:463** ***Study Abroad in Oman (BA)***
Study for a semester or a year with AMIDEAST in Muscat, Oman.

**01:959:466** ***Study Abroad in Belize (BA)***
Study animal science in Belize in the summer.

# 799 Supply Chain Management (RBS-NB)

## 799 Supply Chain Management

Major requirements for students who entered RBS ***from fall 2016 to fall 2022:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (junior or senior year33:140:320 required if

double majoring in Accounting)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required SCM Courses**

33:799:305 Global Procurement and Sourcing Strategies (3) (prerequisite: 33:799:301)
33:799:330 Business Logistics and Transportation (3) (prerequisite: 33:799:301)
33:799:310 Demand Planning and Fulfillment (3) (prerequisite: 33:799:301)
33:799:380 Introduction to Project Management (3) (prerequisite: 33:799:301)
33:799:493 Internship in Supply Chain Management (3) (prerequisite: 33:799:301) OR 33:799:421 Co-op in Supply Chain Management (3) (prerequisite: 33:799:301) OR 33:799:420 SCM Industry Client Projects (3)** (prerequisites: 33:799:380 and seniors only)

**Three Supply Chain Electives (9)****

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

**Students may only take one experiential learning course towards their SCM required courses from among these three categories: Industry Client Projects, Internship in Supply Chain Management, and Co-op in Supply Chain Management. Co-op in Supply Chain Management and Internship in Supply Chain Management for SCM required credits are by application only through the Supply Chain department. If you choose to take Co-op in Supply Chain as your one SCM required course you will also be registered for both 799:421 (SCM Co-op) and 799:422 (SCM Elective Co-op) with 799:422 counting toward SCM elective credit. This is the only exception for experiential learning toward SCM elective credit. Any other experiential learning experience after your one allowed for SCM required credit must apply through to the Office of Career Management and you will be registered for general elective credit only.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required SCM Courses**

33:799:305 Global Procurement and Sourcing Strategies (3) (prerequisite: 33:799:301)
33:799:330 Business Logistics and Transportation (3) (prerequisite: 33:799:301)
33:799:310 Demand Planning and Fulfillment (3) (prerequisite: 33:799:301)
33:799:380 Introduction to Project Management (3) (prerequisite: 33:799:301)
33:799:493 Internship in Supply Chain Management (3)** (prerequisite: 33:799:301) OR 33:799:421 Co-op in Supply Chain Management (3)** (prerequisite: 33:799:301) OR 33:799:420 SCM Industry Client Projects (3)** (prerequisites: 33:799:380 and seniors only)

**Three Supply Chain Electives (9)****

** Students may only take **one** experiential learning course towards their SCM required courses from among these three categories: Industry Client Projects, Internship in Supply Chain Management, and Co-op in Supply Chain Management. Co-op in Supply Chain Management and Internship in Supply Chain Management for SCM required credits are by application only through the Supply Chain department. If you choose to take Co-op in Supply Chain as your **one** SCM required course you will also be registered for both 799:421 (SCM Co-op) and 011:482 (Special Topics in Admin Studies) with 011:482 counting for general elective credit only. SCM students are limited to one experiential learning experience. After your **one** course allowed for SCM required credit, you must apply through to the Office of Career Management and you will be registered for general elective credit only.

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

# Theater 965 (MGSA)

## THEATER 965

Department of Theater, Mason Gross School of the Arts

The bachelor of arts (B.A.) program in theater is designed for those students seeking a liberal arts education coupled with a solid fundamental overview of the professional theater. The program provides a high-quality, general perspective of theater encompassing academic study, performance studies, production practice, and appropriate internships and/or project work. Several opportunities exist for students to study abroad in university-sponsored programs. B.A. students enjoy several performing/production outlets with extracurricular theater organizations on campus: the Cabaret Theater, the College Avenue Players, Hillel Theater, and the Livingston Theater Company.

See the Mason Gross School of the Arts section of this catalog for faculty listing and bachelor of fine arts (B.F.A.) information. Students who wish to specialize in acting, design, or production should consider auditioning or interviewing to be a B.F.A. student. Please note that casting opportunities in departmental Rutgers Theater Company productions are limited to bachelor of fine arts (B.F.A.) students.

Theater 965 (MGSA)

## Major Requirements

## Major Requirements

As a means to explore potential aptitude for a theater major, School of Arts and Sciences students should take: 07:965:211 Theater Appreciation and 07:965:271 Basic Acting or 07:965:215 Intro to Theatrical Design & Production.

Bachelor of arts (B.A.) theater majors should complete courses in 07:965:281-282 Theater History (or the online equivalent 07:965:231-232); 07:965:215 Intro to Theatrical Design & Production; and 07:966:123 Theater Practice (taken twice) by the end of the junior year, since they are required of all majors and are prerequisites for most advanced theater courses. Theater History is a two-semester course, which must be taken in sequence, beginning in the fall semester for the in-person section. The Theater History course is also offered online each semester. Students are expected to achieve grades of C+ or better in the major and no course with a grade of D or lower will count toward the major.

Depending on the student's interest, Theater arts students are encouraged to take correlative courses in dramatic literature (modern drama, Shakespeare) as well as courses in art, dance, and music history and appreciation.

Theater majors in the B.A. program are required to take a minimum of 47 credits, distributed as follows:

*16 Credits in Academic Courses (*Required)*
07:965:231-232 (online)* Theater History I and II (3,3) fall/spring
07:965:390* Theater Horizons (1)
07:965:211 Theater Appreciation I (3) fall and spring
07:965:214 Black Theater History (3) spring
07:965:234 Intro to Dramaturgy (3) fall
07:965:260 Musical Theater Appreciation (3) spring
07:965:290 Broadway: American Musical (3) spring
07:965:300 New York Theater Experience (3) spring
07:965:302 Theater for Social Development (3)
07:965:314 Playwriting (3) fall
07:965:370 Global Theater I (3)
07:965:401 Theater Criticism (3) spring
07:965:473 Clothing and Culture (3) fall

*9-10 Credits* in Physical Theater Courses (Required):*
07:965:215* Introduction to Theatrical Design & Production (3) fall
07:966:123* Theater Practice (2,2) **course is taken twice and must take different sections**
07:965:310-11 Introduction to Costume Design (3,3) fall/spring
07:966:315 Intro to Stage Management (3) fall
07:965:216 Scenic Art II (3) spring
07:9656:219 Intro to Scenic Construction (2)
07:966:242 Intro to Stage Lighting (2)
07:966:249 Intro to Stage Management (3)
07:966:219 Costume Construction (2)
07:966:310 Costume Design I (3)
07:966:361 Sound Tech & Design for Theater (2)
07:966:490 Advanced Light Lab (2)
07:965:496 Seminar Topics: Embellishments (BA)
07:966:277 Production Properties (2)
07:966:305 Advanced Lighting Techniques (2)
07:966:350 Fabric Dyeing (2)

*6 Credits in Performance (Acting and/or Directing) (*Required):*
07:965:210 Intro to Medical Acting (3) fall
07:965:271* Basic Acting (3) fall/spring
07:965:272 Intermediate Acting: Scene Study (3) fall/spring
07:965:275 On Camera Acting (3)
07:965:325 Advanced Acting (3) spring
07:965:326 Performance Workshop (3) by audition only fall
07:965:421 Directing (3) fall
07:965:422 Advanced Directing Project (3) by special permission only spring

*9-10 Credits in Theater Electives* chosen from among any of the following that were not taken to fill another requirement in academic, physical theater, or performance elective:
07:965:214 Black Theater History (3) spring
07:965:222 Performing Solo from Stage to YouTube Online (3) online
07:965:225 Creating Characters Onstage and Online (3) online
07:965:227 Voice & Speech I (2)
07:965:240 Staging Resistance: Theater, Protest, and Social Change Online (3) online
07:966:242 Introduction to Stage Lighting (2) spring
07:965:260 Musical Theatre Appreciation (3) spring
07:965:272 Intermediate Acting (3) fall and spring
07:965:275 On Camera Acting (3)
07:965:290 Broadway: American Musical (3) spring
07:965:300 New York Theater Experience (3) spring
07:965:302 Theater for Social Development (3) fall
07:965:310 Introduction to Costume Design (3) fall
07:965:311 Introduction to Costume Design (3) spring
07:966:315 Intro to Stage Management (3) fall
07:965:325 Advanced Acting (3) spring
07:965:326 Performance Workshop (3) fall
07:965:330 Improving Communication Through Improv (3)
07:965:350 Improvisation and Theater Games (2) fall
07:965:364 Theater Management (3) alternate falls
07:965:365 Theater Management: Producing (3) alternate falls
07:965:371 Global Theater II (3) spring
07:965:410 Theater Criticism (3) spring
07:965:421 Directing (3) fall
07:965:422 Advanced Directing Project (3) spring
07:965:451 Storytelling Workshop (2) spring
07:965:471 Creative Dramatics for Children (2) fall
07:965:472 Creative Dramatics for Children (2) spring
07:965:473 Clothing and Culture (3) fall
07:966:496 Race, Identity & Theater (3)

**9 credits in Physical Theater requires 10 credits to be completed in Theater Electives to reach the required 47 credits for completion of the major.

*Other 966 Theater Classes Are Also Available as Theater Electives*
Most require prerequisites or permission of instructor. Note: the semester a course is offered is subject to change. Courses offered by the English Department may also be accepted towards the major, but must be approved in advance.

*6 Credits in Required Project Work or Internship*
Working closely with the B.A. adviser, and any additional faculty adviser, junior or senior students develop and propose appropriate work for the advanced Internship and/or Project Work. Internships involve the student

working in a professional theater environment outside of the university. Project Work is comprised of major involvement on a theatrical project such as writing or directing a production. On rare occasions an appropriate acting project can be considered.

07:965:396 Internship/Theater (BA)
07:965:491-492 Project Work (BA,BA)
07:965:493 Honors Project (BA)
Approved study abroad credits may be substituted.
All credits in this category must be planned and supervised by the B.A. theater arts adviser.

Theater 965 (MGSA)

# Minor Requirements

# Minor Requirements

The minor in theater arts requires 18 credits. Students are required to take 07:965:281-282 Theater History (3,3) (or the online equivalent 07:965:231-232 [3,3]) and 07:965:215 Intro to Theatrical Design & Production (3). In addition, theater arts minors take 3 credits toward the Physical Theater requirement and 6 credits in theater arts electives. Bachelor of arts (B.A.) advisers in theater arts must be consulted for approval of elective selections.

Theater arts minors who are declaring in the senior year must preregister for classes to ensure availability; space is limited. Theater History is a two-semester course, which must be taken in sequence, beginning in the fall semester. The course is also offered online. 07:965:215 Intro to Theatrical Design & Production is required and is offered in the fall semester. It is a prerequisite for all other theater electives. Students are expected to achieve grades of C+ or better in the minor. A course with a grade of D will not count toward the minor.

*6 Credits in Required Academic Courses*
07:965:281-282 Theater History I and II (3,3) or the online equivalent 07:965:231-232 (3,3)
07:965:390* Theater Horizons (1)
07:965:211 Theater Appreciation I (3) fall and spring
07:965:214 Black Theater History (3) spring
07:965:234 Intro to Dramaturgy (3) fall
07:965:260 Musical Theater Appreciation (3) spring
07:965:290 Broadway: American Musical (3) spring
07:965:300 New York Theater Experience (3) spring
07:965:302 Theater for Social Development (3)
07:965:314 Playwriting (3) fall
07:965:370 Global Theater I (3)
07:965:410 Theater Criticism (3) spring
07:965:473 Clothing and Culture (3) fall
07:966:306 Aesthetics of Space (3) fall

*6 Credits in Physical Theater (Required*)*
07:966:123 Theater Practice (2,2 **course is taken twice and must take different sections**
07:965:215* Intro to Theatrical Design & Productio (3) fall

07:965:216 Scenic Art II (3) spring
07:965:310 Introduction to Costume Design (3) fall
07:965:311 Introduction to Costume Design (3) spring
07:966:242 Introduction to Stage Lighting (2) spring
07:966:219 Intro to Scenic Construction (2)
07:966:249 Intro to Stage Management (3)
07:966:219 Costume Construction (2)
07:966:361 Sound Tech & Design for Theater (2)
07:965:490 Advanced Light Lab (2)
07:965:496 Seminar Topics: Embellishments (BA)
07:966:277 Production Properties (2)
07:966:305 Advanced Lighting Techniques (2)
07:966:350 Fabric Dyeing (2)

*6 Credits in Theater Electives chosen from among any of the following which were not taken to fill another requirement in curricular core or physical theater (see course listing for prerequisites):*
07:965:211 Theater Appreciation I (3) fall and spring
07:965:214 Black Theater History (3) spring
07:965:222 Performing Solo from Stage to YouTube Online (3) online
07:965:225 Creating Characters Onstage and Online (3) online
07:965:240 Staging Resistance (3) online
07:965:260 Musical Theatre Appreciation (3) spring
07:965:271 Basic Acting (3)
07:965:272 Intermediate Acting (3) fall and spring
07:965:275 On Camera Acting (3)
07:965:290 Broadway: American Musical (3) spring
07:965:300 New York Theater Experience (3) spring
07:965:302 Theater for Social Development (3) fall
07:965:310 Introduction to Costume Design (3) fall
07:965:311 Introduction to Costume Design (3) spring
07:965:325 Advanced Acting (3) spring
07:965:326 Performance Workshop (3) fall
07:965:330 Improving Communication Through Improv (3)
07:965:350 Improvisation and Theater Games (2) fall
07:965:364 Theater Management (3) alternate falls
07:965:365 Theater Management: Producing (3) alternate falls
07:965:370 Global Theater I (3) fall
07:965:410 Theater Criticism (3) spring
07:965:421 Directing (3) fall
07:965:422 Advanced Directing Project (3) spring
07:965:451 Storytelling Workshop (2) spring
07:965:471 Creative Dramatics for Children (3) fall
07:965:472 Creative Dramatics for Children (3) spring
07:965:473 Clothing and Culture (3) fall

07:965:490 Advanced Light Lab (2)
07:966:242 Introduction to Stage Lighting (2) spring
07:965:496 Race, Identity & Theater (3)

Note: The semester a course is offered is subject to change.

Theater 965 (MGSA)

# Departmental Honors Program

# Departmental Honors Program

A student in the theater arts major qualifies as a candidate for departmental honors after meeting several requirements: at the time the proposal for candidacy is submitted, the student must have a cumulative grade-point average of 3.0 or better and an average of 3.5 or better in the major; the student must submit to their bachelor of arts (B.A.) adviser a project proposal that has the sanction of one member of the department, approved by the B.A. adviser who has agreed to serve as mentor. The project may take the form of a paper in theater history; or aesthetics and criticism; or may be a creative work in areas of acting and directing, design, or playwriting.

The candidate whose proposal is accepted must enroll in 07:965:493, an honors seminar, or 07:965:494, the thesis project. This project must be completed by May 1 and is judged by the student's mentor and the B.A. adviser and one other faculty member who determine whether the student's work merits high honors, honors, or no honors.

Theater 965 (MGSA)

# Courses (965)

# Courses (965)

**07:965:210** ***Introduction to Medical Acting (3)***
This course will provide students with an opportunity to use theatre training to learn how to portray patients in the physician training program at RWJ Medical School and beyond. Improvisation and actor training techniques will be used to develop skills as actor/educators in this unique course.

**07:965:211** ***Theater Appreciation I (3)***
Designed for students in theater. Students attend a wide spectrum of theater offerings: Broadway, Off-Broadway, Off-Off-Broadway, repertory, and university theater performances and, through discussion and lectures by professional artists, gain an appreciation of performance. Theater tickets and in-class presentation course fee (generally, no text is required).

**07:965:214** ***Black Theater History (3)***
This course is designed to further develop the student's understanding of the evolution of black theater in America coupled with the historical impact of race as a fundamental component. The class dictates an analysis of the student's understanding/acceptance of racial inequities to further explore how movements, institutions, artists, and writers used theater and live performance as a form of expression.
***Prerequisite: 07:965:211.***

**07:965:215** *Intro to Theatrical Design and Production(3)*
An introductory course in basic theatrical design and production. Lectures (given twice a week) cover a wide range of topics relating to the technical, historical, and aesthetic aspects of designing scenery, costumes, and lighting for the stage.
*Fall only.*

**07:965:216** *Scenic Art (3)*
Lecture/workshop course in theatrical set design that expands on concepts covered in the fall semester. Lectures cover both conceptual/artistic and technical topics, and lab periods will be used to learn hands-on technical skills. The class culminates in a single set design project, formally presented at the end of the semester.
*Prerequisite: 07:965:215. Spring only.*

**07:965:222** *Performing Solo: From Stage to YouTube Online (3)*
This is a performance-based elective course designed for students of all disciplines who wish to persuasively communicate in person or on video. If you¿re scared of public speaking, then this class is a great way to find your comfort zone, from the comfort of your own home. Students will try vlogging, stand-up, monologues, narration, and even multi-character dialogue, with the help of a supportive instructor and class. Students will study these formats through lectures and by watching videos. Students will have the freedom to write their own scripts on a variety of topics important to them. Performance experience is not required to take this course. These skills are not only used in entertainment, but also in video conferencing and marketing for any profession. No matter your major or future career, this course can help you be the person who is confident, comfortable, and stands out.

**07:965:225** *Creating Characters Onstage and Online (3)*
This is a performance-based elective course designed for students of all disciplines who wish to persuasively communicate in person or on video. If you¿re scared of public speaking, then this class is a great way to find your comfort zone, from the comfort of your own home. Students will try vlogging, stand-up, monologues, narration, and even multi-character dialogue, with the help of a supportive instructor and class. Students will study these formats through lectures and by watching videos. Students will have the freedom to write their own scripts on a variety of topics important to them. Performance experience is not required to take this course. These skills are not only used in entertainment, but also in video conferencing and marketing for any profession. No matter your major or future career, this course can help you be the person who is confident, comfortable, and stands out.

**07:965:230** *Theater Apprciation Online (3)*
Students attend a wide spectrum of theater offerings including Broadway, off-Broadway, off-off-Broadway, regional, educational, and community events, and, through viewing those theatrical productions and online lectures, gain an appreciation of performance and everything that goes into producing theater.
*Note: Students will not receive credit for both 07:965:230 and 07:965:211. This course does not fulfill any SAS core requirements.*

**07:965:231** *Theater History I (3)*
The objective is to examine the traditions of primarily Western theater from its origins to the English Restoration, within the context of wider cultural and political developments. The class focuses on the relationship of these dramatic traditions to current issues such as gender, race, power, and identity, as well as theater as a vital expression of universal human empathy.
*Students may not receive credit for both 07:965:231-232 and 07:965:281-282.*

**07:965:232** ***Theater History II Online (3)***
Theater II picks up where the first class leaves off and takes us to the present time. A survey of key theater developments, concepts, and trends, primarily Western, from the 18th Century to the present, within the broader context of emergent modernity, the crises this radical change produced, and the range of artistic responses to this new and destabilizing reality.
***Prerequisites: 07:965:231 or 07:965:281. Students may not receive credit for both 07:965:231-232 and 07:965:281-282.***

**07:965:240** ***Staging Resistance: Theater, Protest, and Social Change Online (3)***
Through plays and other performance texts, videos, graphics, media accounts, and critical theory readings, this class will explore the vibrant tradition of the atricalized or staged resistance to the injustice and inequality endemic to contemporary culture. Sources include: plays and films that explicitly challenge embedded power hierarchies; radical performative disruptions such as Pussy Riot, Occupy Wall Street, and Take a Knee protests; and participatory community-engaged theater for social change.

**07:965:255** ***Upcycling (3)***
This course focuses on utilizing ancient techniques, rooted in culture and tradition, to counteract the current effects of fast fashion on the future of our environment. The class combines exploring how what we wear negatively affects the environment and reimagines ancient crafts through the art of upcycling fashion which has grown out of the need for environmental stewardship among artists and craftspeople.

The class combines lectures covering the effects of fast fashion on our environment and hands on pedagogy in the art of upcycling as a response.

**07:965:260** ***Musical Theatre Appreciation (3)***
An overview of the American art form. This course will explore the history, vocabulary, style, and growth of musical theatre through lectures, special guest demonstrators, and live performances. Theater tickets and in-class presentation course fee.

**07:965:271** ***Basic Acting (3)***
This course is designed to provide students a basic understanding of the technique of acting. Students discover the basic approaches to the technique of acting through active participation in exercises, improvisations, and scene work

**07:965:272** ***Intermediate Acting (3)***
This course builds on the skills acquired in Basic Acting; upon that foundation, students will study and practice specific techniques designed to interpret and rehearse scripted material. Students will explore genuine and spontaneous responses to imaginary circumstances that they will both craft and interpret from established texts.
***Prerequisite: 07:965:271.***

**07:965:275** ***On-Camera Acting (3)***
To provide hands-on experience for students interested in film and television acting techniques for the camera. This course covers acting techniques that are used in various film and television productions.
***Summer only.***

**07:965:281** ***Theater Histories I (3)***
All of theater is a conversation with collaborators, audiences, contemporaries and the past. In order to criticize and reflect on our present day, we need to understand where we have been. THEATER HISTORIES I is the tart of that conversation. It is a first step in understanding what came before this very moment we find ourselves living in today. This course aims to develop a set of conceptual and analytical tools for the close reading and interpretation of plays and historical texts as blueprints or scores for theatrical performance. It provides an analytical vocabulary and dramaturgical skillset useful both to students with a general interest in theater as an artistic and cultural form and to aspiring theater-makers, whether in acting, directing, design, dramaturgy or other areas.
***Students may not receive credit for both 07:965:231-232 and 07:965:281-282.***

**07:965:282** ***Theater Histories II (3)***
This course aims to develop a set of conceptual and analytical tools for the close reading and interpretation of plays and historical texts as blueprints or scores for theatrical performance. It provides an analytical vocabulary and dramaturgical skillset useful both to students with a general interest in theater as an artistic and cultural form and to aspiring theater-makers, whether in acting, directing, design, dramaturgy, or other areas.
***Prerequisites: 07:965:281 or 07:965:231. Students may not receive credit for both 07:965:231-232 and 07:965:281-282.***

**07:965:290** ***Broadway: American Musical (3)***
Examine the masterworks to explore musical theater history, execution, and cultural significance. Live discussion will be interwoven with multimedia and attendance at shows to highlight the contributions of important artists and productions. Course fee for tickets to live theater and in-class presentation. Travel costs to see assigned plays are not included.

**07:965:300** ***New York Theater Experience (3)***
This course is designed to provide the student with an enhanced, detailed experience as an audience member of contemporary theater. This is done by examining and challenging the plays in deep analytical terms: examining play/script structure, elements of design, performance truth, and directing/staging. Students attend up to 12 professional productions--Broadway, Off Broadway, and regional. The class attends plays every Wednesday night, and an in-depth student panel discussion occurs the following Monday evening. Course fee for tickets to live theater. Travel costs to see assigned plays are not included. Attendance is required for seeing plays.
***Prerequisites: 07:965:211***

**07:965:302** ***Theater for Social Development (3)***
Theater for Social Development is designed to develop students' understanding of how the arts can be integrated into community development and engaged social interventions.

**07:965:310** ***Introduction to Costume Design (3)***
Introduction to Costume Design is a lecture course that covers the fundamentals of costume design; character analysis, basic research techniques, and rendering are covered as they pertain to costume design.

**07:965:311** ***Introduction to Costume Design (3)***
This is an introductory course on the fundamentals of costume design. In this course, we will cover the practical application of methods, materials, and techniques used in the creative storytelling process. Character analysis, costume research, and rendering will be introduced with the focus on providing students with a working

understanding of the theatrical design process as well as the essential skills needed to design costumes for live performance.
***Prerequisites: 07:965:310***

**07:965:314** ***Playwriting (3)***
This course will introduce you to the fundamentals of playwriting. During the semester, we will practice short-form exercises and peer critiques in preparation for writing and presenting a final, fully original one-act play.
***Prerequisites: 07:965:211 or 07:965:230***

**07:965:325** ***Advanced Acting (3)***
This course is designed to deepen the acting student's understanding of the craft of acting using structured improvisations, acting exercises, and a study of the rehearsal process as it relates to the production of a one-act play. Actor training will focus on and make use of individual and group exercises that challenge both the mind and the body.
***Prerequisites: 07:965:326. Approval of instructor or audition required for admission.***

**07:965:326** ***Performance Workshop (3)***
An active, process-oriented approach to play devising, this course will be concerned with the creation of a single one-act play. Though there will be many opportunities for writing in the class, the nature of this writing will be focused more on active on-your-feet crafting of the elements that make up a piece of dramatic writing than on the traditional pen-to-paper approach. Each student will act as a scribe in collaboration with the group to record and fashion our process into a completed play which will then be rehearsed and performed as a culminating experience for the class.
***Prerequisites: 07:965:271 and 07:965:272. Approval of instructor or audition required for admission.***

**07:965:330** ***Improving Communication through Improv (3)***
In this introductory course the theories of improvisation are adapted to the goals and objectives of communication for scientists of various disciplines. The game is a natural form that encourages individual involvement through cooperation with others to achieve a collective goal. In this workshop, participants will develop skills through direct involvement with each other and with the problem-solving process that is required for the playing of theatre games. The only necessity is an open mind and an interest in exploring the power of intuition as a spontaneous and effective tool for experiencing your own creativity.

**07:965:350** ***Improvisation and Theater Games (2)***
This course is designed will provide the student with the skills needed to keep the actor's instrument (body, voice, mind ) tuned and in good working order. Various improvisational techniques and theatre games are utilized to this end. While the techniques are fun, the skills acquired are tangible.
***Prerequisite: 07:965:271.***

**07:965:359-360** ***Independent Study (BA,BA)***
This course allows students to work and study on a project independently which provides the opportunity to develop and refine their theater skills with one-on-one support and direction from professional faculty.
***Prerequisites: Open only to upper-class theater arts majors with permission of instructor and student's theater arts adviser.***

**07:965:364** *Theater Management (3)*
This course is designed to develop students' understanding of the fundamental concepts and practices of today's theater manager, which includes several management aspects of professional regional theater, including organizational design, administration, marketing, budgeting, and fundraising.
*Open to 965/966 majors or by permission of instructor.*

**07:965:365** *Theater Management: Producing (3)*
This course is designed to further develop the student's understanding of the fundamental concepts of producing theatrical shows. The class presents an in-depth examination of the art of producing by assessing such theater management aspects as leadership, script selection, AEA & other unions, contract negotiation, and marketing.

**07:965:370** *Global Theater I (3)*
This course explores the theories and practices ¿ the ideas behind the art ¿ of theater and theatrical performance in the 21st century, with an emphasis on historical perspectives and contemporary applications. Through questioning the nature and function of the art form and interdisciplinary comparisons, the students are encouraged to examine their own values and beliefs and how those values and beliefs might shape the future.**Listed on website & catalog, but not in CSS.
*Prerequisite: 07:965:281-282 or 07:965:231-232.*

**07:965:371** *Global Theater II (3)*
Builds on the classwork of the first semester in Global I. The class examines shared and divergent ideas about the nature of theater and its diverse expressions across and between contemporary world theatre-makers, with a particular emphasis on challenging global issues and currents. The class places the student in the context of and in dialogue with a wide array of artists around the world.
*Prerequisite: 07:965:370. Open to 966 majors or by permission of instructor.*

**07:965:390** *Theater Horizons (1)*
Students are provided with a comprehensive integration of career development approaches, entrepreneurial strategies, and explorations of regional, national, and global markets, movements, and players. With the guidance of theater faculty, alumni, and outside guests, this class also considers the business of being an artist, from the presentation of oneself as a working professional to the handling of different contracts, finances, and a freelance lifestyle.
*Required of all Theater Arts 965 majors.*

**07:965:396** *Internship/Theater (BA)*
Supervised work experience in a department of a professional theater organization. Includes design and production, performance, stage management, business management, or literary management.
*Prerequisite: Permission of instructor.*

**07:965:410** *Theater Criticism (3)*
Study of criteria for analyzing and evaluating plays and performances; workshops in critical writing.
*Prerequisites: 07:965:281-282 or 231-232*

**07:965:421** *Directing (3)*
The focus of this course is to introduce the student to the theoretical definitions of directing as well as the craft required to achieve success as a stage director. This includes, but is not limited to, research, casting, table work and

staging. The class will also investigate the thoughts, values, and practices of highly successful stage directors both past and present.
*Prerequisites: 07:965:271 or 07:965:215.*

**07:965:422** *Advanced Directing Project (3)*
Advanced Directing is designed for students who have successfully completed the first semester of Directing and have demonstrated a strong interest in deepening their knowledge about the craft and role of a director. This is a select in-person studio class that focuses on an exploration of dramaturgy and scene work stemming from a variety of styles and sensibilities. A smaller class size allows each student ample opportunity to collaborate with volunteer acting students to create fully articulated presentations.
*Prerequisites: 07:965:421*

**07:965:451** *Storytelling Workshop (2)*
An introduction to the art and practice of storytelling including the writing of stories for children using important universal iconography. The different techniques for reading aloud and for telling stories will be taught and practiced throughout the semester. Students will have a chance to perform for elementary school classes. The instructor will provide the placements.

**07:965:471-472** *Creative Drama for Children (3,3)*
This course is designed to provide the student with the skills to utilize the creative process in order to positively impact a child¿s imagination within the school environment. The students will work with elementary school children in the children¿s own classrooms to bring appropriate literature to life. They will teach the children to use their bodies, voices, and imaginations in ways that are freeing and joyful.

**07:965:473** *Clothing & Culture I (3)*
This course introduces the human phenomenon of dress and adornment, with themes from the fields of psychology, anthropology, art, textile, fashion, and cultural history. Diverse examples of global dress from prehistory to the late 20th century provide rich comparisons. Enhancing the curriculum of students preparing for careers in the arts, the class examines the role of fashion in the cultural construction of identity.

**07:965:490** *Advanced Light Lab (2)*
A weekly discussion and exploration of the properties of light and how to manipulate the medium to support storytelling, affect perception and inform overall point of view.

**07:965:491-492** *Project Work (BA, BA)*
Application of performance, production, or critical theory under professional supervision in an outside theatrical organization. Activities include, but are not limited to, literary management, directing, stage management, design, and theater management. In certain instances, an acting project can be proposed by the student.
*Permission of student's B.A. adviser required. Open to juniors and seniors.*

**07:965:494** *Honors Project in Theater Arts (3)*
Students with 3.0 GPA within the major are eligible to select performance, production, or critical theory under faculty supervision. An Honors Committee comprised of three university professors evaluate the student's project. Students need to possess the ability to work independently.
*Permission of B.A. adviser required. Student must have at least a 3.0 within the major.*

**07:965:495-496** ***Seminar: Topics in Theater (BA,BA)***
***Open to B.F.A./B.A. students by permission of instructor.***

**07:965:497-498** ***Workshop Topics in Theater (BA,BA)***
***Open to B.F.A./B.A. students by permission of instructor.***

# Ukrainian 967 (SAS)

## UKRAINIAN 967

Department of Germanic, Russian, and East European Languages and Literatures, School of Arts and Sciences

**Website:** Here

Ukrainian 967 (SAS)

## Course in English

## Course in English

**01:967:259** ***Ukrainian Literature in Translation (3)***
Reading and interpretation of major writers.

Ukrainian 967 (SAS)

## Courses in Ukrainian

## Courses in Ukrainian

NOTE: Rutgers currently offers Ukrainian language courses only through BTAA course share. For more information, visit: https://tlc.rutgers.edu/btaa . Please contact the REELL Program Director with questions.

**01:967:101,102** ***Elementary Ukrainian (4,4)***
Introductory course in spoken and written standard Ukrainian for students with minimal or no prior experience with the language. Development of proficiency in speaking, reading, listening, and writing.

**01:967:121,122** ***Ukrainian in Review (4,4)***
Overview of grammar; development of conversation, reading, and composition skills.
***Prerequisite: Placement test or permission of instructor.***

**01:967:493,494** ***Independent Study: Ukrainian (3,3)***
***Prerequisite: Permission of instructor.***

# Urban Planning and Design Major (971, 971D) and Minor (EJB-U)

## URBAN PLANNING AND DESIGN MAJOR (971, 971D) AND MINOR

### Urban Planning and Design Major (51 credits)

The major in Urban Planning and Design (971, 971D) combines the processes of urban design and urban planning to provide students with a sharper focus on city design, community development, GIS and graphic communication, as well as planning practice.

It prepares students for entry-level positions in the planning sector and graduate studies in city and regional planning. Students learn graphic communications, video software, geographic information systems, and web communication. They help design, promote, and administer plans to address issues involving land use, zoning, transportation, infrastructure, housing, community facilities, and more. Studios allow students to conduct field and observational studies and surveys, and analyze data that evaluate community demands for land uses and services.

Upon completing all degree requirements, the student will receive the bachelor of science (B.S.) degree.

### Rutgers School of Arts and Sciences and School of Environmental and Biological Sciences Students

This program is designed to accommodate the needs of traditional students at Rutgers University-New Brunswick.

Students in the School of Arts and Sciences (SAS) must apply for admission prior to declaring the major. SAS students may pursue UPD as their first major and remain within SAS. Students in the School of Environmental and Biological Sciences (SEBS) wishing to declare Urban Planning & Design (UPD) as their second major should contact the Bloustein School's Office of Student and Academic Services at ugadmissions@ejb.rutgers.edu.

To ensure degree completion by their anticipated graduation date, students are advised to declare the UPD major no later than the first semester of their junior year. **However, students must start planning their scheduled set of courses with a Bloustein advisor during the first semester of sophomore year.**

Students can apply for the UPD major during one of our application cycles listed here. Applicants must have a minimum grade of 'C' or better in each of the prerequisite courses and be in good academic standing. The application may be found on the school's website.

The UPD major is *sequence-dependent*. To prepare students for two capstone design studios during their final undergraduate year, the curriculum builds knowledge and skills in urban planning and design over the preceding two semesters. The required sequence of courses is listed below. Please note that the capstone courses, Planning

and Design Studio I and II are only offered consecutively in the fall and spring semester. **Because all required courses are sequenced, it is important that a student develop an academic plan with their Bloustein advisor when they declare the UPD major.**

As a credit intensive major, UPD does not require declared students to complete a minor. However, students may benefit from completing a minor and this option should be discussed with the Bloustein School advisor while developing their academic plan. In addition, if choosing a minor, students are encouraged to meet with the UPD Program Coordinator for career advice.

Only courses with 'C' or better may be counted towards the health administration major, and students must complete the core curriculum requirements of their primary school.

The most current information for the Planning and Public Policy major may be found on the Bloustein School website here.

## Transfer Students

This program is designed to accommodate the needs of transfer, adult, and nontraditional students.

Students seeking the Urban Planning and Design major must have at least 30 credits before applying to the Bloustein School. Successful applicants will have completed the prerequisite courses with a grade of 'C' or better, and have achieved an overall GPA of at least 2.5.

Current Rutgers students seeking a school-to-school transfer from another Rutgers unit, or students transferring to Rutgers from another college or university, must apply via the Rutgers Office of Undergraduate Admissions. Contact ugadmissions@ejb.rutgers.edu for more information.

Transfer students from New Jersey community colleges are encouraged to complete lower-division prerequisite courses and the associate's degree to benefit from the NJ Statewide Transfer Agreement.

Only courses with a 'C' or better may be counted towards the major.

For more information about transferring, please see the school's website.

## URBAN PLANNING AND DESIGN MAJOR REQUIREMENTS

(51 credits)

*Effective Spring 2024*

*Prerequisite Courses (3 credits)*

- 01:355:101 College Writing (3) or equivalent

*Major Requirements (971, 971D) (51 credits)*

*Core Courses (36 credits)*

- 10:775:205 Basic Statistical Methods or equivalent (3-4)
- 10:971:201 Introduction to Urban Planning and Design (3)
  **or** Environmental Design Analysis (3)
- 10:971:202 Designing Healthy Cities (3)
- 10:971:250 Introduction to GIS (3)
- 10:971:314 Graphic Communication for Planning (3)
- 10:971:315 Fundamentals of Urban Planning & Design (3)
- 10:971:316 Introduction to Site Planning and Urban Design (3)
- 10:971:318 History and Theory of Urban Planning & Design (3)
- 10:971:395 Methods of Planning Analysis (3)
- 10:971:403 Advanced Graphic Communication (3)
- 10:971:404 Planning and Design Studio I (3)
- 10:971:405 Planning and Design Studio II (3)
- 10:971:463 Environmental Law and Policy (3)

*Required Electives (15 credits)*

- Five, 3-credit courses see approved list in Degree Navigator.

## Joint BA/MCRP or BS/MCRP Program

Exceptional, well-prepared students from any Rutgers University-New Brunswick matriculating unit with a GPA of 3.5 or higher, exceptional GRE scores, a dedication to public service and outstanding recommendations who wish to study urban planning are encouraged to seek advising about the 3-1-1 master of city and regional planning (M.C.R.P.) program. Contact ugadmissions@ejb.rutgers.edu for more information.

## Urban Planning & Design Minor (18 credits)

The Bloustein School welcomes current and prospective Rutgers-New Brunswick students to consider the Planning and Public Policy minor. Students should declare a minor with their matriculating school. They need not apply for minor status with the Bloustein School. Only courses with a grade of 'C' or better can be counted toward the minor program of study.

This minor is well-matched to majors in art history; civil engineering; environmental science; public health; geography; landscape architecture; sociology; and more.

Students seeking the urban planning and design minor must complete three core courses and three 300-level or higher 971 electives, excluding those designated for 'majors only'.

- 10:971:201 Introduction to Urban Planning and Design (3)

- 10:971:202 Designing Healthy Cities (3)
- 10:971:314 Graphic communication for Planners (3)
- 10:971:315 Fundamentals of Urban Planning and Design (3)
- Three upper-level 971 (or substituted upper-level 762) electives, as above (9)

For the most current configuration of courses for the Urban Planning and Design minor, please see the school's website here.

# Urban Studies Minor (EJB-U)

## URBAN STUDIES MINOR

The 18-credit Urban Studies (975) minor is well matched to majors in sociology, economics, labor studies and employment relations, political science, social justice, geography, psychology, ethnic studies, public health, and urban planning and design, as well as the pre-law track

Students seeking the Urban Studies minor must complete one core course and five elective courses, four of which must be 300-level or higher, excluding those designated for 'majors only'.

- 10:975:101 Introduction to Urban Studies (3)
- Five electives

For the most current configuration of courses for the Urban Studies minor, please see the school's website here.

# Art 080 (MGSA)

## ART 080

(See also Art History 082)

Department of Art & Design, Mason Gross School of the Arts

See the Mason Gross School of the Arts section for faculty listing and bachelor of fine arts (B.F.A.) program information.

The bachelor of arts (B.A.) program in art provides students the opportunity to explore the techniques, processes, materials, places, events, and images that are the basis for creative work. The program offers a curriculum that seeks to develop professional skills as well as an understanding of the cultural and social implications of art. All B.A. students begin with the same foundation studio curriculum as those in the B.F.A. Track. These courses are designed to familiarize students with core concepts and basic skills in preparation for a rigorous studio practice. The course's emphasis is on the study of drawing, color, and composition, as well as time and screen-based contemporary art practices. Beyond the foundations level, the B.A. art program offers studio and critical study courses. Studio courses

focus on the mastery of skills within specialized media such as sculpture, drawing, painting, design, media, photography, and print. Critical studies courses focus on art in relation to social, environmental, psychological, and philosophical systems. This focus provides a basis for understanding the position of the artist in the modern world.

Art 080 (MGSA)

# Major Requirements: B.A. Program

# Major Requirements: B.A. Program

Art majors in the bachelor of arts (B.A.) degree program are required to complete a total of 42 credits as follows:

Foundation Courses (28 credits)

Drawing Fundamentals and 4D Fundamentals 121-122 (4,4)

Introduction to Art History 105 and 106 (3,3)

Seminar in Contemporary Art A and B 200-201 (3,3)

Visual Thinking A and B 227-228 (4,4)

Studio Electives (12 credits)

Visual Arts Practice (2 credits Pass/Fail)

Each student plans a cohesive program of study with faculty and staff advisers.

Dual majors and special interdisciplinary degree programs that include those offered through the Department of Art & Design should be arranged through the School of Arts and Sciences and the Art & Design faculty and staff advisers.

Bachelor of arts students who desire to major in art must submit a portfolio and transcripts for review by the Art & Design Evaluation Committee for acceptance into the program. Additionally, students submit a request to declare the art major in myMajor.

Please click here for details.

Art 080 (MGSA)

# Courses (081)

# Courses (081)

The following bachelor of fine arts (B.F.A.) courses serve as the advanced courses for the bachelor of arts (B.A.) curriculum and are open to all B.A. majors after fundamental requirements have been met.

Note: All but a few of these courses have prerequisites. See Art 081 in the Course Listing chapter in the Mason Gross School of the Arts section of this catalog for prerequisites and course descriptions.

07:081:105 Visual Arts Practice (1-3)

07:081:121 Drawing Fundamentals (4)

07:081:122 4-D Fundamentals: Time and Space (4)

07:081:200-201 Seminar in Contemporary Art A and B (3,3)

07:081:221-222 Drawing I-A and I-B (4,4)

07:081:227 Visual Thinking A: Black and White (4)

07:081:228 Visual Thinking B: Color (4)

07:081:231-232 Design I-A and I-B (4,4)

07:081:243-244 Media I-A and I-B (4,4)

07:081:251-252 Painting I-A and I-B (4,4)

07:081:261-262 Photography I-A and I-B (4,4)

07:081:271-272 Print I-A and I-B (4,4)

07:081:281-282 Sculpture I-A and I-B (4,4)

07:081:303 Seminar in Media (3)

07:081:306 Seminar in Print (3)

07:081:308 Seminar in Design A: History (3)

07:081:310 Seminar in Photography (3)

07:081:313 Ceramics/Sculpture (3)

07:081:317 Seminar in Sculpture (3)

07:081:321-322 Drawing II-A and II-B (4,4)

07:081:324 Figure Drawing (3)

07:081:329 Seminar in Painting (3)

07:081:331-332 Design II-A and II-B (4,4)

07:081:343-344 Media II-A and II-B (4,4)

07:081:351-352 Painting II-A and II-B (4,4)

07:081:361-362 Photography II-A and II-B (4,4)

07:081:371-372 Print II-A and II-B (4,4)

07:081:381-382 Sculpture II-A and II-B (4,4)

07:081:391,392 Independent Study (3,3)

07:081:393,394 Internships (3,3)

07:081:421-422 Drawing III-A and III-B (4,4)

07:081:431-432 Design III-A and III-B (4,4)

07:081:433-434 Advanced Design A and B (4,4)

07:081:441-442 Media III-A and III-B (4,4)

07:081:446-447 Advanced Media A and B (4,4)

07:081:451-452 Painting III-A and III-B (4,4)

07:081:453-454 Advanced Painting A and B (4,4)

07:081:455-456 Advanced Drawing A and B (4,4)

07:081:461-462 Photography III-A and III-B (4,4)

07:081:463-464 Advanced Photography A and B (4,4)

07:081:471-472 Print III-A and III-B (4,4)

07:081:473-474 Advanced Print A and B (4,4)

07:081:481-482 Sculpture III-A and III-B (4,4)

07:081:483-484 Advanced Sculpture A and B (4,4)

07:081:491-492 Independent Study (3,3)

07:081:493,494 Internships (3,3)

# Women's, Gender, and Sexuality Studies 988 (SAS)

## WOMEN'S, GENDER, AND SEXUALITY STUDIES 988

Department of Women's, Gender, and Sexuality Studies, School of Arts and Sciences

**Website:** Here

**Chair:** Ethel Brooks

**Director of Undergraduate Studies:** Kyla Schuller

**Faculty:**

Evelyn Autry, Women's, Gender, and Sexuality Studies; Ph.D., Georgia

Ethel Brooks, Women's, Gender, and Sexuality Studies/Sociology; B.A., Williams College; Ph.D., New York

Abena Busia, English/Women's, Gender, and Sexuality Studies; Ph.D., St. Anthony's College (Oxford)

Sylvia Chan-Malik, American Studies; B.A., M.A., Ph.D., California (Berkeley)

Ed Cohen, Women's, Gender, and Sexuality Studies; Ph.D., Stanford

Brittney Cooper, Women's, Gender, and Sexuality Studies; B.A., Howard; Ph.D. Emory

Carlos Ulises Decena, Women's, Gender, and Sexuality Studies/Latino and Caribbean Studies; B.A., Pennsylvania; Ph.D., New York

Marisa Fuentes, Women's, Gender, and Sexuality Studies/History; B.A., California (Santa Cruz); Ph.D., California (Berkeley)

Jacquelyn Litt, Women's, Gender, and Sexuality Studies; B.A., William Smith College; M.A., Ph.D., Pennsylvania

Dana Luciano, Women's, Gender, and Sexuality Studies/English; Ph.D. Cornell

Martin F. Manalansan, Women's, Gender, and Sexuality Studies; Ph.D. Rochester

Rebecca Mark, Women's, Gender, and Sexuality Studies/Institute for Women's Leadership; Ph.D. (Stanford)

Maya Mikdashi, Women's, Gender, and Sexuality Studies/Middle Eastern Studies; Ph.D., Columbia

Zakia Salime, Sociology/Women's, Gender, and Sexuality Studies; B.A., Mohamed Ben Abdullah (Morocco); M.A., Ph.D., Illinois (Urbana-Champaign)

Kyla Schuller, Women's, Gender, and Sexuality Studies; B,A. Oregon; Ph.D. California (San Diego)

Mary Trigg, Women's, Gender, and Sexuality Studies/Institute for Women's Leadership; B.S., Michigan; M.A., Ph.D., Brown

Asli Zengin, Women's, Gender, and Sexuality Studies; Ph.D. Toronto

**Affiliate Faculty:**

Laura Ahearn, Anthropology; Ph.D., Michigan

Oussenia D. Alidou, African, Middle Eastern, and South Asian Languages and Literatures; Ph.D., Indiana

Louise Barnett, English; Ph.D., Bryn Mawr College

Emily Bartels, English; Ph.D., Harvard

Frances Bartkowski, English, Rutgers University-Newark; Ph.D., Iowa

Mia E. Bay, History; Ph.D., Yale

Christine Chism, English; Ph.D., Duke

Ann Baynes Coiro, English; Ph.D., Maryland

Sheila Cosminsky, Anthropology-Rutgers University-Camden; Ph.D., Brandeis

Jeanette Covington, Sociology; Ph.D., Chicago

Jocelyn Crowley, Public Policy; Ph.D., Massachusetts Institute of Technology

Cynthia Daniels, Political Science; Ph.D., Massachusetts

Belinda Davis, History; Ph.D., Michigan

Marianne DeKoven, English; Ph.D., Stanford

Kayo Denda, Douglass Library; M.A., Rutgers

Elin Diamond, English; Ph.D., California (Davis)

Christina Dunbar-Hester, Journalism and Media Studies; Ph.D., Cornell

Katherine Ellis, English; Ph.D., Columbia

Leslie E. Fishbein, American Studies; Ph.D., Harvard

Nicole Fleetwood, American Studies; Ph.D., Stanford

Jerry Flieger, French; Ph.D., California (Berkeley)

Sandra Flitterman-Lewis, English; Ph.D., California (Berkeley)

Jeff Friedman, Dance; Ph.D., California (Riverside)

Ziva Galili, History; Ph.D., Columbia

Fakhrolmolouk Haghani, Middle Eastern Studies; Ph.D., Georgia State

Sandra Harris, Psychology; Ph.D., SUNY (Buffalo)

Angelique Haugerud, Anthropology; Ph.D., Northwestern

Martha Helfer, Germanic, Russian, and East European Languages and Literatures; Ph.D., Stanford

Dorothy L. Hodgson, Anthropology; Ph.D., Michigan

Allan P. Isaac, American Studies/English; Ph.D., New York

Karla Jackson-Brewer, Africana Studies; M.S., Bank Street College of Education

Temma Kaplan, History; Ph.D., Harvard

Renée B. Larrier, French; Ph.D., Columbia

Barbara A. Lee, Industrial Relations and Human Resources; Ph.D., Ohio

Joan M. Marter, Art History; Ph.D., Delaware

Yolanda Martinez-San Miguel, Latino and Caribbean Studies; Ph.D., California (Berkeley)

Meredith L. McGill, English; Ph.D., Johns Hopkins

Ferris Olin, Institute for Women and Art; Ph.D., Rutgers

Francoise S. Puniello, Rutgers University Libraries; M.A., M.L.S., Rutgers

Nancy Rao, Music, Mason Gross School of the Arts; Ph.D., Michigan

Patricia A. Roos, Sociology; Ph.D., California (Los Angeles)

Sarah Rosenfield, Sociology; Ph.D., Texas

Dianne F. Sadoff, English; Ph.D., Rochester

Diana Sanchez, Psychology; Ph.D., Michigan

Paul Schalow, Asian Languages and Cultures; Ph.D., Harvard

Mark Schuster, Student Affairs; M.A., Iowa

Richard Serrano, French; Ph.D., California (Berkeley)

Susan Sidlauskas, Art History; Ph.D., Pennsylvania

Jane E. Sloan, Rutgers University Libraries; M.A., California State (San Francisco)

Kristen W. Springer, Sociology; Ph.D., Wisconsin (Madison)

Arlene Stein, Sociology; Ph.D., California (Berkeley)

Gayle T. Tate, Africana Studies; Ph.D., CUNY

Sarah Tobias, Institute for Research on Women; Ph.D., Columbia

Camilla Townsend, History; Ph.D., Rutgers

Meredeth Turshen, Urban Studies; Ph.D., Sussex (UK)

Carolyn Williams, English; Ph.D., Virginia

Virginia Yans, History; Ph.D., SUNY (Buffalo)

Yael Zerubavel, Jewish Studies; Ph.D., Pennsylvania

Women's, Gender, and Sexuality Studies has a rich history at Rutgers University. Inaugurated as a department in 2001, Women's, Gender, and Sexuality Studies has grown from offering a few courses at the university in 1973 to becoming one of the strongest interdisciplinary graduate and undergraduate programs in the United States.

At the undergraduate level, we offer a major (women's, gender, and sexuality studies) and four minors (women's, gender, and sexuality studies; critical sexualities; social justice; and gender and media). We have developed each of these minors to introduce pathbreaking research that addresses concerns of particular interdisciplinary constituencies. Reflecting the fundamental commitments of feminist pedagogy, our major and minors provide students with critical tools to engage the challenges of contemporary life and to work toward social transformation and social justice. Annually we teach approximately 4,000 undergraduate students and over 200 graduate students enrolled in courses offered by the department.

Women's, Gender, and Sexuality Studies 988 (SAS)

# Learning Goals

# Learning Goals

The curriculum of the Department of Women's, Gender, and Sexuality Studies is centered around the following learning goals:

- Understand and critique the formation of categories of gender and sexuality as they function in social, economic, cultural, and/or political contexts and as they intersect with other categories of difference such as race and ethnicity.
- Communicate effectively using gender analytics as a tool for academic research, for creative production, for collaborative work, and/or for practices of social change.
- Know the complexity and variety of differently gendered lives and livelihoods around the globe.
- Recognize stereotypes and the naturalization of hierarchies of difference through analyzing power dynamics from the micro to the macro level.
- Identify the politics of issue framing and knowledge production.

Honors students (10-15 percent) will complete independent research and present it to a public audience.

Women's, Gender, and Sexuality Studies 988 (SAS)

# Major Requirements

# Major Requirements

Students are required to complete 12, 3-credit courses (with a grade of C or better) in the major, for a total of 36 credits.

18 credits must be in required 988 courses, and 18 credits must be in elective 988 courses or in approved cognate courses from other departments.

I. 988:101 Introduction to Gender, Race, and Sexuality (3 credits)
or
988:130 Knowledge and Power (3 credits)

II. 988:201 Feminist Practices (3 credits)
or
988:284 Feminist Knowledge Production¿¿(3 credits)

III. 01:988:301 Feminist Theory: Historical Perspectives (3)
(Prerequisites: 01:988:101, 201, 202, or 235, or by special permission)
*or*
01:988:302 Feminist Theory: Contemporary Engagements (3)
(Prerequisites: 01:988:101, 201, 202, or 235, or by special permission)

IV. 01:988:303 Global Feminisms (3)
(Prerequisites: 01:988:101, 130, 201, 202, or 235, or by special permission)
or
One approved WGSS Transnational Feminism Course
Approved WGSS courses that focus on transnational feminisms
01:888:338 Transnational Sexualities
01:988:270 War: Critical Perspectives
01:988:310 South Asian Feminism
01:988:312 African Feminism
01:988:337 Globalization, Sex, and Families
01:988:405 Gender and Human Rights
01:988:407 Women's Global Health Movements
01:988:408 Impacts of Economic Inequality on Women's Health
01:988:409 The Growth Imperative, Global Ecology, and Women's Health
01:988:410 Debt, Crisis, and Women's Health
01:988:411 Gendered Health Impacts of Structural Adjustment Programs
01:988:412 Health Consequences of Global Trade in Food Commodities
01:988:413 Health Consequences in the Global Trade in Pharmaceuticals
01:988:414 Gendered Professions and the Transnational Care Economy
01:988:416 Women's Global Health: Special Topics
01:988:447 Gender-Based Violence as Human Rights Violations: Histories and Trajectories (3)
01:988:486 Gender, Development, Environment: Policies, Politics, Perspectives

V. 988:235 Dynamics of Class, Race, and Sex (3 credits)
or
One approved WGSS Intersectionality Course

VI. Internship (988:422 or 988:426) or Senior Seminar (988:490) or 400-level special topics (988:491 or 988:492) or Honors Seminar (988:497 or 988:498)

VII. 6 elective courses
At least 4 approved electives must be 300 level or above

Women's, Gender, and Sexuality Studies 988 (SAS)

# Minor Requirements

# Minor Requirements

Students are required to complete six 3-credit courses (with a grade of C or better) in the minor, for a total of 18 credits.

01:988:101 Introduction to Gender, Race, and Sexuality (3)
*or*
*988:130 Knowledge & Power (3)*
*or*
01:988:201 Feminist Practices (3)
*or*
01:988:202 Gender, Culture, and Representation (3)
*or*
01:988:235 Dynamics of Race, Class, Sex (3)
01:988:301 Feminist Theory: Historical Provocations (3)
(Prerequisites: 01:988:101, 130, 201, 202, or 235, or by special permission)
*or*
01:988:302 Feminist Theory: Contemporary Engagements (3)
(Prerequisites: 01:988:101, 130, 201, 202, or 235, or by special permission)
or
01:988:303 Global Feminisms (3)
(Prerequisites: 01:988:101, 130, 201, 202, or 235, or by special permission)

Four women's, gender, and sexuality studies electives

Elective courses chosen from either the women's, gender, and sexuality studies core course list or the approved cognate course list or other courses approved by a program adviser, at least one of which must have race, class, or sexuality at its center. Of the four elective courses, not more than two can be from the same department. At least one elective must be at the 300 level and one at the 400 level.

Note that only a few select courses are available each semester. You may also obtain a list from the department.

Women's, Gender, and Sexuality Studies 988 (SAS)

# Honors in Women's, Gender, and Sexuality Studies

# Honors in Women's, Gender, and Sexuality Studies

**Honors in Women's, Gender, and Sexuality Studies**

Women's, gender, and sexuality studies majors may petition to obtain honors if they have an overall cumulative grade-point average of 3.0 or better and a 3.4 average or better in women's, gender, and sexuality studies courses at the end of their junior year.

Candidates are required to write an honors thesis of 75-100 pages on a topic related to women's, gender, and sexuality studies; participate in a 6-credit yearlong honors research seminar (01:988:497,498); and orally present the completed thesis to the Rutgers community at the end of the year.

*Thesis*

The thesis, though grounded in a discussion of what other scholars have written about the topic in question, should be based on the student's original research. Each student will work with at least two faculty advisers in developing his or her project: a primary adviser with expertise in the student's particular field of research and the instructor of the honors research seminar, who will serve as a second adviser.

*Seminar*

The purpose of the honors research seminar is to establish a feminist learning community that will support each student's project. In seminar meetings, students will explore issues in the production of feminist knowledge production as well as read and critique each others' work. In addition to the seminar, we strongly suggest you take Critical Feminist Investigation (01:988:370), but this is not required.

*Presentation*

Students will give an oral presentation of their honors thesis before students, faculty, and staff in the Department of Women's, Gender, and Sexuality Studies and other invited guests in mid- to late April.

**National Honor Society - IOTA IOTA IOTA**

In April 2018, the Department of Women's, Gender, and Sexuality Studies was recognized as the Epsilon Beta Chapter of the National Women's and Gender Studies Honor Society Iota, Iota, Iota.

Iota Iota Iota (Triota) is a National Women's Studies Honor Society with over 50 chapters nationwide. The Greek letter, iota, was selected for the name to represent the three goddesses Inanna, Ishtar, and Isis. Iota Iota Iota strives to maintain the feminist values central to women's studies and encourage diversity, egalitarianism, and a supportive academic environment for all students.

The purpose of Triota is to promote interest in women's studies and research in social problems affecting all women. This society also encourages volunteerism, advocacy, and activism within the community as important methods for promoting and maintaining the feminist values central to women's studies.

*Requirements:*

- Second-semester sophomore, junior, or senior
- Have taken five women's, gender, and sexuality studies courses (including cross-listed courses),
- Overall GPA of 3.0 or above and minimum GPA of 3.3 in women's, gender, and sexuality studies courses

If you meet these requirements, please complete the application. You can find it here.

Return the completed form to undergraduate director Kyla Schuller at upd@womenstudies.rutgers.edu.

Women's, Gender, and Sexuality Studies 988 (SAS)

# Institute for Women's Leadership (IWL) Scholars Certificate Program

# Institute for Women's Leadership (IWL) Scholars Certificate Program

The Leadership Scholars program is a two-year selective, interdisciplinary certificate program of the Institute for Women's Leadership (IWL) that prepares Rutgers undergraduates to be informed, innovative, and socially responsible leaders.

IWL Leadership Scholars explore women's leadership and contributions to social change in contexts that range from politics and government, law and advocacy, business and communications, media and the arts. IWL Leadership Scholars examine how different institutions inform our understanding and practice of leadership and how they encourage--or inhibit--civic innovation.

Women's, Gender, and Sexuality Studies 988 (SAS)

# Online Certificate Program in Women's Global Health Leadership

# Online Certificate Program in Women's Global Health Leadership

The Department of Women's, Gender, and Sexuality Studies has developed an innovative online Certificate Program in Women's Global Health Leadership in collaboration with the Institute for Women's Leadership (IWL) and National Nurses United (NNU), the largest nurses' union in the United States. This certificate program capitalizes on the expertise of the women's, gender, and sexuality studies faculty in the science and health studies, and the commitment of the IWL Consortium to foster women's leadership in all aspects of human endeavor, to provide a series of courses that addresses some of the most pressing issues on the global agenda. The certificate program also draws on the expertise of National Nurses United, which has been at the forefront in championing a comprehensive approach to women's health and preparing nurses in the United States to serve the health needs of women, families, and communities in all regions of the world.

**Required Courses (students must take both/6 credits):**
01:988:407 Global Women's Health Movements
01:988:408 Gender, Economic Inequality, and Health

**Elective Courses (students must take three/9 credits):**
01:988:409 Gender, Environmental Justice, and Health
01:988:410 Debt, Crisis, and Women's Health
01:988:412 Global Food Politics: Health Consequences
01:988:413 The Global Pharmaceutical Economy and Health
01:988:414 Care Work

# Approved Cognate Courses

# Approved Cognate Courses

The women's, gender, and sexuality studies program accepts certain courses offered by other departments as cognate courses, which may be counted toward the women's, gender, and sexuality studies major or minor. These courses are cross-listed below. The courses in this cross-listing have counterparts offered by the women's, gender, and sexuality studies program that *utilize the same last three digits of the course number as the cross-listed course*, but with the women's, gender, and sexuality studies school/subject code designation of 01:988. (For example, course 01:014:206, an Africana studies course, also is offered by the women's, gender, and sexuality studies program as course 01:988:206.)

***There are 31 courses that do not follow this pattern, cross-referenced as follows:***

01:013:430 = 01:988:431

01:014:481 = 01:988:483

01:050:344 = 01:988:315

01:070:324 = 01:988:337

01:354:385 = 01:988:376

01:358:261 = 01:988:265

01:358:307 = 01:988:388

01:358:327 = 01:988:382

01:358:337 = 01:988:383

01:358:348 = 01:988:385

01:358:362 = 01:988:384

01:358:379 = 01:988:366

01:358:395 = 01:988:353

01:358:396 = 01:988:357

01:359:330 = 01:988:346

01:359:335 = 01:988:340

01:359:336 = 01:988:364

01:359:435 = 01:988:495

01:450:361 = 01:988:367

01:470:384 = 01:988:391

01:508:307 = 01:988:308

01:512:381 = 01:988:390

01:563:323 = 01:988:314

01:563:384 = 01:988:391

01:595:323 = 01:988:328

01:790:335 = 01:988:336

01:790:426 = 01:988:428

01:840:350 = 01:988:343

01:840:351 = 01:988:349

01:840:360 = 01:988:361

01:840:361 = 01:988:314

**Full course descriptions for all cross-listed courses can be found under the appropriate originating department's subject code listing.** Credit is ***not given*** for both a women's, gender, and sexuality studies course (01:988:) and its corresponding cross-listed course.

01:013:232 or 01:195:232 Women Writers of South Asia (3) (01:988:232)

01:013:430 or 01:195:430 Gender, Nation, and Literature in South Asia (3) (01:988:431)

01:014:206 The Black Woman (3) (01:988:206)

01:014:306 The Black Woman in Political Context (3) (01:988:306)

01:014:481 The Black Family (3) (01:988:483)

01:016:224 or 01:508:204 Women and Gender in African History (3) (01:988:224)

01:016:312 African Feminism (3) (01:988:312)

01:016:379 Gender and Power in Africa (3) (01:988:379)

01:050:325 Women on the Fringe: Perceptions of Women as Social and Sex-Role Deviants in American Civilization (3) (01:988:325)

01:050:344 Race, Gender, and Islam in the United States (3) (01:988:315)

01:070:225 Gender in Global Perspective (3)

01:070:323 Women Writing Culture (3) (01:988:323)

01:070:324 Globalization, Sex, and Families (3) (01:988:337)

01:070:363 or 01:014:363 Race, Class, Gender, and Schooling (3)

01:070:378 The Anthropology of Gender (3) (01:988:378)

01:070:379 Gender and Power in Africa (3) (01:988:379)

01:070:389 or 01:925:389 Ethnography of Gender in South Asia (3) (01:988:389)

01:082:305 Women and Art (3) (01:988:305)

01:190:320 or 01:510:320 Women in Antiquity (3) (01:988:320)

01:195:327 Women's Traditions in Literature (3) (01:988:327)

01:220:375 or 01:220:475 Women, Men, and the Economy (3)

01:220:427 Women's Work and Labor Markets (3) (01:988:427)

01:354:385 Theories of Women and Film (3) (01:988:376)

01:358:261 or 01:351:265 Introduction to the Study of Women Writers (3) (01:988:265)

01:358:307 or 01:350:381 Medieval Women Writers (3) (01:988:388)

01:358:327 or 01:350:382 Restoration and 18th-Century Women Writers (3) (01:988:382)

01:358:337 or 01:350:383 Nineteenth-Century Women Writers (3) (01:988:383)

01:358:348 or 01:350:385 American Women Writers (3) (01:988:385)

01:358:362 or 01:350:384 Twentieth-Century Women Writers (3) (01:988:386)

01:358:379 or 01:350:371 Black Women Writers (3) (01:988:366)

01:358:394 or 01:351:355 Theater and Drama by Women (3) (01:988:352)

01:358:395 or 01:351:356 Fiction by Women (3) (01:988:353)

01:358:396 or 01:351:357 Poetry by Women (3) (01:988:357)

01:359:330 or 01:353:346 Theories of Gender and Sexuality (3) (01:988:346)

01:359:335 or 01:353:340 Feminist Theory in Literary Study (3) (01:988:340)

01:359:336 or 01:351:361 Issues and Problems in Feminist Literary Studies (3) (01:988:364)

01:359:435 or 01:353:496 Seminar: Topics in Feminist Theory (3) (01:988:495; 01:988:496)

01:420:313 ¿Gender and Sexuality in Modern France and the Francophone World (3) (01:988:313)

01:420:319 Women Writers from 1789 to the Present (3) (01:988:319)

01:450:361 Gender Geographies (3) (01:988:367)

01:470:374 Matriarchy and Modernity (3)

01:470:384 or 01:563:384 Gender and Politics in Yiddish Literature and Culture (3) (01:988:391)

01:470:385 The Changing Image of Women in German Literature (3)

01:506:211 Women in Europe and the Americas until 1800 (3) (01:988:211)

01:506:212 Women in Europe and the United States since 1800 (3) (01:988:212)

01:506:311 History of Feminism (3)

01:506:373 or 01:563:373 History of Jewish Women (3) (01:988:373)

01:506:393 Advanced Topics in the History of Women (3)

01:508:224 or 01:016:224 Women and Gender in African History (3) (01:988:224)

01:508:307 or 01:685:307 Women and Society in the Islamic Middle East (3) (01:988:308)

01:508:316 or 01:563:316 or 01:685:316 Israeli Women: Historical and Literary Perspectives (3) (01:988:316)

01:508:346 or 01:098:340 TransAsia: A Transnational History of Gender and Sexuality in Asia (3)

01:510:253 History of Witchcraft and Magic (3) (01:988:253)

01:512:380 Women in American History I (3) (01:988:380)

01:512:381 Women in American History II (3) (01:988:390)

01:560:356 Women in Italian Literature and Society (3)

01:563:316 Israeli Women: Historical and Literary Perspectives (3)

01:563:322 or 01:840:361 Women in the Bible (3) (01:988:314)

01:563:335 or 01:050:335 Jewish-American Women: Contested Lives (3) (01:988:334)

01:563:384 or 01:470:384 Gender and Politics in Yiddish Literature and Culture (3) (01:988:391)

01:565:360 Japanese Women Writers (3) (01:988:360)

01:590:150 The Latin American Woman (3) (01:988:150)

01:595:210 or 01:836:210 Women in the Caribbean-Caribbean Women in the U.S. (3) (01:988:210)

01:595:323 U.S. Latina Feminists (3) (01:988:328)

01:730:347 Philosophical Issues in Feminism (3) (01:988:347)

01:790:335 Women and American Politics (3) (01:988:336)

01:790:355 Women and Public Policy (3) (01:988:355)

01:790:365 Gender and Political Theory (3) (01:988:365)

01:790:423 Contemporary Feminist Theory (3) (01:988:423)

01:790:424 Gender and Political Economy (3) (01:988:424)

01:790:426 Gender, Public Policy, and Law (3) (01:988:428)

01:830:362 Psychology of Sex and Gender (3) (01:988:362)

01:830:381 Psychology of Women (3)

01:840:350 Women in Eastern Religions (3) (01:988:343)

01:840:351 Women in Western Religions (3) (01:988:349)

01:840:360 Feminist Theology (3) (01:988:361)

01:860:435 Gender and Sexuality in Russian Literature (3) (01:988:435)

01:920:216 Sociology of Women (3) (01:988:216)

01:920:272 Sociology of the Family (3) (01:988:272)

01:920:324 Sociology of Gender (3) (01:988:324)

01:920:354 or 01:685:354 Global Gender Issues (3) (01:988:354)

01:920:440 Sexuality and Society (3) (01:988:440)

01:920:470 Seminar in the Sociology of Gender (3) (01:988:470)

01:940:342 Women Writers of the Hispanic World (3) (01:988:342)

01:940:351 Women Writers of the Hispanic World-English (3) (01:988:351)

07:080:300 Women Artists (3)

37:575:309 Working Women in American Society (3) (01:988:309)

37:575:335 Women and Labor Movements: A Global Perspective (3)

# Courses

# Courses

**01:988:101** ***Introduction to Gender, Race, and Sexuality (3)***
Introductory survey examining key concepts and themes in women's and gender studies, including: body image and media, class, feminisms, gender/sex, globalization and neoliberalism, intersectionality, patriarchy and privilege, race, reproductive justice, sexuality and queer theory, social justice and human rights, violence, conflict, and terrorism.

**01:988:130** ***Knowledge and Power: Issues in Women's Leadership (3)***
Study of gender, in the construction of knowledge in different fields, and the factors that encourage women to achieve agency and leadership.

**01:988:160** ***Women in the Global Economy: Feminist Perspectives (3)***
This course examines issues related to women's paid and unpaid work as world markets integrate. Analyzes actions of governments, unions, women's movements, employers, and nongovernmental organizations (NGOs) to promote equality and women's well-being.

**01:988:201** ***Feminist Practices (3)***
Examines development of women's and gender studies as interdisciplinary field of study; explores relationship of feminist scholarship to activism; introduces students to basic research techniques.
***Required for major.***

**01:988:202** ***Gender, Culture, and Representation (3)***
Examines how gender is represented in cultural texts and artifacts; introduces students to theories of representation.

**01:988:221** ***Breaking the Glass Ceiling: Women Religious Leaders (3)***
Interdisciplinary approach to analyzing women's religious leadership in Judaism, Christianity, and Islam. Ethnographic case studies of religious communities. Topics include: strategies that preclude women from leadership; informal and formal leadership for women; differences across traditions; feminism; Internet and religious authority. Readings, films, discussions, interviews with female religious leaders.

Credit not given for both this course and 01:070:284 or 01:563:224.

**01:988:235** ***Dynamics of Class, Race, and Sex (3)***
Examination of dynamics of, and connections among, classism, racism, and sexism in contemporary American society; ways they influence and are influenced by the structure of society at large; their effect on individuals; and strategies for personal and social change.

**01:988:240** ***Gender and Science (3)***
Role of gender, race, and class in production and use of scientific and medical knowledge. Impact of gender bias on research in the life, physical, and social sciences.

**01:988:250** ***Feminist Perspectives (3)***
Feminist examination of significant contemporary issues. The issue chosen will vary each year. Students should check the department's website for information. Issues to be considered include war, trafficking, poverty, environment, migration, globalization, and religion.

**01:988:252** ***Mentoring, Leadership, and Young Women's Lives (3)***
Feminist theory, model, and practice of mentoring. Topics include definitions and history of mentoring; personal narratives and mentoring practices; and mentoring women's leadership for social change.

**01:988:255** ***Gender, Art, and Society (3)***
Women artists, their achievements, and impact. Social and cultural reasons for their neglect in the visual arts and how that neglect is being remedied today. Different ways in which men and women are depicted in art and how those differences relate to culture and society.
***Please note that this is an online course.***

**01:988:257** ***Gender and the Body: Representation and Pornography (3)***
Examination of representations of gendered bodies in art, sexuality, gender, politics, and pornography. Examines how to understand who defines what is obscene and why some work is called pornography.

**01:988:258** ***Gender, Race, and Contemporary Art (3)***
Intersection of gender and race in contemporary American art. Black and white racial politics in relation to gender and contemporary art in the United States. Special focus on African-American artists.

**01:988:259** ***Homosexuality and Visual Culture (3)***
Central role of homosexuality and homoeroticism in visual culture in the distant and recent past as well as the present. Marginalization of homosexual artists, critics, and patrons despite direct participation in cultural production of art and popular culture.

**01:988:260** ***The Modern Girl (3)***
Examines the so-called "modern girl" of the 1920s and 1930s. Representations in fiction, film, and advertisements. Concentrates on the West, with comparative evidence from Asia and Africa.
***Credit not given for both this course and 01:506:215.***

**01:988:261** ***Resisting Petrocapitalism: Oceanians against Climate Collapse (3)***
Analysis of how literary works of the Pacific Islands' Indigenous activists across Oceania denounce the entanglement of capitalism, imperialism, and environmental crises and use their strategic position at the heart of the global fluxes of oil, goods, and capital transiting between Asia and North America to challenge petrocapitalism and the military industrial complex protecting it.

Credit not given for both this course and 01:195:271.

**01:988:270** ***War: Critical Perspectives (3)***
Critical examination of the nature, functions, and effects of war with particular attention to racialized and gendered dynamics of militarization, terrorism, counterterrorism, and genocide.
***Credit not given for both this course and 01:920:273.***

**01:988:280** ***Introduction to Critical Study of Masculinities (3)***
Interdisciplinary and comparative introduction to the study of masculinities in the United States. Includes social history, and analyses of contemporary national and international contexts.

**01:888:285** ***Lesbians and Gay Men and Society (3)***
Introduction to various disciplines' contributions to understanding the relationship of homosexuality, particularly lesbianism, to society. Includes a section on the political organization and recent theory coming out of the gay movement.

**01:888:290** ***Introduction to Critical Sexualities (3)***
Introduction to the study of sexuality as well as sexual and gendered identity from multidisciplinary and historical perspectives. Includes U.S. and European approaches to sexology, legal regulation of sexual practices, and family formation.

**01:988:295** ***Reilly BOLD Professional Development (1)***
Professional development curriculum to accompany the Reilly BOLD at Douglass externships, advancing career preparation of Douglass women. Students will develop an understanding of new trends in leadership and other business concepts; and identify measures to sustain diversity, equity, and inclusion for women in the workplace. Some key concepts that will be covered include bias in the workplace, salary negotiation, the gender pay gap, mentoring and sponsorship, and future of work for women.

DRC students only, SPN required

**01:988:299** ***Mentoring Leadership and Practice (3)***
Explores meaning of women's leadership, knowledge, and power through the mentor experience. Topics include how gender shapes knowledge and power; the challenges women's colleges present to orthodox conceptions of leadership; and practical and theoretical applications of feminist pedagogies.

**01:988:301** ***Feminist Theory: Historical Perspectives (3)***
Introduction to feminist theories about women, sex, gender, sexuality, embodiment, politics, social relations; examination of feminist theories' challenge to Western literary, philosophical, and scientific traditions.
***Prerequisite: 01:988:101 or 130 or 201 or 202 or 235 or by special permission.***

**01:988:302** ***Feminist Theory: Contemporary Engagements (3)***
Introduction to basic concepts central to contemporary feminist thought; exploration of the critical, productive relationship between feminist and patriarchal theory.
***Prerequisite: 01:988:101 or 130 or 201 or 202 or 235 or by special permission.***

**01:988:303** ***Comparative Feminisms (3)***
Compares the development of feminist writing in several historical periods across different cultures.
***Prerequisite: 01:988:101 or 130 or 201 or 202 or 235 or by special permission.***

**01:988:307** ***Women and the Law (3)***
Areas of law that regulate the position of women, including birth control, abortion, marriage, alimony, child support and custody, child care, education, employment, criminal law (including rape, prostitution, women in prison, and the juvenile justice system), and constitutional rights. Readings in court decisions, statutes, and supplementary materials.

**01:988:310** *South Asian Feminism (3)*
Women's activism in South Asia in autonomous feminist movements, as participants in organized political movements, and in family and community.

**01:988:311** *Gender, Race, and Visual Media (3)*
Examines visual culture, especially Hollywood cinema and television, in light of the economic structure of neoliberalism. Race, gender, and sexuality as sites of power; visual texts; connections between culture and politics.

**01:988:312** *African Feminism (3)*
What feminism means to Africa; how gender affects female socialization, women as state subjects; how diverse African feminist strategies differ from and/or parallel other feminisms.
*Prerequisite: 01:988:101 or 235. Credit not given for both this course and 01:016:312.*

**01:988:313** *Gender and Sexuality in Modern France and the Francophone World (3)*
An introduction to the tools and principles to retrieve, tidy, clean, and visualize data in preparation for statistical analysis. The R statistical environment is used but no prior knowledge is required. Interactions with databases will be included.

Credit not given for this course and 01:420:313. Taught in English.

**01:988:317** *Gender and Consumption (3)*
Introduces feminist approaches to consumption through readings that examine the relation of consumption to body, race, nation, and sex work.
*Prerequisite: 01:988:101 or 201 or 235 or permission of instructor.*

**01:988:318** *The Gendered Body (3)*
Explores the processes by which the body is gendered in different cultures. How is the relationship between physical body, gender, and sexuality forged?

**01:888:321** *Queer Contexts: Same-Sex Desire, Culture, and Representation (3)*
Cultural construction and representation of same-sex desire in Western societies. Debates about identity, subjectivity, and the uses of experience included.

**01:988:325** *Women on the Fringe: Perceptions of Women as Social and Sex-Role Deviants in American Civilization (3)*
Societal reaction to female behavior deviating from social and feminine norms. Use of historical narratives, literature, and film to treat such themes as heresy, madness, prostitution, adultery, criminality, political protest, and lesbianism.
*Credit not given for both this course and 01:050:325.*

**01:988:326** *Psychology of Women (3)*
Evaluation of some major psychological conceptualizations of women in light of current research. Bases for these formulations and their influence on the position of women today.
*Credit not given for both this course and 01:830:381.*

**01:988:329** *History of Race and Sex in America (3)*
Examines how race and gender have independently and jointly determined life chances throughout American history.
*Credit not given for both this course and 01:014:366 and 01:512:366.*

**01:988:330** ***Memoir and Autobiography (3)***
Reading of several women's memoirs, all written within the last 50 years; some by "famous" and some by "ordinary" women.

**01:988:331** ***Theorizing Sexuality and Gender (3)***
Examines how sexuality and gender became meaningful categories in Western culture through the emergence of sexual politics and queer theory.

**01:988:332** ***The Color of AIDS: The Politics of Race During the AIDS Crisis (3)***
Focuses on AIDS crisis, explores relationships between illness, race, ethnicity, and gender in health policy, research, and care for communities of color.

**01:988:333** ***Power, Subjectivity, and Resistance (3)***
Examines development of feminist concepts of power and the relations between feminist and patriarchal theories.

**01:988:337** ***Globalization, Sex, and Families (3)***
Transnational intimacies, travel, and migration. Case studies of transnational adoption, marriage, sex work, and domestic work. Larger contexts of globalization and impact on families and sexual relations.
***Prerequisite: 01:070:101 or 01:988:101 or permission of instructor. Credit not given for both this course and 01:070:324.***

**01:888:338** ***Transnational Sexualities (3)***
Considers how globalization alters conceptualizations of sexuality and its relationship to gender. Issues include global, diasporic, and postcolonial gay, lesbian, bisexual, and transgender activism, tourism and travel, HIV/AIDS organization, "sexual rights" discourses, sex work, and asylum based on gender and sexual orientation.

**01:988:341** ***Gender and Popular Culture (3)***
Use of varied theoretical approaches to examine how popular culture texts shape everyday perceptions of race, gender, family, and nation. Texts include film, television, and radio.
***Prerequisite: 01:988:101 or 201 or 235 or permission of instructor.***

**01:988:344** ***Women and Leadership (3)***
Course explores women's leadership for social change at work, in politics, communities, and the household in a variety of historical and contemporary meetings.
***Prerequisites: By special permission of instructor. Students for this course must have applied and been accepted into the IWL Leadership Scholars Program.***

**01:988:350** ***Gender and Spirituality (3)***
Class explores women's spirituality, feminist theology, and spiritual systems from around the world. How are spiritual systems and practices gendered?

**01:988:368** ***Producing Identities: Race, Gender, Class, and Sexualities (3)***
Social constitution of the self and communities through emergence and transformation of concepts and categories (race, gender, ethnicity, and sexuality) associated with personal identity.

**01:988:369** ***Feminism, Space, and Visuality (3)***
Examines how space and vision have been associated with historically developed concepts of femininity and masculinity.

**01:988:370** ***Critical Feminist Investigation (3)***
Introduces modes of knowledge production, research methods, and strategies for interdisciplinary feminist scholarship.
***Required for students pursuing honors in women's, gender, and sexuality studies.***

**01:988:371** ***Making Change (3)***
In-depth analysis of different ways women have organized for change. Focus on three or four case studies using cross-cultural perspectives to illustrate various themes of gender and collective action by women.
***Credit not given for both this course and 01:560:313.***

**01:988:372** ***Contemporary Feminist Activism (3)***
Autonomous women's movements in the 20th and 21st centuries. Select case studies illustrate themes of gender and collective action.
***Credit not given for both this course and 01:506:314.***

**01:988:387** ***Feminism, Signs, and Representation (3)***
Introduces major theories in contemporary critical theory including structuralism, recent critiques of structuralism. Focuses on the models and criteria to analyze cultural and social life.

**01:988:392** ***Thinking Bodies (3)***
Examines work of theorists questioning the subordination of body to mind in modern Western thought.

**01:988:394** ***Black Women in the United States (3)***
Examines cultural stereotypes; political, economic, and social challenges confronting black women in the United States; and strategies of resistance developed by black women.
***Prerequisite: 01:988:101 or 235 or by permission.***

**01:988:395** ***Race, Gender, Media, and the Law (3)***
Considers relationship between gender, law, and race in contemporary popular and political culture. Addresses impact of rise in televised court cases on perceptions of legal system and in stimulating public debates about justice.
***Prerequisite: 01:988:101 or 201 or 202 or 235.***

**01:988:396** ***Topics in Women's and Gender Studies (3)***
Selected topics in women's and gender studies. Topics vary each semester. Consult department.

**01:988:397** ***Freud and Feminism: Sexuality (3)***
Introduces Freudian concepts, methods and terminology, and the corresponding issues and debates in feminist theory.

**01:988:398** ***Freud and Feminism: The Unconscious (3)***
Examines Freud's account of the unconscious and its relevance to theories of subjectivity, especially to feminist theory and antiracist theory.

**01:988:399** ***CESEP (1)***
Community service placement in women's and gender studies.
***Corequisite: Must be taken in conjunction with a designated CESEP (Civic Engagement and Service Education Partnerships) course offered in the women's, gender, and sexuality studies program.***

**01:988:405** ***Gender and Human Rights (3)***
Examines history and discourse of women's human rights; uses of humanitarian law in wartime; issues of gender-based violence, health, and sexuality.
***Prerequisite: 01:988:101 or 235 or permission of instructor.***

**01:988:406** ***Women, Work, and Social Change (3)***
Study of problems faced by women working in industry, unions, the home, and professions in light of modern agitation and social trends; analysis of sex-differentiated occupations, legislation, and service roles with attention to biological, psychological, and social differences between the sexes.

**01:988:407** ***Women's Global Health Movements (3)***
Politics and structure of global women's health movements. Relationship between health and phenomena such as international politics, globalization, economic policy, and conflict and war.

**01:988:408** ***Gender, Economic Inequality, and Health (3)***
Fully online. Examines how resource distribution shapes health risk, access to health care, and clinical outcomes. Relationship of gender, class, race, sexuality, and nation to health.

**01:988:409** ***Gender, Environmental Justice, and Health (3)***
Fully online. Examines women's health in relationship to contradictions between capitalist growth and resource exhaustion. Health consequences of environmental crises linked to new markets and technologies.

**01:988:410** ***Debt, Crisis, and Women's Health (3)***
Explores relationship between debt and economic crisis; examines impact of austerity policies on women's health in various nations.

**01:988:411** ***Gendered Health Impacts of Structural Adjustment Programs (3)***
Compares global impact of World Bank and International Monetary Fund aid to developing countries. Investigates impact of cuts in public services on women's health.

**01:988:412** ***Global Food Politics: Health Consequences (3)***
Fully online. Investigates shifting modes of food production, distribution, diet, and health. Compares consequences of changes for women in global North with women in global South.

**01:988:413** ***The Global Pharmaceutical Economy and Health (3)***
Fully online. Explores aspects of pharmaceutical industry. Analyzes burdens and benefits of drug research and development on different populations.

**01:988:414** ***Care Work (3)***
Fully online. Overview of "care economy." Explores recent efforts to heighten its profit-making potential; considers long-term implications of efforts to deskill and outsource care work.

**01:988:416** ***Women's Global Health: Special Topics (3)***
Topic varies with instructor. The requirements for the course would be the equivalent of any 400-level course in the department.

**01:988:420,421** ***Women's Global Health Internship (3,3)***
RN Response Network provides medical assistance in the context of natural disasters wherever they may occur. This internship placement involves 150-180 hours of professional work with RN Response Network in conjunction with a research paper that links this professional experience with relevant academic work on humanitarian intervention.

**01:988:422** ***Internship in Women's and Gender Studies (3)***
Students work in organizations related to women's and gender studies. Supervision by assigned staff at the placement. Paper, student journal, and assessment of work performed at placement required.
***Permission of undergraduate director required.***

**01:988:425** ***Internship in Women's and Gender Studies (6)***
Interns work in organizations related to women's and gender studies. Supervision by assigned staff at the placement site. Seminar, student journal, paper, and assessment of work experience required.
***Prerequisite: 01:988:301 or 302 or 303. Permission of undergraduate director required.***

**01:988:426** ***Internship for IWL Scholars (BA)***
Examination of women, community activism, and leadership for change; explores how women's leadership shapes organizations, social movements, and policy development. Interns work in placements relevant to their policy interests and produce proposals for social action projects.
***Prerequisites: Acceptance into IWL Leadership Scholars Program and 01:988:344, or by permission of instructor.***

**01:988:429** ***Engendering Development (3)***
Examines gender differences in economic opportunity, human rights, and political representation across developing countries.
***Prerequisite: 01:988:101 or 235 or 301.***

**01:988:430** ***IWL Social Action Project (BA)***
Independent action projects designed to address a particular problem or women's policy issue relevant to the work done at the internship site. Projects include gender component and development of leadership skills. Class meets biweekly.

**01:988:447** ***Gender-Based Violence as Human Rights Violations: Histories and Trajectories (3)***
Grasp key concepts such as structural and interpersonal violence, sexism, heterosexism, heteropatriarchy, privilege and oppression, intersectionality, and decoloniality, through multi-disciplinary perspectives. Explore the histories, presents, and futures of varied movements eradicating gender-based violence across the globe. Develop feminist writing, researching, and reflective and transformative learning and practical skills.

**01:988:465** ***The Queering of Theory (3)***
Considers the historical and conceptual events that precipitated the emergence of queer theory.

**01:988:480** ***Ethics and Leadership (3)***
Explores contemporary relations between ethics and politics, between conceptions of leadership and the production of depoliticized masses, between individual values and public beliefs.

**01:988:481** *Feminism and Visual Culture (3)*
Examines the history of cultural contexts of visual narratives that address gender and sexuality and their influence on cultural policies.
*Prerequisite: 01:988:101 or 201 or 202 or 235 or permission of instructor.*

**01:988:482** *Feminism, Policy, and the Poor (3)*
Explores the contributions of feminist analysis, advocacy, and policy making to antipoverty policy and social justice politics.
*Prerequisite: 01:988:101 or 201 or 202 or 235 or permission of instructor. Fulfills capstone requirement for IWL Leadership Scholars Certificate.*

**01:988:485** *Motherhood: Nature and Culture, Policy, and Politics (3)*
Investigates how motherhood is shaped by intentional public policies and social, economic, political, and cultural forces in the United States and globally.
*Prerequisite: 01:988:101 or 201 or 202 or 235 or permission of instructor. Fulfills capstone requirement for IWL Leadership Scholars Certificate.*

**01:988:486** *Gender, Development, Environment: Policies, Politics, Perspectives (3)*
Using ethnography and gender as a category of analysis, examines the experiences and implications of transnational development and environmental policies in specific localities.
*Prerequisite: 01:988:101 or 201 or 202 or 235 or permission of instructor. Credit not given for both this course and 01:070:486. Course fulfills the capstone requirement for the IWL Leadership Scholars Certificate.*

**01:988:487** *Language of Women's Health and Health Policy (3)*
Examines the creation of narratives of women's health and health policy; through visits from health care experts, considers the impact of these narratives on practice.
*Prerequisite: 01:988:101 or 201 or 202 or 235 or permission of instructor. Fulfills the capstone requirement for the IWL Leadership Scholars Certificate.*

**01:988:490** *Seminar: Women and Contemporary Issues (3)*
Intensive reading and discussion; designed for graduating seniors. Topic changes annually.
*Prerequisite: 01:988:301 or 302 or 303 or by permission of instructor.*

**01:988:491** *Seminar in Women's and Gender Studies (3)*
Advanced course on a selected topic in women's and gender studies. Paper is required.
*Prerequisite: 01:988:301 or 302 or 303 or by permission of instructor.*

**01:988:492** *Seminar: Special Topics in Women's and Gender Studies (3)*
Selected interdisciplinary topics in women's and gender studies. Past topics included sexuality, popular culture, women and religion, and women and the arts.
*Prerequisite: 01:988:301 or 302 or 303 or by permission of instructor. Open to junior and senior majors and minors; others with instructor's permission.*

**01:988:493,494** *Independent Study (3,3)*
Independent study project under the guidance of a faculty supervisor.
*Permission of associate director required.*

**01:988:497-498** ***Honors Research in Women's and Gender Studies (3,3)***
Individual research project to be written as honors thesis.
***Open only to seniors who are candidates for honors in women's and gender studies. Permission of undergraduate director required. Both semesters required.***

# World Language Proficiency Certificates (SAS)

## WORLD LANGUAGE PROFICIENCY CERTIFICATES

Several of the world language and literature departments (AMESALL, French, German, Italian, Russian, and Spanish) award a certificate in world language proficiency and/or translation based on demonstrated ability to comprehend, speak, read, and write the world language. The usual requirement is a grade of B or better in 6 credits of work taken in courses at or above the 300 level conducted entirely in the world language. Individual departments may specify particular courses or examinations to be completed in demonstrating this standard. For further information, consult the appropriate world language department.

Note: The world language proficiency certificates are awarded only with or subsequent to the awarding of a baccalaureate degree in an approved major.

# History and Aims of the School (SAS)

## HISTORY AND AIMS OF THE SCHOOL

**School of Arts and Sciences**

Websites: Here
Here

The School of Arts and Sciences (SAS) has deep roots at Rutgers University.

Rutgers was founded in 1766 with the mission of providing a classical liberal arts education that at the time included such subjects as Latin, Greek, arithmetic, and geometry.

As it grew from a small colonial college to a major public research university, Rutgers built an expansive liberal arts program while striving to create the ideal setting and structure for undergraduate education.

By the 1970s, four outstanding undergraduate colleges were educating Rutgers-New Brunswick students: Douglass College, Livingston College, Rutgers College, and University College.

The School of Arts and Sciences was launched in 2007, bringing together the talent, traditions, energy, and resources of all four colleges with a new, unifying vision.

The classical liberal arts education that the first Rutgers students received now finds full expression in the more than 100 majors and minors at SAS, covering the spectrum of life sciences, mathematical and physical sciences, humanities, and social and behavioral sciences.

Today, the School of Arts and Sciences is a diverse, dynamic, and creative community, dedicated to preparing students for meaningful lives and advancing knowledge that improves the world.

# Requirements (SAS)

## REQUIREMENTS

Requirements (SAS)

## Credits and Residency

## Credits and Residency

All students must earn at least 120 credits, with a minimum cumulative grade-point average of 2.000. Students should successfully complete 15 degree credits each fall and spring semester, or a total of 30 degree credits a year including Summer Session in order to earn the required 120 credits in four years. Students admitted with placement into noncredit remedial courses and students in majors with rigid sequencing requirements that require certain courses be taken in the first year will need to plan very carefully to complete their baccalaureate requirements in four years of full-time study. The deans and advisors in the SAS Office of Advising and Academic Services can assist in developing an academic plan.

Students matriculated (i.e., registered in pursuit of a degree) at the School of Arts and Sciences (SAS) must earn 30 of their last 42 credits while registered in classes offered by Rutgers University-New Brunswick departments or registered in special programs, such as Study Abroad, approved in writing by the SAS Office of Advising and Academic Services. Students who transfer into SAS from other institutions with senior status must earn a minimum of 30 credits while registered as SAS students in order to receive a bachelor's degree from the school.

Requirements (SAS)

## Core Curriculum

## Core Curriculum

The School of Arts and Sciences (SAS) requires that all students complete a goal-based Core Curriculum, as well as an approved major and an approved minor. Students who are pursuing an approved credit-intensive major or who are double majoring will have the minor requirement waived.

The distinctive SAS Core Curriculum is structured as a set of core arts and sciences learning goals. All are framed as activities students will be able to do at a foundational level by virtue of meeting the specified core goal. Courses may be counted as meeting up to two learning goals; students generally will complete the core in 10 to 14 courses of 3 or 4 credits each. A course used to meet core goals may also be used to fulfill a major or minor requirement. Only graded degree credit-bearing courses worth at least 3 credits and certified by the SAS faculty may be used to meet core goals. For lists of courses certified as meeting each goal, see here.
SAS Core Curriculum course lists are also available in the Rutgers online degree audit system, Degree Navigator, and each semester the Schedule of Classes is searchable by Core Code.

AREAS OF INQUIRY

**CONTEMPORARY CHALLENGES [CCD], [CCO]** Students must take two approved courses that meet these goals.

**Diversities And Social Inequalities [CCD]**

- Analyze the degree to which forms of human differences and stratifications among social groups shape individual and group experiences of, and perspectives on, contemporary issues. Such differences and stratifications may include race, language, religion, ethnicity, country of origin, gender identity, sexual orientation, economic status, abilities, or other social distinctions and their intersections.
- Analyze contemporary social justice issues and unbalanced social power systems.
- **Our Common Future [CCO]** Analyze a contemporary global issue from a multidisciplinary perspective.
- Analyze the relationship that science and technology have to a contemporary social issue.

*Natural Sciences [NS]* Students must take two approved courses that meet one or both of these goals.

- Understand and apply basic principles and concepts in the physical or biological sciences.
- Explain and be able to assess the relationship among assumptions, method, evidence, arguments, and theory in scientific analysis.

**Social and Historical Analysis [HST] [SCL]** Students must take two approved courses that meet one or both of these goals.

*Historical Analysis [HST]* Students must take one approved course that meets one or both of these goals.

- Explain the development of some aspect of a society or culture over time, including the history of ideas or history of science.
- Employ historical reasoning to study human endeavors, using appropriate assumptions, methods, evidence, and arguments.

*Social Analysis [SCL]* Students must take one approved courses that meets one or both of these goals.

- Understand different theories about human culture, social identity, economic entities, political systems, and other forms of social organization.
- Employ tools of social scientific reasoning to study particular questions or situations, using appropriate assumptions, methods, evidence, and arguments.

***Arts and Humanities [AH]*** Students must take two approved courses that meet one or more of these goals.

- Examine critically philosophical and other theoretical issues concerning the nature of reality, human experience, knowledge, value, and/or cultural production. [AHo]
- Analyze arts and/or literatures in themselves and in relation to specific histories, values, languages, cultures, and technologies. [AHp]
- Understand the nature of human languages and their speakers. [AHq]
- Engage critically in the process of creative expression. [AHr]

**COGNITIVE SKILLS AND PROCESSES [WC] [WCr] [WCd]**

***Writing and Communication [WC]*** Students must take three approved courses that meet all 5 of these goals, including College Writing 01:355:101 or College Writing Extended 01:355:104; one WCr; and one WCd.

- Communicate complex ideas effectively, in standard written English, to a general audience.
- Respond effectively to editorial feedback from peers, instructors, and/or supervisors through successive drafts and revision. [WCr]
- Communicate effectively in modes appropriate to a discipline or area of inquiry. [WCd]
- Evaluate and critically assess sources and use the conventions of attribution and citation correctly.
- Analyze and synthesize information and ideas from multiple sources to generate new insights.

Students receiving a score of 4 or above on the AP English composition or literature tests, or transferring in an equivalent to College Writing, are exempted from College Writing 01:355:101. For such students the writing and communication goals become a two-course requirement: WCr and WCd.

The Revision-Based Writing and Communication learning goal [WCr] must be fulfilled by taking a class at Rutgers University-New Brunswick; transfer and AP courses are not certified to meet this learning goal.

**Quantitative and Formal Reasoning [QQ] [QR]** Students must take two approved courses that meet one or more of these goals.

- Formulate, evaluate, and communicate conclusions and inferences from quantitative information. [QQ]
- Apply effective and efficient mathematical or other formal processes to reason and to solve problems. [QR]

# Completion of a Major and a Minor

# Completion of a Major and a Minor

Students must complete an approved major and an approved minor listed in the Programs of Study chapter in this section. The requirement for a minor may be waived for students completing multiple majors or credit-intensive majors. Students in credit-intensive majors are encouraged to complete a minor, even though they are not required to do so, if their graduation plan can support it.

All students are responsible for consulting with the undergraduate director in the department of their major and of their minor to ensure that they will have fulfilled all requirements by the time of graduation.

Requirements (SAS)

# Declaration and Change of Major and Minor

# Declaration and Change of Major and Minor

Students are not admitted to the School of Arts and Sciences (SAS) by major. Full-time students normally declare their major in the second semester of their second year, although some majors encourage students to declare even earlier in order to facilitate the planning needed for an appropriate sequence of the courses required to complete the major within four years. Part-time students normally declare their major by the time they have completed 60 credits. Declaration requirements vary by department; some academic departments have prerequisites and/or require approval by a department advisor.

Students who are not able to declare their major by their third year are encouraged to seek advising to ensure timely degree completion.

A list of majors open to SAS students is included under the Programs of Study and Courses for Liberal Arts and Sciences Students in this catalog and online at https://sasundergrad.rutgers.edu. Students are strongly urged to consult with an academic advisor and the specific departments offering the majors they are considering during their first year at SAS. Some majors, including many in the sciences and in world languages, require that courses be sequenced in a particular way, making planning during the first year critical to timely completion of the major.

The major and the minor may not be selected from the same academic program. In general, there are no other SAS restrictions on selection of available majors and minors; however, some combinations are prohibited. Please see the Major/Minor restrictions at https://sasundergrad.rutgers.edu.

Please check the requirements of the specific majors and minors you are considering.

Students are advised to consult Degree Navigator and department webpages for the most up-to-date information on the requirements for majors and minors.

In addition, certain bachelor of arts (B.A.) and bachelor of science (B.S.) majors offered in other Rutgers University-New Brunswick schools may require separate admission. These schools include: the Edward J. Bloustein School of Planning and Public Policy; the School of Communication and Information; the School of Management and Labor Relations, and the School of Social Work. SAS students completing these majors will receive a single bachelor's degree conferred by SAS in conjunction with the cognate professional school.

Prospective applicants to any of these professional schools at Rutgers University need to refer to the section of the catalog for the school of interest for specific application guidelines and a listing of the courses to be completed prior to application. All students should meet with an academic advisor to determine how the sequence of courses to be completed for application will affect their graduation from SAS if their application to the professional school is unsuccessful.

**Change of Major or Minor.** Students wishing to apply for a change of major or minor should complete the appropriate form online here. Please note that changes or additions of major/minor that would delay degree completion will not be approved. Students should have their major and minor declarations set by Junior year at the latest to ensure on-time graduation.

Requirements (SAS)

# Second Baccalaureate Degree

# Second Baccalaureate Degree

Students who have already completed a bachelor's degree at an accredited college or university may pursue a second bachelor's degree at the School of Arts and Sciences (SAS) in a major area entirely different from their previous major.

If you intend to take a course which requires a pre-requisite, you may be required to take a placement test. Students with international bachelor's degrees are required to take the English placement test.

1. A minimum of 30 credits at Rutgers University-New Brunswick beyond those applied to the initial degree
2. All requirements for a new major
3. The SAS Core Curriculum

Students may apply approved coursework completed during the first degree toward the Areas of Inquiry and Cognitive Skills and Processes components of the Core Curriculum. However, all second-degree candidates must complete at least the Contemporary Challenges [CC] learning goals and one Writing and Communication with revision [WCr] course at Rutgers-New Brunswick as part of the second degree; courses taken as part of the first degree cannot be used to satisfy these requirements. Second Degree students are not eligible to have their SAS Core Curriculum waived through the New Jersey Statewide Transfer Agreement (NJSWTA).

Two baccalaureate degrees may not be earned concurrently except through approved dual-degree programs, such as that between SAS and the School of Engineering. Students who complete multiple majors earn a single bachelor's degree.

# Graduation (SAS)

## GRADUATION

Degrees are conferred at the annual commencement at the end of the spring semester. Students completing degree requirements in August (after Summer Session) or January (after the fall semester) will receive a letter of completion by the end of their graduation month, and will have the degree noted on the official Rutgers transcript approximately one month after graduation. All diplomas are mailed to the student's permanent mailing address within three months of degree completion.

**Graduation with Honors.** The bachelor's degree is conferred with the distinction summa cum laude for graduates with a Rutgers cumulative grade-point average of 3.850 or higher; magna cum laude for those with an average of 3.700 or higher; and cum laude for those with an average of 3.500 or higher. Averages are not rounded to the next higher number in the calculation of honors. Students who successfully complete the Rutgers School of Arts and Sciences Honors Program receive special recognition at graduation. Academic departments may recommend students for departmental honors or recognition based on special work and/or examinations. See statements under individual department listings.

**Phi Beta Kappa.** Phi Beta Kappa, established in 1776, is the oldest and most widely recognized liberal arts honorary society in the United States. Each spring semester, the Phi Beta Kappa Society invites to membership the outstanding students of the junior and senior classes. Election to the society is based on high academic achievement, a record of coursework that is at least three-quarters liberal in nature, proficiency in a world language through the intermediate level, a minimum of two years equivalent of full-time coursework at Rutgers University, and breadth of scholarship.

**Departmental Honors.** Many departments have a departmental honors program for outstanding students in their majors. Small group seminars, honors course sequences, specialized advising, and senior thesis programs are available in certain departments. For further information about the specific offerings of the departmental honors program in a particular department, see the website for each major program.

**National Society of Collegiate Scholars.** The National Society of Collegiate Scholars is an honors organization which recognizes outstanding academic achievement among first- and second-year college students. The society was founded in 1994 at The George Washington University in Washington, D.C., and has grown to nearly 300 colleges and universities nationwide. The three pillars of the society are: scholarship, leadership, and service.

**Prizes and Honors.** The School of Arts and Sciences, academic departments, and other units of Rutgers University offer a variety of prizes and awards for students with excellent academic records or special eligibility. Students should consult with their academic departments and visit the corresponding websites for additional information.

**Post-Obitum Degrees.** In the unfortunate event of the death of a student while registered at the School of Arts and Sciences as a senior, requests will be considered for the awarding of the degree that was being earned. The request may be submitted in writing to the Rutgers Office of the Dean of Students.

# Programs of Study for Arts and Sciences Students (SAS)

## PROGRAMS OF STUDY FOR ARTS AND SCIENCES STUDENTS

Students are advised to consult Degree Navigator and department webpages for the most up-to-date information on the requirements for majors and minors.



## Majors

## MAJORS

Students must declare and complete a major from among the following disciplines, as well as a minor from among those listed under Minors.

- African, Middle Eastern, and South Asian Languages and Literatures
- Africana Studies
- American Studies
- Anthropology, Cultural
- Anthropology, Evolutionary
- Art
- Art History
- Asian Studies
- Astrophysics
- Biological Sciences
- Biomathematics
- Cell Biology and Neuroscience
- Chemistry
- Chinese
- Cinema Studies
- Classics
- Cognitive Science
- Communication
- Comparative Literature
- Computer Science
- Criminal Justice
- Dance
- Data Science
- Earth and Planetary Sciences
- Economics
- English

- Environmental Studies (available as a second major only)
- European Studies
- Exercise Science
- French
- Genetics
- Geography
- German
- Health Administration
- History
- History/French
- History/Political Science
- Human Resource Management
- Information Technology and Informatics
- Italian
- Japanese
- Jewish Studies
- Journalism and Media Studies
- Korean
- Labor Studies and Employment Relations
- Latin American Studies
- Latino and Caribbean Studies
- Linguistics
- Mathematics
- Medieval Studies
- Middle Eastern Studies
- Molecular Biology and Biochemistry
- Music
- Philosophy
- Physics
- Political Science
- Portuguese
- Psychology
- Public Health
- Public Policy
- Religion
- Russian
- Social Work
- Sociology
- Spanish
- Sport Management
- Statistics
- Statistics/Mathematics

- Theater Arts
- Urban Planning and Design
- Women's, Gender, and Sexuality Studies

A bachelor of arts degree is conferred for all majors except the following, for which a bachelor of science degree is awarded: astrophysics; chemistry; evolutionary anthropology; exercise science; geological sciences; health administration; public health; sport management; and urban planning and design. Either a bachelor of arts degree or a bachelor of science degree is available in the following subjects: computer science, data science, mathematics, and physics. For subjects offering both a bachelor of arts and a bachelor of science degree, students may not graduate with a bachelor of arts degree, then return to complete the courses necessary for a bachelor of science degree. All courses required for the desired degree must be completed at the time of graduation.

For information, see the departmental listing in the Programs of Study and Courses for Liberal Arts and Sciences Students chapter.



# Minors

# MINORS

- African Area Studies
- African Languages
- African, Middle Eastern, and South Asian Languages and Literatures
- Africana Studies
- Agroecology
- American Studies
- Animal Science
- Anthropology
- Anthropology, Cultural
- Anthropology, Evolutionary
- Arabic
- Archaeology
- Architectural Studies
- Art
- Art History
- Arts Management and Leadership
- Asian American Studies
- Asian Studies
- Astrobiology
- Astronomy
- Biochemistry
- Biological Sciences
- Business Administration

- Business and Technical Writing
- Chemistry
- Chemistry Education
- Chinese
- Cinema Studies
- Classical Humanities
- Cognitive Science
- Comparative and Critical Race and Ethnic Studies
- Comparative Literature
- Computer Science
- Creative Expression and the Environment
- Creative Writing
- Criminology
- Critical Intelligence Studies
- Culinary Nutrition
- Dance
- Data Science
- Developmental Psychology
- Digital Communication, Information, and Media
- Disabilities Studies
- Earth and Planetary Sciences
- Ecology, Evolution, and Natural Resources
- Economics
- Education as a Social Science
- English
- Entomology
- Entrepreneurship
- Environmental and Business Economics
- Environmental Policy, Institutions, and Behavior
- Environmental Sciences
- Environmental Studies
- European Studies
- Food Science
- French
- Gender and Media
- Geography
- German
- Government and Business
- Greek (Ancient)
- Greek (Modern)
- Health Administration
- Health and Society

- Health Equity
- Hindi
- History
- History- Law and History
- History- STEM in Society
- Holocaust Studies
- Horticulture Therapy
- Human Resource Management
- Hungarian
- International and Global Studies
- Italian
- Japanese
- Jewish Studies
- Korean
- Labor Studies
- Labor Studies - Diversity in the Workplace
- Labor Studies - Labor Unions and Social Movements
- Labor Studies - Law and the Workplace
- Labor Studies - Work Organization and Management
- Labor Studies - Work, Globalization, and Migration
- Landscape Design
- Language and Culture of Ancient Israel
- Latin
- Latin American Studies
- Latino and Caribbean Studies
- Linguistics
- Marine Sciences
- Mathematics
- Medical Ethics and Health Policy
- Medieval Studies
- Meteorology
- Middle Eastern Studies
- Military Science (Aerospace)
- Military Science (Military)
- Military Science (Naval)
- Military Science (Non-commissioning)
- Music
- Music Technology
- Nutrition
- Organizational Leadership
- Persian
- Philosophy

- Philosophy, Politics, and Economics
- Physics
- Plant Science
- Political Science
- Portuguese
- Psychology
- Public Administration and Management
- Public Health
- Public Policy
- Quantitative Economics
- Religion
- Russian
- Sexualities Studies
- Slavic and Eastern European Studies
- Social Justice
- Sociology
- South Asian Studies
- Spanish
- Sport Management
- Statistics
- Theater Arts
- Turkish
- Urban Planning and Design
- Urban Studies
- Women's, Gender, and Sexuality Studies

Many of the five year, accelerated graduate programs that are offered to School of Arts and Sciences students will substitute for the minor requirement; please see an academic advisor for details.

Programs of Study for Arts and Sciences Students (SAS)

# Certificate Programs

# CERTIFICATE PROGRAMS

A number of academic departments and programs offer a variety of certificates to School of Arts and Sciences students. Certificates are awarded only with or subsequent to the awarding of a baccalaureate degree. Please visit the certificate programs page in the Undergraduate Education in New Brunswick chapter of this catalog.

Programs of Study for Arts and Sciences Students (SAS)

## Other Academic Programs

## OTHER ACADEMIC PROGRAMS

- Accelerated M.A. Degree Program in Political Science - Concentration in the United Nations and Global Policy Studies
- Arts and Sciences Coordinated B.A. or B.S./M.B.A. in Professional Accounting
- Bachelor's Degree/J.D. Degree Program with Rutgers Law School
- Bachelor's Degree/Master of Applied Psychology
- Bachelor's Degree/Master of Arts Co-Terminal Degree in Art History
- Bachelor's Degree/Master of Arts Degree in Criminal Justice Program
- Bachelor's Degree/Master of Arts in Feminist Practices for Social Change
- Bachelor's Degree/Master's Degree Programs with the Edward J. Bloustein School of Planning and Public Policy
- Bachelor's Degree / Master in Communication and Media (BA/MCM) Dual Degree Pathway
- Bachelor's Degree (ITI)/ Master of Information (BA/MI) Dual Degree Pathway
- Bachelor's Degree/M.P.H. Degree Program with Rutgers School of Public Health
- Doctor of Physical Therapy (DPT) 4+3 Program
- Five-Year, Dual-Degree Program in Engineering and Liberal Arts/Sciences
- Bachelor of Science / Entry Level-Master of Science Clinical Nutrition Program
- Five-Year, Dual-Degree Program MA/BA in Religion
- Five-Year Teacher Certification Program
- Future Leaders M.B.A. (B.A./B.S. Accelerated M.B.A. for Undergraduates)
- Joint Programs (Economics 4 + 1 Masters Program)
- Master of Science in Speech-Language Pathology (MSSLP)
- Postbaccalaureate Prehealth Program
- School of Arts and Sciences Honors Program
- School of Arts and Sciences/Rutgers Biomedical and Health Sciences Articulated Programs
- School of Management and Labor Relations joint Bachelor's and Master's Five-Year Program
- Study Abroad
- Thesis Programs

# Administration (SAS)

## ADMINISTRATION

**Administration**

Juli Wade, Executive Dean

James Masschaele, Executive Vice Dean

Zaire Dinzey-Flores, Vice Dean of Diversity, Equity, and Inclusion

Susan Lawrence, Vice Dean for Undergraduate Education

Bob Maruca, Vice Dean of Administration

Tom Vosseler, Executive Director of IT and Data Analytics

Rob Eccles, Senior Director of Development

Kareem Mumford, Senior Director of Communications and Marketing

**Division Deans**

Lori Covey, Dean of Life Sciences

Robin Leichenko, Dean of Social and Behavioral Sciences

James Masschaele, Dean of Humanities (Interim 2024-2025)

Thu Nguyen, Dean of Mathematical and Physical Sciences

**Office of Undergraduate Education**

Susan Lawrence, Vice Dean for Undergraduate Education

Sharon Bzostek, Senior Associate Dean for Undergraduate Education

Courtney Stanzione, Associate Dean and Director of Advising and Academic Services

Vanessa Coleman, Assistant Dean and Director for Student Records and Administrative Systems

A. Musu Davis, Administrative Dean of the SAS Honors Program

Michelle Shostack, Associate Dean and Director of the SAS Educational Opportunity Fund

# History and Aims (SEBS)

## HISTORY AND AIMS

**Our History: How George H. Cook Shaped Rutgers**

George Hammell Cook (1818-1889) was raised on a small farm in Morris County, NJ, in the early 1800s. After high school, he spent a number of years as an itinerant, working as an engineer with a railroad in the Catskills, teaching and studying at the Rensselaer Institute, managing a glassmaking house in Albany, NY, and teaching at the Albany Academy. He came to Rutgers College as professor of chemistry and natural sciences in 1853 at the invitation of then President Theodore Frelinghuysen. By the time he came to Rutgers, Cook had expertise in geology, chemistry, engineering, and agriculture. Among Cook's first research projects was the chemical analysis of "greensand marl," a soil deposit found in central and south Jersey. This research led to his appointment as assistant state geologist. A thorough geological survey of New Jersey, published in 1840, was already out of date, and Professor Cook was appointed to undertake its revision. His work would become the model for the U.S. Geological Survey.

In 1862, the Morrill Act was signed into law by President Abraham Lincoln. The Morrill Act was driven by the idea that everyone (every young man, at least) could benefit from an education in the sciences. The act provided for the establishment of a college in each state where students would receive an education that included scientific and classical studies, military tactics, agriculture, and the mechanic arts. A unique American contribution to higher education, the land-grant concept applied scientific research to local problems. Cook, who was a strong believer in the concept of scientific agriculture, led successful lobbying efforts (against Princeton and the state Normal School at Trenton) to have Rutgers designated as the site of the land-grant college. The Rutgers Scientific School (as it was then called) was founded in 1864 as New Jersey's land-grant college, with George H. Cook at the head. A 100-acre farm on the outskirts of New Brunswick was purchased from the estate of James Neilson to serve as the school's experimental farm. (Rutgers was given 210,000 acres of what is now Utah under the Morrill Act, which was sold to establish the college and purchase land for the experimental farm.) That land is now the heart of the G. H. Cook Campus.

In 1887, the Morrill Act was amended by the Hatch Act, which established funds for state agricultural experiment stations. These federal- and state-appropriated funds were used to build New Jersey Hall, which housed Rutgers Scientific School, and to acquire additional faculty and farmland. George H. Cook became the first director of the New Jersey Agricultural Experiment Station, which now includes offices in all 21 New Jersey counties. In 1912, the (by then) College of Agriculture moved from the College Avenue Campus to the campus of the experiment station. The land-grant triad was completed in 1914 with the Smith-Lever Act. This act established the Agricultural Extension Service, which located College of Agriculture faculty in each of the counties.

Under the land-grant framework, campus-based academic programs complement experiment station research, which in turn is disseminated to the public by local extension agents. Residents call extension agents with a problem, who either work to resolve the problem or initiate research into it. In 1917, the New Jersey legislature designated the Rutgers Scientific School, also called the State College of Agriculture, as the State University of New Jersey. In 1924, Rutgers College assumed the name Rutgers University, but the College of Agriculture remained as a distinct unit. It was not until 1945 that Rutgers University as a whole (with the College of Agriculture as a unit) achieved state university status. In 1965, the College of Agriculture became the College of Agriculture and Environmental Sciences (CAES).

The creation of Cook College from the CAES in 1971 was in many ways transformative. Cook College aimed to offer an interdisciplinary, problem-oriented curriculum that emphasized environmental studies as well as the arts and sciences. This combination of features in a land-grant school was unique at the time. Today, with the transformation to the School of Environmental and Biological Sciences (SEBS), the focus on creating a multidisciplinary learning environment remains, and new efforts have begun to enhance the learning environment for students. Through living-learning communities, an emphasis on hands-on and service learning, as well as international education opportunities, SEBS students will gain a deeper, more nuanced understanding of their curricular work. Together with NJAES, Rutgers and, more specifically the School of Environmental and Biological Sciences, works to fulfill the goals of land-grant institutions by enlarging the land-grant mission to include the study of environmental problems, natural resources, economic and community development, fisheries, nutrition, public health, and youth development--all of which address the diverse needs of a highly developed state.

The Morrill Act laid the foundation for the development of our nation's great public university system. The commitment of Rutgers University to the land-grant concept makes us unique among the universities in New Jersey. Rutgers students and faculty are part of a proud tradition of academic study, research, and public service, a tradition that began with the remarkable efforts of George H. Cook--educator, innovator, and public servant. As committed

to science-based solutions as George H. Cook was in the 19th century, the faculty of the School of Environmental and Biological Sciences and the New Jersey Agricultural Experiment Station are equally committed to addressing the socioeconomic issues that face our state's residents today.

History and Aims (SEBS)

# Mission-Oriented Education, Research, and Outreach

# Mission-Oriented Education, Research, and Outreach

The School of Environmental and Biological Sciences pursues excellence in research, teaching, and outreach in areas of study that address the biological spectrum from organisms to ecosystems. Its emphasis is on both the fundamental sciences and the social and human dimensions. The school offers 21 undergraduate majors, including plant biology and animal sciences; entomology; microbiology; biotechnology; biochemistry; agriculture and food systems; landscape architecture; environmental planning and design; food and nutritional sciences; ecology, evolution, and natural resources; marine science and oceanography; environmental sciences and meteorology; environmental policy, institutions, and behavior; and environmental and business economics.

In addition to instruction in the classroom, field, and laboratory, students have opportunities for experiential learning on and off campus, including a growing emphasis on international experiences through short- and long-term study abroad. Students also have access to a robust program of applied research and outreach hosted by the New Jersey Agricultural Experiment Station laboratories, farms, business incubators, and marine stations throughout the state.

History and Aims (SEBS)

# Scholarships

# Scholarships

Students attending the School of Environmental and Biological Sciences have the opportunity to compete on both a merit and a need basis for school-based scholarships.

In February of each academic year, the school's Office of Academic Programs notifies students matriculated in the School of Environmental and Biological Sciences (except seniors) of the start of the annual scholarship application process for the following academic year.

Academic prizes and departmental scholarships are also awarded through academic departments to the schools' students in various fields of study, often on the recommendation of the faculty in the appropriate curriculum. Students automatically are considered for all awards for which they are eligible. For additional scholarship information, visit here.

History and Aims (SEBS)

# General Information

## General Information

Faculty, staff, and students are the core of the School of Environmental and Biological Sciences community. There are about 240 on-campus faculty members and about 3,700 undergraduate students. The school offers an education that encompasses the personal and professional development of its students in a small campus setting within the larger Rutgers community.

The school's undergraduate instruction programs are closely linked to the rest of the university. Its students, like all Rutgers students, are able to take courses offered by the schools at Rutgers University-New Brunswick.

# Credits and Residency (SEBS)

## CREDITS AND RESIDENCY

To be awarded a degree, a student in the School of Environmental and Biological Sciences must complete a minimum of 120 credits* of coursework with a cumulative grade-point average of 2.000 or better. The student must satisfactorily complete the requirements of one of the curricula (major programs of study) available to the school's students. These curricula are listed and their requirements are outlined in the chapter on Programs of Study. In addition, the student must complete 30 of the last 42 credits at Rutgers. With careful planning, full-time students who begin their higher education at the School of Environmental and Biological Sciences, and who have not placed into remedial courses or changed majors, should be able to complete their degree requirements in four years.

*Students completing the Fall 2015 SEBS Core must complete 128 credits. Students completing the Environmental Engineering degree will complete 129 credits.

# Double Majors (SEBS)

## DOUBLE MAJORS

Students seeking to complete the requirements of a second program of study offered by the School of Environmental and Biological Sciences and/or another school of Rutgers University must complete a second major form available both at the Office of Academic Programs in Martin Hall and online, in order to have that declaration verified by the curriculum or department offering the program. Satisfactory completion of these requirements is noted on the student's final transcript, but only one bachelor's degree is conferred upon graduation. Students should consult with an academic adviser at the Office of Academic Programs, Martin Hall, when considering adding any additional majors, minors or certificate programs.

# Second Bachelor's Degree (SEBS)

## SECOND BACHELOR'S DEGREE

Students with a previously earned bachelor's degree from another institution who matriculate at the School of Environmental and Biological Sciences for the purpose of earning a second degree must: 1) complete a minimum of 30 credits from Rutgers University, and 2) fulfill the course requirements listed under experience-based education and proficiency in a field/concentration for the major (see the Programs of Study chapter). These requirements may, however, be modified by the undergraduate program director, in consultation with the student, and subject to final approval by the school's Admissions and Scholastic Standing Committee.

# Mission, Goals, and Core Curriculum of the Undergraduate Program (SEBS)

## MISSION, GOALS, AND CORE CURRICULUM REQUIREMENTS OF THE UNDERGRADUATE PROGRAM

Human impacts on the earth's ecosystem are profound and far reaching. The faculty of the School of Environmental and Biological Sciences is committed to educating students to understand and sustain the integrity of this ecosystem, as both specialists within their fields of concentration and well-informed citizens. The programs of study offered by the school apply the natural and social sciences to this dynamic system.

The curricula are designed to achieve the following goals for graduates of the School of Environmental and Biological Sciences:

To understand and appreciate the interaction between the natural and social sciences as they relate to the earth's ecosystem, students master the basic knowledge and approaches of a field of specialization and are introduced to multidisciplinary perspectives that locate their field and its contributions in this larger context.

To evaluate issues critically, so that graduates may become autonomous, versatile, and productive people who understand that they are inextricably related to the natural world and to other people. Mastery of both quantitative and qualitative modes of inquiry develops each student's ability to deal with the complexity and dynamism of real-world issues.

To understand and appreciate human impacts on the earth's ecosystem, students develop a historical, global, and multicultural consciousness in order to expand their bases for decision making.

To sustain the integrity of the global ecosystem, students develop the ethical sensitivity and analytical skills necessary to address questions of social responsibility, environmental ethics, moral choice, and social equity.

# Core Curriculum Requirements

# CORE CURRICULUM REQUIREMENTS

The School of Environmental and Biological Sciences (SEBS) offers bachelor's degree programs in 21 programs of study (curricula), many with several areas of further concentration (options). All programs of study are designed to achieve the goals outlined in the section on Missions, Goals, and Core Curriculum Requirements of the Undergraduate Program.

First-year students matriculating fall 2015 to fall 2018 and transfer students matriculating fall 2016 to spring 2019 must complete a goal-based Core Curriculum: Here. Students wishing to adopt the fall 2019 Core Curriculum must meet with a dean at the Office of Academic Programs.

First-year and transfer students matriculating fall 2019 must complete a goal-based Core Curriculum: Here.

The SEBS goal-based Core Curriculum is structured as a set of core liberal arts and sciences learning goals framed as activities that students will be able to do at a foundational level by virtue of meeting the specific core goal. Courses may be counted as meeting multiple learning goals; students generally will complete the core in 10 to 13 courses of 3 or 4 credits each. A course used to meet core goals may also be used to fulfill a major or minor requirement. Only graded degree credit-bearing courses worth at least 3 credits and certified by the faculty may be used to meet core goals. Lists of courses certified as meeting each goal can be found in the Degree Navigator system.

## Contemporary Challenges

(6 credits) Students must take two courses and meet one goal in each of the Contemporary Challenges areas. [CC-D, CC-O]

*Diversities and Social Inequalities [CC-D]*

- Analyze the degree to which forms of human differences and stratifications among social groups shape individuals and group experiences of, and perspectives on, contemporary issues. Such differences and stratifications may include race, language, religion, ethnicity, country of origin, gender identity, sexual orientation, economic status, abilities, or other social distinctions and their intersections.
- Analyze contemporary social justice issues and unbalanced social power systems.

*Our Common Future [CC-O]*

- Analyze a contemporary global issue from a multidisciplinary perspective.
- Analyze the relationship that science and technology have to a contemporary social issue.

## Experiential Learning (previously called Experience-Based Education, EBE)

(3 credits) Practical application of disciplinary knowledge. Students must participate in a certified experience that meets this goal. [EL]

- Complete and report on an applied experience (e.g., professional practice, service learning, or research) in order to examine and evaluate ideas within a discipline.

## Areas of Inquiry

*Natural Sciences* (6 credits) Students must meet two goals with courses in two of the following disciplines: physical, biological or environmental sciences. [NS]

- Understand and apply basic principles and concepts in the physical or biological sciences.
- Explain and be able to assess the relationship among assumptions, method, evidence, arguments, and theory in scientific analysis.
- Identify and critically assess ethical and societal issues in science.

*Social and Historical Analysis* (9 credits; see HST and SCL below.)

- Understand the bases and development of human and societal endeavors across time and place.
- Explain and be able to assess the relationship among assumptions, method, evidence, arguments, and theory in social and historical analysis.
- Identify and critically assess ethical issues in social science and history.

*Historical Analysis* (3 credits) Students must meet one goal. [HST]

- Explain the development of some aspect of a society or culture over time, including the history of ideas or history of science.
- Employ historical reasoning to study human endeavors.

*Social Analysis* (6 credits) Students must meet one goal in each area below. [SCL]

*Social Cultural Analysis/ Economic Analysis* (3 credits) [SCL-SCA/ECN]

- Understand different theories about human culture, social identity, economic entities, political systems, and other forms of social organization.
- Apply concepts about human and social behavior to particular questions or situations.
- Use the principles of economics, finance, and accounting to analyze and solve problems related to institutions, policies, and management.
- Evaluate the institutional factors that underlie and influence policy decisions.

***Governance and Regulation Analysis*** (3 credits) [GVT]

- Analyze ethical, moral, and legal dimensions of environmental resource use, regulation, and management spanning governmental and nongovernmental institutions.
- Use theory and evidence from the social sciences to analyze the decisions made by organizations that affect resource use, the environment, and health; including the organizations involved, the influences on those decisions, and the intended and unintended consequences that are likely to result.

***Arts and Humanities*** (3 credits) Students must meet one goal. [AH]

- Examine critically philosophical and other theoretical issues concerning the nature of reality, human experience, knowledge, value, and/or cultural production.
- Analyze art and/or literature in themselves and in relation to specific histories, values, languages, cultures, and technologies.
- Understand the nature of human languages and their speakers.
- Engage critically in the process of creative expression.

## Cognitive Skills and Processes

***Writing and Communication*** (6 credits) Students must meet one goal in two areas. [WC, WCd]

***Expository Writing*** (101) or Exposition and Argument (103) (3 credits) [WC]

- Communicate complex ideas effectively, in standard written English, to a general audience.
- Evaluate and critically assess sources and use the conventions of attribution and citation correctly.
- Analyze and synthesize information and ideas from multiple sources to generate new insights.

***Writing in a Discipline*** (3 credits) [WCd]

- Communicate effectively in modes appropriate to a discipline or area of inquiry. [WCd]

***Quantitative and Formal Reasoning*** (6 credits) Students must meet two goals. [QQ; QR]

- Formulate, evaluate, and communicate conclusions and inferences from quantitative information. (Includes various quantitative methods courses as well as 640 courses) [QQ]
- Apply effective and efficient mathematical or other formal processes to reason and to solve problems. (Includes 640 courses and formal reasoning course--or placement out of) [QR]

# Area Requirements for Students Matriculating Prior to Fall 2015

# AREA REQUIREMENTS FOR STUDENTS MATRICULATING PRIOR TO FALL 2015

In the following descriptions of the first seven of these area requirements, the numbers of credits indicated are the minimum requirements established by the school's faculty for all bachelor's degree programs. Many programs require specific courses that must be used to fulfill some of these areas and in some cases these program-specific requirements may exceed the school's minimum requirements. No course may be used to fulfill simultaneously more than one of the general school core requirements (Areas I-VII); however, a given course may fulfill simultaneously both a general school core requirement in Areas I-VII and a major program requirement (Area VIII--proficiency in a field). Before selecting courses, students should consult the requirements for each program that they are considering, and discuss these with their academic adviser.

**Lists of courses that fulfill the various requirements can be found in the Degree Navigator system (Here).**

**Descriptions of some of the courses available for fulfillment of Areas I to VII can be found in the New Brunswick Undergraduate Catalog 2013-2015.**

*Area I. School Mission: Interdisciplinary Critical Analysis*

The undergraduate program's goals are to help students develop the abilities to think critically; address problems with a variety of modes of inquiry; and recognize and assess ethical problems related to the environment, natural resources, food and human nutrition, and agriculture, in order to make decisions based upon an understanding of the long- and short-term implications of the various choices. As a means of meeting these goals, students are required to complete one 3-credit junior/senior colloquium course. This colloquium course is a capstone, integrative educational experience for students concluding their undergraduate studies, enabling them to synthesize information and techniques gained in previous courses. Working cooperatively with peers who have different capabilities and interests and using the case study method, students in these courses devise creative, interdisciplinary solutions to multifaceted problems with ethical, social, political, and technical content in the school's mission areas. Current lists of the junior/ senior colloquia offerings are posted on the school's website: Here.

*Area II. Introductory Life and Physical Sciences*

To provide a foundation for understanding and evaluating important questions related to the life and physical sciences, students are required to complete courses in both the life sciences and in the physical sciences, as follows:

*A. Life Sciences (4-8 credits).* Introductory courses in biological sciences (subject 119), plant biology (subject 776), animal sciences (subject 067), ecology and evolution (subject 216) with a laboratory.

*B. Physical Sciences (3-5 credits).* A basic chemistry (subject 160) or physics (subject 750) course, or an introductory course that applies the physical sciences to earth systems including geography (subject 450), geology (subject 460), environmental sciences (subject 375), marine sciences (subject 628), meteorology (subject 670).

Many programs of study require specific courses and additional credits in the life and physical sciences. Students should consult the requirements of the specific program(s) of study they are considering before selecting courses from this list.

*Area III. Humanities and the Arts*

To develop an understanding and appreciation of the humanities, art forms, and modes of critical response and interpretation, students are required to complete a minimum of 6 credits in the following subject areas. Upper-level literature and art courses in a foreign language may satisfy this requirement, but elementary and intermediate foreign language courses (i.e., conversation, grammar, and composition courses) do not satisfy this requirement. The two courses selected may be from the same or different disciplines.

*Area IV. Multicultural and International Studies*

To encourage students to see the world through the eyes of people whose culture differs from their own, students are required to complete a minimum of 6 credits in multicultural and international studies. These courses are intended to expose students to international, cross-cultural, and historical perspectives; to acquire an appreciation for the diversity and variability of institutions, cultures, and individuals; and to consider the complex and changing interactions of cultural, situational, and institutional factors that affect human behavior.

Several programs of study require specific courses or additional credits in multicultural and international studies. Students should consult their advisers and/or the requirements of the specific majors they are considering before selecting courses from the list.

Students who have studied outside the United States at an accredited institution for one semester or more may waive 3 credits of this requirement.

*Area V. Human Behavior, Economic Systems, and Political Processes*

Civic engagement in our democratic society is enhanced by an understanding of human behavior and of the political processes and institutional frameworks within which public policies are developed, and by the ability to evaluate policy issues through the application of economic concepts and theory. To develop these understandings, students are required to complete courses in human behavior, in economic systems, and in political processes.

*Area VI. Oral and Written Communication*

To develop the speaking and writing skills essential for success in both the university and in the professions that students are preparing to enter, written and oral presentations are incorporated into all courses, where feasible. Students are further required to complete a minimum of 6 credits.

*Area VII. Experienced-Based Education*

To develop the ability to apply curricular and extracurricular-based learning, including leadership development and personal as well as interpersonal management skills, within settings appropriate to their fields, each of the school's programs of study specifies a course or mechanism of study. Examples of currently available options are internships and cooperative education placements through the Student to Professional Internship Network (SPIN) Program, practica, independent research, and the George H. Cook Scholars Program.

Students completing two major programs offered by the School of Environmental and Biological Sciences must complete at least one experience-based education course, approved by both curricula.

*Area VIII. Proficiency in a Field/Concentration*

To develop proficiency in a field/concentration related to the environment, natural resources, food and human health, or agriculture, each curriculum specifies required courses, elective courses, and, where applicable, option requirements. Every program of study also specifies minimum requirements in quantitative skills and in professional ethics as they apply to the particular field/concentration for which it prepares its students.

*Quantitative Skills.* The quantitative skills requirement is designed to help students develop mathematical literacy and skills for analytical reasoning, including an understanding of statistical methodologies appropriate to the field for which students are preparing.

*Professional Ethics.* The professional ethics requirement is designed to help students develop the ability to recognize, assess, and respond to ethical problems that could be encountered in the careers students are preparing to enter.

*Additional Requirements.* Each degree program stipulates additional required courses in the field and may require students also to fulfill requirements in more specialized options.

*Area IX. Unspecified Electives*

All students must complete a minimum of 128 credits for the bachelor's degree (or 159 credits for the five-year bioenvironmental engineering curriculum). The minimum credit requirements to satisfy areas I-VIII total 125 credits or less for at least one option in every major available at the school (with the exception of the five-year bioenvironmental engineering major). The additional 3 or more credits required for graduation may be fulfilled by any courses for which the student has met all the prerequisites. Students who have completed at least 60 credits of coursework may register for up to two of these unspecified elective courses (no more than one per semester) on a Pass/No Credit basis.

# Graduation (SEBS)

## GRADUATION

Degrees are conferred by Rutgers University on the recommendation of the faculty of the School of Environmental and Biological Sciences only at the annual commencement in May. Students completing degree requirements in August or January may obtain a letter from the Office of Academic Programs or ask the university registrar for a certificate attesting to their completion of degree requirements, provided they have filed a Diploma Information Card.

Degrees are conferred in absentia when the candidate has advised the school's Office of Academic Programs in advance of his or her inability to attend the University Commencement ceremony.

Students who complete courses at other institutions or return to Rutgers to complete degree deficiencies must notify the school's Office of Academic Programs of their intent to graduate and arrange to have an official transcript forwarded to the School of Environmental and Biological Sciences, Office of Academic Programs, Rutgers, The State University of New Jersey, 88 Lipman Drive, New Brunswick, NJ 08901-8525. Deadlines for this notification are February 1 for May graduation, August 1 for an August degree date, and November 1 for a January degree date.

Diplomas will be withheld from all students whose financial accounts are not clear.

*Graduation with Honors.* Academic excellence is recognized by the school faculty's recommendation that the bachelor's degree be conferred with summa cum laude to students whose cumulative grade-point average is 3.850 or higher; magna cum laude to those whose cumulative grade-point average is 3.700 to 3.849; and cum laude to those whose cumulative grade-point average is 3.500 to 3.699.

*Phi Beta Kappa.* Each spring semester, the Phi Beta Kappa Society invites to membership outstanding students of the junior and senior classes. Election to the society is based on high academic achievement, a record of coursework that involves the pursuit of a liberal arts major, proficiency in a foreign language through the intermediate level, a minimum of two years equivalent of full-time coursework at Rutgers University, and breadth of scholarship. Phi Beta Kappa, established in 1776, is the oldest and most widely recognized liberal arts honorary society in the United States.

*Prizes and Honors.* The School of Environmental and Biological Sciences, its individual academic departments, and other units of the university offer a variety of prizes and awards for students with excellent academic records or special eligibility. Students should consult with their academic departments for additional information.

*Post-Obitum Award of Degree.* In the unfortunate event of the death of a student who was enrolled in the School of Environmental and Biological Sciences as a senior in good standing, requests will be considered for the awarding of the degree that was being earned. The request may be submitted in writing to the school's Admissions and Scholastic Standing Committee.

# Summary (SEBS)

## SUMMARY

Graduation from the School of Environmental and Biological Sciences requires the successful completion of one of the curricula (major programs of study) listed below. Any student in the school who decides to double-major may choose the second major from those offered by other faculties or schools at Rutgers University; however, only one bachelor's degree is conferred upon graduation. Students in the School of Environmental and Biological Sciences may also minor in programs offered by other faculties and schools. They may also enroll in individual courses offered by other faculties and schools of the university.

Any potential student who does not wish to major in a curriculum that is on the list below should apply directly to the school at Rutgers that offers the desired major. Any student already enrolled in the School of Environmental and Biological Sciences, but who no longer wishes to major in a curriculum on the list below should consult with one of the school's deans in the Office of Academic Programs in Martin Hall about initiating an application for a school-to-school transfer within Rutgers (here).

The School of Environmental and Biological Sciences uses a system of adviser codes to aid in the advising and registration process. Adviser codes are indicated in the lists of faculty advisers for each curriculum.

Summary (SEBS)

## Premedical, Predental, and Prelaw Programs

## Premedical, Predental, and Prelaw Programs

Please note that there are no specific programs of study for students interested in medical, dental, or law school. Individuals can major in any of the programs available to students in the School of Environmental and Biological Sciences and complete the necessary admission requirements for these professional programs.

# Agriculture and Food Systems 020 (SEBS)

## AGRICULTURE AND FOOD SYSTEMS 020

**Degree:** B.S.

**Director:** -

**Program Website:** Here

*(Sunsetting curriculum)* Agriculture and food systems aim to appeal to those who are interested in an entrepreneurial and innovative education in the agricultural sciences, spanning the entire range from production to table. The A&FS major targets students who seek careers in agribusiness, government service, and agricultural education and extension, as well as those preparing to be owners/operators of farming enterprises.
Students interested in agricultural education can enroll in the Agricultural Education option within the Agriculture and Food Systems major. This option must be combined in a 4 + 1 program with the Graduate School of Education.

Agriculture and Food Systems 020 (SEBS)

## Graduation Requirements for the Major

## Graduation Requirements for the Major

Students matriculating prior to the fall semester of 2015 in the School of Environmental and Biological Sciences (SEBS) must complete the SEBS general education requirements. In addition, students majoring in agriculture and food systems must complete the major requirements described below.

Students matriculating fall 2015 or after and transfer students matriculating in 2016 and after must complete a goal-based Core Curriculum in place of general education requirements. The goal-based core is described here. Courses are certified for the Core Curriculum by a faculty committee. A current list of certified courses can be found here.

Agriculture and food systems major requirements are as described below. The program has flexibility so academic advising is provided to ensure that students choose courses that support their career goals.

For an up-to-date description of agriculture and food systems major requirements, courses, and course sequences please refer to the program website here.

Total Credits: 60 to 63 credits

**A. Required Courses:**

**i. Science Requirements:**

- At least one introductory biology course (01:119:101 or 103 or 119 or 199)
- At least one introductory chemistry course (01:160:126 or 127 or 128 or 134 or 140 or 159 or 161 or 163)
- At least one introductory earth science, ecology, or geological sciences course (01:460:100 or 101; or 11:216:101 or 217 or 351; or 11:374:101; or 11:375:101; or 11:573:445)

**ii. Agriculture and Food Systems Requirements:**

11:020:210 Introduction to Agriculture and Food Systems
11:020:215 Applied Practical Applications in Agriculture and Food Systems

**iii. Soils Requirement (choose one course):**

11:216:422 Soil Organismal Diversity
11:375:360 Soils and Water
11:375:453 Soil Ecology
11:776:102 Soils and Society
11:776:440 Soil Fertility

**iv. Economics Requirement (choose one course):**

01:220:102 Introduction to Microeconomics
01:220:103 Introduction to Macroeconomics
11:373:101 Economics, People, and Environment
11:373:121 Principles and Applications of Microeconomics
11:373:122 Principles and Applications of Microeconomics

**v. Quantitative Requirements (2 courses):**

01:640:026 Intermediate Algebra or place into Pre-calculus (01:640:111)

and

One quantitative skills course (Pre-calculus I or II; or calculus; or statistics or applied statistics)

**vi. Experiential Learning (choose one course):**

11:020:490 Agriculture and Food Systems Practicum
11:020:495 or 495 Special Problems in Agriculture and Food Systems
11:067:201, 202, 203, 205, or 207 Animal Science Practicum
11:554:488 G. H. Cook Scholars Program
11:776:350 Agroecology Practicum
11:776:495 or 496 Special Problems in Plant Science
11:902:301 or 302 or 400 School of Environmental and Biological Sciences (SEBS) Internship

**B. Foundational Courses for Agriculture and Food Systems (3 courses from):**

01:830:101 General Psychology (NB)
01:920:101 Introduction to Sociology (NB)
11:020:305 Starting and Managing A Small Farm (NB)
11:020:315 Direct Farm Marketing and Agritourism (NB)
11:067:142 Animal Science (NB)
11:216:101 Introduction to Ecology and Evolution (NB)
11:216:217 Principles of Natural Resource Management (NB)
11:216:272 Dendrology (NB)
11:216:332 Plant Ecology (NB)
11:216:351 Principles of Ecology (NB)
11:370:226 Pesticide Impacts on Humans and Environmental Health (NB)
11:370:308 Apiculture (NB)
11:370:350 Agricultural Entomology and Pest Management (NB)
11:370:381 Insect Biology (NB)
11:374:101 Introduction to Human Ecology (NB)
11:375:101 Intro to Environmental Sciences (NB)
11:400:103 Science of Food (NB)
11:400:104 Food and Health (NB)
11:400:106 Food as Medicine (NB)
11:400:201 Principles of Food Science (NB)
11:628:120 Introduction to Oceanography (NB)
11:709:201 Culinary Nutrition (NB)
11:709:255 Nutrition and Health (NB)
11:776:210 Principles of Botany (NB)
11:776:211 Introduction to Horticulture (NB)
11:776:231 Commercial Floral Design (NB)
11:776:242 Plant Science (NB)

**C. Additional course selected in consultation with an advisor:**
A total of 30 credits from {Area of Inquiry 1: Agricultural Sciences, Area of Inquiry 2: Agribusiness and Entrepreneurship, Area of Inquiry 3: Food Systems; Culture; Community Food Justice and Advocacy; Nutrition & Health, Area of Inquiry 4: Policy, Politics, Economics, Ethics and Law, Area of Inquiry 5: Education, Communication, Leadership, Foundational Course Taught by the School of Arts and Sciences}

- with at least 3 credits from {Area of Inquiry 1: Agricultural Sciences, Foundational Course Taught by the School of Arts and Sciences}
- and at least 3 credits from {Area of Inquiry 2: Agribusiness and Entrepreneurship}
- and at least 3 credits from {Area of Inquiry 3: Food Systems; Culture; Community Food Justice and Advocacy; Nutrition & Health}
- and at least 3 credits from {Area of Inquiry 4: Policy, Politics, Economics, Ethics, and Law}
- and at least 3 credits from {Area of Inquiry 5: Education, Communication, Leadership}

Agriculture and Food Systems 020 (SEBS)

# Agriculture and Food Systems Teacher Education Track

# Agriculture and Food Systems Teacher Education Track

The B.S. in Agriculture and Food Systems Teacher Education Track is designed for preparation to become a certified K-12 Teacher of Agriculture. It also prepares students for agricultural extension and outreach work.

This program provides agricultural science, subject area preparation toward teacher certification at the Rutgers Graduate School of Education (Five Year, 4+1 Agricultural Science Education, teacher education program). However, graduates will also be prepared to pursue teacher certification at other graduate schools or the Alternative Route teaching certificate. Successful completion of N. J. Teacher Certification is required to qualify as a K-12 Teacher of Agriculture. Students apply to the 5-year program at GSE by February 1, ideally in their Junior year.

For more information, contact Dr. Xenia Morin or Dr. Thomas Leustek.

**Graduation Requirements**

A minimum of 120 earned credits are required to graduate with a B.S. in Agriculture and Food Systems, Teacher Education Track. Students must fulfill the SEBS Core graduation requirements and the following Agriculture and Food Systems Education Option requirements.

**R1: Science Requirements (all AFS majors) (9 credits)**
A total of 3 courses, one in each of the following categories:

- One chemistry course
- One biology course*
- One ecology, earth science, or geology class

*Note: These are minimum science requirements. Students are encouraged to take the biology course sequence 01:119:115, 01:119:116 and 01:119:117 if they intend to become certified to also teach biological sciences or if these biology classes are pre-requisites for other classes.

**R2: Agriculture and Food Systems Required Foundation Courses for the Education Track (15 credits)**

A total of 5 courses as agriculture and food systems foundational classes (for all AFS Majors)(6 credits)

- 11:020:210 Introduction to Agriculture and Food Systems
- 11:020:215 Applied Practical Applications in Agriculture and Food Systems

And two of these three classes (6 credits):

- 11:067:142 Animal Science
- 11:776:211 Introduction to Horticulture
- 11:776:242 Plant Science

One of these (3 credits):

- 11:776:391 Weeds, Diseases, and Insects of Plants (3)
- 11:776:105 Stories of Plant Diseases (3)
- 11:776:402 Weeds: Impact and Management (3)
- 11:067:330 Animal Nutrition (3) along with 11:067:331 Animal Nutrition Laboratory (1)

**R3: Educational Foundation Courses specific to the Education Track (18 credits)**
Five classes from this list:

*Pre-admission to the 5-year program and taken in Sophomore or Junior Year*

- 05:300:200 Introduction to Education (3) 05:300:201
- Introduction to Education Field Based Lab - Clinical Experience (0.5)
- 05:300:306 Educational Psychology: Principles of Classroom Learning (3)
- 11:374:416 Environmental Education in the School (3)

*SEBS Senior Year, Fall Semester (also Year 1 of 2 of GSE requirements)*

- 05:300:498 Clinical Experience Phase I (0.5)
- 05:300:450 Urban Education 1 (1.5)
- 05:300:307 Human Development: Infancy through Early Adulthood (3)
- 11:020:425 Developing Ideas in Agricultural Education (3) or 11:300:425 Developing Ideas in Agriculture (3)

*Senior year, Spring semester (also Year 1 of 2 of GSE requirements)*

- 05:300:498 Clinical Experience Phase 2 (0.5)
- 11:020:426 Teaching Agriculture and Food Systems (3) or 11:300:426 Teaching Agriculture (3)

*Note: The 11:300:425/426 will be replaced by 11:020:425/426 starting in Fall 2019.*

**R4: Soils Requirement (all AFS Majors) (3 credits)**
A total of 1 class from a list of soils classes:

- 11:776:102 Soil and Society (3)
- 11:776:440 Soil Fertility (3).

*Note: Soils and Water or Soils and Organisms can be taken if you have the prerequisites.*

**R5: Economics Requirement (all AFS Majors) (3 Credits)**
A total of 1 class:

- 11:373:121 Microeconomics

**R6: Quantitative Skills (all AFS Majors*)(3 credits)**
Complete one of the following:

- Placement into pre-calculus or complete Intermediate Algebra (01:640:026) or equivalent transfer credit.
- Total of 1 quantitative course which meet the QQ and QR requirements for the SEBS Core. (3 credits): (*New expanded list!)

**R7 Experiential Learning (6 credits)**
6 credits from an approved experiential learning course(s) (one course, or a combination of courses to make 3 credits):

- 11:300:417 Supervised Ag Educational Experience Practicum (3)
- 11:020:255 Special Topics in Agriculture and Food Systems (3) Subtopics: Ag Tech

*Acceptable alternatives if related to agriculture and food systems or education:*

- 11:067:200-207 Animal Practicums (1-3 credits)
- 11:020:490 Agriculture and Food Systems Practicum (1-3 credits)
- 11:902:300 SEBS Internship I (3)
- 11:902:301 SEBS Internship II (3)

**R8 Approved electives for the Agriculture and Food Systems Education Track (minimum 21 credits; at least 12 credits should be at, or above, 300 level)**
A minimum of 12 credits in agricultural sciences, food science, ecology, and natural resource management, landscape architecture with 6 credits coming from agriculture and food systems or plant science:

At least 12 credits from:

- 11:020:296 Honors Seminar in Agriculture and Food Systems
- 11:020:321 Principles and Practices of Small Organic Farming (summer farm course)
- 11:020:340 Indoor Cultivation of High Value Crops
- 11:020:455 Special Topics in Agriculture and Food Systems
- 11:020:436 Sustainable Agriculture

*Any of the following 200 or higher:*

- 11:776:202 Applied Physiology of Horticultural Crops (3)
- 11:776:205 Intro to Ethnobotany (3)
- 11:776:242 Plant Science (3)*
- 11:776:221 Principles of Organic Crop Production (3)
- 11:776:257 Edible and Poisonous Fungi (3)
- 11:776:390 Hemp and Medical Cannabis (3)
- 11:776:302 General Plant Pathology (3)
- 11:776:310 Plant Propagation (3)
- 11:776:321 Greenhouse Systems Management (3)
- 11:776:341 Fruit Production (3)
- 11:776:391 Weeds, Diseases and Insects of Plants (3)
- 11:776:439 Nursery Crop Production (3)
- 11:776:440 Soil Fertility (3)
- 11:776:442 Agroecology

**Other approved elective courses:**

Approved Animal Science Courses

- 11:067:200-207 Animal Practicum, Cattle; Sheep; Swine; Lab Animal; Horse (2);
- 11:067:330 Animal Nutrition (3) with 11:067:331 Animal Nutrition Laboratory (1)

Approved Entomology Courses

- 11:370:226 Pesticide Impacts on Human and Environmental Health (3)
- 11:370:350 Agricultural Entomology and Pest Management (3)
- 11:370:308 Apiculture (3)

Approved Food Science Courses

One of:

- 11:400:103 Science of Food (3)
- 11:400:106 Food as Medicine (3)
- 11:400:107 Foods: From Field to Table (3)

Approved Landscape Agriculture Courses (035) such as

- 11:550:271 Agriculture and the Landscape (3)

Approved Agriculture and Natural Resource Courses

- 11:035:268 Environmental Pollution - Issues in Agriculture, Industry, and Communities (2)
- 11:035:272 River and Stream Ecology (1)
- 11:035:274 Organic Farming and Gardening (2)
- 11:035:280 American Lawns and Turfgrass (1.5)

- 11:035:288 Edible Gardening for Enrichment and Education (2)

Approved Urban Forestry Courses

- 11:216:332 Plant Ecology (4)
- 11:216:365 Arboriculture (4)
- 11:216:377 Practicum in Forest Management (1-12)
- 11:216:403 Urban Forestry (3)
- 11:770:391 Diseases of Urban and Forest Trees (1.5)

Approved Marine Science Courses

- 11:628:309 Fishery Science (3)
- 11:628:317 Aquaculture (3)

Approved Microbiology Course

- 11:680:103 Microbiology of Agricultural Products in New Jersey (3)

Note: Other courses approved with permission of the undergraduate program director for agriculture and food systems. At least 3 credits in agribusiness or entrepreneurship.

- 11:020:305 Starting and Managing a Small Farm (3)
- 11:020:340 Indoor Cultivation of High Value Crops (4)
- 11:020:442 Entrepreneurial Agriculture (3)
- 11:373:231 Introduction to Marketing (3)
- 11:373:241 Introduction to Management (3)
- 11:373:331 Economics of the Food Marketing System (3)
- 11:035:300 Agricultural Commodities and Markets

A least 3 credits in food systems, policy, economics, ethics, or law:

- 11:020:333 Community Food Justice and Advocacy
- 11:020:337 Sustainability: Tackling Food Waste\
- 11:020:465 Feeding America's Cities
- 11:374:279 Politics of Environmental Issues (3) (also a SEBS core class)
- 11:374:289 Sustainable Food: Politics, Policy and Ethics (3)
- 11:374:313 U.S. Environmental Policy (3)
- 11:373:218 Sustainable Food Policy for Developing Countries (3)
- 11:373:323 Agriculture and Food Policy (3)
- 11:373:362 Natural Resource Economics
- 11:373:371 Food, Nutrition and Health Policy (3)
- 11:373:XXX Food Policy and other approved 11:373:XXX approved courses

Optional credits in education, communication, leadership, and youth development.

- 11:374:227 Agriculture in Society and Mass Media (3)

- 11:607:200 Principles of Leadership (3)
- 11:607:202 Leadership and Civic Engagement (3)
- 11:607:203 Foundations of Volunteer Management (3)
- 11:607:401 Foundations of Program Planning (3)
- 11:607:402 Building Community Partnerships (3)
- 11:607:484 Practical Leadership Applications in Agricultural Science (4)

# Animal Science 067 (SEBS)

## ANIMAL SCIENCE 067

**Degree:** B.S.

**Director:** Aparna Zama (zama@rutgers.edu)

**Undergraduate Program Website:** Here

**Department:** Carol Bagnell

**Chair:** Nicholas Bello

**Department Website**: Here

The animal science curriculum provides training and career development for students that have an interest in animal biology or related fields including veterinary medicine, biomedical research, laboratory animal care, companion animal-related careers, equine science, agribusiness, and livestock production and management. The biological sciences form a basis for the study and management of animals. Options are offered in preveterinary medicine/research, companion animal science, laboratory animal science, and equine and production animal science. .

**Options within the Animal Science Major**

*1. Preveterinary Medicine/Research.* Rigorous instruction and experience are provided in the biological and molecular basis of animal sciences in preparation for further education in medical or graduate studies. This option fulfills the academic course requirements of most U.S. veterinary colleges. Students completing this option may also enter medical and dental schools or pursue graduate studies leading to advanced degrees.

*2. Companion Animal Science.* Instruction and practical experience in companion animal science (selection, breeding/reproduction, nutrition, physiology, behavior) and appropriate business courses provide students the basic knowledge and skills to manage commercial or not-for-profit companion animal science enterprises.

*3. Laboratory Animal Science.* Instruction and practical experience are provided in research techniques and the care and use of laboratory animals. Many graduates choose careers in animal care programs as well as research laboratories of major pharmaceutical and related industries, many of which are located in New Jersey.

***4. Equine and Production Animal Science.*** Instruction and practical experience in equine and production animal science (selection, breeding/reproduction, nutrition, physiology, behavior) and appropriate business courses provide students with the basic knowledge and skills needed to manage commercial or research enterprises in the horse and livestock (dairy/beef, poultry, sheep, swine) industries, or pursue careers in related/supporting fields such as the feed and animal health care industries, zoos, or wildlife preserves.

Animal Science 067 (SEBS)

# Learning Goals

# Learning Goals

Learning goals for students who successfully complete the program in animal science:

1. Students will gain a broad knowledge of the animal science discipline to understand the future of the field and its diversity
2. Students will apply biological and chemical principles and quantitative reasoning to concepts presented in core subject areas in animal science such as physiology, nutrition, genetics, and reproduction.
3. Students will develop an in-depth understanding of option-specific subject areas such as preveterinary medicine, equine and production animal science, companion animal science, and lab animal science.
4. Students will acquire skills for handling and caring for laboratory animals and livestock species.
5. Students will develop critical thinking skills to identify scientific questions and devise solutions, including designing experiments, analyzing and interpreting research data, and summarizing findings.
6. Students will develop oral and written communication skills to effectively deliver scientific and technical information to scientists as well as the public.
7. Students will develop an understanding of the principles of animal welfare and the ethical treatment of animals.

Animal Science 067 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

Students matriculating fall 2015 or after and transfer students matriculating in 2016 and after must complete a goal-based Core Curriculum. The goal-based core is described here. Courses are certified for the Core Curriculum by a faculty committee. A current list of certified courses can be found here. Animal science major requirements are as described below.

For an up-to-date description of animal sciences major requirements, courses, and course sequences please refer to the program website here.

## Major Requirements for All Students Regardless of Matriculation Date

**A. REQUIRED COURSES (35-37)**

01:119:115,116 General Biology I, II (4,4) or 01:119:101,102 General Biology (4,4)
01:119:117 Biological Research Laboratory (2)
01:160:161,162 General Chemistry I, II (4,4) or equivalent
01:160:171 Introduction to Experimentation (1)

11:067:142 Animal Science (3)

11:067:300 Integrative Physiology (4) or 01:146:356 Systems Physiology (3)

11:067:327 Animal Reproduction (3)

11:067:328 Animal Genetics (3) or 01:447:380 Genetics (4 cr)

11:067:330 Animal Nutrition (3)

11:067:331 Animal Nutrition Laboratory (1)

**B. OPTIONS (42-61)**

**1. Preveterinary Medicine and Research (57-61)**

Required Courses (35-36)

01:160:307-308 Organic Chemistry (4,4)

01:160:311 Organic Chemistry Laboratory (2)

01:640:135 Calculus I (4) or 01:640:151 Calculus for Mathematical and Physical Sciences (4)

01:750:193-194 Physics for the Sciences (4,4) or equivalent

01:960:401 Basic Statistics for Research (3)

11:115:403,404 General Biochemistry (4,3) or 01:694:407,408 Molecular Biology and Biochemistry (3,3)

11:680:390 General Microbiology (4) or 01:447:390 General Microbiology (4)

Option-specific Electives: at least three of the following (9-12):

01:146:322 Human Histology (4)

01:146:328 Human Parasitology (3)

01:146:474 Immunology (3)

01:377:213 Functional Human Anatomy (4)

01:377:424 Human Anatomy (4)

01:640:136 Calculus II (4) or equivalent

01:694:315 Introduction to Molecular Biology and Biochemistry Research (3) or equivalent

11:067:390 Equine Nutrition (3)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:398 Advanced Equine Health Care and Management (3)

11:067:404 Animal Diseases (3)

11:067:410 Neuroendocrinology (3)

11:067:416 In Vivo Lab Animal Techniques

11:067:430 Animal Microtechniques and Tissue Culture (4)

11:067:450 Endocrinology (4)

11:067:490 Pathophysiology (3)

11:067:491 Reproductive and Developmental Toxicology (3)

11:067:492 Molecular and Cellular Physiology (3)

11:126:481 Molecular Genetics (3) and 11:126:482 Molecular Genetics Laboratory (4)

11:216:441 Animal Behavior (3) or equivalent

11:370:406 Medical and Veterinary Entomology (3)

Experiential Learning courses (7); no more than 6 credits from practicum or research courses.

01:090:320 Peer Instructor Education (3)

11:015:483 Research Problems: Agriculture and Environmental Science (BA)

11:015:484 Research Problems: Agriculture and Environmental Science (BA)

11:067:150 Introduction to Animal Handling (P/NC 1)

11:067:175 Animal Handling, Fitting, and Exhibition (P/NC 1)

11:067:176 Animal Handling, Fitting, and Exhibition Supervisor (P/NC 1)

11:067:201 Cattle Practicum (2)

11:067:202 Small Ruminant Practicum (2)

11:067:203 Swine Practicum (2)

11:067:205 Laboratory Animal Practicum (2)

11:067:207 Horse Practicum (2)

11:067:210 Introduction to Veterinary Technology (3)

11:067:260 Animal Evaluation and Selection (3)

11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:406 Farm Productivity Analysis (3)

11:067:411 Studies in Animal Science (BA)

11:067:414 Teaching in Animal Science (BA)

11:067:415 Leadership in Animal Science (BA)

11:067:416 In Vivo Lab Animal Techniques (3)

11:067:493,494 Research in Animal Science (BA, BA)

11:902:300,301,400 SPIN (3-6)

11:554:487,488 George H. Cook Scholars Program (3-6, 3-6)

Animal Science Electives (6)
At least 6 additional credits approved by the adviser, depending on the student's interests and career goals. See additional courses listed in the Animal Science (067) section of the Course Listings chapter.

**2. Companion Animal Science (49)**

Required courses (36)

01:160:209 Elementary Organic Chemistry (3) or equivalent

01:160:211 Elementary Organic Chemistry Laboratory (1) or equivalent

01:640:115 Precalculus College Mathematics (4) or equivalent

11:115:301 Introductory Biochemistry (3)

11:115:313 Introductory Biochemistry Laboratory (1)

11:373:121,122 Principles and Applications if Microeconomics/Macroeconomics (3,3)

11:067:101 Careers in Animal Science (3)

11:067:250 Companion Animal Science (3)

11:067:404 Animal Diseases (3)

11:704:441 Animal Behavior (3)

At least two of the following (6):

01:830:311 Learning Processes (3)

01:830:313 Physiological Psychology (3)

01:830:315 Comparative Psychology (3)

11:067:395 Animal Assisted Therapy (3)

11:067:460 Animals and the Law (3)

11:067:461 Topics in Companion Animal Science Issues (3)

11:216:240 Behavioral Biology (3)

11:216:269 Evolution of Animal Behavior (3)

Option-specific Electives (6):

11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:336 Livestock Production and Management II (3)

11:067:384 Horse Management (3)

11:067:390 Equine Nutrition (3)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:395 Animal Assisted Therapy (3)

11:067:398 Advanced Equine Health Care & Management (3)

11:067:401 Topics in Equine Science (3)

11:067:402 Equine Exercise Physiology (3)

11:067:406 Farm Productivity Analysis (3)

11:067:410 Neuroendocrinology (3)

11:067:413 Developing Future Leaders for the Equine Industry (1)

11:067:450 Endocrinology (4)

11:216:323 Ornithology (4)

11:216:325 Vertebrate Zoology (4)

Experiential Learning courses (7); no more than 6 credits from practicum or research courses.

01:090:320 Peer Instructor Education (3)

11:015:483 Research Problems: Agriculture and Environmental Science (BA)

11:015:484 Research Problems: Agriculture and Environmental Science (BA)

11:067:150 Introduction to Animal Handling (P/NC 1)

11:067:175 Animal Handling, Fitting, and Exhibition, Section DO (P/NC 1)

11:067:176 Animal Handling, Fitting, and Exhibition, Supervisor (P/NC 1)

11:067:201 Cattle Practicum (2)

11:067:202 Small Ruminant Practicum (2)

11:067:203 Swine Practicum (2)

11:067:205 Laboratory Animal Practicum (2)

11:067:207 Horse Practicum (2)

11:067:210 Introduction to Veterinary Technology (3)

11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:336 Production Animal Management (3)

11:067:406 Farm Productivity Analysis (3)

11:067:411 Studies in Animal Science (BA)

11:067:414 Teaching in Animal Science (BA)

11:067:415 Leadership in Animal Science (BA)

11:067:416 In Vivo Lab Animal Techniques (3)

11:067:493,494 Research in Animal Science (BA,BA)

11:902:300,301,400 SPIN (3-6) in a companion animal-related field

11:554:487,488 George H. Cook Scholars Program (3-6, 3-6) or equivalent

**3. Laboratory Animal Science (49)**

Required Courses (36)

01:160:307-308 Organic Chemistry (4,4)

01:160:311 Organic Chemistry Laboratory (2) or 01:160:313,314 Organic Chemistry Laboratory (1,1)

01:640:115 Precalculus College Mathematics (4) or equivalent

01:960:401 Basic Statistics for Research (3)

11:067:205 Laboratory Animal Practicum (2)

11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:404 Animal Diseases (3)

11:067:430 Animal Microtechniques and Tissue Culture (4)

11:373:121 Principles and Applications or Microeconomics (3)

11:680:390 General Microbiology (4) or 01:447:390 General Microbiology (4)

Experiential Learning courses (7); no more than 6 credits from practicum or research courses.

01:090:320 Peer Instructor Education (3)

11:015:483 Research Problems: Agriculture and Environmental Science (BA)

11:015:484 Research Problems: Agriculture and Environmental Science (BA)

11:067:150 Introduction to Animal Handling (P/NC 1)

11:067:175 Animal Handling, Fitting, and Exhibition (P/NC 1)

11:067:176 Animal Handling, Fitting, and Exhibition Supervisor (P/NC 1)

11:067:201 Cattle Practicum (2)

11:067:202 Small Ruminant Practicum (2)

11:067:203 Swine Practicum (2)

11:067:207 Horse Practicum (2)

11:067:210 Introduction to Veterinary Technology (3)

11:067:260 Animal Evaluation and Selection (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:336 Production Animal Management (3)

11:067:406 Farm Productivity Analysis (3)

11:067:411 Studies in Animal Science (BA)

11:067:414 Teaching in Animal Science (BA)

11:067:415 Leadership in Animal Science (BA)

11:067:416 In Vivo Lab Animal Techniques (3)

11:067:493,494 Research in Animal Science (BA, BA)

11:902:300,301,400 SPIN (3-6)

11:554:487,488 George H. Cook Scholars Program (3-6, 3-6)

Option-specific Electives (6)

11:067:101 Careers in Animal Science (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:336 Livestock Production and Management II (3)

11:067:384 Horse Management (3)

11:067:390 Equine Nutrition (3)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:395 Animal Assisted Therapy (3)

11:067:398 Advanced Equine Health Care & Management (3)

11:067:401 Topics in Equine Science (3)

11:067:402 Equine Exercise Physiology (3)

11:067:406 Farm Productivity Analysis in the Animal Sciences (3)

11:067:410 Neuroendocrinology (3)

11:067:416 In Vivo Lab Animal Techniques (3)

11:067:450 Endocrinology (4)

11:067:460 Animals and the Law (3)

11:067:490 Pathophysiology (3)

**4. Equine and Production Animal Science (50)**

Required courses (33)

01:640:111,112 Precalculus Pts1, 2 (2,2) or 01:640:115 Precalculus College Mathematics (4) or 01:640:135 Calculus I (4) or 01:640:151 Calculus for Mathematical and Physical Sciences (4)

11:960:285 Introductory Statistics for Business (3)

11:067:336 Production Animal Management (3)

11:067:384 Horse Management (3)

11:067:406 Farm Productivity Analysis (3)

11:373:121,122 Principles and Applications of Microeconomics/Macroeconomics (3,3) or 01:220:102,103 Introduction to Microeconomics/Macroeconomics (3,3)

11:373:231 Introduction to Marketing (3) or 11:020:305 Starting and Managing a Small Farm (3)

11:373:241 Introduction to Management (3)

33:010:272 Introduction to Financial Accounting (3) or 11:373:200 Agricultural Accounting (3)

Experiential Learning courses (7); no more than 6 credits from practicum or research courses.

01:090:320 Peer Instructor Education (3)

11:015:483 Research Problems: Agriculture and Environmental Science (BA)

11:015:484 Research Problems: Agriculture and Environmental Science (BA)

11:067:150 Introduction to Animal Handling (P/NC 1)

11:067:175 Animal Handling, Fitting, and Exhibition, Section HO (P/NC 1)

11:067:176 Animal Handling, Fitting, and Exhibition Supervisor (P/NC 1)

11:067:201 Cattle Practicum (2)

11:067:202 Small Ruminant Practicum (2)

11:067:203 Swine Practicum (2)

11:067:205 Laboratory Animal Practicum (2)

11:067:207 Horse Practicum (2)

11:067:210 Introduction to Veterinary Technology (3)

11:067:260 Animal Evaluation and Selection (3) 11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:411 Studies in Animal Science (BA), with equine research faculty

11:067:414 Teaching in Animal Science (BA)

11:067:415 Leadership in Animal Science (BA)

11:067:416 In Vivo Lab Animal Techniques (3)

11:067:493,494 Research in Animal Science (BA,BA), with equine research faculty

11:902:300,301,400 SPIN (3-6), in equine-related field

11:554:487,488 George H. Cook Scholars Program (3-6, 3-6)

Option-specific Electives (6)

11:067:310 Domestic Animal Behavior and Welfare (3)

11:067:390 Equine Nutrition (3)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:398 Advanced Equine Health Care and Management (3)

11:067:401 Topics in Equine Science (3)

11:067:402 Equine Exercise Physiology (3)

11:067:404 Animal Diseases (3)

11:067:460 Animals and the Law (3)

11:216:360 Animal Physiological Ecology (3)

11:373:321 Economics of Production (3)

11:375:453 Soil Ecology (3)

11:776:301 The Grain Crops (3)

11:776:440 Soil Fertility (3)

Animal Science Electives

At least 6 additional credits approved by the adviser, depending on the student's interests and career goals. See additional courses listed in the Animal Science (067) section of the Course Listings chapter. Suggested courses are:

11:020:210 Introduction to Agriculture and Food Systems (3)

11:067:101 Careers in Animal Science (3)

11:067:260 Animal Evaluation and Selection (3), also EL

11:067:250 Companion Animal Science (3)

11:067:275 Lab Animal Science: Management and Techniques (3)

11:067:295 Biosecurity in Animal Agriculture (3)

11:067:296 Honors Seminar (3)

11:067:310 Domestic Animal Behavior and Welfare (3)

11:067:322 Dairy Cattle Artificial Insemination (1)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:410 Neuroendocrinology (3)

11:067:430 Animal Microtechniques and Tissue Culture (4)

11:067:450 Endocrinology (4)

11:067:460 Animals and the Law (3)

11:067:490 Pathophysiology (3)

11:067:491 Reproductive and Developmental Toxicology (3)

11:067:492 Molecular and Cellular Physiology (3)

11:373:205 Small Business Essentials (3)

11:776:200 Modern Crop Production (3)

11:776:221 Principles of Organic Crop Production (3)

**C. UNSPECIFIED ELECTIVES**

In addition to courses meeting the above requirements, students can take other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 120 (matriculated 2018 or later) or 128 (matriculated prior to 2018) required for graduation.

# Biochemistry 115 (SEBS)

## BIOCHEMISTRY 115

**Degree**: B.S.

**Director:** Lori A. White (lori.white@rutgers.edu)

**Undergraduate Program Website:** Here

**Department Managing the Undergraduate Program in Biochemistry:** Biochemistry and Microbiology

**Department Chair:** Max Haggblom

**Department Website:** Here

The biochemistry major provides students with an integrated education in biochemistry that brings together the basics of biochemistry and its application to biological systems. The major takes advantage of the diversity of molecular/biochemical research and coursework that is offered at Rutgers School of Environmental and Biological Sciences (SEBS) and the other schools. Students will apply their basic understanding of biochemistry to a specific area of interest, ranging from toxicology/pharmacology to food and nutritional sciences, microbiology, animal science, and plant biology. This redesigned and enhanced curriculum follows the recommendations of the American Society for Biochemistry and Molecular Biology (ASBMB) and has components of both a traditional course-centered approach to teaching and the more current content- and outcome-centered approach. The purpose of the major is to prepare students for futures in science, either through obtaining advanced degrees or through entering the workforce in the pharmaceutical, biotechnological and chemical industries, government service, communications, law, and many other fields.

Biochemistry 115 (SEBS)

# Learning Goals

# Learning Goals

Upon graduation, students will have an understanding of the following:

1. Biochemistry graduates will be able to describe and discuss the basic concepts of biochemistry, including metabolism, enzymatic structure and function, and regulation of gene and protein expression.
2. Biochemistry Major graduates will be able to apply the scientific method, stating and testing a hypothesis, and will be able to design experiments to solve problems in biochemistry.
3. Graduates will gain hands-on experience in current biochemical techniques and be able to evaluate and present scientific data.
4. Upon completion, students will be able to critically analyze scientific data and scientific papers and be able to be effective science communicators
5. Graduates will be able to discuss and communicate a fundamental understanding of ethical and current issues in biochemistry and demonstrate an understanding of the importance of ethics in scientific research.

Biochemistry 115 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

Students matriculating prior to the fall semester 2015 in the School of Environmental and Biological Sciences (SEBS) must complete the SEBS general education requirements. In addition, students majoring in biochemistry must complete the major requirements described below.

Students matriculating fall 2015 or after and transfer students matriculating in 2016 and after must complete a goal-based Core Curriculum in place of general education requirements. The goal-based core is described here. Courses are certified for the Core Curriculum by a faculty committee. A current list of certified courses can be found here. Biochemistry major requirements are as described below.

For an up-to-date description of biochemistry major requirements, courses, and course sequences please refer to the program webpage.

**Proficiency in Biochemistry (90 credits)**

The major in Integrated biochemistry consists of the six parts listed immediately below. They are described briefly here; the specific requirements are listed below.

- **Life and Physical Sciences Core**
  These courses prepare students to enter the major. These courses are normally completed in the first two years of college.
- **Quantitative Methods**
  Quantitative reasoning, computational facility, and a grasp of calculus are essential skills for people to be well educated in molecular biosciences. As with the life and physical sciences core, students should normally complete this requirement within the first two years of college.
- **Biochemistry Core**
  This set of courses is required for all majors and prepares the student for both advanced coursework and research experience.
- **Professional Ethics**
  Ethical conduct has at least two components: general ethical behavior and the ethical implications for society at large as a consequence of advances in biochemistry. Although Contemporary Issues in Biochemistry will meet the formal requirement, all courses within the major will include ethical components and examples. In addition, all students in the major and in any of our courses will be required to adhere to a strict honor code.
- **Major-Related Experiential Learning**
  It is important that students be able to apply their knowledge of biochemistry in a laboratory setting. Therefore, all students will be required to take 6 credits of Experiential Learning. The School of Environmental and Biological Sciences requires 3 cr for graduation; therefore, Biochemistry Majors take an additional 3 cr. This can be accomplished through working in an academic laboratory at Rutgers, either at SEBS or the other campuses. This requirement can also be met through the George H. Cook Honors program, the General Honors Program, the Aresty Program, summer research opportunities (RISE or SURF), or through research experience through the Student Professional Internship Network (SPIN). The Research Experience may be structured to satisfy the college's experiential learning requirement.

- **Biochemistry Options**

    - **Biochemistry of Microbial Systems**
      This option blends biochemistry with microbiology, allowing students to become proficient in the biochemistry of microbial organisms and systems. This will include aspects of clinical microbiology and infection, as well as environmental microbiology. Microbial infections of higher organisms are of continuing importance in human and animal health. Microorganisms also have profound environmental implications. Microbial systems detoxify toxic substances and contribute to nutrient cycling in the ecosphere. Another area of study is the use of microbial organisms to synthesize useful materials and to convert biomass to fuels.

- **Biochemical Toxicology**
  This option will allow the student to gain specific understanding of the study of toxic compounds. Toxicology is of critical importance in food and nutrition, the environment, and in pharmacological science. Understanding the biochemical effects allows one to design appropriate treatments of illness, and to learn what exposures must be avoided. An equally important second purpose, the study of how biochemical systems are made to go awry by toxic substances, illuminates normal functioning and development of organisms. This understanding applies equally to all animals, including humans, as well as to plants and microorganisms. It applies also to ecological communities of organisms, as toxic substances alter the interactions within ecosystems.
- **Biochemistry of Plant Systems**
  Plants are not only at the root of the human and animal food chains, they are one of the dominant components of the planet's ecosphere. Understanding their biochemistry is a large and growing area of basic and applied research and public policy development.
- **Protein and Structural Biochemistry**
  Biochemistry stands on two legs: structure and function. Neither can be understood without the other. The principles that confer thermodynamic stability--or the lack of it--on proteins, nucleic acids, and other biomolecules are universal to all forms of life as are the principles by which enzyme catalysis and other functions arise from three-dimensional structure. Evolution drives the formation of structure based on the functional needs of the organism and on the prior constraints imposed by the species' evolutionary history. In addition to basic understanding, study in this area develops the bases for protein design to solve practical problems.

**Detailed Requirements**

**I. Life and Physical Sciences Core**
*The following are required*
01:119:115/116 General Biology I, II (4,4)
01:119:117 Biological Research Laboratory (2)
01:160:161,162 General Chemistry I, II (4,4) or equivalent
01:160:171 Introduction to Experimentation (1)
01:750:193,194 Physics for the Sciences* (4,4) or
01:750:201,202 Extended General Physics (5,5) or
01:750:203,204 General Physics I, II (3,3)
01:160: 307,308 or 315,316 Honors Organic Chemistry I, II (4,4)
01:160:309 (2.5) or 311 Organic Chemistry Laboratory (2)
01:447:380 Genetics (4)

**II. Quantitative Core**
01:640:135 Calculus I for the Life & Social Sciences (4) OR
01:640:151 Calculus I for Mathematical & Physical Science (4)
01:640:136 Calculus II for the Life & Social Sciences (4) OR
01:640:152 Calculus II for Mathematical & Physical Science (4) OR

01:960:401) Basic Stats for Research (4) OR
01:960:211 Statistics I (4) and 01:960:212 Statistics II (4)
**FOR PROTEIN AND STRUCTURAL BIOLOGY OPTION Calc II is Required.

**III. Biochemistry Core**
11:115:201 Contemporary Issues in Biochemistry** (2)
11:115:403/404 General Biochemistry I, II (4,3)
*Note: To enroll in 11:115:403,404 General Biochemistry (4,3), students, be they majors in biochemistry or not, must have completed 01:160:307-308 Organic Chemistry (4,4) or 160:315-316 Honors Organic Chemistry with grades of C or higher.*
11:115:413/414 Experimental Biochemistry I, II (3,3)
11:115:409 Principles of Biophysical Chemistry (3) or
01:160:341Phys Chem Bio System (3)
11:115:491 Biochemical Communications (3)

***Normally taken in the sophomore year. Transfer students entering in the fall of the junior year will take it in the fall of that year. Among other matters included in it, this class will satisfy the ethics requirement for biochemistry majors.*

**IV. Upper Level Lab Courses(two of the following courses)**
11:115:436 Molecular Toxicology (3)
11:680:494 Applied Microbiology (4)
11:126:383 Nucleotide Sequence Analysis (3)
11:126:482 Molecular Genetics Laboratory (4)
11:126:484 Tools for Bioinformatic Analysis (3)
11:126:485 Bioinformatics (3)
11:776:452 Plant Tissue Culture (3)
01:146:357 Systems Physiology Lab (1)
01:160:251 Analytical Chemistry (3)
11:115:493/494 Research Problems in Biochemistry (3)
01:198:111 Intro to Comp Sci (3)
01:198:142 Data 100 Data Literacy (3)

**V. Ethics**
11:115:201 Contemporary Issues in Biochemistry (3)
11:115:321 Ethical Issues in Biochemical Research (3)
11:015:405 Ethics in Science (3)
11:015:433 Critical Scientific Thinking (3)
01:730:249 Bioethics (3)

**VI. Research Experience (3 cr)**
The curriculum is designed to provide students with the basics of laboratory experimentation followed by independent research experience in a research lab. A minimum of two semesters of research is required. With the

approval of the undergraduate program director, Experiential Learning may be accepted to meet this requirement. Biochemical Communications provides the opportunity for students to present their own research, in both written and oral formats, as well as research from the biochemical literature.

11:115:493,494 (Research Problems in Biochemistry May be replaced by 11:015:497, 498 George H. Cook Honors Research,11:554:302 Aresty Research Assistantship

**VII. Options:**
Requires four classes from the specific lists below. Biochemistry electives, including option requirements, must equal at least 12 credits.
*Course(s) indicated by an * in each option is(are) required.*

**Biochemistry of Microbial Systems**
11:115:423 Fundamentals of Genomics (3)
11:680:390 General Microbiology (4)*
11:680:494 Applied Microbiology (4)
11:680:475 Microbiomes and Health (3)
11:680:480 Microbial Genetics and Genomics (3)
11:680:481 Microbial Physiology (3)
11:067:490 Pathophysiology (3)
11:126:486 Analytical Methods in Microbiology (3)
11:126:407 Comparative Virology (3)
11:126:481 Molecular Genetics (3)
01:146:481 Virology (3)
01:146:474 Immunology (3)
11:216:405 Evolution in Infectious Disease (3)
11:400:423 Food Microbiology

**Biochemical Toxicology**
11:115:421 Biochemistry of Cancer (3)
11:115:422 Biochemical Mechanisms of Toxicology (3)*
11:115:436 Molecular Toxicology Laboratory (3)
11:067:450 Endocrinology (4)
11:067:300 Integrative Physiology (4)
11:067:301 Integrative Physiology Lab (1)
11:067:490 Pathophysiology (3)
11:067:491 Reproductive and Developmental Toxicology (3)
01:146:356 Systems Physiology (3)
01:146:474 Immunology (3)
11:126:481 Molecular Genetics (3)
01:146:245 Fundamentals Of Neurobiology (3)
01:146:270 Fundamentals of Cell and Developmental Biology (3)
01:146:295 Essentials of Cell Biology and Neurobiology (3)
01:146:445 Advanced Neurobiology I (3)
01:146:447 Advanced Neurobiology II (3)

**Biochemistry of Plant Systems**
11:115:423 Fundamentals of Genomics (3)
16:765:520 Plant Biochemistry and Metabolism (3)*
11:776:382 Plant Physiology (4)
11:776:302 General Plant Pathology (3)
11:776:312 Medicinal Plants (3)
11:776:242 Plant Science (3)
11:776:305 Plant Genetics (4)
11:776:312 Medicinal Plants (3)
11:776:415 Hemp and Medical Cannabis (3)
11:776:403 Plant Science Techniques (3)
11:776:415 Fungi and Human Health (3)
11:776:438 Plants and Human Health (3)
11:776:452 Plant Tissue Culture & Engineering (3)

**Protein and Structural Biochemistry**
11:115:423 Fundamentals of Genomics (3)
11:115:485 Advanced Methods for 3D Structure Determination of Biomolecules (3)
11:216:405 Evolution in Infectious Diseases (3)
01:160:344 Introduction to Molecular Biophysics Research (3)
01:160:410 Introduction to Molecular Modeling (3)
01:160:418 Bioorganic Mechanisms (3)
01:160:480 Structural Biology, Structural Biophysics, and Chemical Biology of Transcription (3)01:640:251 Multivariable Calculus III (4)
01:694:412 Proteomics and Functional Genomics (3)
01:694:413 Chromatin and Epigenomics: The Science of Chromatin Modifications in Development and Disease (3)
01:160:480 Structural Biology, Structural Biophysics, and Chemical Biology (3)
11:115:485 Structural Biochemistry (3)

**General Option (12 cr total)**
12 credits of classes taken from any of the above lists

**Unspecified Electives**
In addition to courses meeting the above requirements, students can take other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 120 (matriculated 2018 or later) or 128 (matriculated prior to 2018) required for graduation.

# Bioenvironmental Engineering 117 (SEBS)

## BIOENVIRONMENTAL ENGINEERING 117

**Degrees:** B.S., School of Engineering; B.S., School of Environmental and Biological Sciences

**Department Managing the Undergraduate Program:** Department of Environmental Sciences

**Department Chair:** Donna Fennell

**Departmental Website:** Here

**Undergraduate Program Director:** A.J. Both

**Undergraduate Program Website:** Here

**Program Description**

***Beginning in fall 2020, Bioenvironmental Engineering 116 (4-year) and Bioenvironmental 117 (5-year) will be replaced by Environmental Engineering 366, a joint SEBS and SoE program.***

Bioenvironmental engineering utilizes engineering principles and the physical, chemical, and biological sciences to prevent and solve environmental problems related to human activities. This program prepares students for immediate employment as practicing engineers with engineering consulting firms; drinking water, wastewater, solid waste, and air pollution treatment facilities; manufacturing industries; environmental regulatory and planning agencies; research laboratories; international development agencies, and public-interest groups. The undergraduate program in BioEnvironmental Engineering is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria and Program Criteria for Environmental Engineering. This enables graduates to take examinations leading to a professional engineering license. The bioenvironmental engineering curriculum provides a strong foundation in engineering and physical, chemical, and biological sciences during the first two years. In the upper-level major courses of the program, these fundamentals are applied to multidisciplinary problem solving in various environmental fields.

Bachelor of science degrees from the School of Engineering and the School of Environmental and Biological Sciences are awarded upon completion of the five-year curriculum. A four-year program of study in bioenvironmental engineering is offered jointly by the School of Engineering and the School of Environmental and Biological Sciences starting in fall 2020.

Bioenvironmental Engineering 117 (SEBS)

# Learning Goals

# Learning Goals

**Website**: Here

**Program Educational Objectives**

- Graduates will meet the expectations of employers of environmental engineers.
- Qualified graduates will pursue advanced study if they so desire.
- Graduates will pursue leadership positions in their profession and/or communities.

**Student Outcomes**

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Bioenvironmental Engineering 117 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

Students must complete both, the SEBS Undergraduate Core Curriculum and the graduation requirements for the major as described below.

For an up-to-date description of the bioenvironmental engineering major requirements, courses, and course sequences please refer to the program webpage here.

**SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)**

**Contemporary Challenges**(6 credits)*Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities*[CC-D]*and Our Common Future*[CC-O]

**Experiential Learning**(3 credits)*Students must participate in a certified experience that meets this goal*[EL]

**Natural Sciences**(6 credits)*Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences*[NS]

**Historical Analysis**(3 credits)*Students must take one course*[HST]

**Social Analysis**(6 credits)*SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis*[SCL]

**Arts and Humanities**(3 credits)*Students must complete one course*[AH]

**Writing and Communication**(6 credits)*Students must take 01:355:101 or its equivalent [WC] and one course that fulfills the learning goal tocommunicate effectively in modes appropriate to a discipline or area of inquiry*[WCD]

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

# Graduation Requirements for the Major (129 credits)

**A. REQUIRED COURSES (117 credits)**

01:119:103 Principles of Biology (4) a)
01:160:159-160 General Chemistry for Engineers (3,3) a)
01:160:171 Introduction to Experimentation (1)
01:160:209 Elementary Organic Chemistry (3)
01:160:211 Elementary Organic Chemistry Laboratory (1)
01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4) b)
01:640:244 Differential Equations for Engineering and Physics (4)
01:640:251 Multivariable Calculus (4)
01:750:123-124 Analytical Physics I (2,2)
01:750:227 Analytical Physics IIA (3) a)
01:750:229 Analytical Physics IIA Laboratory (1)
11:117:100 Introduction to Bioenvironmental Engineering (1)
11:117:333 Environmental Engineering Tools (3)
11:117:413,414 Unit Processes in Environmental Engineering I, II (3,3)
11:117:423,424 Environmental Unit Processes Laboratory I, II (1,1)
11:117:462 Design of Solid Waste Treatment Systems (3)
11:117:468 Hazardous Waste Treatment Engineering (3)
11:117:474 Air Pollution Engineering (3)
11:117:488,489 Environmental Engineering Design I, II (2,2) c)
11:216:351 Principles of Ecology (3)
11:374:279 Politics of Environmental Issues (3) d)
11:374:460 Environmental Law and Policy I (3)
11:375:201 Biological Principles of Environmental Sciences (3)
11:375:202 Chemical Principles of Environmental Sciences (3)
11:375:203 Physical Principles of Environmental Sciences (3)
11:375:303 Numerical Methods in Environmental Science (3) (or 300+ level statistics course)
11:375:423 Environmental Fate and Transport (3)
11:670:453 Air Quality Modeling (3) (or 11:375:322 Energy Technology and Its Environmental Impact)
11:680:201 Introduction to Microbiology (3)
14:180:215 Engineering Graphics (1)
14:180:243 Mechanics of Solids (3)
14:180:387 Fluid Mechanics (3)
14:180:389 Fluid Mechanics Laboratory (1)
14:440:127 Introduction to Computers for Engineers (3)
14:440:221-222 Engineering Mechanics (3,3)
14:540:343 Engineering Economics (3)
14:650:351 Thermodynamics (3)

**B. ELECTIVES (12 credits must be fulfilled)**

01:460:414 Hydrologic Processes (3)
01:460:428 Hydrogeology (3)
01:640:250 Introductory Linear Algebra (3)
01:640:350 Linear Algebra (3)
01:750:326 Computer-Based Experiments (4)
01:750:327 Modern Instrumentation (3)
11:117:450 Applied Instrumentation and Control (4)
11:117:494 Contaminant Hydrogeology Engineering (3)
11:117:495 Surface Water Quality Engineering (3)
11:117:496 Planning and Design of Land Treatment Systems (3)
11:117:497,498 Special Problems in Environmental Engineering (Up to 6 credits count toward technical electives)
11:375:312 Environmental Microbiology Laboratory (3)
11:375:322 Energy Technology and its Environmental Impacts (3)
11:375:340 Environmental Applications of Organic Chemistry (3)
11:375:346 Introduction to Atmospheric Chemistry (3)
11:375:360 Soils and Water (4)
11:375:407 Environmental Toxicology (3)
11:375:411 Environmental Microbiology (3)
11:375:421 Fundamentals of Air Pollution (3)
11:375:424 Air Sampling and Analysis Techniques (3)
11:375:430 Hazardous Wastes (3)
11:375:434 Principles of Industrial Hygiene (3)
11:375:444 Water Chemistry (3)
11:375:453 Soil Ecology (3)
11:573:232, 233 Fundamentals of Environmental Geomatics (3) and Laboratory (1) (4)
11:670:102 Introduction to Climate Science (3)
11:670:323 Thermodynamics of the Atmosphere (3)
11:670:324 Dynamics of the Atmosphere (3)
11:670:453 Air Quality Modeling (3)
11:680:390 General Microbiology (4)
14:180:372,374 Soil Mechanics (3) and Laboratory (1) (4)
14:180:382 Hydraulic and Environmental Engineering (3)
14:180:443 Advanced Hydraulics (3)
14:180:448 Elements of Hydrology (3)
14:650:462 Power Plants (3)
14:650:481 Heat Transfer (3)
14:xxx:2xx/3xx/4xx 200+ level engineering courses

*Notes:*

a) Fulfills Natural Sciences [NS] requirement of SEBS Core Curriculum (6 credits).
b) Fulfills Quantitative and Formal Reasoning [QQ, QR] requirement of SEBS Core Curriculum (6 credits).
c) Fulfills Experiential Learning [EL] requirement of SEBS Core Curriculum (3 credits).
d) Partially fulfills Social Analysis [SCL] and Contemporary Challenges [CC-O] requirements of SEBS Core Curriculum (6 credits).

*Unspecified Electives*
In addition to courses meeting the above requirements, students can take any other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 159 required for graduation in bioenvironmental engineering.

# Biological Sciences 119 (SEBS)

## BIOLOGICAL SCIENCES 119

**Degree:** B.A.

**Program Director:** Martha Haviland (haviland@biology.rutgers.edu)

**Director of Advising:** Anne Carr-Schmid (schmid@biology.rutgers.edu)

**Adviser:** Joseph Ventola (ventola@rutgers.edu)

Students in the School of Environmental and Biological Sciences (SEBS) may choose the major in biological sciences, which is offered by the School of Arts and Sciences (SAS). Completion of the major prepares students for graduate study; for careers in government, industry, or secondary school teaching; and also satisfies the entrance requirements for medical and dental schools.

Students interested in more specialized majors in the life/biological sciences (such as agriculture and food systems; animal science; biochemistry; biotechnology; cell biology and neuroscience; ecology, evolution, and natural resources; exercise science; food science; genetics; marine sciences; microbiology; molecular biology and biochemistry; nutritional sciences; or plant biology) should refer to the relevant sections of the catalog and should also contact the program coordinator or adviser for the specific major of interest.



# Learning Goals

# Learning Goals

Our overarching goal for educating our students majoring in biological sciences is to inspire them to want to discover and understand the natural world. In the process of achieving this goal, we expect our students to acquire not only facts and concepts but also skills and perspectives. We hope that our learning goals will both prepare our students for a variety of career objectives and supply them with the tools to become lifelong learners in the ever-evolving world of biological sciences.

**Learning Goals**

I. To acquire the appropriate factual and conceptual knowledge that provides students with a foundation to further their education and career in the areas of life science or health science. Students will be able to demonstrate basic knowledge (e.g., identify, define, explain, etc.) of the concepts, practices, and principles that comprise the biological sciences.

II. To develop data analysis and statistical reasoning skills that prepare students for a society increasing reliant on the use of data and information. Students will be able to interpret/evaluate patterns in data presented in tables, figures, and graphs as well as be able to organize, summarize, and present data.

III. To develop the ability to use scientific reasoning as embodied by the structured process commonly known as the scientific method to empower students with the ability to generate and refine knowledge. Students will be able to evaluate and apply the practice of science.

IV. To develop critical thinking and problem-solving skills appropriate to prepare students to evaluate, synthesize, and generate knowledge that provides them with a competitive advantage to adapt to an evolving, global, and knowledge-based society. Students will be able to demonstrate application of higher order thinking (e.g., classify, diagnose, evaluate, synthesize, hypothesize, etc.). Students will develop an understanding of not only the connections within biology but also the connections between biology and other scientific disciplines.

Biological Sciences 119 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

Students wishing to major in biological sciences must have completed two semesters of General Biology and the Biological Research Laboratory with a grade of C or better in each course. Both semesters of General Biology must have been completed at the same institution or on the same campus at Rutgers. No more than two courses with a grade of D may be used to fulfill the requirements of the major. A 2.0 GPA must be maintained in the life sciences core and elective courses applied toward the major. Students must meet with an adviser before they can successfully declare their major.

Biological Sciences 119 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

**A. Major Requirements (73 credits)**

The major in biological sciences is offered by the School of Arts and Sciences (SAS). It involves 49 credits of required life science core courses, and 24 credits of approved life science electives. No more than two courses with a grade of D may be used to fulfill the requirements of the major. Please refer to the SAS section of the catalog for the Life Sciences for a full description of the requirements of the major.

**B. Additional SEBS Requirements for Students Majoring in Biological Sciences**

School of Environmental and Biological Sciences (SEBS) biological sciences majors matriculating fall 2015 or after and transfer students matriculating in 2016 must complete a goal-based Core Curriculum. A current list of certified courses can be found here.

SEBS biological sciences majors matriculating prior to the fall semester 2015 must complete major requirements as described in the SAS section of the catalog for the Life Sciences as well as the general education requirements.

# Biotechnology 126 (SEBS)

## BIOTECHNOLOGY 126

**Degree:** B.S.

**Director:** Paul Meers (paul.meers@rutgers.edu)

**Program Website:** Here

The field of biotechnology has emerged as a major contributor to the advancement of agriculture, medicine, and environmental sciences. Recent developments in biotechnology, particularly molecular biology, promise major improvements in agricultural productivity, breakthroughs in human health care, and new solutions to environmental problems.

The biotechnology curriculum is designed to provide students with fundamental knowledge and laboratory skills in biotechnology, including applied genetics, molecular biology, biochemistry and a firm foundation in biology and the physical sciences. The primary objectives of the program are to broadly educate students for positions in the rapidly developing biotechnology industry and to prepare students for graduate and graduate/professional study in the life sciences. The strong life and physical sciences foundation of the curriculum involves extensive laboratory and coursework and research experience, as well as specializations in the following fields: animal biotechnology, microbial biotechnology, plant biotechnology, bioinformatics, and bioscience policy and management.

Biotechnology 126 (SEBS)

# Learning Goals

# Learning Goals

As a biotechnology major, each student will:

1. be able to describe the basic molecular concepts essential for understanding the field of biotechnology and the applications of biotechnology;
2. demonstrate proficiency in using the tools of biotechnology in an applied laboratory setting;
3. be able to find and read published scientific research in biotechnology and summarize and communicate that research effectively and critically;
4. acquire knowledge of ethical aspects of biotechnology and be able to analyze alternate viewpoints; and

5. learn to work as a team in the laboratory setting or group presentations.

By achieving these goals the student will have the knowledge base, technical proficiency, and communication skills for postbaccalaureate employment in the biotechnology field or for graduate/professional advanced education.

Biotechnology 126 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

To take biotechnology (11:126) courses, students must have completed 01:119:115 General Biology and 01:160:161 General Chemistry with grades of C or better and achieved a cumulative grade-point average of 2.0 or higher. Students whose cumulative grade-point average falls below 2.0 will be allowed one semester to restore the average to 2.0 or higher.

Biotechnology 126 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of biotechnology major requirements, courses, and course sequences please refer to the program webpage.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EBE]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent [WC] and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

# Major Requirements for All Students Regardless of Matriculation Date

**Proficiency in Biotechnology (70-74 credits)**

**Courses usually taken first year that are prerequisites for many required biotechnology courses (22):**

- 01:355:101 Expository Writing (3) - required before or concurrently with General Biology 1
- 01:119:115 General Biology 1 (4) and 01:119:116 General Biology 2 (4)
- 01:119:117 General Biology Laboratory (2)
- 01:160:161 General Chemistry 1 (4) and 01:160:162 General Chemistry 2 (4)
- 01:160:170 Introduction to Experimentation (1)

**Further courses for proficiency in biotechnology:**

**Quantitative Skills (7-8)**

- 01:640:135 Calculus 1 (4)
- 01:960:401 Basic Statistics for Research (3)* or 01:640:136 Calculus 2 (4) or 01:960:212 Statistics II (3) (this course has prereqs)

*Basic Statistics for Research 01:960:401 (or equivalent - 01:960:212) required for bioinformatics option (see below)

**Computer and information technology competence (3)**

- 11:126:383 Nucleotide Sequence Analysis (3)

**Professional Ethics (1.5)**

- 11:126:111 Ethical and Scientific Challenges in Biotechnology (3)** or with approval,11:126:110 Concepts and Issues in Biotechnology (1.5)

***11:126:111 is certified in SEBS core curriculum categories NS-1 and -2 (natural science) and CCO-2 (contemporary challenges)*

**Other biotechnology required courses:**

- 01:447:380 Genetics (4) or 11:776:305 Plant Genetics (4) (only for plant biotechnology option)
- 11:680:390 General Microbiology (4)
- 01:750:193-194 Physics for the Sciences (4,4) or equivalent**
- 01:160:307-308 Organic Chemistry (4,4)**
- 11:115:403-404 General Biochemistry (4,3) or equivalent
- 11:115:313 Introductory Biochemistry Laboratory (1)
- 11:126:481 Molecular Genetics (3)

- 11:126:482 Molecular Genetics Laboratory (4)
- 11:126:401 Seminar in Biotechnology (1.5)
- 11:126:427 Methods and Applications in Molecular Biology (4)

**If Basic Statistics for Research is chosen to satisfy the Quantitative Skills requirement, it cannot also be used as an option elective.*

***Physics for the Sciences requires coregistration in a 0-credit laboratory section. If students opt for the 01:750:203-204 General Physics 1 and 2 sequence instead, they must also take a corresponding lab section in 01:750:205 and 206. Students intending to apply to medical or dental school and certain Ph.D. programs should be aware that many professional schools and some graduate schools require two semesters of calculus and 01:160:311 Organic Chemistry Laboratory and a physics laboratory.*

**B. OPTIONS (14-18)**

**General Biotechnology (15-17)**

*Required Courses*
*Choose one of the following:*
11:067:430 Animal Microtechniques and Tissue Culture (4)
or
11:776:452 Plant Tissue Culture (3)

*Choose one of the following courses (3):*
01:146:474 Immunology (3)
11:115:421 Biochemistry of Cancer (3)
11:115:422 Biochemical Mechanisms of Toxicology (3)
11:115:436 Molecular Toxicology Lab (3)
11:115:452 Biochemical Separations (3)
11:126:407 Comparative Virology (3)
11:126:484 Tools for Bioinformatic Analysis (3)
11:126:485 Bioinformatics (3)
11:126:486 Analytical Methods in Microbiology (3)
11:680:480 Microbial Genomics (3)
11:776:410 Plants for Bioenergy (3)
11:776:486 Functional Genomics for Research (3)

*Electives (9-10)*
Three additional electives from the required and elective courses listed in each of the six biotechnology curriculum options. One to three credits of Research in Biotechnology may be substituted for an equal number of credits of elective work.

**Animal Biotechnology (16-17)**

*Required Courses (7)*
*Two courses:*
11:067:300 Integrative Physiology (3) or
11:067:492 Molecular and Cellular Physiology (3)
11:067:430 Animal Microtechniques and Tissue Culture (4)

*Electives (9-10) - Choose from the following courses:*
11:067:327 Animal Reproduction (3)
11:067:450 Endocrinology (3)
11:067:492 Molecular and Cellular Physiology (3)
11:126:407 Comparative Virology (3)
11:126:410 Process Biotechnology (3)
11:126:484 Tools for Bioinformatic Analysis (3)
11:126:485 Bioinformatics (3)
11:709:400 Advanced Nutrition I (3)
11:709:401 Advanced Nutrition II (3)
11:146:474 Immunology (3) with or without 01:146:475 Immunology Lab (1)
01:447:451 Genomes (3)
01:447:481 Topics in Human Genetics (3)
01:447:486 Evolutionary Genetics (3)
01:447:495 Cancer (3)
01:694:412 Proteomics and Functional Genomics (3)
01:694:492 Gene Regulation of Cancer and Development (3)
01:960:401 Basic Statistics for Research (3)
11:115:421 Biochemistry of Cancer (3)
11:115:422 Biochemical Mechanisms of Toxicology (3)
11:115:436 Molecular Toxicology Lab (3)
11:115:452 Biochemical Separations (3)
11:776:486 Functional Genomics for Research (3)

*One to three additional credits of research in biotechnology may be substituted for an equal number of credits of elective work.*

**Bioinformatics (17)**

Bioinformatics option students should take 01:640:135 Calculus 1 and 01:960:401 Basic Statistics for Research to satisfy their quantitative skills requirement.

*Required Courses (17)*
01:198:111 Introduction to Computer Science (4) or equivalent
01:198:112 Data Structures (4)
11:126:484 Tools for Bioinformatic Analysis (3) or 11:776:486 Functional Genomics for Research (3)
11:126:485 Bioinformatics (3)

*Elective (3)*
Choose from the general biotechnology electives or one approved programming course (suggested). Students in the option who would like to take Calculus 2 to meet medical school or graduate school requirements may use that course for this elective.

**Bioscience Policy and Management (18)**

*Required Courses (15)*
11:373:121 Principles and Applications of Microeconomics (3)
11:373:231 Introduction to Marketing (3)
11:373:241 Introduction to Management (3)
11:373:403 Innovation and Entrepreneurship (3)
11:373:404 Bioscience Policy (3) or suitable alternative

*Electives (3)*
One course from **either** of the following areas of concentration:

Business Management Concentration:
11:373:351 Business Finance I (3)
11:373:352 Economics of Futures Markets (3)
11:373:402 Global Marketing (3)
11:373:451 Business Finance II (3)
*OR*
Bioscience Policy Concentration:
11:373:323 Public Policy toward the Food Industry (3)
11:374:341 Social and Ecological Aspects of Health and Disease (3)
11:373:371 Food Health and Safety Policy (3)

**Microbial Biotechnology (15.5-17)**

*Required courses (7)*
11:680:494 Applied Microbiology (4)
and at least one from the list:
11:680:480 Microbial Genetics and Genomics (3)
or
11:680:481 Microbial Physiology (3)
or
11:680:491 Microbial Ecology and Diversity (3)

*Electives (8.5-10)*
01:146:328 Human Parasitology (3)
01:146:329 Human Parasitology Laboratory (1)
01:146:470 Advanced Cell Biology (3)
01:146:474 Immunology (3)
01:146:475 Laboratory in Immunology (1)

01:447:495 Cancer (3)
11:067:430 Animal Microtechniques and Tissue Culture (4)
11:067:492 Molecular and Cellular Physiology (3)
11:115:452 Biochemical Separations (3)
11:126:407 Comparative Virology (3)
11:126:410 Process Biotechnology (3)
11:126:486 Analytical Methods in Microbiology (4)
11:375:411 Environmental Microbiology (3)
11:400:419 Food Physical Systems (3)
11:400:423 Food Microbiology (3)
11:400:424 Food Microbiology Laboratory (1)
11:680:480 Microbial Genomics (3)
11:680:481 Microbial Physiology (3)
11:680:491 Microbial Ecology and Diversity (3)
11:680:492 Microbial Ecology and Diversity Laboratory (2)
11:126:484 Tools for Bioinformatic Analysis (3)
11:126:485 Bioinformatics (3)
11:776:486 Functional Genomics for Research (3)

*One to three additional credits of research in biotechnology may be substituted for an equal number of credits of elective work.*

**Plant Biotechnology (15-16)**

*Required courses (6)*
11:776:242 Plant Science (3)
11:776:452 Plant Tissue Culture and Engineering (3)

*Electives, three courses (9-10):*
01:146:470 Advanced Cell Biology (3)
01:694:492 Gene Regulation of Cancer and Development (3)
01:960:401 Basic Statistics for Research (3)
11:115:452 Biochemical Separations (3)
11:126:407 Comparative Virology (3)
11:126:410 Process Biotechnology (3)
11:126:413 Plant Molecular Biology (3)
11:400:419 Food Physical Systems (3)
11:680:486 Analytical Methods in Microbiology (3)
11:680:491 Microbial Ecology and Diversity (3)
11:776:310 Plant Propagation (3)
11:776:312 Medicinal Plants (3)
11:776:406 Plant Physiology (4)
11:776:405 Plant Biosecurity (3)
11:776:406 Plant Breeding (3)

11:776:410 Plants for Bioenergy (3)
11:776:452 Plant Tissue Culture and Engineering (3)
11:776:486 Functional Genomics for Research (3)

*One to three additional credits of research in biotechnology may be substituted for an equal number of credits of elective work.*

# Ecology, Evolution, and Natural Resources 216 (SEBS)

## ECOLOGY, EVOLUTION, AND NATURAL RESOURCES 216

(Formerly 704)

**Degree:** B.S.

**Director:** Kimberly N. Russell; 124 ENR Building, 848-932-9383, (Kimberly.russell@rutgers.edu)

**Program Webpage:** Here

**Department of Ecology, Evolution, and Natural Resources Webpage:** Here

The ecology, evolution, and natural resources curriculum provides an understanding of how natural living systems function and evolve, and how they can be managed to conserve biodiversity while providing benefits to people. Students may pursue coursework that prepares them for traditional careers in resource management or they may take a broader array of courses that meets interests related to the conservation of natural resources and the ecology and evolution of natural systems. Graduates may pursue further study at the graduate level or find career opportunities in academia and in public or private organizations involved in the management of natural resources. The major provides a broad general understanding of the functioning, significance, and conservation of living systems. In addition to the general major curriculum, we offer two specialized disciplinary tracks with a more focused sequence of courses in 1) Natural Resources and Ecosystem Management, or 2) Urban Forestry. The flexibility of this major is intended to meet a variety of student interests and needs. Students are encouraged to organize curricular and elective courses to fulfill simultaneously the requirements of a minor or certificate program. Particularly appropriate are the Minor in Sustainability; the Certificate in Environmental Geomatics; and the Certificate in Evolutionary Medicine.

Ecology, Evolution, and Natural Resources 216 (SEBS)

# Learning Goals

# Learning Goals

Goal 1: Explain basic population, community ecology, and ecosystem-level concepts.

Goal 2: Describe the evolutionary origins, processes, and patterns over geologic time.

Goal 3: Create a natural resource management plan demonstrating an understanding of societal values and interests.

Goal 4: Effectively utilize software, hardware, field, and laboratory techniques commonly used in the study of ecology, evolution, and natural resource management.

Goal 5: Use quantitative methods to analyze and understand ecological systems, including interpretation of numeric and graphical data.

Goal 6: Communicate effectively orally and through written text and graphics.

Goal 7: Evaluate ecology, evolution, and natural resource management concepts in a global context.

*Natural Resources and Ecosystem Management Track Specific Learning Goals:*

Goal 3a: Utilize common forestry inventory methods and apply a fundamental knowledge of silviculture and ecology to create a forestry management plan that fosters the long-term capacity of the land and demonstrates an understanding of societal values and interests.

Goal 8: Evaluate conflicts and dilemmas through a lens of professional ethics.

Goal 9: Describe natural resource relevant laws and policies in New Jersey and at the national level.

*Urban Forestry Track Specific Learning Goals:*

Goal 3b: Utilize common urban forestry analysis tools to create a community forestry management plan demonstrating an understanding of societal values and interests as well as the long-term capacity of the urban forest.

Goal 10: Apply a fundamental knowledge of tree biology and professional ethics to tree care management and practice.

Goal 11: Describe urban forestry relevant laws and policies in New Jersey and at the national level.

The department has publicly posted mission statement and curricular learning goals on its website.

Ecology, Evolution, and Natural Resources 216 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

**EENR General Track**

*Biology: Required*
01:119:115 Gen Bio I
01:119:116 Gen Bio 2
01:119:117 Bio Res. Lab

*Chemistry & Physics - Choice of: 1 Year of Chemistry (with lab) OR 1 Year of Physics (with lab) OR 1 Semester of Each (with labs)*
01:160:161 Gen Chem 1

01:160:162 Gen Chem 2
01:160:171 Intro to Exp.
01:750:203 Gen Physics 1
01:750:204 Gen Physics 2
01:750:205 Gen Physics 1 Lab
01:750:206 Gen Physics 2 Lab
01:750:193 Phys for the Sci. 1
01:750:194 Phys for the Sci. 2

*Experienced Based Education: Required (3 cr)*
11:216:440 Pract Exp in EENR
11:216:484 Res. Probl in EENR
11:216:376 Pract Fish.
11:216:377 Pract Forestry
11:554:488 GHCook
11:902:300 SEBS Internship I
11:902:301 SEBS Internship II
01:556:221/2 or 301/302 Aresty

*Math - Choice of 1*
01:640:135 Calculus 1 for Life/SS
01:640:151 Calculus 1 for Math/Phy

*Core Courses: Required*
11:216:104 Topics in EENR
11:216:217 Principles of Natural Resource Management
11:216:351 Principles of Ecology
11:216:352 Principles of Ecology lab
11:216:369 Analytical Methods (SEBS Core QQ)
11:216:431 FEEM
11:216:499 Capstone in EENR

*Evolution Core: Choice of 1*
11:216:486 Principles of Evolution
11:216:251 Fundamentals of Evolution
*Required*
11:216:252 Fundamentals of Evol. Lab

*Ecology Electives: Choice of 2*
11:216:272 Dendrology
11:216:317 Conservation Ecology (SEBS Core CCO/WCd)
11:216:332 Plant Ecology
11:216:360 Anim Phys. Ecol
11:216:450 Landscape Ecology
11:216:451 Global Change Ecology

11:216:487 Urban Ecology
11:216:296 Honors Seminar
11:216:435 Freshwater and Wetland Ecosystems

*Evolution Electives: Choice of 2*
11:216:240 Behavioral Biology
11:216:269 Evol of Animal Behavior
11:216:296 Honors Seminar
11:216:323 Ornithology
11:216:324 Invertebrate Zoology
11:216:325 Vertebrate Zoology
11:216:405 Evolution of Infec. Dis.
11:216:441 Animal Behavior
11:216:411 & 412 Plant Diversity & Evol

*Natural Resources/Techniques Electives: Choice of 2*
11:216:314 Forest Measurements
11:216:274 Field Techniques
11:216:371 Introduction to Remote Sensing
11:216:464 Wildlife Ecology & Cons
11:216:471 Silviculture
11:216:477 Forest Management Applications
11:573:232 & 233 Fund. of Geom. & lab
11:216:403 Urban Forestry
11:573:362 Intem. Envi. Geom.
11:573:462 Advan. Envi. Geom.
11:216:210 Nature Journaling
11:216:315 Conservation Techniques
11:216:320 Controversies in Sustainability
11:216:365 Arboriculture
11:216:474 Adv. Remote Sensing
11:216:475 Winter Field Ecology

*Additional Courses: Choice of 4*
*Any 216 or 573 course listed above and/or:*
11:216:101 Intro to Ecol & Evol (SEBS Core NS)
11:216:110 Evol Disease and Med (SEBS Core NS)
11:216:115 Evol Sex & Gender (SEBS Core NS/CCO)
11:216:199 Trees in the Environment (SEBS Core NS) Fall Only
*Non-216 (approval possible for 200+ level courses)*
11:067:300 Integrative Physiology
11:067:328 Animal Genetics
11:067:404 Animal Diseases
11:115:301 Introductory Biochemistry
11:115:423 Fundamentals of Genomics
11:370:300 Insects & The Environment

11:370:320 Insect Ecology and Evolution
11:370:308 Apiculture
11:370:355 Applied Acarology
11:370:380 Insect Biotechnology
11:370:381 Insect Biology
11:370:402 Aquatic Entomology
11:370:403 Insect Structure and Function
11:370:404 Insect Structure and Function II
11:370:406 Medical and Veterinary Entomology
11:370:409 Insect Classification
11:370:430 Urban Entomology
11:573:231 Fundamentals of Environmental Planning
11:573:322 Land Measurement and Mapping
11:573:371 Air-Photo Interpretation
11:373:362 Natural Resource Economics
11:373:363 Environmental Economics
11:374:313 U.S. Environmental Policy
11:374:314 Natural Resource Policy
11:374:325 Environmental Communication
11:375:346 Introduction to Atmospheric Chemistry
11:375:360 Soils and Water
11:375:407 Environmental Toxicology
11:375:411 Environmental Microbiology
11:375:421 Air Pollution
11:375:444 Water Chemistry
11:375:450 Terrestrial Carbon Cycle
11:375:453 Soil Ecology
11:628:309 Fishery Science
11:628:320 Dynamics of Marine Ecosystems
11:628:342 Marine Conservation
11:670:201 Elements of Meteorology
11:670:202 Elements of Climatology
11:680:491 Microbial Ecology and Diversity
11:776:210 Principles of Botany
11:776:242 Plant Science
11:776:305 Plant Genetics
11:776:306 Weed Science and Management
11:776:382 Plant Physiology
11:776:400 Fungi in the Environment
01:460:101 Introductory Geology
01:460:303 Paleontology
01:070:212 Life of Primates
01:070:348 Primate Behavioral Ecology
01:070:402 Primate Conservation
01:070:409 Primate Nutritional Ecology

01:160:209 Elementary Organic Chemistry
01:160:307 Organic Chemistry
01:160:308 Organic Chemistry
01:447:380 Genetics
01:640:136 Calculus II for the Life and Social Sciences
01:640:138 Calculus II for the Biological Sciences

**EENR Urban Forestry Track**

*Biology: Required*
01:119:115 Gen Bio I
01:119:116 Gen Bio 2
01:119:117 Bio Res. Lab

*Chemistry: Required*
01:160:161 Gen Chem 1
01:160:171 Intro to Exp.

*Physics: Choice of 1*
01:750:203 Gen Physics 1 & 01:750:205 Gen Physics 1 Lab
01:750:193 Phys for the Sci. 1

*Experienced Based Education: Choice (3 cr)*
11:216:440 Pract Exp in EENR
11:216:484 Res. Probl in EENR
11:216:377 Pract Forestry
11:554:488 GHCook
11:902:300 SEBS Internship I
11:902:301 SEBS Internship II

*Math: Choice of 1*
01:640:135 Calculus 1 for Life/SS
01:640:151 Calculus 1 for Math/Phy

*Core Courses: Required*
11:216:104 Topics in EENR
11:216:217 Principles of Natural Resource Management
11:216:351 Principles of Ecology
11:216:352 Principles of Ecology lab
11:216:369 Analytical Methods (SEBS Core QQ)
11:216:431 FEEM
11:216:499 Capstone in EENR

*Ecology: Required*
11:216:272 Dendrology
11:216:487 Urban Ecology

*Evolution: Required*
11:216:411 & 412 Plant Diversity & Evol

*Natural Resources/Techniques: Required*
11:216:371 Introduction to Remote Sensing
11:216:471 Silviculture
11:573:232 & 233 Fund. of Geom. & lab
11:216:403 Urban Forestry
11:216:365 Arboriculture

*Additional Courses: Required*
11:373:101 Economics, People, and the Environment (SEBS Core CCO/ECN/SCL)
11:573:202 Environmental Issues in US (SEBS Core CCO/WCd)
11:776:302 General Plant Pathology
11:374:250 Environmental Justice (SEBS Core CCD)
*Additional Courses: Choice of 2*
11:370:350 Agricultural Entomology and Pest Management
11:373:362 Natural Resource Economics (SEBS Core GVT/SCL)
11:375:360 Soils and Water
11:573:231 Fundamentals of Environmental Planning
11:776:202 Applied Physiology of Horticultural Crops
11:776:404 Soil Management for Sport and Landscapes
11:550:230 Environmental Design Analysis
11:216:199 Trees in the Environment
11:573:413 Open Space Planning

**EENR: Natural Resources and Ecosystem Management Track**

*Biology: Required*
01:119:115 Gen Bio I
01:119:116 Gen Bio 2
01:119:117 Bio Res. Lab

*Chemistry: Required*
01:160:161 Gen Chem 1
01:160:171 Intro to Exp.

*Physics: Choice of 1*
01:750:203 Gen Physics 1 & 01:750:205 Gen Physics 1 Lab
01:750:193 Phys for the Sci. 1

*Experienced Based Education: Choice (3 cr)*
11:216:440 Pract Exp in EENR
11:216:484 Res. Probl in EENR
11:216:377 Pract Forestry

11:554:488 GHCook
11:902:300 SEBS Internship I
11:902:301 SEBS Internship II

*Math: Choice of 1*
01:640:135 Calculus 1 for Life/SS
01:640:151 Calculus 1 for Math/Phy

*Core Courses: Required*
11:216:104 Topics in EENR
11:216:217 Principles of Natural Resource Management
11:216:351 Principles of Ecology
11:216:352 Principles of Ecology lab
11:216:369 Analytical Methods (SEBS Core QQ)
11:216:431 FEEM
11:216:499 Capstone in EENR

*Ecology: Required*
11:216:272 Dendrology
*Ecology: Choice of 1*
11:216:317 Conservation Ecology
11:216:332 Plant Ecology
11:216:360 Animal Physiological Ecology
11:216:450 Landscape Ecology
11:216:451 Climate Change Ecology
11:216:487 Urban Ecology
11:216:296 Honors Seminar

*Evolution: Required*
11:216:411 & 412 Plant Diversity & Evol

*Natural Resources/Techniques (Required)*
11:216:371 Introduction to Remote Sensing
11:216:471 Silviculture
11:573:232 & 233 Fund. of Geom. & lab
11:216:314 Forest Measurements
11:216:274 Field Techniques
11:216:464 Wildlife Ecology & Conservation
11:216:477 Forest Management Applications

*Additional Courses: Required*
11:373:101 Economics, People, and the Environment (SEBS Core CCO/ECN/SCL)
11:573:202 Environmental Issues in US (SEBS Core CCO/WCd)
11:776:302 General Plant Pathology
11:374:250 Environmental Justice (SEBS Core CCD)
*Additional Courses: Choice of 2*
11:370:350 Agricultural Entomology and Pest Management

11:373:362 Natural Resource Economics (SEBS Core GVT/SCL)
11:375:360 Soils and Water
11:573:231 Fundamentals of Environmental Planning
11:776:202 Applied Physiology of Horticultural Crops
11:776:404 Soil Management for Sport and Landscapes
11:374:201 Research Methods in Human Ecology
11:216:199 Trees in the Environment
11:375:453 Soil Ecology

# Entomology 370 (SEBS)

## ENTOMOLOGY 370

**Degree:** B.S.

**Director:** Chloe Hawkings (c.hawkings@rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

The entomology major is the study of insects and their arthropod relatives. Insects are one of the most diverse and abundant organisms on the planet and play important roles in their ecosystems. Insects are exceptional models for understanding fundamental aspects of genetics, ecology, and evolution. Society benefits from diverse roles of insects as critical pollinators, sources of food in agricultural and wildlife food chains, as well as decomposers; on the flip side, many insects as well as ticks pose a danger to human health, our structures, and agriculture. Students in the Entomology major gain career opportunities in corporate and private agribusiness, urban pest management companies, scientific and technical organizations, public health agencies, local, state, and federal governments, and international organizations. Employment also exists in conservation biology, scientific policy, and environmental quality assurance. Our curriculum is flexible so students may expand their knowledge to interdisciplinary areas to meet their career goals. Students interested in the major or a double major should contact an academic advisor for additional information.

In addition to offering a major in entomology, the School of Environmental and Biological Sciences offers a minor in entomology.

Entomology 370 (SEBS)

# Learning Goals

# Learning Goals

Graduates of the undergraduate entomology major will have demonstrated:

1. Broad knowledge of the systematics, anatomy, physiology, ecology, and biochemistry of insects

2. Ability to explain and assess the detrimental and beneficial impacts that insects have on plants, animals, and humanity
3. Ability to design, implement, and analyze experiments or pest management programs and interpret data
4. Communication of entomological information to the scientific community and to the general public
5. Ethical principles required in professional fields

Entomology 370 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of the entomology program major requirements, courses, and course sequences, please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

Options are chosen from lists of courses certified in each learning goal: Here.

*Note: The SEBS Core Curriculum requirements differ slightly from SAS Core Curriculum requirements*

**I. Contemporary Challenges** (total 6 credits, 3 in CCO and 3 in CCD)
Suggested Course: 11:373:101 Economics, People, and Environment (CCO)
Suggested Course: 11:550:371 Agriculture and the Landscape (CCD)

**II. Natural Sciences** (total 6 credits, 3 in A and 3 in B)
A. Life Sciences (3 credits)
Required: 01:119:115 or 116 General Biology (4)

B. **Physical Sciences** (3 credits)
Required 01:750:193 Physics for the Sciences (4)

**III. Historical Analysis** (3 credits)
Suggested Course: 01:070:102 Introduction to Human Evolution

**IV. Social Analysis** (6 credits)
Suggested Course: 11:373:362 Natural Resource Economics
Suggested Course: 11:372:202 Environmental Issues in the USA
Suggested Course: 11:373:101 Economics, People, and Environment*
**also counted under Contemporary Challenge.*

**V. Arts and the Humanities** (3 credits)
Suggested Course: 01:190:101 Word Power
Suggested Course: 01:730:103 Introduction to Philosophy

**VI. Writing and Communication** (6 credits)
One from 01:355:101 Expository Writing (3) or 01:355:103 Exposition and Argument (3)
One from 01:355:302 Scientific and Technical Writing (3), 01:355:312 Writing for Biology and Natural Science (3), or 01:355:342 Science Writing (3)

**VII. Quantitative and Formal Reasoning** (6 credits)
Major required: 01:640:135 Calculus I (4)
One from 01:960:211 Statistics I (3), or 01:640:136 Calculus II for the Quantitative Social and Life Sciences (3)

**VIII. Experiential Learning** (3 credits)
All students are required to obtain practical experience in an area of entomology. Students can demonstrate appropriate employment or volunteer service with a public agency, private industry, nonprofit organization, or fulfill the requirement by research or field experience in suitable courses. Before starting an experienced-based course students must get the approval of their adviser. Possible courses include:
11:370:493, 494 Research problems in Entomology
11:015:497, 498 George H. Cook Scholars Program
11:902:300 and 400 SPIN Student to Professional Internship Network

**Required: Entomology Major**
*Total 44-45 credits*

01:119:115-116, 117 General Biology and Lab (4,4,2).
*Note: 4 credits can be counted as SEBS core - Natural Sciences*

01:160:161-162, 171 General Chemistry & Lab (4,4,1)
*Note: 4 credits can be counted as SEBS core - Natural Sciences*

01:640:135 Calculus I (4) or 01:960:211 Statistics I (3)
or 11:216:369 Analytical Methods in EENR (3)

11:216:351 Principles of Ecology (3)

11:370:350 Agricultural Entomology & Pest Management (3)
11:370:381 Insect Biology (4)
11:370:409 Insect Classification (4)
11:370:403 Insect Structure and Function (4)
11:370:407 Careers and Professional Development in Entomology (1)
11:370:495, 496 Seminar in Entomology (3)

*Note: Seminar in Entomology is 1 credit per semester. Students are required to take a total of three times to equal 3 credits*
*Note: Juniors and seniors may, with the permission of the instructor and the graduate dean, register for appropriate graduate courses in entomology for elective credits.*

**Entomology Electives**
*At least 5 (15+ credits)*

11:370:308 Apiculture (3)
11:370:355 Applied Acarology (3)
11:370:414 Forensic Entomology (3)
11:370:352 Toxicology of Insecticides (3)
11:776:408 Turfgrass Pest Science (4)
11:370:406 Medical & Veterinary Entomology (3)
11:370:430 Urban Entomology (3)
11:370:404 Insect Structure & Function (4)
11:370:415 Decomposition Ecology (3)
11:370:380 Insect Biotechnology (3)

*Note: Additional entomology electives can be taken and counted for approved elective credits*

*Note: For Careers in Pest Management, the following entomology elective courses are recommended:*
*11:370:430 Urban Entomology (3)*
*11:370:352 Toxicology of Pesticides (3)*
*11:776:408 Turfgrass Pest Science (4)*
*11:370:380 Insect Biotechnology (3)*

**Approved General Electives**
*At least 8 (24+ credits)*

11:573:232 Fundamentals of Environmental Geomatics (4)
11:216:371 Intro to Remote Sensing Image Analysis (3)
11:776:302 General Plant Pathology (3)
11:776:402 Principles of Weed Science (3)
11:776:405 Plant Biosecurity Issues & Technologies (3)
01:160:209 Elementary Organic Chemistry (4)
01:160:307-308 Organic Chemistry (4,4)
01:447:380 Genetics (4)
11:115:301 Introductory Biochemistry (3)
11:115:403 Biochemistry (4)
11:115:404 Biochemistry (4)
11:776:305 Plant Genetics (4)
11:216:302 Parasite Ecology (4)
11:216:317 Conservation Ecology (3)
11:216:324 Invertebrate Zoology (4)
11:216:332 Plant Ecology (4)
11:216:411 Plant Diversity & Evolution (3)

11:216:421 Wetland Ecology (3)
11:216:441 Animal Behavior (3)
11:216:464 Wildlife Ecology & Conservation (3)
11:375:407 Environmental Toxicology (3)
11:776:210 Principles of Botany (4)
11:776:382 Plant Physiology (4)
11:680:390 General Microbiology (4)
11:216:269 Evolution of Animal Behavior (3)
11:067:328 Animal Genetics (3)
11:126:481 Molecular Genetics (3)
11:126:484 Tools for Bioinformatic Analysis (3)
11:776:485 Functional Genomics for Research (3)
11:776:391 Weeds, Disease, and Insects of Plants (3)
11:020:436 Sustainable Agriculture (3)
11:020:321 Principles and Practices of Organic Farming (3)
11:375:453 Soil Ecology (3)

*Note: For Careers in Pest Management, the following courses nonentomology elective courses are recommended:*
*11:115:301 Introductory Biochemistry (3)*
*11:115:403 Biochemistry (4)*
*11:115:404 Biochemistry (4)*
*11:375:407 Environmental Toxicology (3)*

# Environmental and Business Economics 373 (SEBS)

## ENVIRONMENTAL AND BUSINESS ECONOMICS 373

**Degree:** B.S.

**Director:** Isaac Vellangany; Cook Office Building Room 112, 848-932-9131, isaacv@sebs.rutgers.edu

**Program Webpage:** Here

**Department of Environmental and Business Economics Webpage:** Here

The environmental and business economics program provides students with a foundation in the principles of economics, a knowledge of practical economic and analytical problem-solving techniques, an ability to apply economic concepts to the analysis of public and private policy issues, and an understanding of the institutional factors underlying and influencing policy decisions. The program qualifies students for a broad spectrum of positions in business and government, or for continued study at the graduate level.

To encourage students to develop depth in their understanding of the applications of economics, the curriculum offers the following four options:

***Business Economics.*** This option includes all of the same foundation courses required in traditional business school curricula plus the additional analytical tools provided in the program's economic courses. It is this rich blend of courses such as Finance, Management, Marketing, Demand and Price Analysis, and Economics of Production that make graduates of this option so attractive to employers in business and industry as well as to those in government agencies and nonprofit organizations. Indeed, many of the graduates from this option are among the ranking economists, analysts, financial advisers, managers, marketing specialists, consultants, and policy directors in agencies and companies ranging from biotechnology and pharmaceutical industries on Wall Street to smaller organizations including small business and entrepreneurial ventures. The option familiarizes students both with analytical and decision-making techniques used in the business world and with the public and private institutional framework within which businesses operate. It is also appropriate for students who are interested in graduate studies in business management or economics.

***Environmental and Natural Resource Economics.*** This option emphasizes the application of economics to policy issues associated with environmental problems and the utilization of natural resources. It familiarizes students both with analytical and decision-making techniques used in assessing problems of the environment and natural resources and with the institutional framework within which environmental policy must be developed. It is appropriate for students interested in employment either by private organizations concerned with environmental policies or by government agencies responsible for policies relating to the environment and natural resources and for students interested in graduate study in environmental or natural resource economics.

***Food Industry Economics.*** This option emphasizes the application of economics in the areas of food policy, marketing, and finance. It is appropriate for students interested in employment in the food industry or by federal or state departments of agriculture and for students interested in graduate study in agricultural economics.

***Food Science and Management Economics.*** This option, offered in cooperation with the food science curriculum, is designed for students with a strong interest in the management aspects of food science, process, production, and product development. While the option requirements of both programs are similar, students seeking degrees in environmental and business economics take additional courses in economics. This option is appropriate for students interested in employment in the food industry or in graduate study in agricultural economics, economics, or business administration.

Environmental and Business Economics 373 (SEBS)

# Learning Goals

# Learning Goals

After completing the program in environmental and business economics students will be able to:

1. utilize and explain core economic, management, financial, and accounting concepts;

2. apply economic theories and concepts to contemporary social issues, as well as the formulation of policy;

3. demonstrate quantitative reasoning skills;

4. recognize the role of ethical values in economic decisions; and

5. demonstrate critical and effective communication skills.

Environmental and Business Economics 373 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

Official admission to the major requires completion of introductory courses in micro- and macroeconomics, a semester of calculus, and a semester of statistics, with grades of C or better. These four courses are prerequisites to junior- and senior-level courses in the required option areas. Students may, however, declare the major before completing these four courses.

Environmental and Business Economics 373 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of environmental and business economics major requirements, courses, and course sequences please refer to the program webpage.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent [WC] and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

# Major Requirements for All Students Regardless of Matriculation Date

**Proficiency in Environmental and Business Economics (55-70 credits)**

**A. REQUIRED COURSES (22-23)**

*Quantitative Skills (10)*

11:373:211 Applied Mathematical Concepts in Ag Economics I (4) or 01:640:1__ CALC1 (4)

11:373:215 Applications of Statistics in Business Economics (3) or 01:960:285 Introductory Statistics for Business (3) or 01:960:211 Statistics I (3)

11:373:200 Agricultural Accounting (3) or 33:010:272 Introduction to Financial Accounting (3)

*Computer and Information Technology Competence (3)*

11:373:210 Business Decision Computer Tools (4) or 01:198:170 Computer Applications for Business (3)

**Professional Ethics**

11:373:201 Corporate Social Responsibility (3)

*Additional Requirements (9)*

11:373:241 Introduction to Management (3)

11:373:321 Economics of Production (3)

11:373:422 Demand and Price Analysis (3)

**B. OPTIONS (33-44)**

Majors must complete all option-required courses with a grade of C or better. No more than one grade of D is allowed in the remaining option elective courses.

*1. Business Economics (33-35)*

Required courses (12)

11:373:201 Corporate Social Responsibility (3) or equivalent

11:373:231 Introduction to Marketing (3)

11:373:341 Organizational Dynamics (3)

11:373:351 Business Finance I (3)

Electives (21-23)

At least three of the following business/economics courses:

01:220:300 International Economics (3)

01:220:301 Money and Banking (3)

01:220:302 Labor Economics (3)

01:220:308 Introduction to Managerial Economics (3)

01:220:311 Methods of Cost Benefit Analysis (3)

01:220:322 Econometrics (3)

01:220:394 Economics of Capital Markets (3)

01:220:415 Portfolio Theory (3)

11:373:331 Economics of Food Marketing Systems (3)

11:373:352 Economics of Futures Markets (3)

11:373:402 Global Marketing (3)*

11:373:403 Innovation and Entrepreneurship (3)*

11:373:425 Econometric Applications (3)

11:373:451 Business Finance II (3)

11:373:465 Business Research (4)*

At least two of the following policy courses:

11:373:202 Sustainability Decision Tools (3)

11:373:218 Sustainable Food Policy for Developing Countries (3)

11:373:323 Agricultural and Food Policy (3)

11:373:335 Energy Economics and Policy (3)

11:373:361 Land Economics (3)

11:373:362 Natural Resource Economics (3)

11:373:363 Environmental Economics (3)

11:373:371 Food, Nutrition, and Health (3)

11:373:404 Bioscience Policy (3)

11:373:431 International Trade Policy (3)

11:374:313 Environmental Policy and Institutions (3)

11:374:314 Human Dimensions of Natural Resource Management (3)

01:790:237 Political Economy and Society (3)

01:790:305 Public Policy Formation (3)

01:790:327 International Political Economy (3)

01:790:337 American Political Economy (3)

01:790:338 Government and Business (3)

11:374:315 International Environmental Policy (3)

At least two additional courses in environmental and business economics (373), economics (220), or Calculus II.

*2. Environmental and Natural Resource Economics (33-34)*

Required courses (12)

11:373:201 Corporate Social Responsibility (3) or equivalent

11:373:361 Land Economics (3)

11:373:362 Natural Resource Economics (3)

11:373:363 Environmental Economics (3) or 01:220:332 Environmental Economics (3)

Electives (21-22)

At least three of the following courses in problem solving or policy analysis:

01:220:311 Methods of Cost Benefit Analysis (3)

01:220:386 Operations Research I (3)

01:220:395 Law and Economics (3)

01:790:305 Public Policy Formation (3)

01:960:337 Managerial Statistics (3)

11:372:232 Fundamentals of Environmental Geomatics (3)

11:373:351 Business Finance I (3)

11:373:425 Application of Econometrics in Agricultural Economics (3)

11:375:333 Environmental Law I (3)

11:375:409 Environmental Statement and Impact (3)

At least one of the following courses in policy applications:

01:450:140 The Greenhouse Effect (3)

01:450:370 Global and Regional Climate Change (3)

11:373:231 Introduction to Marketing (3)

11:373:335 Energy Economics and Policy (3)

11:373:404 Bioscience Policy (3)

11:374:315 International Environmental Policy (3)

11:375:301 Environment and Health (3)

11:375:410 Workshop in Environmental Assessment and Impact (3)

11:375:421 Air Pollution (3)

11:628:401 Science in Shoreline Management (3)

11:704:451 Ecosystems Ecology and Global Change (3)

At least one of the following interdisciplinary courses:

01:512:323,324 History of the North American Environment (3,3)

10:975:315 Theory and Methods of Land-Use Planning (3)

11:372:231 Fundamentals of Environmental Planning (3)

11:372:384 A Systems Approach to Environmental and Agricultural Issues (3)

11:373:431 International Trade Policy (3)

11:375:333,334 Environmental Law I,II (3,3)

11:704:351 Principles of Ecology (3)

Two additional courses in environmental and business economics (373), economics (220), or Calculus II.

*3. Food Industry Economics (33-35)*

Required courses (12)

11:373:201 Corporate Social Responsibility (3) or equivalent

11:373:231 Introduction to Marketing (3)

11:373:331 Economics of Food Marketing Systems (3)

11:373:341 Management: Human Systems Development (3)

Electives (21-23)

Four of the following courses, of which at least three must come from group A:

A. Courses in business strategy/policy

11:373:205 Small Business Essentials (3)

11:373:323 Agriculture and Food Policy (3)

11:373:351 Business Finance I (3)

11:373:352 Economics of Futures Markets (3)

11:373:371 Food, Nutrition, and Health (3)

11:373:402 Global Marketing (3)*

11:373:403 Innovation and Entrepreneurship (3)*

11:373:425 Econometric Applications (3) *or* 01:220:322 Econometrics (3)

11:373:451 Business Finance II (3)

11:373:465 Business Research (4)*

B. Courses in environmental/resource economics

11:373:335 Energy Economics and Policy (3)

11:373:361 Land Economics (3)

11:373:362 Natural Resource Economics (3)

11:373:363 Environmental Economics (3)

At least 3 credits of courses in one of the following areas: animal science (067), soils (in environmental sciences 375), food science (400), nutritional sciences (709), or plant biology (776).

At least two additional courses in environmental and business economics (373), economics (220) or Calculus II.

*4. Food Science and Management Economics (43-44)*

Required courses in the sciences (26)

01:160:209 Elementary Organic Chemistry (3)

11:400:201 Principles of Food Science (3)

11:400:301 Food Processing Technologies (4)

11:400:405 Sensory Evaluation of Foods (3)

11:400:411 Food Chemistry (3)

11:400:412 Food Product Development (3)

11:400:423 Food Microbiology (3)

11:680:390 General Microbiology (4)

Required courses related to business management (17-18)

11:373:201 Corporate Social Responsibility (3) or 11:400:314 Current Issues in Food Science (2) or equivalent

11:373:231 Introduction to Marketing (3)

11:373:321 Economics of Production (3)

11:373:323 Agricultural and Food Policy (3) or 11:373:371 Food, Nutrition, and Health (3)

11:373:351 Business Finance I (3)

11:373:422 Demand and Price Analysis (3)

**Fulfills SEBS Experience-Based Education requirement.*

**Unspecified Electives**

In addition to courses meeting the above requirements, students can take other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 120 (matriculated 2018 or later) or 128 (matriculated prior to 2018) required for graduation.

# Environmental Engineering 366 (ENG)

Environmental Engineering 366 (ENG)

## Field of Study

## Field of Study

Environmental engineers utilize engineering principles and physical, chemical, and biological science fundamentals to devise effective solutions for current and emerging environmental problems related to human activities. Environmental engineers practice in many areas: green infrastructure for urban stormwater and flood management; air pollution prevention and control; safe drinking water production and supply; sustainable treatment of wastewater and solid wastes; remediation of contaminated sites; ensuring industry compliance with environmental regulations; environmental health and safety in the workplace; alternative energy technologies; design of green buildings; and analysis and modeling of big data to guide societal responses to global environmental change.

This program prepares students for immediate employment as practicing engineers with engineering consulting firms; green energy and sustainable development companies; drinking water, wastewater, solid waste, and air pollution treatment facilities; manufacturing industries; environmental regulatory and planning agencies; industry and academic research laboratories; international development agencies; and public-interest groups.

The environmental engineering curriculum provides a strong foundation in engineering and the physical, chemical, and biological sciences during the freshman and sophomore years. In the upper-level major courses these fundamentals are applied to multidisciplinary problem solving in various environmental engineering fields. The faculty has extensive experience in teaching, research, and consulting with private firms and government agencies, and close ties to our strong alumni network.

The environmental engineering program is a unique joint program between the School of Engineering and the School of Environmental and Biological Sciences. Students matriculate into the environmental engineering program through the School of Engineering. The undergraduate program in Environmental Engineering is accredited by the Engineering Accreditation Commission of ABET under the commission's General Criteria and Program Criteria for Environmental Engineering. The program prepares graduates for taking the Fundamentals of Engineering (FE) examination pursuant to becoming a licensed professional engineer (PE).

Environmental Engineering 366 (ENG)

# Four-Year Undergraduate Curriculum

# Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 366

The undergraduate program in Environmental Engineering is accredited by the Engineering Accreditation Commission of ABET under the commission's General Criteria and Program Criteria for Environmental Engineering.

**First Year**

See First-Year Program (35)

**Sophomore Year**

*First Semester*

01:119:103 Principles of Biology (4)

01:640:251 Multivariable Calculus (4)

01:750:227 Analytical Physics IIA (3)

01:750:229 Analytical Physics II Laboratory (1)

14:180:215 Engineering Graphics (1)

14:440:222 Engineering Mechanics: Dynamics (3)

*Second Semester*

01:160:209 Elementary Organic Chemistry (3)

01:640:244 Differential Equations for Engineering and Physics (4)

11:117:333 Environmental Engineering Tools (3)

14:180:243 Mechanics of Solids (3)

General elective (3)

**Junior Year**

*First Semester*

01:160:211 Elementary Organic Chemistry Laboratory (1)

11:375:201 Biological Principles of Environmental Sciences (3)

11:375:202 Chemical Principles of Environmental Sciences (3)

11:375:303 Numerical Methods in Environmental Sciences or 300-400 level statistics (3)

14:180:387 Fluid Mechanics (3)

14:180:389 Fluid Mechanics Laboratory (1)

*Second Semester*

11:117:462 Design of Solid Waste Treatment Systems (3)

11:375:423 Environmental Fate and Transport (3)

14:180:448 Elements of Hydrology (3)

14:540:343 Engineering Economics (3)

14:650:351 Thermodynamics (3)

Humanities/social sciences elective (3)

**Senior Year**

*First Semester*

11:117:413 Unit Processes in Environmental Engineering I (3)

11:117:423 Environmental Engineering Unit Processes Laboratory I (1)

11:117:474 Air Pollution Engineering (3)

11:117:488 Environmental Engineering Design I (2)*

11:375:322 Energy Technology and its Environmental Impact (3)

Option elective (3)

*Second Semester*

11:117:414 Unit Processes in Environmental Engineering II (3)

11:117:424 Environmental Engineering Unit Processes Laboratory II (1)

11:117:489 Environmental Engineering Design II (2) or 14:180:431 Design of Environmental Engineering Facilities (4)*

Humanities/social sciences elective (3)

Option elective (3)

Option elective (3)

*Total Credits = 129*

**Notes**

*For the water resources concentration, it is optional to take 14:180:431 instead of 11:117:488/489.

*Option electives may be selected for one of four concentrations from the following:*

Water Resources: 11:117:494, 11:117:495, 11:117:497, 11:117:498, 11:372:232, 233, 11:375:434, 14:180:372, 374, 14:180:382, 14:180:443; 11:682:451; 11:628:425

Environmental Unit Processes and Remediation: 11:117:468, 11:117:494, 11:117:497, 11:117:498, 11:375:340, 11:375:407, 11:375:411, 11:375:434, 11:375:444, 11:375:453, 11:680:201

Air Quality: 11:117:497, 11:117:498, 11:375:346; 11:375:407, 11:375:424, 11:375:434, 11:670:453, 14:650:461

Sustainable Environmental Systems: 11:117:468, 11:117:497, 11:117:498, 11:375:360; 11:375:430, 11:375:434, 11:375:450, 11:375:474; 11:776:382; 14:332:443; 14:635:405; 14:440:378: 10:971:202: 11:020:340

# Environmental Planning 573 (SEBS)

## ENVIRONMENTAL PLANNING 573

**Degree:** B.S.

**Director:** Frank Gallagher (gallagher@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

The Environmental Planning curriculum provides a broad educational experience emphasizing an understanding of planning and management of the physical and cultural environments. The program strives to consider our relationship with the land, in an effort to foster ethical planning solutions. A program that promotes sustainability regardless of location, strives for social equity, and envisions a post-industrial landscape that provides ecological services.

***Environmental Planning Major:*** The environmental planning curriculum provides a broad educational experience emphasizing an understanding of planning and management of the physical and cultural environments. The program strives to consider our relationship with the land, in an effort to foster ethical planning solutions. The program promotes sustainability regardless of location, strives for social equity, and envisions a postindustrial landscape that provides ecological services.

**Environmental Planning Minor**: Environmental planning requires the integration of environmental information into the planning process and is concerned with the protection and enhancement of environmental systems while meeting demands for growth and development. This minor is intended for students from any discipline, who are interested in pursuing professional careers in environmental planning and related areas. It also provides a basis for graduate and professional studies. An environmental planning certificate program is also available for students in other programs of study as well as all minors of this major. View course requirements for minor.

**Environmental Geomatics Minor:** Environmental geomatics synthesizes a number of concepts and techniques, including remote sensing, spatial analysis, geographic information systems (GIS), and global positioning systems (GPS) that are used to improve the planning and management of natural resource systems. These techniques include the development of complex spatial databases from a wide range of data sources and the application of this information to solve environmental problems. The minor is intended for students interested in pursuing professional careers in environmental planning/management, remote sensing, and geomatics, and provides a basis for graduate and professional studies. An environmental geomatics certificate program also is available for students in other programs of study as well as all minors of this major. View course requirements for minor.

**Green Technologies Minor:** As individuals, businesses, and communities seek solutions to pressing environmental concerns, the green technology minor is positioned as an emerging source of innovation, entrepreneurialism, and action towards the development of sustainable land use practices. This minor seeks to provide students with a broad-based education in preparation for careers in landscape-related industries such as contracting, maintenance, nursery production, and garden-center operations. While covering pragmatic issues associated with the maintenance and management of gardens and properties, the curriculum also gives students opportunities to study best practices and new approaches to on-site stormwater management, energy production, and healthy ecological systems. View course requirements for minor.

**Urban Forestry Minor:** Urban and community forestry is the fastest growing segment of the forestry profession, especially in the northeast, where the total expenditure of time and money on community forestry (nursery, planting, pruning, removals, and line clearance) exceeds that spent on woodlands. This certificate is designed to provide students with the necessary credentials for employment by providing the fundamental knowledge and expertise required for this field. View course requirements for minor.

Environmental Planning 573 (SEBS)

# Learning Goals

# Learning Goals

1) Understand, analyze, and incorporate natural features and systems in planning and land management practices.

2) Analyze and incorporate social, cultural, and behavioral factors in planning.

3) Understand the history of environmental planning and policy, including contemporary and sustainable practices and their impact on people and the land.

4) Evaluate implications of institutions and policy in terms of their ability to shape sustainable regions.

5) Effectively communicate with the public, communities, and policy makers on issues of land stewardship, environmental justice, and social well-being.

Environmental Planning 573 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of environmental planning major requirements, courses, and course sequences, please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning**(3 credits)*Students must participate in a certified experience that meets this goal*[EL]

**Natural Sciences**(6 credits)*Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences*[NS]

**Historical Analysis**(3 credits)*Students must take one course*[HST]

**Social Analysis**(6 credits)*SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis*[SCL]

**Arts and Humanities**(3 credits)*Students must complete one course*[AH]

**Writing and Communication**(6 credits)*Students must take 01:355:101 or its equivalent [WC] and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry*[WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

## Graduation Requirements: Major in Environmental Planning (573)

The environmental planning curriculum provides a broad educational experience emphasizing an understanding of planning and management of the physical and cultural environments. The program strives to consider our

relationship with the land, in an effort to foster ethical planning solutions. A program that that promotes sustainability regardless of location, strives for social equity and envisions a post-industrial landscape that provides ecological services.

| Course Number | Credits | Name | SEBS |
|---|---|---|---|
| ***Requirement I*** | ***9*** | ***Physical Sciences*** | ***Core*** |
| 01:119:103 | 3 | Principles Biology | |
| *Plus 3 credits from:* | | | |
| 01:450:101 | 3 | Earth Systems *or* | |
| 01:460:100 | 3 | Planet Earth *or* | NS |
| 11:776:102 | 3 | Soil and Society | |
| *Plus 3 credits from:* | | | |
| 11:670:102 | 3 | Intro. Climate Science *or* | |
| 11:670:101 | 3 | Intro. Meteorology | |
| ***Requirement II*** | ***4*** | ***Quantitative Methods*** | |
| 01:640:115 | 4 | Pre-calculus College Math | |
| 01:640:111 | 2 | Pre-calculus I *plus* | QQ |
| 01:640:112 | 2 | Pre-calculus II | |
| ***Requirement III*** | ***34*** | ***Environmental Planning Core*** | |
| 11:573:202 | 3 | Environmental Issues | |
| 11:573:231 | 3 | Fundamentals of Environmental Planning | |
| 11:550:231 | 5 | Intro. Environmental Design | |
| 11:573:232 | 3 | Fundamentals of Environmental Geomatics | |
| 11:573:233 | 1 | Fundamentals of Environmental Geomatics Laboratory | |
| 11:550:237 | 3 | Visualization I-Drawing and Drafting | |
| 11:573:413 | 3 | Open Space Planning and Management | |
| 11:550:241 | 4 | Construction I: Mapping and Engineering | |
| *Plus 5-6 credits from:* | | | |
| 11:573:232 | 3 | Intro. Geomatics | |
| 11:372:462 | 3 | Adv. Geomatics | |
| 11:573:409 | 3 | Challenges and Opportunities | |

| | | | |
|---|---|---|---|
| 11:550:301 | 3 | Social and Cultural Aspects of Design | EBE |
| 11:550:331 | 5 | Environmental Planning Studio | |
| *Plus 3 credits from:* | | | |
| 11:550:442 | 3 | Planting Design | |
| 11:373:202 | 3 | Sustainability Decision Tools | |
| 11:216:101 | 3 | Intro. Ecology | |
| ***Requirement IV*** | ***9*** | ***Environmental Sequence*** | |
| *3 credits from:* | | | |
| 11:375:360 | 4 | Soils and Water | |
| 11:776:440 | 3 | Soil Fertility | |
| 11:776:102 | 3 | Soils and Society | |
| *Plus 3 credits from:* | | | |
| 11:216:272 | 4 | Dendrology | |
| 11:550:233 | 3 | Landscape Plants I | |
| *Plus 3 credits from:* | | | |
| 11:375:101 | 3 | Intro. Environmental Science | |
| 11:573:445 | 3 | Ecological Design and Stewardship | |
| 11:216:332 | 3 | Plant Ecology | |
| 11:216:351 | 3 | Principles of Ecology | |
| ***Requirement V*** | ***6*** | ***History/Theory Sequence*** | |
| 11:550:230 | 3 | Environmental Design Analysis | |
| 11:550:250 | 3 | History of Landscape Architecture | AH/ CC |
| 11:573:302 | 3 | Ecological History of North America | |
| ***Requirement VI*** | ***9*** | ***Planning Electives*** | |
| 3 credits from: | | | |
| 11:375:202 | 3 | Water and Wastewater Treatment | |
| 11:375:307 | 3 | Solid Waste Management and Treatment | |

| | | | |
|---|---|---|---|
| 10:762:335 | 3 | Gender, Family, and Public Policy | |
| 10:762/832/971:202 | 3 | Designing Healthy Cities (studio format) | |
| 11:373:362 | 3 | Natural Resource Economics | |
| 11:373:363 | 3 | Environmental Economics | |
| 11:573:437 | 3 | Sustainability Decision Tools | |
| *Plus 3 credits from:* | | | |
| 11:573:444 | 3 | Watershed Planning and Management | |
| 10:762:233 | 3 | Urban World | |
| 10:762/833/843:210 | 3 | Principles of Public Policy | |
| 10:762/971:201, 10:762:306 | 3 | Intro. Urban Planning and Design | |
| 10:762:413 | 3 | Urban Revitalization | |
| *Plus 3 credits from:* | | | |
| 11:550:332 | 5 | Praxis Studio I (Junior) Section CD | EBE |
| 11:550:332 | 5 | Praxis Studio I (Junior) Section EC | EBE |
| 11:550:332 | 5 | Praxis Studio I (Junior) Section OD | EBE |
| 11:550:234 | 3 | Landscape Plants II | |
| 11:550:235 | 3 | Herbaceous Plants in the Landscape | |
| 11:573:437 | 3 | Spatial Data Visualization | |
| 16:550:545 | 3 | Intro. Geomatics | |
| 11:216:474 | 3 | Adv. Geomatics | |
| | | | |
| **TOTAL** | **71** | | |
| | | | |
| *Cannot use planning electives twice within the major.* | | | |

**List of suggested but not required certificates/minors and required number of credits:**

**Certificate Programs:**
Environmental Geomatics (19)

**Minor Programs:**
Agroecology (21-24)
Ecology, Evolution, and Natural Resources (20-23)
Environmental and Business Economics (21-23)
Entomology (19-26)
Environmental Policy, Institutions, and Behavior (21)
Environmental Sciences (21)
Marine Sciences (18)
Meteorology (18)
Plant Science (18-20)
Urban Forestry (21)

# Environmental Policy, Institutions, and Behavior 374 (SEBS)

## ENVIRONMENTAL POLICY, INSTITUTIONS, AND BEHAVIOR 374

**Degree:** B.S.

**Director:** Rachael Shwom (shwomrac@sebs.rutgers.edu)

**Program Website:** Here

**Managing Department (Department of Human Ecology):** Here

**Program Description**

Environmental policy, institutions, and behavior (EPIB) examines the human dimensions of environmental problems. It addresses such issues as how human actions affect the environment; how societies adapt to changes in natural resource availability; and how individuals, nations, and international agencies respond to environmental hazards. Courses in the program deal with local, regional, and national differences in the use of resources; social and environmental aspects of health and illness; alternative strategies for environmental management; ethical, moral, and legal dimensions of environmental and resource issues; and the roles of governmental and nongovernmental agencies in environmental affairs.

To understand these topics, students are exposed to a multidisciplinary view of the environment and draw upon concepts from a variety of fields, including anthropology, ecology, economics, geography, sociology, political science, and psychology.

The objectives of the curriculum are to teach basic concepts and methods from the social, biological, and physical sciences as they relate to the interactions among people and the environment; to train students in the techniques of empirical research; to provide opportunities for experiences in real-world situations; to guide students in acquiring practical skills such as environmental assessment, professional writing, data analysis, and demographic analysis; and to broaden students' knowledge regarding environmental problems and how people cope with them.

Graduates are prepared for careers in health and environmental agencies at all levels of government, nonprofit organizations in the United States and internationally, and private companies, including environmental consulting firms, pharmaceutical companies, and green businesses. Some students also pursue graduate or professional studies in the social sciences, public health and medicine, public administration, law, and international development.

Environmental Policy, Institutions, and Behavior 374 (SEBS)

# Learning Goals

# Learning Goals

Learning goals for the environmental policy, institutions, and behavior major:

**Goal 1**

Students graduating from the major will understand and analyze the varied perspectives offered by the social and natural sciences regarding the causes and consequences of social, ecological, and environmental change. This includes interactions among natural resources, climate, population, energy use and technology, health, forces of globalization, social institutions, and cultural values.

*Graduates should be able to:*

1.1 Describe major patterns and drivers of natural resource use, pollution, and climate and environmental change.

1.2 Identify different approaches to the governance and management of human activities that affect the environment, both in the United States and abroad, including institutions, property relations, management regimes, politics, and policies.

1.3 Explain characteristics of human populations, including population growth, demographic transitions, social stratification, consumption, and indicators of human welfare.

1.4 Describe technological trends affecting human well-being and the environment including energy use and development, biotechnology, and geospatial and communication technologies.

1.5 Evaluate major issues in health, including race, gender, and socioeconomic position, food and nutrition access and policies, cultural factors, and understanding of risk and vulnerability.

1.6 Discuss the dynamics of development and globalization, including historical antecedents, current trends and pathways, and local responses to global forces.

1.7 Explain how social forces, cultural values, and behavior affect human environmental interactions, including issues such as political and economic relations, inequality, access to resources, and interactions between human diversity and biological diversity.

**Goal 2**

Students will acquire the skills to use appropriate conceptual and methodological tools to structure inquiries about human-environment interactions.

*Graduates should be able to:*

2.1. Assess the relevant contexts for addressing environmental problems at the appropriate spatial, temporal, and organizational scale(s).

2.2. Identify the relevant biological, historical, sociocultural, governance, and political issues that need to be addressed.

2.3. Identify what constitutes valid and relevant evidence to address the question and demonstrate an ability to understand and work with quantitative information.

2.4. Conduct ethical primary and secondary research using appropriate methods and considering relevant community norms.

2.5. Analyze and interpret evidence.

2.6. Identify appropriate governance tools to manage human-environment impacts and be capable of engaging with regulatory, legislative, and other democratic processes.

2.7. Apply this understanding to identify policies and plans that address the problem.

2.8. Identify different decision-making processes and criteria for selecting from among alternatives.

2.9. Evaluate the alternatives' environmental and differentiated social consequences.

2.10. Identify relevant audiences, determine communication goals, and communicate the results in oral and/or written form in a manner effective for each targeted audience.

2.11. Work effectively in team settings.

**Goal 3**

Students will undertake their work guided by ethical considerations. They will identify their own values with respect to environmental, health, and food issues. They will evaluate and address the ethical dimensions and implications of related problems, assessments, plans, and communication, including their differentiated social impacts.



# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of environmental policy, institutions, and behavior major requirements, courses, and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges (6 credits)** *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning (3 credits)** *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences (6 credits)** *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis (3 credits)** *Students must take one course* [HST]

**Social Analysis (6 credits)** *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities (3 credits)** *Students must complete one course* [AH]

**Writing and Communication (6 credits)** *Students must take 01:355:101 or its equivalent* [WC] *and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning (6 credits)** *Students must take two courses* [QQ; QR]

## Major Requirements for All Students Regardless of Matriculation Date

**Requirement V8: Foundation courses (15 credits)**

11:374:101 Introduction to Human Ecology
11:374:279 Politics of Environmental Issues
11:374:305 Globalization, Development, and Environment
11:374:312 Environmental History
11:374:460 Environmental Law and Policy

**Requirement V9: Methods (9 credits)**

*Statistics (choose one):*
01:960:211 Statistics I
01:960:401 Basic Statistics for Research
10:762:205 Basic Statistical Methods for Policy, Planning, and Health
11:374:302 Data Analysis in Human Ecology

*Required:*
11:374:110 Theories and Reasoning in Human Ecology
11:374:201 Research Methods

**Requirement V10: Math Proficiency**

Notes: All students must place in Precalculus or higher or complete Intermediate Algebra (01:640:026)

**Requirement V11: Skills (9 credits)**

*Required:*
11:374:220 Environmental Solutions
11:374:280 Careers in EPIB

*Communication, choose one:*
11:374:225 Environment in Society and Mass Media
11:374:240 Visualizing Information: Storytelling with Data
11:374:310 Storytelling About Science
11:374:311 Environmental Writing
11:374:325 Environmental Communication

**Requirement V12: Experiential Learning Requirement (3 credits)**

*Choose one:*
11:374:399 Practicum in Sustainability
11:374:481 Watershed Management Internship
11:374:482 Climate Action Internship
11:374:483 Science and Communication Internship
11:374:490 Readings and Practicum in Human Ecology
11:374:492 Environmental Studies Internship

**Requirement V13: Policy, Governance, and Management Cluster (3 credits)**

*Choose one:*
11:374:175 Energy and Society
11:374:115 Water and Society
11:374:313 U.S. Environmental Policy
11:374:314 Natural Resource Policy
11:374:428 Marine Fisheries Policy
11:374:462 International Environmental Law

**Requirement V14: Food, Health, and Disease Cluster (3 credits)**

*Choose one:*
11:374:141 Health and Society
11:374:430 Risk, Health, and Safety
11:374:436 Segregation and Health
11:374:437 Culture and Health
11:374:438 Health in the Latino Community

**Requirement V15: Globalization, Development, and Sustainability Cluster (3 credits)**

*Choose one:*
11:374:289 Sustainable Food: Politics, Policy, and Ethics
11:374:299 Introduction to Sustainability
11:374:426 Climate Change Policy
11:374:429 Agrarian Landscapes

**Requirement V16: People, Communities, and the Environment Cluster (3 credits)**

*Choose one:*
11:374:223 Urban Society and Environment
11:374:322 Environmental Behavior
11:374:335 Communities and Environmental Change
11:374:440 Race and the Environment
11:374:416 Environmental Education
11:374:433 Environmental Justice

**Requirement V17: Upper-Level Classes (6 credits)**

Choose two additional 374 courses at the 300-400 level that are not being counted to fulfill other requirements. **Please note: 11:374:490, 11:374:491, and 11:374:492 cannot count toward this requirement.**

**Requirement V18: Capstone (3 credits)**

*Choose one:*
11:374:499 Capstone in Human Ecology
11:015:497 George H. Cook Honors
11:015:498 George H. Cook Honors
11:374:491 Capstone Independent Study

**Unspecified Electives**

In addition to courses meeting the above requirements, students can take other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 120 (matriculated 2018 or later) or 128 (matriculated prior to 2018) required for graduation.

# Environmental Sciences 375 (SEBS)

## ENVIRONMENTAL SCIENCES 375

**Degree:** B.S.

**Department:** Environmental Sciences

**Department Chair:** Donna Fennell

**Department Website:** Here

**Undergraduate Program Director:** Jeffra Schaefer

The environmental sciences program is designed to provide students with an understanding of the application of the biological, chemical, and physical sciences to problems in the environment. The core emphasizes the chemical, physical, and biological principles, and options and electives allow specialization in the study of air, water, or soils, as well as pollution and treatment sciences, and environmental health.

With the consultation of a faculty adviser, students can design a program to meet the requirements for graduate study or to provide the basis for a professional career in government, education, consulting, or industry.

The program offers a bachelor of science (B.S.) in environmental sciences, as well as a minor in environmental sciences. Within the B.S. program, we offer three options: environmental science, applied environmental science, and environmental health. The differences between the options are not large, but generally the environmental science option is more theoretical and is preferred by students considering graduate school, while the applied option is more practical and is intended to prepare students for careers in the environmental field. The environmental health option is geared toward careers in health, such as the occupational health and safety arena.

Environmental science offers a co-terminal 4+1 BS+MS program where students can pursue a 5-year joint Bachelor of Science (B.S.) and Master of Science (M.S.) degree in environmental science (website: here). Likewise, students can apply for the Accelerated Bachelors and Masters of Public Health degrees (BS/MPH) at Rutgers (website: here). Students interested in this either opportunity should discuss specific course requirements with their adviser or the undergraduate program director of environmental science.

Students can meet the requirements for the 40-hour OSHA Hazardous Waste Operations and Emergency Response certification by including the following course in their program:

11:375:434 Principles of Industrial Hygiene (3)

Environmental Sciences 375 (SEBS)

# Learning Goals

# Learning Goals

**Students completing this program will be able to:**

1. Apply knowledge, skills, and techniques from the sciences and mathematics to identify, characterize and provide solutions to environmental problems
2. Design and conduct experiments, analyze, and interpret data to draw informed conclusions
3. Communicate technical information effectively (orally, in writing, and through electronic media)
4. Function effectively on teams to accomplish collaborative tasks
5. Recognize and discuss the ethical and professional responsibilities of environmental scientists in addressing contemporary environmental science issues and the impact of environmental science in a global and societal context

Environmental Sciences 375 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of the environmental science major requirements, courses and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

*Options are chosen from lists of courses certified in each learning goal: Here.*

**Note: The SEBS Core Curriculum requirements differ slightly from SAS Core Curriculum requirements**

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future [CC-O]*

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *One course* [HST]

**Social Analysis** (6 credits) *Two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *One course* [AH]

**Writing and Communication** (6 credits) *01:355:101 or its equivalent* [WC] *and one course in communicating effectively in modes appropriate to a discipline or area of inquiry* [WCD]

**Quantitative and Formal Reasoning** (6 credits) *Two courses* [QQ; QR]

## Graduation Requirements for the Major

Students matriculating prior to the fall semester 2015 in the School of Environmental and Biological Sciences (SEBS) must complete the SEBS general education requirements. In addition, students majoring in environmental sciences must complete the major requirements described below.

Students matriculating fall 2015 or after and transfer students matriculating in 2016 and after must complete a goal-based Core Curriculum in place of general education requirements. The goal-based core is described here. Courses are certified for the Core Curriculum by a faculty committee. A current list of certified courses can be found here. Environmental sciences major requirements are as described below.

For an up-to-date description of environmental sciences major requirements, courses, and course sequences please refer to the program website here.

**PROFICIENCY IN THE ENVIRONMENTAL SCIENCES (63-82 credits)**

**1. Biological and Physical Sciences (24-34)**

01:119:103 Principles of Biology (3) or 01:119:115-116 General Biology I & II (3,3)1
01:160:161-162 General Chemistry (4,4)1
01:160:171 Introduction to Experimentation (1)
01:160:209 Elementary Organic Chemistry (3) or 01:160:307-308 Organic Chemistry (4,4)
01:750:193-194 Physics for the Sciences (4,4) or 01:750:203-204 General Physics (3,3)1
11:216:351 Principles of Ecology (3)

**2. Quantitative Skills (7)**

Calculus I (4)2
Choose one of the following:

i. 01:960:211 Statistics I (3)3 or equivalent
ii. 11:375:303 Numerical Methods in Environmental Science (3)
iii. 11:573:232 Fundamentals of Geomatics (3)

**3. Environmental Sciences (12)**

11:375:201 Biological Principles of Environmental Sciences (3)
11:375:202 Chemical Principles of Environmental Sciences (3)
11:375:203 Physical Principles of Environmental Sciences (3)
11:375:310 Analytical Environmental Chemistry Laboratory (3)4

**4. Environmental Science Lab Course, *choose one* (2-4)**

11:375:312 Environmental Microbiology Laboratory (2)
11:375:360 Soils and Water (4)
11:375:424 Air Sampling Techniques (3)

**Also choose from one of the following options:**

**Environmental Science Option (25)**
01:640:1 Calculus 2 (4)
11:375:423 Environmental Fate and Transport (3)
Environmental Science Option Courses, choose *three* (9)
11:375:346 Introduction to Atmospheric Chemistry (3)
11:375:340 Environmental Applications of Organic Chemistry (3)
11:375:302 Water and Wastewater Treatment (3)
11:375:411 Environmental Microbiology (3)

11:375:444 Water Chemistry (3)
11:375:453 Soil Ecology (3)
Electives, *see below (9)*

**Applied Environmental Option (24)**
11:375:302 Water and Wastewater Treatment (3)
11:375:307 Solid Waste Management and Treatment (3)
11:375:430 Hazardous Waste (3)
11:375:407 Environmental Toxicology (3)
Electives, *see below (12)*

**Environmental Health Option (23-25)**
11:375:302 Water and Wastewater Treatment (3)
11:375:307 Solid Waste Management and Treatment (3)
11:375:407 Environmental Toxicology (3) or ENOH 0594 Environmental and Occupational Toxicology (3)*
10:832:335 Epidemiology (3) or PHCO 0502 Principles and Methods of Epidemiology (3)*
Microbiology course, choose one (2-4):
11:375:312 Environmental Microbiology Laboratory (2) (if not already used for other major requirement)
11:680:201 Introduction to Microbiology (3)
11:680:390 General Microbiology (4)
*Electives*, see below (9)

*School of Public Health classes for B.S./M.P.H students or B.S. students with permission.

**ELECTIVES**

Students can choose from any 300- or 400-level 375 course or any of the following list of non-375 courses. **Note that to satisfy as an elective course, it must not already be used to satisfy other environmental science major or option requirements.**

*Possible electives:*
11:680:201 Introduction to Microbiology (3)
11:680:390 General Microbiology (4)
11:374:460 Environmental Law and Policy I - Nature, Law, and Society (3)
11:375:302 Water and Wastewater Treatment (3)
11:375:303 Numerical Methods (3)
11:375:307 Solid Waste Management and Treatment (3)
11:375:322 Energy, Technology, and its Environmental Impact (3)
11:375:340 Environmental Applications of Organic Chemistry (3)
11:375:346 Introduction to Atmospheric Chemistry (3)
11:375:360 Soils and Water (4)
11:375:407 Environmental Toxicology (3)
11:375:411 Environmental Microbiology (3)
11:375:421 Principles of Air Pollution (3)
11:375:423 Environmental Fate and Transport (3)
11:375:424 Air Sampling and Analysis Techniques (3)

11:375:430 Hazardous Wastes (3)
11:375:434 Principles of Industrial Hygiene (3)
11:375:444 Water Chemistry (3)
11:375:450 The Terrestrial Carbon Cycle (3)
11:375:453 Soil Ecology (3)
11:375:474 Coastal Biogeochemical Cycles in a Changing World (3)

_____

1Satisfies SEBS Natural Science [NS] requirement
2Satisfies SEBS Mathematical or Formal Reasoning [QR] requirement
3Satisfies SEBS Quantitative Information [QQ] requirement
4Satisfies SEBS Discipline-Based Writing and Communication [WCd] requirement

# Exercise Science 377 (SEBS)

## EXERCISE SCIENCE 377

Offered in cooperation with the Department of Kinesiology and Health of the School of Arts and Sciences (SAS) students from the School of Environmental and Biological Sciences (SEBS) matriculating prior to the fall semester in 2015 must complete the SEBS general education requirements. SEBS students matriculating fall 2015 or after and transfer students matriculating in 2016 and after must complete a goal-based core curriculum in place of general education requirements. The goal-based core is described here. SEBS students are advised that the SEBS core is very similar to the SAS core, but it is not identical.

In addition, SEBS students majoring in exercise science must complete major requirements as described on the SAS program catalog page. The learning goals, options, entry requirements, major, and courses are also as described on the exercise science catalog pages in the Programs of Study and Courses for Liberal Arts and Sciences Students chapter of this catalog.

SEBS students who qualify for departmental honors may undertake the George H. Cook Scholars Program in conjunction with departmental honors.

# Food Science 400 (SEBS)

## FOOD SCIENCE 400

**Degree:** B.S.

**Director:** Chitra Ponnusamy (chitra.ponnusamy@rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

Food science is the study of the chemical, biological, and engineering aspects of food and its components. While this curriculum applies principles acquired in biology, chemistry, physics, and mathematics to food, there is emphasis on the development of important problem-solving skills, giving students experience in reasoning and the use of scientific and mathematical techniques. Attention also is devoted to current issues, innovations, and ethical issues in foods and food processing. Finally, students are given an opportunity to utilize their creative abilities in a course devoted to the development of new foods and food products.

All Food Science majors are required to complete basic sciences and Food Science courses, along with the current SEBS Core Curriculum. Starting Fall 2022, all Food Science majors must follow One Pathway to Food Science Major. Upon graduation, students can choose to apply for jobs in food, beverage, and related industries or pursue graduate studies.

Food Science 400 (SEBS)

# Learning Goals

# Learning Goals

Program Goal 1: Graduates will demonstrate and apply knowledge of the core competencies in food processing and engineering.

Program Goal 2: Graduates will demonstrate and apply knowledge of the core competencies in food chemistry and analysis.

Program Goal 3: Graduates will demonstrate and apply knowledge of the core competencies of food microbiology.

Program Goal 4: Graduates will demonstrate critical thinking and quantitative reasoning skills to solve technical and applied problems in food science.

Program Goal 5: Graduates will effectively communicate food science issues.

Program Goal 6: Graduates will demonstrate effective professional and leadership skills.

Food Science 400 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of food science major requirements, courses, and course sequences please refer to the program website here.

# SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges**(6 credits)*Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning**(3 credits)*Students must participate in a certified experience that meets this goal*[EL]

**Natural Sciences**(6 credits)*Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences*[NS]

**Historical Analysis**(3 credits)*Students must take one course*[HST]

**Social Analysis**(6 credits)*SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis*[SCL]

**Arts and Humanities**(3 credits)*Students must complete one course*[AH]

**Writing and Communication**(6 credits)*Students must take 01:355:101 or its equivalent*[WC]*and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry*[WCD]

**Quantitative and Formal Reasoning**(6 credits)*Students must take two courses*[QQ; QR]

**Graduation Requirements for One Pathway to Food Science (400) Major**
Starting Fall 2022, all Food Science majors must follow One Pathway to Food Science Major. One Pathway provides all majors with a unified, comprehensive education in Food Science major. All Food Science majors are required to complete basic sciences and Food Science courses, along with the current SEBS Core Curriculum. Upon graduation, students can choose to apply for jobs in food, beverage, and related industries or pursue graduate studies.

### A. CORE + FOOD SCIENCE MAJOR REQUIRED COURSES (18 Cr)

QQ - 01:640:135/151 (4) Calculus I
QR - 01:960:211/285/401/11:373:215 (3) Statistics
NS - 01:119:115 (4) General Biology I
NS - 01:160:161 (4) General Chemistry I
EL - 11:400:493/494/11:902:300 SPIN (3) Experiential Learning

### B. SEBS CORE COURSES (24 cr)

WC - 01:355:101 (3) Expository Writing
CC Contemporary Challenges (6)
A & H Arts and Humanities (3)
HST, SCL Historical, Social Analysis (9)
WCD 2nd writing course (3)

**C. REQUIRED FOOD SCIENCE COURSES (38 cr)**

**11:400:103 OR 104 (3) Science of Food/Food and Health**
[Satisfies NS-core requirements]. This course satisfies Food Science Program Learning Goal: Graduates will effectively communicate food science issues.
Prerequisites: None. Need to complete only one.

**11:400:201+ 202 (5) Principles of Food Science + lab**
This course satisfies the Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies in food chemistry and analysis.
*Prerequisites: General Biology I and II (01:119:115-116) and General Chemistry I and II (01:160:161-162). Pre- or corequisites for 201: Organic Chemistry (01:160:209 or 307).*
*Co-requisite for 202: Principles of Food Science (11:400:201)*

**11:400:301 (4) Food Processing Technologies**
This course satisfies the Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies in food processing and engineering.
*Prerequisites: Physics I (01:750:193 or 201 or 203 and 205) and Calculus I (01:640:135 or 151).*

**11:400:302 (3) Food Process Engineering**
This course fulfills Food Science Program Learning goal: Graduates will demonstrate and apply knowledge of the core competencies in Food Processing and Engineering.
*Pre-requisite: Food Processing Technologies 11:400:301*

**11:400:304+305 (4) Food Analysis + Laboratory**
This course fulfills Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies in Food Chemistry and analysis. Students MUST register for 304 and 305 in the same semester.
*Pre-requisites for 304: Principles of Food Science (11:400:201), Organic Chemistry (01:160:209)*
*Co-requisite for 305: Food Analysis (11:400:304).*

**11:400:314 (2) Current Issues in Food Science Food Laws**
This course satisfies Food Science Program Learning Goal: Graduates will effectively communicate food science issues.
*Prerequisite: Principles of Food Science (11:400:201).*

**11:400:405 (3) Sensory Evaluation of Foods**
This course satisfies Food Science Program Learning Goal: Graduates will demonstrate critical thinking and quantitative reasoning skills to solve technical and applied problems in food science.
*Prerequisite: Statistics (01:960:211/285/401 or 11:373:215).*

**11:400:411+ 413 (4) Food Chemistry + laboratory**
This course satisfies Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies in food chemistry and analysis.
*Prerequisites for 411: Principles of Food Science 11:400:201; Must have previously taken Biochemistry (11:115:301 or 403) or be registered this semester.*
*Co-requisite for 413: Food Chemistry 11:400:411*

**11:400:412 (3) Food Product Development**
This course satisfies Food Science Program Learning Goal: Graduates will demonstrate effective professional and leadership skills.
*Prerequisites: Food Processing Technologies (11:400:301) and Current Issues in Food Science and Food Law (11:400:314) and Food Chemistry (11:400:411) and Sensory Evaluation of Foods (11:400:405).*
*Pre-or corequisite: Food Microbiology (11:400:423).*

**11:400:419 (3) Food Physical Systems**
This course satisfies Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies in Food Chemistry and analysis.
*Prerequisite: Biochemistry 11:115:301 or 403.*

**11:400:423+ 424 (4) Food Microbiology + laboratory**
This course satisfies Food Science Program Learning Goal: Graduates will demonstrate and apply knowledge of the core competencies of food microbiology.
*Prerequisite: Elementary Organic Chemistry (01:160:209) OR Orgo I (01:160:307) OR Introduction to Microbiology (11:680:201) OR General Microbiology (01:447:390/11:680:390)*
*Pre- or corequisite: Food Microbiology 11:400:423*

**D. REQUIRED SCIENCE COURSES (22 cr)**

| | |
|---|---|
| 01:160:209+ 211 (4) | Elementary Organic Chemistry + lab |
| 01:750:193/201/203,205(4) | Physics with lab |
| 11:115:301 OR 01:694:301 (3) | Biochemistry |
| 01:119:116 + 117 (6) | General Biology II + lab |
| 01:160:162 + 171 (5) | General Chemistry II + lab |

**E. ELECTIVE COURSES (18 cr)**
Students can choose their area of specialization using elective course credits. There is sufficient flexibility for each student to add a minor of their choosing (although some minors will require credits beyond the 120 required for graduation.) This flexibility allows students to build expertise in a complementary field (Microbiology, Spanish, Entrepreneurship, etc.) that may enhance their career prospects in food technology ( Business Economics for management positions, Sustainability for specialized positions, Animal Sciences to work within pet food industries, etc.) or even to satisfy a purely personal academic interest (philosophy, history, linguistics, etc.).

**Elective Courses offered by the Food Science department**

| | |
|---|---|
| 11:400:106 (3) | Food as Medicine |
| 11:400:107 (3) | Foods: from Field to Table |
| 11:400:315 (3) | Food and Sustainability: Study abroad in Thailand |
| 11:400:316 (3) | Sustainable Food Production: Study abroad in Ireland |
| 11:400:350 (1.5) | Wine Basics from Field to Glass |
| 11:400:410 (3) | Nutrigenomics and Nutraceuticals |
| 11:400:422 (3) | Food Safety: Fads, Facts, and Politics |
| 11:400:490 (3) | Applying immersive learning to rural Agro-Food issues: Study Abroad in Southern India |

# Landscape Architecture 550 (SEBS)

## LANDSCAPE ARCHITECTURE 550

**Degree:** B.S.L.A.

**Director:** Holly Grace Nelson (Holly.Nelson@rutgers.edu)

Program Webpage: Here

**Managing Department Webpage:** Here

Landscape Architecture is the planning and design of outdoor environments at the residential, city, and regional scale. The program engages students in art, science, theory, and practice with a commitment to equitable, sustainable, and resilient solutions that contribute to human and environmental health and well-being.

Our nationally accredited program prepares students for Landscape Architecture licensure through a creative, analytic, and interdisciplinary approach to stewardship of the environment. Set in the School of Environmental and Biological Sciences, the program examines the ideas shaping the interaction of people and landscape and integrates scientific knowledge creatively in the designed environment. Interdisciplinary courses with environmental planning students provide a mutual foundation for both majors, promote collaboration between programs, and sets the groundwork for professional practice where landscape architects are part of or lead interdisciplinary teams of planners, engineers, ecologists, and social scientists.

The program also has a Minor in Landscape Design for students interested in
exploring design solutions to the environmental issues of our time--climate change, demographic shifts, increasing income inequality, food scarcity, and the spread of global pandemics to make our world more sustainable, viable, just, healthy, inclusive, and beautiful.



# Learning Goals

# Learning Goals

**Our Program's Learning Goals**

Explore . . . the potential of space and spatial relationships to create socially vibrant and culturally inclusive design solutions.

Analyze . . . and thoughtfully incorporate natural features and systems to create enduring and ecologically sensitive design solutions.

Understand . . . social, cultural, and behavioral factors in the historical development of designed and everyday landscapes to equitably shape our public realm.

Master . . . technical and industry standards to effectively and sustainability foster safe accessible environments using the materials, methods, and technologies of site design and engineering.

Apply . . . design principles at large as well as small scales.

Demonstrate . . . knowledge of the professional practice skills required for the Landscape Architecture Accreditation licensure exam and manifest sensitivity to issues of power.

Communicate . . . creatively with the public, communities, and policymakers in graphic, written, and verbal formats to advance social justice

Landscape Architecture 550 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of the landscape architecture major requirements, courses, and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis [SCL]*

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent* [WC] *and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

# Graduation Requirements: Major in Landscape Architecture (550)

*No more than one course* with a grade equal to D may be used from (landscape architecture courses) in any requirements or conditions.

*Year 1*

11:460:100* Planet Earth or 01:450:101 Earth Systems

01:640:115* Pre-Calculus or 11:640:111 and 11:640:112 or 11:640:135 or 11:640:139 or 11:640:151

11:573:231 Fundamentals of Environmental Planning

11:550:237* Landscape Drawing and Drafting

11:550:133* Architectural Design

Core requirements (contemporary challenges, writing, economics, social analysis). (See here for core classes met by major requirements.)

*Year 2*

11:550:231 11:550:232

11:550:241* 11:573:232

11:550:233 11:573:233

11:119:103* 11:550:341

11:550:345, 11:550:347

*Year 3*

11:550:331 *11:550:332*

11:550:250* 11:550:340

11:216:332 11:550:301* or Theory Elective (see DN List)

or 11:216:101

11:550:350 Plant/Ecology Elective (see DN List)

*Year 4*

11:550:431 11:550:432 or 11:550:333 or 11:550:443

11:550:441 11:550:435

Electives 11:550:499

*Meets core requirement

# Marine Sciences 628 (SEBS)

## MARINE SCIENCES 628

**Marine Sciences 628**

**Degree:** B.S.

**Director:** Silke Severmann, Marine and Coastal Sciences Building, Room 303D, 848-932-3488 (silke@marine.rutgers.edu)

**Program Webpage:** Here

Marine science is the study of the marine environment and its interactions with the Earth, the biosphere, and the atmosphere. It is, therefore, an interdisciplinary science requiring a knowledge of the principles of physics, geology and geophysics, mathematics, chemistry, and biology. A major in marine sciences provides students with a broad curriculum in the sciences, which demonstrates how the different disciplines can be brought to bear on understanding marine processes and managing ocean resources wisely.

The major prepares students for graduate work in oceanography or one of the basic disciplines, civil service careers in environmental management, employment in the many applied environmental and marine science fields, or teaching in secondary schools.

The marine science courses emphasize the improvement of oral and written communication skills, and competency in reading, understanding, and synthesizing scientific literature. Courses at all levels emphasize hands-on, experiential learning in the laboratory or the field. Students also are required to complete the experience-based education requirement with at least one semester or summer of supervised, independent research.

**Options**

The program includes the following options:

***Marine Biology/Biological Oceanography.*** This option prepares students for professional opportunities or graduate study in oceanography or the biological sciences. Concentrations within the option permit students to focus on different levels of biological organization at the molecular, cellular, organismic, community, or ecosystem level. Depending on their choice of electives, students also may fulfill the requirements of a major in the biological sciences or ecology and natural resources.

***Marine Chemistry.*** This option prepares students for professional opportunities or graduate study in oceanography or chemistry. Depending on their choice of electives, students may also fulfill the requirements of a major in chemistry.

***Marine Geology.*** This option prepares students for graduate study in oceanography, geology, environmental science, or an allied field, as well as for immediate employment. Depending on their choice of electives, students may also fulfill the requirements of a major in geological sciences.

***Physical Oceanography.*** This option prepares students for graduate study in physical oceanography, meteorology, fluid dynamics, or a related field, as well as immediate employment in environmental agencies or consulting firms and technical positions in marine sciences.

***Directed Marine Studies.*** This option prepares students for professional opportunities in oceanography, the biological sciences, and related fields. It differs from the other four options in requiring students to complete one of several minor and certificate programs offered by the School of Arts and Sciences or the School of Environmental and Biological Sciences, either the Professional Writing Certificate (355), the minor in Education (300), the Certificate in Environmental Geomatics (372), the minor in Environmental Policy, Institutions, and Behavior (374), the minor in Fisheries Science (392), the minor in Sustainability, or a program approved by the Undergraduate Program Director. This requirement is included in order to ensure that students in this option will acquire a focused set of knowledge and skills to complement their marine science studies and to help them find employment upon graduation. Students in this option would choose the minor or certificate program that fulfills part of their major requirements no later than in their fourth semester of study at the university.

Marine Sciences 628 (SEBS)

# Learning Goals

# Learning Goals

1. Master the basic biological, chemical, physical, and geological principles of marine science.

2. Analyze and interpret contemporary oceanographic datasets.

3. Show evidence of scientific literacy, and communicate the information effectively both orally and in writing.

4. Develop, conduct, and report on an applied research experience in marine science in collaboration with a scientific mentor.

5. Evaluate contemporary global issues and the ethics of how the ocean's resources are used.

Marine Sciences 628 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of marine sciences major requirements, courses, and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent [WC] and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

## Major Requirements For All Students Regardless of Matriculation Date

### A. REQUIRED COURSES (12)

*Professional Ethics*
Ethical issues in marine sciences are addressed throughout the program in both introductory and advanced courses, especially within the framework of the experience-based education requirement.

- 01:960:401 Basic Statistics for Research (3)
- 11:628:120 Introduction to Oceanography (3)
- 11:628:320 Dynamics of Marine Ecosystems (3)
- 11:628:363 Oceanographic Methods and Data Analysis: Biol/Chem (3) OR 11:628:364 Oceanographic Methods and Data Analysis: Biol/Physical (3)

### B. OPTIONS (63-78)

#### 1. Marine Biology/Biological Oceanography (70-74)

*Required Courses (58-59)*

- 01:119:115-116 General Biology I&II (4+4)
- 01:119:117 Biological Research Lab (2)
- 01:447:380 Genetics (4) OR 11:776:305 Plant Genetics (4)
- 01:160:161-162 General Chemistry I&II (4+4)

- 01:160:171 Introduction to Experimentation (1)
- 01:160:307-308 Organic Chemistry I&II (4+4) OR
    - 01:160:209 Elementary Organic Chemistry (3) AND 01:694:301/11:115:301 Introductory Biochemistry (3) AND 01:694:313/11:115:313 Introductory Biochemistry Laboratory (1)
- 01:640:135-136 Calculus I&II (4+4)
- 01:750:193-194 Physics for the Sciences I&II (4+4)
- 11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
- 11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
- Experiential Learning (6)

*One of the following (3-4):*

- 01:146:356 Systems Physiology (3) AND 01:146:357 Systems Physiology Lab. (1)
- 11:216:360 Animal Physiological Ecology (3)
- 11:680:481 Microbial Physiology (3)
- 11:776:382 Plant Physiology (4)

*One of the following (3-4):*

- 11:628:321 Ichthyology (4)
- 11:680:390 General Microbiology (4)
- 11:216:323 Ornithology (4)
- 11:216:324 Invertebrate Zoology (4)
- 11:216:325 Vertebrate Zoology (4)
- 11:776:400 Fungi in the Environment (3)

*One of the following (3-4):*

- 11:628:405 Molecular Microbial Oceanography (3)
- 11:628:410 Biophysical Interactions: Barnacles to Jellyfish (3)
- 11:628:476 History of the Earth System (3)
- 11:670:451 Remote Sensing of the Ocean and Atmosphere (3)
- 11:216:240 Behavioral Biology (4)
- 11:216:351 Principles of Ecology (3)
- 11:216:486 Principles of Evolution (3)

*At least 3 credits from the following:*

- 11:628:201-203, 205-210 Topics in Marine Science (1.5)
- 11:628:309 Fishery Science (3)
- 11:628:317 Aquaculture (3)
- 11:628:340 Identification of Marine Invertebrates (2)

- 11:628:341 Hydrothermal Vents (3)
- 11:628:451 Physical Oceanography (4)
- 11:628:472 Chemical Oceanography (3)
- 11:628:402 The Role of Polar Regions in the Earth System
- 11:628:474 Coastal Biogeochemical Cycles in a Changing World

**2. Marine Chemistry (66-68)**

*Required courses (60)*

- 01:119:115-116 General Biology I&II (4+4)
- 01:119:117 Biological Research Lab (2)
- 01:160:161-162 General Chemistry I&II (4+4)
- 01:160:171 Introduction to Experimentation (1)
- 01:160:251 Analytical Chemistry (3)
- 01:160:307-308 Organic Chemistry I&II (4+4)
- 01:160:311 Organic Chemistry Laboratory (2)
- 01:160:348 Instrumental Analysis (3)
- 01:640:151-152 Calculus for Mathematical and Physical Sciences I&II (4+4)
- 01:750:203-204 General Physics I&II (3+3)
- 01:750:205-206 General Physics Laboratory I&II (1+1)
- 11:628:472 Chemical Oceanography (3)
- Experiential Learning (6)

*One of the following (3-4)*

- 01:460:101 Introductory Geology (3)
- 01:460:304 Introduction to Geochemistry (4)
- 01:460:417 Environmental Geochemistry (3)
- 11:375:202 Chemical Principles Environmental Science (3)
- 11:375:340 Environmental Applications of Organic Chemistry (3)
- 11:375:360 Soils and Water (4)
- 11:375:444 Water Chemistry (3)
- 11:670:323 Thermodynamics of the Atmosphere (3)
- 11:670:451 Remote Sensing of the Ocean and Atmosphere (3)

*At least 3 credits from the following (3-4):*

- 11:628:201-203, 205-210 Topics in Marine Science (1.5)
- 11:628:309 Fishery Science (3)
- 11:628:317 Aquaculture (3)
- 11:628:340 Identification of Marine Invertebrates (2)

- 11:628:341 Hydrothermal Vents (3)
- 11:628:402 The Role of Polar Regions in the Earth System
- 11:628:405 Molecular Microbial Oceanography (3)
- 11:628:410 Biophysical Interactions: from Barnacles to Jellyfish (3)
- 11:628:451 Physical Oceanography (4)
- 11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
- 11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
- 11:628:474 Coastal Biogeochemical Cycles in a Changing World

**3. Marine Geology (71-74)**

*Required Courses (59)*

- 01:119:115-116 General Biology I&II (4+4)
- 01:119:117 Biological Research Lab (2)
- 01:160:161-162 General Chemistry I&II (4+4)
- 01:160:171 Introduction to Experimentation (1)
- 01:460:101 Intro Geology (3)
- 01:460:330 Sedimentary Geology (4)
- 01:460:451 Marine Geology (3)
- 01:750:203-206 General Physics I+II and Lab I+II (4+4)
- 01:640:151-152 Calculus for Mathematical and Physical Sciences I&II (4+4)
- 01:750:203-204 General Physics I&II (3+3)
- 01:750:205-206 General Physics Laboratory I&II (1+1)
- Experiential Learning (6)

*One of the following (3-4)*

- 11:628:402 The Role of Polar Regions in the Earth System
- 11:628:451 Physical Oceanography (4)
- 11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
- 11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
- 11:628:472 Chemical Oceanography (3)
- 11:628:474 Coastal Biogeochemical Cycles in a Changing World

*One of the following (3-4)*

- 01:450:321 Geographic Information System (3)
- 01:460:303 Paleontology (4)
- 01:460:304 Introduction to Geochemistry (4)
- 01:460:407 Structural Geology (4)
- 01:460:414 Hydrological Processes (3)

- 01:460:453 Paleoecology (3)

*One of the following (3-4)*

- 01:450:403 Advanced Physical Geography (3)
- 01:460:306 Introduction to Geophysics (4)
- 01:460:417 Environmental Geochemistry (3)
- 11:628:476 History of the Earth Systems (3)
- 11:670:451 Remote Sensing of the Ocean & Atmosphere (3)

**4. Physical Oceanography (63-64)**

*Required Courses (51-52)*

- 01:119:103 Principles of Biology (3)
- 01:160:161-162 General Chemistry I&II (4+4)
- 01:160:171 Introduction to Experimentation (1)
- 01:640:151-152 Calculus for Mathematical and Physical Sciences I&II (4+4)
- 01:640:251 Multivariable Calculus (4)
- 01:640:252 Differential Equations (3) OR 01:640:244 Differential Equations/Engineers & Physics (4)
- 14:440:127 Intro Computers/Engineers (3) OR 11:670:212 Computational Methods Meteorology (3)
- 01:640:373 Numerical Analysis (3) OR 01:198:323 Numerical Analysis & Computing (3)
- 01:750:203-204 General Physics I&II (3+3)
- 01:750:205-206 General Physics Laboratory I&II (1+1)
- 11:628:451 Physical Oceanography (4)
- Experiential Learning (6)

*Four of the following with at least one from Group A and at least one from Group B:*

Group A

- 01:640:250 Introduction Linear Algebra (3)
- 01:640:421 Advanced Calculus/Engineers (3)
- 14:650:312 Fluid Mechanics (3)

Group B

- 11:628:402 The Role of Polar Regions in the Earth System
- 11:628:410 Biophysical Interactions: from Barnacles to Jellyfish (3)
- 11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
- 11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
- 11:628:472 Chemical Oceanography (3)
- 11:628:474 Coastal Biogeochemical Cycles in a Changing World

- 11:670:324 Atmospheric Thermodynamics (3)
- 11:670:451 Remote Sensing of the Ocean & Atmosphere (3)

**5. Directed Marine Studies (74-78)**

*Required Courses (44)*

- 01:119:115-116 General Biology I&II (4+4)
- 01:119:117 Biological Research Lab (2)
- 01:447:380 Genetics (4) OR 11:776:305 Plant Genetics (4)
- 01:160:161-162 General Chemistry I&II (4+4)
- 01:160:171 Introduction to Experimentation (1)
- 01:640:135 Calculus I (4)
- 01:750:193-194 Physics for the Sciences I&II (4+4)
- 11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
- 11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
- Experiential Learning (3)

*One of the following (3-4):*

- 01:146:356 Systems Physiology (3) AND 01:146:357 Systems Physiology Lab. (1)
- 11:216:360 Animal Physiological Ecology (3)
- 11:680:481 Microbial Physiology (3)
- 11:776:382 Plant Physiology (4)

*One of the following (3-4):*

- 11:628:321 Ichthyology (4)
- 11:680:390 General Microbiology (4)
- 11:216:323 Ornithology (4)
- 11:216:324 Invertebrate Zoology (4)
- 11:216:325 Vertebrate Zoology (4)
- 11:776:400 Fungi in the Environment (3)

*One of the following (3-4):*

- 11:628:405 Molecular Microbial Oceanography (3)
- 11:628:410 Biophysical Interactions: Barnacles to Jellyfish (3)
- 11:628:476 History of the Earth System (3)
- 11:670:451 Remote Sensing of the Ocean and Atmosphere (3)
- 11:216:240 Behavioral Biology (4)
- 11:216:351 Principles of Ecology (3)

- 11:216:486 Principles of Evolution (3)

*At least 3 credits from the following:*

- 11:628:201-203, 205-210 Topics in Marine Science (1.5)
- 11:628:309 Fishery Science (3)
- 11:628:317 Aquaculture (3)
- 11:628:340 Identification of Marine Invertebrates (2)
- 11:628:341 Hydrothermal Vents (3)
- 11:628:402 The Role of Polar Regions in the Earth System
- 11:628:451 Physical Oceanography (4)
- 11:628:472 Chemical Oceanography (3)
- 11:628:474 Coastal Biogeochemical Cycles in a Changing World

*Completion of an approved Minor or Certificate Program (~ 18 credits)*

Professional Writing Certificate (355), the minor in Education (300), the Certificate in Environmental Geomatics (372), the minor in Environmental Policy, Institutions, and Behavior (374), the minor in Fisheries Science (392), the minor in Sustainability (374), or a program approved by the Undergraduate Program Director.

# Meteorology 670 (SEBS)

## METEOROLOGY 670

**Degree:** B.S.

**Director:** Steven Decker (decker@envsci.rutgers.edu)

**Program Webpage:** Here

Meteorology is the study of weather and climate, of the characteristics, structure, and processes of the atmosphere. Students learn how to forecast the weather and how to understand climate change. The emphasis of the bachelor of science degree program is on developing a broad understanding of the fundamental physical and dynamic processes governing the motions and behavior of the atmosphere, and its interactions with the underlying land and ocean surfaces. Basic courses in chemistry, physics, and mathematics are the prerequisite foundation on which the meteorology program is built. Students who wish to pursue an undergraduate meteorology degree should have a strong high school or equivalent background in mathematics and the sciences prior to enrollment. This program meets all the U.S. federal government civil service requirements for classification as a meteorologist and the American Meteorological Society recommendations for undergraduate meteorology programs.

# Learning Goals

# Learning Goals

A successful meteorology graduate will be able to:

1. Conduct a weather discussion and apply diagnostic, prognostic, and technological tools to evaluate atmospheric processes across a multitude of scales.

2. Demonstrate integrated understanding of the linked Earth-atmosphere-ocean-cryosphere-biosphere system, including the roles of atmospheric chemistry and human impacts on the system.

3. Apply critical and analytical thinking to solve relevant scientific problems in both individual and collaborative settings.

4. Effectively communicate scientific information orally and in writing, including by electronic means, at an appropriate level for their audience.

5. Demonstrate mastery of the mathematical and physical foundations of meteorology and climatology as well as key atmospheric processes that occur at a variety of spatial and temporal scales.

6. Understand and utilize the principles of proper ethical behavior within the atmospheric sciences and be aware of the scientific limits of prediction.



# Entry Requirements for the Major

# Entry Requirements for the Major

To enter meteorology courses at the 300 and 400 level and to satisfy the major requirements, students must achieve a grade of C or better in the following courses:

01:640:151-152 Calculus for Mathematical and Physical Sciences

01:640:251 Multivariable Calculus

01:750:203-204 General Physics *and* 01:760:205-206 General Physics Laboratory

11:670:101 Introduction to Meteorology

11:670:102 Introduction to Climate Science

Meteorology 670 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

**SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)**

*Parts of the SEBS core are satisfied by the major requirements.*

**Contemporary Challenges**(6 credits)*Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities*[CC-D]*and Our Common Future*[CC-O]

**Experiential Learning**(3 credits)*Students must participate in a certified experience that meets this goal*[EL]

**Natural Sciences**(6 credits)*Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences*[NS]

**Historical Analysis**(3 credits)*Students must take one course*[HST]

**Social Analysis**(6 credits)*SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis*[SCL]

**Arts and Humanities**(3 credits)*Students must complete one course*[AH]

**Writing and Communication** (6 credits) Students must complete two courses, one in [WC], and the other in [WCD]. For Meteorology majors, the [WCD] course must be one of the following:

01:355:302 Scientific and Technical Writing (3) or
01:355:201 Research in the Disciplines (3) or
01:355:301 College Writing and Research (3)

**Quantitative and Formal Reasoning** (6 credits) Students must take two courses [QQ; QR]

## Graduation Requirements for the Meteorology Major (75 or 76 credits)

For an up-to-date description of meteorology major requirements, courses, and course sequences please refer to the program website here.

**Quantitative Skills(22 credits)**
01:640:151-152 Calculus for Mathematical and Physical Sciences (4,4)*
01:640:244 Differential Equations for Engineering and Physics (4)
01:640:251 Multivariable Calculus (4)
11:670:212 Computational Methods for Meteorology (3)
11:375:303 Numerical Methods in Environmental Science (3) or
01:960:401 Basic Statistics for Research (3) or
01:960:379 Basic Probability and Statistics (3)

*Calculus courses satisfy SEBS Quantitative [QQ] and Formal Reasoning [QR] requirements.

**Physical Sciences (13 credits)**
01:160:161 General Chemistry (4)
01:160:171 Introduction to Experimentation (1)
01:750:203-204 General Physics (3,3)
01:750:205-206 General Physics Laboratory (1,1)

**Meteorology (37 or 38 credits)**
11:670:101 Introduction to Meteorology (3)**
11:670:102 Introduction to Climate Science (3)***
11:670:211 Meteorological Analysis (3)
11:670:323 Thermodynamics of the Atmosphere (3)
11:670:324 Dynamics of the Atmosphere (3)
11:670:431 Physical Meteorology (3)
11:670:433 Weather Analysis and Forecasting I: Synoptic Meteorology (4)****
11:670:434 Weather Analysis and Forecasting II: Mesoscale Meteorology (3)
11:670:451 Remote Sensing of the Ocean and Atmosphere (3)
11:670:461 Climate Dynamics (3)

**Satisfies SEBS Natural Sciences [NS] (Physical) requirement
***Satisfies SEBS Natural Sciences [NS] (Environmental) requirement
****Satisfies SEBS Experiential Learning [EL] requirement

*Also choose two courses from the following list:*
11:375:346 Introduction to Atmospheric Chemistry (3)
11:628:451 Physical Oceanography (4)
11:670:414 Hydrologic Processes (3)
11:670:444 Tropical Meteorology (3)
11:670:453 Air Quality Modeling (3)

**Capstone Experience (3 credits)**
Complete at least three credits from among the following courses:
11:554:298 Honors Tutorial II (1)
11:554:301/2 Aresty Research Assistantship (1.5)
11:554:397/8 Honors Tutorial III/IV (arr)
11:554:487/8 G. H. Cook Honors Program (arr)
11:670:334 Severe Weather Forecasting Field Trip (3)
11:670:493/4 Research Problems in Meteorology (arr)
11:902:300 SEBS Internship I (arr)

**ELECTIVES (23-24 credits or more)**
In addition to courses meeting the above requirements, students must take enough other courses offered by the university to bring their total number of credits to the minimum of 128 required for graduation. Although not required, many meteorology students use these electives to complete a minor. A minor in mathematics, requiring only four more mathematics courses, is the most popular. Students also consider other fields, including

oceanography, physics, environmental sciences, and environmental and business economics. Students are strongly encouraged to do internships, which provide valuable career-related experience and contacts, and to pursue research with faculty members. Both can be taken for academic credit.

*A student must achieve a grade of C or better in the following courses:*

Physics 1 (01:750:203 and 205)
Physics 2 (01:750:204 and 206)
Calculus 1 (01:640:151)
Calculus 2 (01:640:152)
Multivariate Calculus (01:640:251)
Introduction to Meteorology (11:670:101)
Introduction to Climate Science (11:670:102)

Students preparing for graduate study in meteorology or atmospheric science are encouraged to consider additional courses in meteorology, oceanography, computer science, and mathematics such as:

11:670:414 Hydrologic Processes (3)
11:670:444 Tropical Meteorology (3)
11:670:453 Air Quality Modeling (3)
11:628:451 Physical Oceanography (4)
01:198:323 Numerical Analysis and Computing (4)
01:640:250 Introduction to Linear Algebra (3)
01:640:423 Elementary Partial Differential Equations (3)
01:640:477 Mathematical Theory of Probability (3)

# Microbiology 680 (SEBS)

## MICROBIOLOGY 680

**Degree:** B.S.

**Director:** Ines Rauschenbach (inesrau@sebs.rutgers.edu)

**Program Webpage:** Here

Microorganisms are the smallest living things, the oldest form of life on earth, ubiquitous in the biosphere and central to the essential life processes on earth. The microbiology curriculum emphasizes the uniqueness of microbial biology, its enormous diversity, and the biochemical basis of microbial life.

The curriculum examines the diverse roles of microorganisms and covers the fundamentals of microbial diversity, physiology, and genetics. The focus is on the examination of microorganisms; microbial processes in natural and managed environments; and their effects on human, animal, plant, and environmental health. The nature and activity of microbial populations in aquatic and terrestrial ecosystems, the interactions within microbial communities, and biogeochemical cycles and energy flows are explored. The curriculum provides students with a fundamental understanding of the applications of microbes in biotechnology, the food industry, agriculture, and medicine. Recent advances in microbial molecular biology and biotechnology have led to an in-depth understanding

of the physiology, genetics, and taxonomy of microbes. Microbes are central to the food, biotechnology, and pharmaceutical industries and are broadly utilized ranging from food fermentations and biosynthetic processes to waste treatment and biodegradation of toxic chemicals. The field of microbiology is a major contributor toward industrial development; human, animal, and plant health; environmental integrity; and agricultural productivity.

The primary objectives of the curriculum are to broadly educate students regarding the biology of microorganisms. The curriculum prepares students for positions in industry, government, and graduate/professional study in life sciences through extensive coursework combined with laboratory and research experience.

Microbiology 680 (SEBS)

# Learning Goals

# Learning Goals

1. Graduates will be able to illustrate and describe the biology of microorganisms, focusing on microbial processes and their effects on other organisms and the environment, microbial communities, and biogeochemical cycles.

2. Graduates will be able to apply the scientific method to formulate questions and hypotheses, design experiments, employ appropriate methodology to solve problems in microbiology, and be able to analyze, interpret, and present scientific data in microbiology.

3. Graduates will be able to critically evaluate scientific literature and explain their findings in written and oral format.

4. Graduates will be able to summarize ethical and current issues in microbiology and apply a code of ethics for microbiologists including ethical conduct, scientific integrity, and the dignity of the profession and practice of microbiology.

Microbiology 680 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

To enter upper-level microbiology (11:680) courses, students must have completed 01:119:115-116,117 General Biology (formerly 01:119:101-102) and 01:160:161-162 General Chemistry with grades of C or better.

Microbiology 680 (SEBS)

# Residency Requirements for the Major

# Residency Requirements for the Major

A minimum of 20 credits of coursework from among the required and elective courses. Proficiency in microbiology, not including quantitative skills (8), must be completed in residence. Of these 20 credits, at least 12 credits must be completed from 680 courses.

This rule is intended to assure that students receiving degrees from Rutgers University-New Brunswick have taken a minimum number of courses in their major with New Brunswick faculty. Please keep in mind that although a course may transfer from another institution into one of the Rutgers-New Brunswick schools, it will not necessarily be accepted toward the major in microbiology. Therefore, transfer courses must be evaluated and accepted by the program director in order to count toward the major.

Microbiology 680 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

All students, regardless of matriculation date must complete a minimum of 20 credits of microbiology major coursework from among the required and elective courses (Area VIII). Proficiency in microbiology, not including quantitative skills (8 credits), must be completed in residence. Of these 20 credits, at least 12 credits must be completed from 680 courses. This rule is intended to assure that students receiving degrees from Rutgers University-New Brunswick have taken a minimum number of courses in their major with New Brunswick faculty. Please keep in mind that although a course may transfer from another institution into one of the Rutgers-New Brunswick schools, it will not necessarily be accepted toward the major in microbiology. Therefore, transfer courses must be evaluated and accepted by the undergraduate program director in order to count toward the major.

For an up-to-date description of microbiology major requirements, courses, and course sequences please refer to the program website here.

## GRADUATION REQUIREMENTS - SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

*Options are chosen from lists of courses certified in each learning goal: Here.*

***Note: The SEBS Core Curriculum requirements differ slightly from SAS Core Curriculum requirements.***

**Contemporary Challenges (6 credits)** *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning (3 credits)** *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences (6 credits)***Two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis (3 credits)** *One course* [HST]

**Social Analysis (6 credits)** *Two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities (3 credits)** *One course* [AH]

**Writing and Communication (6 credits)** *01:355:101 or its equivalent* [WC] *and one course in communicating effectively in modes appropriate to a discipline or area of inquiry* [WCD]

**Quantitative and Formal Reasoning (6 credits)** *Two courses* [QQ; QR]

## GRADUATION REQUIREMENTS FOR THE MAJOR

## GRADUATION REQUIREMENTS FOR THE MAJOR

**A. Introductory Life and Physical Sciences (44 credits)**

- 01:119:115-116 General Biology (4,4)*
- 01:119:117 Biological Research Laboratory (2)
- 01:160:161-162 General Chemistry (4,4)*
- 01:160:171 Introduction to Experimentation (1)
- 01:640:151 Calculus for Mathematics and Physical Sciences (4)**
- 01:960:401 Basic Stats for Research (3)** (other calculus courses may be substituted)
- 01:160:370 - 308 Organic Chemistry (4,4)*** OR 01:160:315 - 316 Principles of Organic Chemistry (4,4)
- 01:447:380 Genetics (4)
- 01:750:193-194 Physics for the Sciences (4,4)* or equivalent

**Up to 6 credits can be applied to the SEBS Core-Natural Sciences*

***Up to 6 credits can be applied to the SEBS Core-Quantitative and Formal Reasoning*

****Students intending to apply to medical school should be aware that many schools require laboratories in organic chemistry and physics.*

**B. Core Microbiology (44 Credits, including electives)**

- 11:680:390 General Microbiology (*Must pass General Microbiology with a minimum grade of C to satisfy prerequisite requirement for: 11:680:401, 11:680:491, 11:680:492, 11:680:494, 11:680:480, and 11:680:481.)
- 11:680:480 Microbial Genetics and Genomics or 11:126:481 Molecular Genetics (3)
- 11:680:481 Microbial Physiology (3)
- 11:680:491 Microbial Ecology and Diversity (3)

- 11:680:494 Applied Microbiology (4)
- 11:680:401 Ethics and Issues in Microbiology (1)
- 11:680:495 Seminar in Microbiology (1)
- 11:115:403-404 General Biochemistry (4,3)
- 11:115:413 Experimental Biochemistry (3)

**Microbiology Electives (15) (Semesters Taught)***

**Please note that no more than one course with a grade of D may be used to fulfill the core microbiology requirements of the major.*

- 11:126:407 Comparative Virology (3) (fall every other year)
- 11:126:427 Methods in Applications in Molecular Biology (4) (fall)
- 11:126:482 Molecular Genetics Laboratory (3) (spring)
- 11:126:484 Tools for Bioinformatic Analysis (3) (spring)
- 11:126:485 Bioinformatics (fall)
- 01:146:328 Human Parasitology (3) (fall)
- 01:146:340 Virology (3) (fall, even years only)
- 01:146:474 Immunology (3) (fall)
- 01:146:475 Laboratory in Immunology (1) (spring)
- 11:216:405 Evolution in Infectious Diseases (3) (spring)
- 11:375:302 Water and Wastewater Treatment (3) (fall)
- 11:375:312 Environmental Microbiology Laboratory (2) (fall)
- 11:375:411 Environmental Microbiology (3) (spring)
- 11:375:453 Soil Ecology (3) (fall)
- 11:400:423 Food Microbiology (3) (spring)
- 01:447:392 Pathogenic Microbiology (3) (fall)
- 01:447:480 Topics in Molecular Genetics (3) (spring)
- 11:680:410 Microbiology and Culture of Cheese and Wine (3) (summer)
- 11:680:486 Analytical Methods in Microbiology (3) (spring, even years)
- 11:680:492 Microbial Ecology Laboratory (3) (spring, odd years)
- 11:680:475 Microbiomes and Health (3) (spring)
- 11:776:302 General Plant Pathology (3) (fall)
- 11:776:400 Fungi in the Environment (3) (fall)
- 11:680:497, 498 Research in Microbiology (fall/spring/summer) - One to three credits of research may be substituted for an equal number of credits of elective courses, with the approval of the curriculum coordinator.

**C. Unspecified Electives (up to 3)**

# Nutritional Sciences 709 (SEBS)

## NUTRITIONAL SCIENCES 709

**Degree:** B.S.

**Director:** John Worobey (worobey@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

The undergraduate program in nutritional sciences provides students with a strong background in the biological, biochemical, physiological, clinical, behavioral, sociological, and psychological dimensions of human nutrition. Students must maintain a cumulative grade-point average of 2.0 or better in all required courses.

The program offers five options:

***Dietetics.*** The dietetics option is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) as a Didactic Program in Dietetics. Upon completion of this option, students are eligible to apply for an accredited-supervised practice program, including the pre-select route with our MS-DI program at Rutgers-New Brunswick, in preparation for the registration examination for dietitians. Since a master's degree is now required to be eligible to take the RDN exam, students in this option are at an advantage in being able to apply to our accredited Rutgers MS-DI program during their senior year. Completing this option also can lead to work in the food business & industry, positions in cooperative extension, WIC, EFNEP, nutrition education, or clinical research.

***Food Service Administration***. The option in food service administration emphasizes the managerial aspects of food service operation. Entry-level employment opportunities include food service marketing, or managing food services in schools, hotels, restaurants, industrial cafeterias, corporations, hospitals, and child or long-term care facilities.

***Biomedical Nutrition.*** The option in nutrition emphasizes research and prepares students for graduate study in the life sciences and medical, dental, and veterinary studies, as well as for immediate employment in the biomedical industry.

***Community Nutrition.*** This option addresses the growing need for nutrition professionals to work with youth in structured organizations at the local, state, and national level such as 4-H, WIC, cooperative extension, after-school care, day care, environmental education, and programs for homeless children.

# Learning Goals

# Learning Goals

Through completion of the program in nutritional sciences, graduates will be prepared for supervised practice in dietetics, graduate school, or employment by focusing upon the biological, social science, and community principles of food and nutrition coursework.

For overall nutritional sciences program learning goals as well as learning goals specific to each of the five options, see the program website here.

Nutritional Sciences 709 (SEBS)

# Entry Requirements for the Major

# Entry Requirements for the Major

**Nutritional sciences majors** (other than Dietetics) are required to take the following courses before acceptance into an option:

- 01:160:161, 162, 171
- 01:119:115-116, 117
- 11:709:255

A grade-point average (GPA) greater than 2.5 is required in these courses for admission into the dietetics and biomedical nutrition options. Students with a GPA less than 2.5 are eligible for admission into the community nutrition and food service administration options. Students must achieve grades of C or better in all required biological sciences, biochemistry, chemistry, and nutrition courses in order to enter advanced courses in nutritional sciences.

Admission to the **Dietetics Option** requires the following:

- General Chemistry I, II and Lab (01:160:161; 01:160:162; 01:160:171)
- Anatomy and Physiology I and II (01:119:127; 01:119:128)
- Principles of Biology (01:119:103)
- Nutrition and Health (11:709:255)
- GPA of 2.5 or higher in the above courses

Nutritional Sciences 709 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of nutritional sciences major requirements, courses, and course sequences, please refer to the program webpage at https://nutrition.rutgers.edu/undergraduate.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent* [WC] *and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

## Graduation Requirements for the Major (64-88 credits)

**PROFICIENCY IN NUTRITIONAL SCIENCES (22 credits)**

**A. REQUIRED COURSES**

Students are required to have placed at the precalculus level or above to take the required biology and chemistry courses.

01:160:161 General Chemistry I (4) [NS]
01:160:162 General Chemistry II (4)
01:160:171 Introduction to Experimentation (1)
11:709:255 Nutrition and Health (3)
Certain Biological Sciences courses (see options below)

Students must achieve a GPA of 2.5 or better across these courses to be admitted to the Nutrition or Dietetics options.

**B. OPTIONS IN NUTRITIONAL SCIENCES**

**1. Dietetics** (74-75)

11:709:102 Careers in Nutrition (1)
11:709:201 Culinary Nutrition (3)
11:709:202 Culinary Nutrition Lab (1)
11:709:255 Nutrition and Health (3)
11:709:301 Food Safety & Sanitation in Food Service (2)
11:709:345 Nutrition through the Lifespan (3)
11:373:341 Organizational Dynamics (3) or equivalent
11:709:400 Advanced Nutrition: Macronutrients (3)
11:709:401 Advanced Nutrition: Energy & Micronutrients (3)
11:709:404 Advanced Nutrition: Clinical Research Practicum (1)
11:709:410 Dietetics Professional Practice (3)
11:709:441 Community Nutrition (3)
11:709:442 Nutrition Education & Communication (3)
11:709:448 Food Production & Management (3) [EL]
11:709:449 Food Service Lab (1) [EL]
11:709:483 Medical Nutrition Therapy I (3)
11:709:484 Nutrition Therapy Lab (1)
11:709:485 Medical Nutrition Therapy II (3)
11:709:489 Experimental Foods (4) or
11:709:493/494 Research in Nutrition (BA)
01:960:401 Basic Statistics for Research or Equivalent (3)
01:119:103 Principles of Biology (4)
01:119:127 Anatomy and Physiology I (4)
01:119:128 Anatomy and Physiology II (4)
01:160:161 General Chemistry I (4)
01:160:162 General Chemistry II (4)
01:160:171 Introduction to Experimentation Lab (1)
01:160:209 Elementary Organic Chemistry (3)
11:115:301 Introduction to Biochemistry (3) or 01:694:301 Introduction to Biochemistry and Molecular Biology (3)

*Many of the science courses have prerequisites. Please see catalog descriptions. Students must achieve a C or better in all required biological sciences, biochemistry, chemistry, and nutrition courses before taking 709:400, 401, and 498.*

**2. Biomedical Nutrition** (53.5-61.5)

11:709:400 Advanced Nutrition I (3)
11:709:401 Advanced Nutrition II (3)
11:709:427 Obesity: Biology, Behavior, and Management (3) or 11:709:443 Methods in Sensory Analysis (3) or 11:709:475 Nutrition and Fitness (3)
11:709:481 Seminar in Nutrition (1.5)
11:709:493 or 494 Research in Nutrition (3) [EL]

11:067:300 Integrative Physiology (4) or 01:146:356, 357 Systems Physiology, Lab (3,1)
01:160:307-308, 311 Organic Chemistry, Lab (4,4,2)
01:119:115-116 General Biology I, II (4,4) [NS]
01:116:117 Biological Research Laboratory (2)
01:447:380 Genetics (4)
01:640:135 Calculus I (4) or equivalent [QQ]
11:115:301 Introductory Biochemistry (3) or 11:694:301 Introductory Biochemistry and Molecular Biology (3) or 11:115:403-404 General Biochemistry (4,4) or 01:694:407-408 Molecular Biology and Biochemistry (3,3)
01:750:193-194 Physics for the Sciences (4,4) or 01:750:203-204 General Physics (3,3) and 01:750:205-206 General Physics Lab (1,1)
01:960:401 Basic Statistics for Research (3) or equivalent [QR]
01:146 3xx/4xx or 01:447:3xx/4xx or 01:694::3xx/4xx or 11:126:3xx/4xx or 11:216:3xx/4xx or other Advanced Life Sciences course (3)

*Many of the science courses have prerequisites. Please see catalog descriptions. Students must achieve a C or better in all required biological sciences, biochemistry, chemistry, and nutrition courses before taking 709:400, 401, and 498.*

**3. Food Service Administration** (29-31)

11:709:201,202 Culinary Nutrition, Lab (3,1)
11:709:302 Food Safety and Sanitation in Food Service (2)
11:709:448 Food Production & Management (3) [EL]
11:709:449 Food Service Lab (1) [EL]
01:640:115 Precalculus or equivalent (4) (QQ)
01:119:115-116 General Biology I, II (4,4) [NS]
01:119:117 Biological Research Laboratory (2)
11:373:121 Principles and Applications of Microeconomics (3) or equivalent [SCL]
11:373:121 Principles and Applications of Macroeconomics (3) or equivalent [SCL]
33:010:272 Introduction to Financial Accounting (3)
11:680:201,202 Introduction to Microbiology, Lab (3,1) or 01:119:131,132 Microbiology for the Health Sciences, Lab (3,1)
11:373:341 Organizational Dynamics (3) or equivalent

*12 Credits selected from:*
11:709:441 Community Nutrition (3)
11:709:442 Nutrition Communication (3)
11:709:443 Methods in Sensory Analysis (3)
01:355:203 Business Writing Essentials (3) [WCD]
11:373:231 Introduction to Marketing (3)
11:373:331 Economics of Food Marketing Systems (3)
11:373:241 Introduction to Management (3)
11:373:371 Food, Health, and Safety Policy (3)
11:375:403 Principles of Epidemiology (3)
11:400:304 Food Analysis (4)
11:400:412 Food Product Development (3)
33:011:201 Introduction to Management for Nonbusiness Majors (3)

33:011:202 Introduction to Marketing for Nonbusiness Majors (3)
33:011:203 Introduction to Finance for Nonbusiness Majors (3)
33:011:204 Principles of Business Law for Nonbusiness Majors (3)

**4. Community Nutrition (51-52)**

11:709:102 Careers in Nutrition (1)
11:709:201 Culinary Nutrition (3)
11:709:202 Culinary Nutrition Lab (1)
11:709:235 or 475 Introduction to Sports Nutrition or Nutrition & Fitness (3)
11:709:245 Food Customs & Nutrition Equity (3)
11:709:255 Nutrition & Health (3)
11:709:301 Food Safety & Sanitation (2)
11:709:448 Food Production & Management, (3) [EL]
11:709:449 Food Service Lab (1) [EL]
11:709:345 Nutrition through the Lifespan (3)
11:709:441 Community Nutrition (3)
11:709:442 Nutrition Education and Communication (3)
11:709:489 Experimental Foods (4)
01:640:115 Precalculus (4) or Calculus
01:119:103 Principles of Bio (4) (or 01:119:115-117)
01:160:161, 101 General Chemistry I & Recitation (4, 1)
01:160:162, 102 General Chemistry II & Recitation (4, 1)
01:160:171 Introduction to Experimentation Lab (1)
01:160:209 Elementary Organic Chemistry (3)
01:119:127-128 Anatomy and Physiology I & II (4, 4) (or 11:067:300 or 01:146:356, 357)
01:960:401 Basic Statistics for Research (3) or equivalent
01:830:101 General Psychology (3)
01:920:272 Sociology of the Family (3)

# Plant Science 776 (SEBS)

## PLANT SCIENCE 776

**Degree:** B.S.

**Director:** Nrupali Patel (npatel@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

The Plant Science undergraduate program prepares students for careers or further study in areas related to food and plant production, turfgrass, plant pathology and pest management, plant breeding, natural products, and bioenergy.

The curriculum offers three options: *General Plant Science (Research)*, for students intending to pursue careers in research laboratories or graduate study; *Horticulture or Turfgrass Industry*, for students intending to pursue careers in the plant business industries; and *Natural Products*, for students interested in historical and cultural botany, economic botany (the study of the interaction of people and plants), and indigenous and modern medicinal plants.

The curriculum also offers minors in agroecology, horticultural therapy, medicinal and economic botany, and plant science; and certificates in horticultural therapy, medicinal and economic botany, and turfgrass science.

Plant Science 776 (SEBS)

# Learning Goals

# Learning Goals

**Plant Science Major: Program Learning Goals**

Students completing degree requirements will be able to:

1. Describe basic knowledge about plant structure and function, fundamentals of plant growth and physiology, and principles of horticulture [technical proficiency];
2. Summarize broadly the role of plants in agriculture, society, and the environment [context];
3. Communicate, in written and oral forms, plant science knowledge to peers and others in society [communication]; and
4. Critically formulate hypotheses, interpret data, and apply basic principles and practices of plant science to solve fundamental and practical problems [critical thinking].

Plant Science 776 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

For an up-to-date description of plant biology major requirements, courses, and course sequences please refer to the program website here.

## SEBS UNDERGRADUATE CORE CURRICULUM (39 credits)

**Contemporary Challenges** (6 credits) *Two courses, one in each of the Contemporary Challenges areas: Diversities and Social Inequalities* [CC-D] *and Our Common Future* [CC-O]

**Experiential Learning** (3 credits) *Students must participate in a certified experience that meets this goal* [EL]

**Natural Sciences** (6 credits) *Students must take two courses, one each in two of the following areas: physical, biological, or environmental sciences* [NS]

**Historical Analysis** (3 credits) *Students must take one course* [HST]

**Social Analysis** (6 credits) *SEBS students must complete two courses, one in either social/cultural analysis or economic analysis, and one in governmental and regulatory analysis* [SCL]

**Arts and Humanities** (3 credits) *Students must complete one course* [AH]

**Writing and Communication** (6 credits) *Students must take 01:355:101 or its equivalent* [WC] *and one course that fulfills the learning goal, communicate effectively in modes appropriate to a discipline or area of inquiry* [WCD].

**Quantitative and Formal Reasoning** (6 credits) *Students must take two courses* [QQ; QR]

## Graduation Requirements for the Major: Proficiency in Plant Science

**A. Plant Science Major Requirements (37-38 credits)**

General Biology and Laboratory (all) (10 credits)1

01:119:115 General Biology I (4)
01:119:116 General Biology II (4)
01:119:117 Biological Research Laboratory (2)

General Chemistry and Laboratory (all) (9 credits)2

01:160:161 General Chemistry (4)
01:160:162 General Chemistry (4)
01:160:171 Introduction to Experimentation (1)

Experienced-Based Education (3 credits).3 *Choose from the following (adviser approved):*

11:776:495,496 Special Problems in Plant Science
11:554:487,488 George H. Cook Scholars Program
11:902:300,301,400 SEBS Internship I,II, Coop
11:550:240 Public Garden Management
11:020:321 Principles and Practice of Small-scale Organic Farming
Study Abroad
SEBS International Summer Study Abroad Program
ARESTY Research Assistant Program

Quantitative Skills (1-2 courses)4

*All students are required to complete one to two math courses, precalculus or higher, depending on option. See option for specific requirements.*

Professional Ethics (3 credits). *Choose from the following:*

01:730:107 Introduction to Ethics (3)5
01:730:249 Bioethics (3)
01:730:250 Environmental Ethics (3)
11:607:385 The Ethical Leader (3)

Soils (3-4 credits). *Choose from the following:*

11:776:102 Soil and Society (3)
11:776:404 Soil Management for Sports and Landscape Applications (3)
11:776:440 Soil Fertility (3)
11:375:360 Soils and Water (4)
11:375:453 Soil Ecology (3)

Plant Science Fundamentals (all) (9 credits)

11:776:210 Principles of Botany (3)
11:776:211 Introduction to Horticulture (3)
11:776:242 Plant Science (3)

**B. Plant Science Option Requirements**
*One of the following three options is required:*

1. General Plant Biology (research focus area) (54-59 credits)
2. Horticulture and Turfgrass Industry (53-55 credits)
3. Natural Products (54-57 credits)

**B1. General Plant Biology Option (54-59 credits)**

Quantitative Methods (all) (7-8 credits)

01:640:135 Calculus I (4) or equivalent
01:640:136 Calculus II (4) or equivalent or 01:960:401 Basic Statistics for Research (3)

Chemistry (all) (15 credits)

01:160:307 Organic Chemistry (4)
01:160:308 Organic Chemistry (4)
11:115:403 General Biochemistry (4)
11:115:404 General Biochemistry (3)

Physics (6-10 credits). *Choose from the following sequences of courses:*

01:750:193 Physics for the Sciences (4)
01:750:194 Physics for the Sciences (4)
or
01:750:201 Extended General Physics (5)
01:750:202 Extended General Physics (5)

or
01:750:203 General Physics (3)
01:750:204 General Physics (3)

Advanced Plant Science (all) (14 credits)

11:776:305 Plant Genetics (4) or 01:447:380 Genetics (4)
11:776:382 Plant Physiology (4)
11:776:452 Plant Tissue Culture and Engineering (3)
11:126:413 Plant Molecular Biology (3) or 11:126:481 Molecular Genetics (3)

Plant Science Electives (12 credits) (if not already used above)

A total of 12 credits from any 11:776:xxx course at the 200 level or above (see here), including:
01:960:401 Basic Statistics for Research (3)
or adviser-approved elective

**B2. Horticulture and Turfgrass Industry Option (53-55 credits)**

Quantitative Methods (4 credits)5

01:640:115 Precalculus (4) OR higher

Business Courses (all) (9 credits)

11:373:121 Principles and Applications of Microeconomics (3)6
11:373:231 Introduction to Marketing (3)
11:373:241 Introduction to Management (3) OR 11:373:341 Management: Human Systems Development (3)

Applied Major Requirements (all) (16-18 credits)

11:776:302 General Plant Pathology (3)
11:776:382 Plant Physiology (4) OR 11:776:202 Applied Physiology of Horticultural Crops (3)
11:776:391 Weeds, Diseases, and Insects of Plants (3)
11:776:406 Plant Breeding (4)
11:776:306 Weed Science Management (3)

Plant Science Electives (24 credits) (if not already used above)

A total of 24 credits from any 11:776:xxx course at the 200 level or above (see here), including
01:960:401 Basic Statistics for Research (3)
or adviser-approved elective

**B3. Natural Products Option (54-57 credits)**
*Students must complete required courses below AND one area of specialization*

Required courses

Quantitative Methods (all) (7-10 credits)5

01:640:115 Precalculus (4) or higher AND
01:960:401 Basic Statistics for Research (3) OR
01:960:211,212 Statistics I, II (3,3) (must take both in series)

Business Courses (3 credits)

11:373:121 Principles and Applications of Microeconomics (3)6

Geography Courses (3 credits). *Choose from the following:*

01:450:211 Environment, Society, and Social Justice (3)
01:450:306 Global Ecosystems and Biodiversity (3)

Major Option Requirements (all) (14 credits)

11:776:205 Introduction to Ethnobotany (3)
11:776:312 Medicinal Plants (3)
11:776:313 Medicinal and Aromatic Plants Laboratory (1)
11:776:382 Plant Physiology (4)
11:776:438 Plants and Human Health (3)

**Areas of Specialization**

*One of the following areas of specialization is required:*

a. Ethnobotany and Global Health (27 credits
b. Production of Medicinal and Aromatic Plants (27 credits)

**a. Ethnobotany and Global Health**

Required (3 credits). *Choose one of the following:*
11:776:390 Hemp and Medical Cannabis (3)
11:776:400 Fungi in the Environment (3)
11:776:410 Plants and Innovative Technologies for Bioenergy (3)

Electives (24 credits). *Choose from the following (if not used above):*
11:776:201 People-Plant Relationships (3)
11:776:221 Principles of Organic Crop Production (3)
11:776:302 General Plant Pathology (3)
11:776:305 Plant Genetics (4)
11:776:390 Hemp and Medical Cannabis (3)
11:776:400 Fungi in the Environment (3)
11:776:406 Plant Breeding (4)
11:776:410 Plants and Innovative Technologies for Bioenergy (3)
11:776:415 Fungi and Human Health (3)

11:776:439 Nursery Crop Production (3)
11:776:442 Agroecology (3)
11:776:495,496 Special Problems in Plant Science (1-3)
11:020:436 Sustainable Agriculture (3)
11:216:217 Principles of Natural Resource Management (4)
11:216:369 Analytical Methods Ecology, Evolution, and Natural Resources (3)
11:216:411 Plant Diversity and Evolution (3)
11:216:412 Plant Diversity and Evolution Lab (1)
11:370:406 Medical and Veterinary Entomology (3)
11:373:362 Natural Resource Economics (3)
11:373:363 Environmental Economics (3)
11:375:201 Biological Principles of Environmental Sciences (3)
11:400:422 Food Safety: Fads, Facts, and Politics (3)
11:709:201 Culinary Nutrition (3)
11:709:255 Nutrition and Health (3)
11:709:363 World Food Customs and Nutrition (3)
or other adviser-approved electives

**b. Production of Medicinal and Aromatic Plants**

Required (3 credits). *Choose one of the following:*
11:776:390 Hemp and Medical Cannabis (3)
11:776:410 Plants and Innovative Technologies for Bioenergy (3)
11:776:439 Nursery Crop Production (3)

Electives (24 credits). *Choose from the following (if not used above)*:
11:776:221 Principles of Organic Crop Production (3)
11:776:302 General Plant Pathology (3)
11:776:305 Plant Genetics (4)
11:776:310 Plant Propagation (3)
11:776:311 General Plant Pathology Laboratory (1)
11:776:321 Greenhouse Systems Management (3)
11:776:341 Fruit Production (3)
11:776:390 Hemp and Medical Cannabis (3)
11:776:406 Plant Breeding (4)
11:776:410 Plants and Innovative Technologies for Bioenergy (3)
11:776:439 Nursery Crop Production (3)
11:776:495,496 Special Problems in Plant Science (1-3)
11:020:215 Applied Practical Applications in Agriculture and Food Systems (3)
11:020:321 Principles and Practices of Small-Scale Organic Farming (3)
11:020:340 Indoor Cultivation of High Value Crops (4)
11:020:442 Entrepreneurial Agriculture (3)
11:216:274 Field Techniques (4)
11:216:332 Plant Ecology (4)
11:216:411 Plant Diversity and Evolution (3)
11:216:412 Plant Diversity and Evolution Lab (1)

11:370:350 Agricultural Entomology and Pest Management (3)
11:373:205 Small Business Essentials (3)
11:400:422 Food Safety: Fads, Facts, and Politics (3)
11:550:235 Herbaceous Plants in the Landscape (3)
or other adviser-approved electives

**Unspecified Electives (2-11 credits)**

In addition to courses meeting the above requirements, students can take other courses offered by the university, for which they meet the course eligibility requirements, to bring their total number of credits to the minimum of 120 (matriculated 2018 or later) or 128 (matriculated prior to 2018) required for graduation.

1 Satisfies SEBS Natural Sciences [NS] - Biological Sciences requirement
2 Satisfies SEBS Natural Sciences [NS] - Physical Sciences requirement
3 Satisfies SEBS Experience-Based Education [EBE] requirement
4 Depending on option, satisfies one to two courses of SEBS Quantitative [QQ] and/or Formal Reasoning [QR] requirements
5 11:730:107 Introduction to Ethics satisfies SEBS Arts and Humanities Human Experience [AHo] requirement
6 11:373:121 Principles and Applications of Microeconomics satisfies SEBS Social Analysis [SCL] - Economic Analysis requirement

# Public Health 832 (SEBS)

## PUBLIC HEALTH 832

**Degree:** B.S.

**Contact:** Christina Torian, Assistant Dean of Undergraduate Education (christina.torian@rutgers.edu)

Students in the School of Environmental and Biological Sciences (SEBS) may choose the major in public health, which is offered by the Edward J. Bloustein School of Planning and Public Policy. This major leads to a bachelor of science (B.S.) degree issued by both SEBS and the Bloustein School.

The major in Public Health (832) prepares students for entry-level careers in population health and disease prevention. Public health professionals work in a wide range of services including infectious disease control; health problems of children, older adults, and the medically underserved; chronic disease management; health monitoring and surveillance; environmental/occupational health and safety; and emergency preparedness. Students learn about the upstream factors that influence community health, particularly poverty, housing, work and unemployment, social exclusion, food security, transportation, access to health and social services, and evidence-based, data-driven decision-making.

See the Edward J. Bloustein School of Planning and Public Policy section of this catalog or visit here.

# Entry Requirements for the Major

# Entry Requirements for the Major

**Entry Requirements for the Major**

To declare a major in public health, students must apply to the Edward J. Bloustein School of Planning and Public Policy. To be accepted, a student must have a GPA of 2.00 or higher, and must have completed the following prerequisite courses with grades of C or better in each course:

- 01:355:101 Expository Writing or equivalent (3)
- 10:775:205 Basic Statistical Methods (4) or any 200-level or higher statistics course
- One human biology course (3-4) (see approved human biology courses in Degree Navigator)
- One chemistry course (3-4)
    - 160:127 Impact of Chemistry (3)
    - 160:128 Chemistry of Life (3)
    - 160:161 or 162 General Chemistry I or II (4)

Applications to the Bloustein School are available online from the website: Here.

See the Edward J. Bloustein School of Planning and Public Policy section of this catalog or visit here.

Public Health 832 (SEBS)

# Graduation Requirements for the Major

# Graduation Requirements for the Major

**Major Requirements (58-61 credits)**

The major in public health is offered by the Edward J. Bloustein School of Planning and Public Policy. It involves a total of 12-15 credits in prerequisite courses that students must complete (with grades of C or better in each of them) prior to declaring the major, plus 9 additional required courses (31 credits), plus five public health elective courses (15 credits).

The prerequisite courses for the major are as follows:

- 01:355:101 Expository Writing or equivalent (3)
- 10:775:205 Basic Statistical Methods (4) or any 200-level or higher statistics course
- One human biology course (3-4) (see approved human biology courses in Degree Navigator)
- One chemistry course (3-4)
    - 160:127 Impact of Chemistry (3)
    - 160:128 Chemistry of Life (3)
    - 160:161 or 162 General Chemistry I or II (4)

The major core requirements are as follows:

- 10:832:201 Principles of Public Health (3)
- 10:832:212 Health Disparities (3)
- 10:832:240 Global Health Perspectives (3)
- 10:832:335 Epidemiology (3)
- 10:832:339 Public Health Literature (3) or
  01:355:302 Scientific and Technical Writing (3) or
  01:355:303 Writing for Business and the Professions (3) or
  01:355:315 Writing Grant Proposals (3) or other preapproved writing course
- 10:832:356 Public Health Law & Ethics (3)
- 10:775:395 Research Methods (4)
- 10:775:450 Leadership Seminar (3)
- 10:775:499 Professional Practice Internship (6)

The five elective courses (at least three of which must be at the 300 level or above) must be public health (subject code 832) courses.

For additional information about the major in public health, please refer to the Edward J. Bloustein School section of the catalog.

# Minors and Certificate Programs (SEBS)

## MINORS AND CERTIFICATE PROGRAMS

The following minors and interdisciplinary certificate programs in a number of the mission areas of the School of Environmental and Biological Sciences are open to all undergraduate students at Rutgers. Options in several of the minors indicate either a subject-matter emphasis or a degree of expertise in cognate fields represented by the courses of the option. Certificates are awarded only with or subsequent to the awarding of a baccalaureate degree in an approved major. The minors are listed first (alphabetically), followed by the certificate programs.

Minor in Agriculture and Food Systems (18 credits)

Minor in Agroecology (21-24 credits)

Minor in Animal Science (22-24 credits)

Minor in Biochemistry (23-25 credits)

Minor in Community Health Outreach (22 credits)

Minor in Creative Expression and the Environment (18 credits)

Minor in Culinary Nutrition

Minor in Ecology, Evolution, and Natural Resources (20-23 credits)

Minor in Entomology (19-26 credits)

Minor in Environmental and Business Economics (21-23 credits)

Minor in Environmental Geomatics (19 credits)

Minor in Environmental Planning (18 credits)

Minor in Environmental Policy, Institutions, and Behavior (21 credits)

Minor in Environmental Sciences (21 credits)

Minor in Fisheries Science (21-22 credits)

Minor in Food Science (18-21 credits)

Minor in Green Technology (20 credits)

Minor in Horticultural Therapy (18 credits)

Minor in Landscape Design

Minor in Leadership Skills (21-22 credits)

Minor in Marine Sciences (18 credits)

Minor in Medicinal and Economic Botany (18-19 credits)

Minor in Meteorology (18 credits)

Minor in Microbiology (19-21 credits)

Minor in Nonprofit Leadership (23 credits)

Minor in Nutrition (20-24 credits)

Minor in Plant Science (18-20 credits)

Minor in Public Garden Management

Minor in Science Communication (18 credits)

Minor in Sustainable Global Food Systems (18 credits)

Minor in Sustainability

Minor in Urban Forestry (21 credits)

Certificate in Environmental Geomatics (19 credits)

Certificate in Environmental Planning (21 credits)

Certificate in Evolutionary Medicine

Certificate in Food Systems Education and Administration (21-22 credits)

Certificate in Horticultural Therapy (34-37 credits)

Certificate in Medicinal and Economic Botany (25 credits)

Certificate in Plant Biosecurity (25 credits)

Turfgrass Science Certificate Program (25-28 Credits)

# Minor in Agriculture and Food Systems (18 credits) (SEBS)

## Minor in Agriculture and Food Systems (18 credits)

**Adviser:** Xenia Morin; Foran Hall, Room 284, 848-932-3502, (xmorin@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

**Required Courses (6 credits)**

11:020:210 Introduction to Agriculture and Food Systems (3)

One agriculture and food systems special topics class (11:020:255) or Advanced Special Topics class (11:020:455) (3)

**Elective Courses (12 credits)**
Selected from courses that come from at least two categories below:

Agricultural sciences with focus on specialty crops, urban, and new technologies
Agribusiness and entrepreneurship
Food systems
Community food justice and advocacy
Health policy, ethics, and law
Education/communication/leadership

# Minor in Agroecology (21-24 credits) (SEBS)

## Minor in Agroecology (21-24 credits)

**Adviser:** Nrupali Patel Foran 372 (npatel@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

**Required Courses (9-10 credits)**

01:119:1__ At least one semester of introductory biology (3-4) or 11:776:242 Plant Science (3)

11:776:221 Principles of Organic Crop Production (3)

11:776:442 Agroecology (3)

**Practical Experience (3 credits)**

11:776:495,496 Special Problems in Plant Science (3) (adviser-approved research or internship focused on an area in agroecology)

**Electives (9-11 credits)**

11:370:350 Agricultural Entomology and Pest Management (3)

11:370:381 Insect Biology (4)

11:375:360 Soils and Water (4)

11:375:453 Soil Ecology (3)

11:776:102 Soil and Society (3)

11:776:302 General Plant Pathology (3)

11:776:310 Plant Propagation (3)

11:776:312 Medicinal Plants (3)

11:776:321 Greenhouse Systems Management (3)

11:776:341 Fruit Production (3)

11:776:391 Weeds, Diseases, and Insects of Plants (3)

11:776:400 Fungi in the Environment (3)

11:776:402 Introduction to Weed Science and Management (3)

11:776:439 Nursery Crop Production (3)

or other adviser-approved electives

# Minor in Animal Science (22-24 credits) (SEBS)

## Minor in Animal Science (22-24 credits)

**Adviser:** Aparna Zama (zama@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

**Prerequisites**: 01:119:115-117 (4,4,2) or equivalent, and 01:161-162, 171 (4,4,1)

**Required Courses (10 credits)**

11:067:142 Animal Science (3)

11:067:327 Animal Reproduction (3)

11:067:330 Animal Nutrition (3)

11:067:331 Animal Nutrition Laboratory (1)

**Elective Courses: choose at least four (12-14 credits) in consultation with the program director or adviser**

11:067:101 Careers in Animal Science (3)

11:067:201 Cattle Practicum (2)

11:067:202 Small Ruminant Practicum (2)

11:067:203 Swine Practicum (2)

11:067:205 Laboratory Animal Practicum (P/NC; 2)

11:067:207 Horse Practicum

11:067:250 Companion Animal Science (P/NC; 2)

11:067:275 Laboratory Animal Science: Management and Techniques (3)

11:067:300 Integrative Physiology (4)

11:067:328 Animal Genetics (3)

11:067:336 Production Animal Management (3)

11:067:338 Production Animal Management Laboratory (2)

11:067:384 Horse Management (3)

11:067:390 Equine Nutrition (3)

11:067:391 Comparative Mammalian Anatomy (3)

11:067:395 Animal Assisted Therapy (3)

11:067:398 Advanced Equine Health and Management (3)

11:067:401 Topics in Equine Science (3)

11:067:402 Equine Exercise Physiology (3)

11:067:404 Animal Diseases (3)

11:067:406 Farm Productivity Analysis (3)

11:067:410 Neuroendocrinology (3)

11:067:411 Studies in Animal Science (BA)

11:067:430 Animal Microtechniques and Tissue Culture (4)

11:067:450 Endocrinology (4)

11:067:460 Animals and the Law (3)

11:067:461 Topics in Companion Animal Issues: Animals and Health (2)

11:067:490 Pathophysiology (3)

11:067:491 Reproductive and Developmental Toxicology (3)

11:067:492 Molecular and Cellular Physiology (3)

11:067:493,494 Research in Animal Science (BA,BA)

# Minor in Biochemistry (23-25 credits) (SEBS)

## Minor in Biochemistry (23-25 credits)

**Adviser:** Lori A. White; Lipman 128, 732-932-9763, ext. 128 (lori.white@rutgers.edu)

**Program Webpage:** Here

**Prerequisites:**
01:119:115, 116 and 117
01:160:161-162
01:160:307-308 Organic Chemistry (4,4) or equivalent
01:447:380 Genetics (4) or 11:776:305 Plant Genetics (4) or 11:067:328 Animal Genetics (3)
11:115:313 or 01:694:313 Introductory Biochemistry Laboratory (1) or 11:115:413 Experimental Biochemistry Laboratory (3)
11:115:403,404 General Biochemistry (4,3)

**And one of the following:**
11:115:421 Biochemistry of Cancer (3)
11:115:422 Biochemical Mechanisms of Toxicology (3)

# Minor in Community Health Outreach (22 credits) (SEBS)

## Minor in Community Health Outreach (22 credits)

**Adviser:** Jennifer Shukaitis (shukaitis@sebs.rutgers.edu)

**Program Webpage:** Here

**Course Description**
With chronic disease at historically high rates and continuing to rise, the need for a workforce trained in community health issues, outreach, and program implementation is greater than ever. The courses included in the community health outreach minor provide a solid basis for understanding health issues that affect diverse communities; how behavior (individual and group) influences health outcomes; how to plan, prepare, conduct, and evaluate community-level health interventions; and leadership skills necessary to involve community partners and stakeholders essential in promoting health within communities.

**Program Goals**
The community health outreach minor will:

- enhance students' understanding of health issues that affect diverse communities and the impact of culture and socioeconomic status on behavior and health;
- provide students the opportunity to develop their knowledge and skills in advocacy, building community partnerships, and developing evidence-based impact-driven health programs;
- provide students the opportunity to engage with faculty and practitioners as they integrate research with evidence-based analysis and programming in the community health sector;
- prepare students to plan, develop, implement, and evaluate community-level health interventions;
- introduce students to leadership theory, methods, and models as the underpinning to responsible leadership behavior;
- develop leadership skills necessary to involve community partners and stakeholders essential in promoting health within communities; and
- prepare students to serve as a responsible leaders in community health outreach programming.

**Learning Goals**
As a result students will:

- examine pressing health issues that affect diverse communities and the impact of behavior on health;
- design relevant educational programs;
- engage with faculty and practitioners to distinguish how research drives evidence-based analysis and programming in the community health sector;
- plan, develop, implement, and evaluate community-level health programs and interventions essential to informing and engaging constituents to make knowledgeable decisions about personal and community health; and

- recognize and apply leadership theories, methods, and models as the underpinnings to responsible leadership skills and behaviors.

**Required Courses (16 credits):**

11:607:200 Principles of Leadership (3) An introduction to leadership. Topics covered include developing leadership skills, creating a vision, and overcoming obstacles.

11:607:381 Presentation Skills: Advocating for Change (3) This course will strengthen student presentation and public speaking skills with the leadership focus on advocating for change, participating in civic engagement, and promoting community service.

11:607:401 Foundations of Program Planning (3) Students develop the skill set to methodically design, develop, implement, and evaluate educational programs that are effectiveness-based and impact-driven. This course is beneficial for students pursuing careers in health care, public health, human services, education, community development, nongovernmental organizations (NGO), faith-based organizations, nonprofits, government (local, state, federal), foundations, and businesses and corporations.

11:607:402 Building Community Partnerships (3) This course presents key elements for building collaborative partnerships. Students examine various coalition/community partnership frameworks and models and develop leadership skills necessary to initiate, build, evaluate, and sustain durable coalitions and community partnerships. This course is beneficial for students pursuing careers in health care, public health, human services, education, community development, nongovernmental organizations (NGO), faith-based organizations, nonprofits, government (local, state, federal), foundation, and business and corporations.

11:193:421 Wellness Behavior (3) In today's world, health and wellness are headline news. What can you do to change your behavior to ensure a long and healthy life along with helping to improve the health of those people around you? Getting and staying well is a worthwhile goal no matter where you are right now. You can make positive changes for yourself and you can be an agent for change for your family, friends, and community.

11:193:440 Community Health Outreach Practicum (1) Students will participate in a community health outreach experience-based practicum. Students will gain knowledge, skills, and practical hands-on experience in community health outreach.

**Electives (6 credits)**

11:193:413 Community Interventions in Obesity-Related Chronic Diseases
11:193:438 Women, Food, and Health
11:709:255 Nutrition and Health
11:709:352 Nutrition and Behavior
11:709:363 World Food Customs and Nutrition
11:709:427 Obesity: Biology, Behavior, and Management
11:709:441 Life Span Community Nutrition
11:709:442 Nutrition Communication

# Minor in Creative Expression and the Environment (18 credits) (SEBS)

## Minor in Creative Expression and the Environment (18 credits)

Program Director: Mary Nucci, Ph.D.

The minor in Creative Expression and the Environment is a multidisciplinary program in which students gain familiarity with fundamentals of environmental issues and learn to respond to them through creative expression in a variety of disciplines and media in the arts and humanities. Students gain the flexibility to develop their skills as readers, writers, musical performers and composers, visual artists, designers, theater artists, filmmakers, dancers, choreographers, and more, even as they see how those skills can contribute to the communication and creation of knowledge in environmental science and social science. Based on the notion that the arts and humanities have the capacity to engage, promote reflection and empathy, demonstrate care, and inspire action, the minor in Creative Expression and the Environment will empower students to imagine and help to build a future that is rooted in environmental knowledge and the quest for environmental sustainability and justice.

**Learning Outcomes**

- Upon completion of the minor, students will articulate fundamental principles and methodologies of environmental issues. They will demonstrate the ability to apply appropriate terminology and express awareness of the environmental challenges that our world faces and how those challenges are being addressed.
- Students will value and engage the humanities in the pursuit of environmental sustainability and justice. They will demonstrate and apply appreciation for diverse traditions of cultural environmental knowledges and stewardship.
- Students will employ the practices of environmental arts and articulate the ways in which the arts can be pressed into service to reflect upon, communicate, and galvanize action around environmental issues.
- Students will understand and apply the practices of collaboration and cross-disciplinary work.

**Requirements**
Students must complete a total of 18 credits of Minor-approved courses:

- three required courses¿one from the categories of Environmental Science, one from Environmental Humanities, and one from Environmental Arts
- three elective courses¿one from each of the categories Environmental Science, Environmental Humanities, and Environmental Arts

**Required Courses (3 Courses Total)**

| Environmental Science and Social Science | Environmental Humanities | Environmental Arts |
|---|---|---|
| 11:375:101 Introduction to Environmental Science (3 credits) | 01:195:220 Our World: Social Justice and the Environment (3 credits) | 07:557:121 Introduction to Environmental Arts (3 credits) |

**Electives (3 Courses Total)**

*Pick ONE from category: Environmental Science and Social Science*

**Environmental Sciences**
11:375:103 Introduction to Environmental Health (not applicable to environmental science majors)
11:375:197 Environmental Science Literacy (not applicable to environmental science majors)
11:375:201 Biological Principles of Environmental Science
11:375:202 Chemical Principles of Environmental Science

**Human Ecology**
11:374:175 Energy and Society
11:374:210 Nature Journaling: Discovering Biodiversity and Nature in Everyday Life
11:374:220 Environmental Solutions
11:374:250 Environmental Justice
11:374:279 Politics of Environmental Issues
11:374:313 US Environmental Policy
11:374:435 Environmental Writing: Rhetorical Strategies for Complex Ecological Issues
11:374:460 Environmental Law and Policy

**Agriculture and Natural Resources**
11:035:268 Environmental Pollution

**Anthropology**
01:070:213 Environment and Human Evolution

**Environmental and Business Economics**
11:373:101 Economics, People and the Environment

**Geography**
01:450:213 The Global Climate System
01:450:306 Global Ecosystems and Biodiversity
01:450:360 Cultural and Political Ecology
01:450:311 Natural Hazards and Disasters

**Earth and Planetary Sciences**
01:460:202 Environmental Geology

**Environmental Planning and Design**
11:573:409 Challenges and Opportunities Environmental Planning
11:573:445 Ecological Design and Stewardship

**Ecology, Evolution and Natural Resources**
11:216:431 Fundamentals of Ecological and Environmental Modeling

**Supply Chain Management**
33:799:440 Supply Chain Environmental Management and Green Purchasing

**Meteorology**
11:670:102 Introduction to Climate Science

**Political Science**
01:790:350 Environmental Politics

*Pick ONE from category: Environmental Humanities*

**Art History**
01:082:101 Building the Future: An Introduction to Architecture
01:082:205 Intro. to Asian Art
01:082:328 Modern and Contemporary Visual Culture in the Islamic World
01:082:391 Nineteenth-Century Architecture and Society in the United States

**Asian Studies**
01:098:479 Environmental Crisis and Cultural Change in Southeast Asia

**Chinese**
01:165:463 Nature in Chinese literature

**Comparative Literature**
01:195:271 Resisting Petrocapitalism: Oceanians against Climate Collapse

**American Studies**
01:050:203 The American West
01:050:272 American Food, Past, and Present.
01:050:302:80 Topics: Beaches, Lakes, and Rivers of NJ
01:050:310:02 Approaches: Messing with Nature

**English**
01:351:209 Multimedia Composition (*only sections of this course on multimedia/creative writing for the environment).
01:358:262 Introduction to Literature and Environment
01:358:205 The Coming Apocalypse (4 credits)
01:358:207 Writing after the End of the World (4 credits)
01:359:209 Introduction to Health, Medicine, and Literature

**French**
01:420:252 Power and Place (taught in English)

**German**
01:470:364 Literature of Chaos and Order

**History**
01:506:249 Climate Politics, a Deep History.
01:512:329 Technology and Nature in American History

**Philosophy**
01:730:250 Environmental Ethics
01:730:252 Eating Right: The Ethics of Food Choices and Food Policy (4 credits)
01:730:253 Human Nature and Human Diversity (4 credits)
01:730:249 Bioethics

**Religion**
01:840:105 Religions Now: 21st-Century Controversies (4 credits)

**Spanish**
01:940:462 Environment and Literature in Hispanic Culture (taught in Spanish)

**Women, Gender Studies and Sexuality Studies**
01:988:409:90 Gender, Environmental Justice, and Health
01:988:250 Feminism in a Time of Environmental Crisis

*Pick ONE from category: Environmental Arts*

**Dance**
07:203:250 Performing Climate Change
07:965:302 Theater for Social Development

**Art and Design**
07:080:215 Graphic Design for Everybody (may not be used for elective credit for the minor by Mason Gross students)
07:080:331 Digital Photo Image (may not be used for elective credit for the minor by Mason Gross students)

**Digital Filmmaking**
07:211:240 The Art of Documentary Filmmaking (may not be used for elective credit for the minor by Mason Gross students)

**Theater Arts**

07:966:255 Upcycling: An Artistic Approach to Fast Fashion
07:965:330 Improving Communication Through Improvisation

# Minor in Culinary Nutrition (SEBS)

## Minor in Culinary Nutrition

**Adviser:** Malcolm Watford; Foran Hall, Room 170 (mwatford@sebs.rutgers.edu)

**Program Webpage:** Here

All non-nutrition undergraduate students at Rutgers may choose to minor in culinary nutrition. This minor provides an opportunity for students to enhance and extend their non-nutrition major and apply that knowledge and skill set in an array of culinary nutrition career opportunities (e.g., food journalism, culinary communication, food and nutrition education, food marketing, food management, test kitchens, food production and processing, hospitality) and round out skills in other related areas (e.g., psychology, exercise science, health and wellness, education).

**Required Courses**

- 11:709:201 Culinary Nutrition (3)
- 11:709:202 Culinary Nutrition Laboratory (1) *Pre/co-req 11:709:201*
- 11:709:255 Nutrition and Health (3)
- 11:709:301 Food Safety & Sanitation in Food Service (2) *Pre-req 11:709:201/202*
- 11:709:443 Methods in Sensory Analysis (3) *Pre-req 11:709:255 and 11:709:201*
- 11:709:445 Problem Solving Using Food (3) *Pre-req: either 11:709:255, 11:400:201, or 11:373:121*
- 11:709:448 Food Production & Management (3) and 11:709:449 Food Service Lab (1) *Pre-req 11:709:301*

# Minor in Ecology, Evolution, and Natural Resources (20-23 credits) (SEBS)

## Minor in Ecology, Evolution, and Natural Resources (20-23 credits)

**Adviser:** Kimberly N. Russell; Blake Hall 100, 848-932-9383, (Kimberly.russell@rutgers.edu)

**Program Webpage:** Here

**Prerequisites:** 01:119:115,116 and 117 General Biology (4,4,2) or 01:119:101-102 General Biology (4,4)

**Required Courses (Six Courses)**

11:216:104 Topics in Ecology, Evolution, and Natural Resources (1)

11:216:217 Principles of Natural Resource Management (3)

11:216:251 Fundamentals of Evolution (3)

11:216:252 Fundamentals of Evolution Lab (1)

11:216:351 Principles of Ecology (3)

11:216:352 Principles of Ecology Laboratory (1)

**Distribution Electives (One from Each of Techniques, Biodiversity, and Functional Systems [9-12 credits])**

To be determined in consultation with the student's adviser. Students can choose from a number of courses offered through the Department of Ecology, Evolution, and Natural Resources, as well as several courses from other departments.

*C. Ecology (one course is required)*

11:216:199 Trees and the Environment (3)
11:216:272 Dendrology (4)
11:216:296 Honors Seminar
11:216:302 Parasite Ecology (4)
11:216:317 Conservation Ecology (3) [CC- and WCd-core requirements]
11:216:332 Plant Ecology (4)
11:216:334 Aquatic Ecology (3)
11:216:335 Freshwater Ecology (4)
11:216:360 Animal Physiological Ecology (3)
11:216:411 and 412 Plant Diversity and Evolution (4)
11:216:422 Soil Organismal Diversity (3)
11:216:450 Landscape Ecology (3)
11:216:451 Global Change Ecology (3)
11:216:487 Urban Ecology (3)

*D. Evolution (one course is required)*

11:216:240 Behavioral Biology (4)
11:216:269 Evolution of Animal Behavior (3)
11:216:296 Honors Seminar (3)
11:216:323 Ornithology (4)
11:216:324 Invertebrate Zoology (4)
11:216:325 Vertebrate Zoology (4)
11:216:351 Principles of Ecology (3)
11:216:405 Evolution of Infectious Diseases (3)
11:216:441 Animal Behavior (3)
11:216:454 Molecular Ecology (3)
11:216:411 and 11:216:412 Plant Diversity and Evolution (3) AND Plant Diversity and Evolution Lab (1)

*E. Natural Resources/Techniques (one course is required)*

11:216:210 Nature Journaling: Discovering Biodiversity and Nature in Everyday Life (3)
11:216:274 Field Techniques (4)
11:216:315 Conservation Techniques (3)
11:216:320 Controversies in Sustainability (3)
11:216:365 Arboriculture (4)
11:216:371 Introduction to Remote Sensing Image Analysis (3)
11:216:403 Urban Forestry (3)
11:216:421 Wetland Ecology (4)
11:216:464 Wildlife Ecology and Conservation (3)
11:216:469 Wildlife Diseases (3)
11:216:471 Silviculture (3)

11:216:474 Advanced Remote Sensing (3)
11:216:475 Winter Field Ecology (1)
11:216:488 Restoration Ecology (4)
11:573:362 Intermediate Environmental Geomatics (3)
11:573:462 Advanced Environmental Geomatics (3)

# Minor in Entomology (19-26 credits) (SEBS)

## Minor in Entomology (19-26 credits)

**Adviser:** Chloe Hawkings; Thompson Hall 132, 848-932-0005 (c.hawkings@rutgers.edu)

**Program Webpage:** Here

**Prerequisites:** 01:119:115,116, and 117 General Biology (4,4,2)

**Required Courses (7-8 credits)**

11:370:350 Agricultural Entomology and Pest Management (3) or 11:370:381 Insect Biology (4)

11:370:409 Insect Classification (4)

**Electives (12-18 credits)**

Any of the following courses for which prerequisites are fulfilled or instructor's permission is granted:

11:370:308 Apiculture (3)
11:370:350 Agricultural Entomology and Pest Management (3)
11:370:352 Toxicology of Pesticides (3)
11:370:355 Agricultural & Medical Acarology (3)
11:370:402 Aquatic Entomology (4)
11:370:425 Insect Behavior (3)
11:370:380 Insect Biotechnology (3)
11:370:409 Insect Classification (4)
11:370:250 Insects & The Environment (3)
11:370:403 Insect Structure and Function (4)
11:370:406 Medical and Veterinary Entomology (3)
11:370:414 Forensic Entomology (3)
11:370:416 Forensic Entomology Laboratory (1)
11:370:403 Urban Entomology (3)
11:370:493,494 Research Problems in Entomology (1-4,1-4)

Students intending to minor in entomology are urged to contact the department as early in their program as possible, and no later than the middle of their junior year

# Minor in Environmental and Business Economics (21-23 credits) (SEBS)

## Minor in Environmental and Business Economics (21-23 credits)

**Restriction - This minor is NOT open to Business and Economics Majors**

**Adviser:** Isaac Vellangany; Cook Office Building, Room 118, 848-932-9132 (isaacv@sebs.rutgers.edu)

**Program Webpage:** Here

This program is not open to majors in environmental and business economics (373) or economics (220) or to Rutgers Business School: Undergraduate-New Brunswick students. Students must complete introductory micro- and macroeconomics courses with a grade of C or better. No more than one D will be allowed in the remaining five courses.

**Required Courses (12 credits)**

11:373:121 Principles and Applications of Microeconomics (3)

11:373:122 Principles and Applications of Macroeconomics (3)

11:373:241 Introduction to Management (3)

11:373:361 Land Economics (3) or 11:373:362 Natural Resource Economics (3) or 11:373:363 Environmental Economics (3)

**Electives (9-11 credits)**

Any three of the following courses for which prerequisites are fulfilled or instructor's permission is granted:

11:373:201 Corporate Citizenship and Social Responsibility (3)

11:373:202 Sustainability Decision Tools (3)

11:373:205 Small Business Essentials (3)

11:373:210 Business Decision Computer Tools (4)

11:373:211 Applied Mathematical Concepts for Agricultural Economics (4)

11:373:215 Applications of Statistics in Business Economics (3)

11:373:231 Introduction to Marketing (3)

11:373:321 Economics of Production (3)

11:373:323 Public Policy toward the Food Industry (3)

11:373:331 Economics of Food Marketing Systems (3)

11:373:335 Energy Economics and Policy (3)

11:373:341 Management: Human Systems Development (3)

11:373:351 Business Finance I (3)

11:373:352 Economics of Futures Markets (3)

11:373:353 Personal Finance (3)

11:373:361 Land Economics (3)

11:373:362 Natural Resource Economics (3)

11:373:363 Environmental Economics (3)

11:373:371 Food Health and Safety Policy (3)

11:373:402 Global Marketing (3)

11:373:403 Innovation and Entrepreneurship (3)

11:373:404 Bioscience Policy (3)

11:373:422 Demand and Price Analysis (3)

11:373:425 Econometric Applications (3)

11:373:431 International Trade Policy (3)

11:373:451 Business Finance II (3)

11:373:465 Business Research (4)

# Minor in Environmental Geomatics (19 credits) (SEBS)

## Minor in Environmental Geomatics (19 credits)

***Minor in Environmental Geomatics*** : Environmental geomatics synthesizes a number of concepts and techniques including remote sensing, spatial analysis, geographic information systems (GIS), and global positioning systems (GPS) that are used to improve the planning and management of natural resource systems. These techniques include the development of complex spatial databases from a wide range of data sources and the application of this information to solve environmental problems. The minor is intended for students interested in pursuing professional careers in environmental planning/management, remote sensing, and geomatics, and provides a basis for graduate and professional studies

**Minor in Environmental Geomatics (19 credits)**
For further information, contact Dave Smith in ENR, Rm. 127 **(**dave.c.smith@rutgers.edu) 848-932-1586

*Required Courses:*
11:573:232 Fundamentals of Environmental Geomatics (3)
11:573:233 Fundamentals of Environmental Geomatics Lab (1)
11:573:362 Intermediate Environmental Geomatics (3) *Prerequisites: 11:573:232 and 11:573:233*
11:573:462 Advanced Environmental Geomatics (3) *Prerequisite: 11:573:362*
11:216:371 Introduction to Remote Sensing Image Analysis (3)
01:960:401 Basic Statistics for Research (3) *or equivalent*

*Plus 3 credits of the following electives:*
11:216:474 Advanced Remote Sensing Image Analysis (3) *Prerequisite: 11:216:371 or 01:450:322*
11:216:369 Analytical Methods for Environmental Geomatics (3) *Prerequisite: 01:960:401 or equivalent*
11:573:437 Spatial Data Visualization and Map Design (3) *Prerequisites: 11:573:232 and 11:573:233 or equivalent*
11:216:450 Landscape Ecology (3) *Prerequisite: 11:216:351 or equivalent*
::__ Other Approved Elective

# Minor in Environmental Planning (18 credits) (SEBS)

## Minor in Environmental Planning (18 credits)

***Environmental Planning Minor:*** Environmental planning requires the integration of environmental information into the planning process and is concerned with the protection and enhancement of environmental systems while meeting demands for growth and development. This minor is intended for students from any discipline who are interested in pursuing professional careers in environmental planning and related areas. It also provides a basis for graduate and professional studies.

***Environmental Planning Graduation Requirements (18 credits)***

| **Course #** | **Credits** | **Name** |
|---|---|---|
| Requirement | 9 | Environmental Planning Core |
| 11:573:202 | 3 | Environmental Issues |
| 11:573:231 | 3 | Fundamentals of Environmental Planning |
| 11:550:230 | 3 | Environmental Design Analysis |
| | | |
| *Plus 9 credits from:* | | *Planning Electives* |
| 11:375:202 | 3 | Water and Wastewater Treatment |
| 10:762:233 | 3 | Urban World |
| 10:762/833/843:210 | 3 | Principles of Public Policy |
| 10:762:306 | 3 | Principles of Urban Planning |
| 10:762/832/971:202 | 3 | Designing Healthy Cities |
| 10:762:335 | 3 | Gender, Family, and Public Policy |
| 10:762:413 | 3 | Urban Revitalization |
| 11:216:474 | 3 | Advanced Remote Sensing Image Analysis<br>*Prerequisite: 11:216:371 or 01:450:322* |
| 11:373:362 | 3 | Natural Resource Economics |
| 11:373:362 | 3 | Environmental Economics |

| | | |
|---|---|---|
| 11:375:307 | 3 | Solid Waste Management and Treatment |
| 11:375:322 | 3 | Energy Technology and Environment |
| 11:550:231 | 5 | Introduction to Environmental Design |
| 11:550:331 | 5 | Environmental Planning Studio |
| 11:550:332 | 5 | Praxis Studio I (Junior) Section OD |
| 11:573:232 | 3 | Fundamentals of Environmental Geomatics |
| 11:573:302 | 3 | Ecological History of North America |
| 11:573:437 | 3 | Sustainability Decision Tools |
| 11:573:437 | 3 | Spatial Data Visualization and Map Design |
| | | *Prerequisites: 11:573:232 and 11:573:233 or equivalent* |
| 11:573:444 | 3 | Watershed Planning and Management |

# Minor in Environmental Policy, Institutions, and Behavior (21 credits) (SEBS)

## Minor in Environmental Policy, Institutions, and Behavior (21 credits)

**Adviser:** Rachael Shwom; Cook Office Building, Room 212, 848-932-9235 (shwomrac@sebs.rutgers.edu)

**Program Webpage:** Here

**Minor Requirements:** Here

**Must take the following course:**

11:374:101 Introduction to Human Ecology

**At total of six courses of which three must be at the 300 or 400 level:**

11:374:110 Theories and Reasoning in Human Ecology

11:374:115 Water and Society

11:374:141 Health and Society

11:374:175 Energy and Society

11:374:201 Research Methods

11:374:220 Environmental Solutions

11:374:225 Environment and Health in Society

11:374:279 Politics Environmental Issues

11:374:280 Careers in Environmental Policy, Institutions, and Behavior

11:374:299 Introduction to Sustainability

11:374:305 Globalization, Development, and Environment

11:374:312 Environmental History

11:374:313 U.S. Environmental Policy

11:374:314 Natural Resources Policy

11:374:322 Behavior and the Environment

11:374:325 Environmental Communications

11:374:335 Communities and Environmental Change

11:374:416 Environmental Education

11:374:424 Segregation and Health

11:374:426 Climate Change Policy

11:374:428 Marine Fisheries Policy

11:374:429 Agrarian Landscapes

11:374:430 Risk, Health, and Safety

11:374:431 New and Reemerging Diseases

11:374:435 Communication in the Life Sciences

11:374:437 Culture and Health

11:374:438 Health in the Latino Community

11:374:440 Race and the Environment

11:374:460 Environmental Law and Policy

11:374:462 International Environmental Law

11:374:481 Raritan Scholars

11:374:490 Research and Practicum in Human Ecology

11:374:491 Capstone in Human Ecology-Independent Study

11:374:492 Environmental Study Internship

11:374:499 Capstone in Human Ecology

# Minor in Environmental Sciences (21 credits) (SEBS)

## Minor in Environmental Sciences (21 credits)

**Adviser:** Jeffra Schaefer; Environmental and Natural Resources Building, 848-932-5779 (jschaefer@envsci.rutgers.edu)

**Program Webpage:** Here

**Required Courses (9 credits)***

11:375:101 Introduction to Environmental Sciences (3)

and two of the following:

11:375:201 Biological Principles of Environmental Sciences (3)

11:375:202 Chemical Principles of Environmental Sciences (3)

11:375:203 Physical Principles of Environmental Sciences (3) or Fate and Transport (11:375:423 or 11:117:323)

**Electives (12 credits)**
*Elective courses cannot be used to satisfy other minor requirements.*
*6 credits must not overlap with Major.*

*List of approved courses:*
11:375:302 Elements of Water and Water Waste Treatment (3)
11:375:303 Numerical Methods in Environmental Science (3)
11:375:307 Solid Waste Management & Treatment (3)
11:375:310 Analytical Environmental Chemistry Lab (3)
11:375:312 Environmental Microbiology Lab (2)
11:375:322 Energy Technology & Environment (3)
11:375:340 Environmental Applications of Organic Chemistry (3)
11:375:346 Intro to Atmospheric Chemistry (3)
11:375:360 Soils & Water (4)
11:375:407 Environmental Toxicology (3)
11:375:411 Environmental Microbiology (3)
11:375:421 Air Pollution (3)
11:375:423 Environmental Fate & Transport (3)
11:375:424 Air Sampling and Analysis (3)
11:375:430 Hazardous Waste Management (3)
11:375:434 Principles of Industrial Hygiene (3)
11:375:444 Water Chemistry (3)
11:375:450 The Terrestrial Carbon Cycle (3)
11:375:453 Soil Ecology (3)
11:375:474 Coastal Biogeochemical Cycles in a Changing World (3)
or equivalent Environmental Science (375) course approved by the program advisor

*Many of the courses require the following prerequisites: 01:119:115,116, and 117; 01:160:161-162; calculus; organic chemistry; two semesters of physics.

# Minor in Fisheries Science (21-22 credits) (SEBS)

## Minor in Fisheries Science (21-22 credits)

The fisheries science minor provides students with a broad introductory training in the interdisciplinary study of fisheries as complex social ecological systems.

**Adviser:** Silke Severmann, Marine and Coastal Sciences Building, Room 303D, 848-932-3488 (silke@marine.rutgers.edu)

**Undergraduate Program Website:** Here

**Required courses (18 credits)**

11:628:309 Fishery Science (3)

01:960:401 Basic Statistics for Research (3)

11:216:440 Practical Experience in Ecology, Evolution, and Natural Resources (1)

11:628:462 Ocean Ecology (4) *or* 11:216:335 Limnology (4) *or* 11:628:320 Dynamics of Marine Ecosystems (4)

11:628:321 Ichthyology (4) *or* 11:216:324 Invertebrate Zoology (4) *or* 11:216:325 Vertebrate Zoology (4)

11:374:314 Human Dimensions of Natural Resource Management (3) *or* 01:220:102 Introduction to Microeconomics (3) *or* 11:373:121 Principles and Applications of Microeconomics (3) *or* 11:374:428 Topics in Environmental and Resource Policy: Marine Fisheries Policy (3) *or* 11:374:460 Environmental Law and Policy (3)

**Elective, choose one of the following (3-4 credits)**

11:216:217 Principles of Natural Resource Management (3)

11:216:317 Conservation Ecology (3)

11:216:320 Sustainable Environmental Management (3)

11:216:369 Analytical Methods in Ecology, Evolution, and Natural Resources (3)

11:216:464 Wildlife Ecology and Conservation (4)

11:373:362 Natural Resource Economics (3)

11:373:363 Environmental Economics (3)

11:374:305 Globalization, Development, and Environment (3)

11:374:313 U.S. Environmental Policy (3)

11:374:462 International Environmental Law and Policy (3)

11:628:317 Aquaculture (3)

# Minor in Food Science (18-21 credits) (SEBS)

## Minor in Food Science (18-21 credits)

**Adviser:** Chitra Ponnusamy (cp470@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

Here are the Food Science Minor Classes

(from 2021 onwards).
**TOTAL CREDITS: MINIMUM 21 CREDITS**

**Prerequisite Courses**

- Gen Biology (01:119:115-117)
- Gen Chemistry (01:160:161-162)
- Elementary Organic Chemistry (01:160:209) or Organic Chemistry (01:160:307-308)

**Pre-requisite courses that may be required based on electives chosen**
**(List of Electives given in Requirement 2)**

- Biochemistry (11:115:301 or 403)
- Statistics (11:960:211or 285 or 401)
- Calculus I (01:640:135)
- Physics I (01:750:193)

**Requirement 1: Mandatory Food Science Courses (Must complete both)**

- 11:400:103 (3) SCIENCE OF FOOD [NS] OR 11:400:104* (3) FOOD AND HEALTH [NS]
- 11:400:201** (3) PRINCIPLES OF FOOD SCIENCE

* Any student who has completed Nutrition and Health (11:709:255) cannot enroll for Food and Health (11:400:104).
** All students must take Principles of Food Science 11:400:201 (3), even if they have completed 11:709:201 & 202
** Principles of Food Science 11:400:201 (3) must be completed successfully before a
student registers for any other 300 or 400 level Food Science courses.

**Requirement 2: Electives (15 or more credits from any of the following)**

- 11:400:106 (3) FOOD AS MEDICINE
- 11:400:107 (3) FOODS: FROM FIELD TO TABLE
- 11:400:301 (4) FOOD PROCESSING TECHNOLOGIES
- 11:400:302 (4) FOOD PROCESS ENGINEERING
- 11:400:304 (4) FOOD ANALYSIS
- 11:400:314 (2) CURRENT ISSUES IN FOOD SCIENCE & FOOD LAWS
- 11:400:405 (3) SENSORY EVALUATION OF FOODS
- 11:400:410 (3) NUTRIGENOMICS AND NUTRACEUTICALS
- 11:400:411 (4) FOOD CHEMISTRY
- 11:400:412 (3) FOOD PRODUCT DEVELOPMENT
- 11:400:419 (3) FOOD PHYSICAL SYSTEMS
- 11:400:422 (3) FOOD SAFETY: FADS, FACTS, & POLITICS
- 11:400:423 (3) FOOD MICROBIOLOGY
- EXPERIENTIAL LEARNING: 11:400:493 RESEARCH-BASED LEARNING OR 11:400:494 INTERNSHIP-BASED LEARNING

# Minor in Green Technology (20 credits) (SEBS)

## Minor in Green Technology (20 credits)

***Green Technology Minor*:** As individuals, businesses, and communities seek solutions to pressing environmental concerns, the green technology minor is positioned as an emerging source of innovation, entrepreneurialism, and action toward the development of sustainable land use practices. This minor seeks to provide students with a broad-based education in preparation for careers in landscape-related industries such as contracting, maintenance, nursery production, and garden-center operations. While covering pragmatic issues associated with the maintenance and management of gardens and properties, the curriculum also gives students opportunities to study best practices and new approaches to on-site storm water management, energy production, and healthy ecological systems.

**Green Technologies Minor Graduation Requirements (20 credits)**

*Required Courses (8 credits)*
11:573:231 Fundamentals of Environmental Planning (3) or 11:550:233 Environmental Design Analysis (3)
11:550:241 Construction I - Mapping and Engineering (5)

*Plus 3 credits of the following:*
11:573:202 Environmental Issues (3)
11:573:445 Ecological Design and Stewardship (3)
11:573:444 Watershed Management: An Interdisciplinary Perspective (3)
11:573:413 Open Spaces Planning and Management (3)
11:216:217 Principles of Natural Resource Management (3)
10:762/832/971:202 Designing Healthy Cities (3)

11:550:221 Site Design (3)
11:550:333 Design Build Studio (5)
10:762/971:201 Introduction to Urban Planning and Design (3)
11:550:443 Studio Abroad Germany Studio (5)
11:704:421 Wetland Ecology (3)

***Plus 12 credits of the following:***

*Landscape Industries*
11:550:331 Praxis EC and Design Build (5)
11:550:341 Construction II Materials and Engineering I (4)
11:550:442 Sustainable Technology (3)
*Prerequisite: 11:550:341 Construction II - Materials and Engineering I*

*Urban Forestry*
11:216:403 Urban Forestry (3)
11:216:456 Trees and the Environment (3)
11:704:365 Arboriculture (4)
11:704:377 Practicum in Forest Management (BA)

*Design and Maintenance of Sustainable Landscapes* (must take at least 3 credits from this category)
11:550:439 Transforming Suburbia: Residential Design, Age of Sustainability (3)
11:550:340 Planting Design (4)
10:762/832/971:202 Designing Healthy Cities (3)
11:776:112 Introduction to Bioenergy Technologies (3)

*Economics of Sustainability*
11:373:202 Sustainability Decision Tools (3)

# Minor in Horticultural Therapy (18 credits) (SEBS)

## Minor in Horticultural Therapy (18 credits)

**Adviser:** Nrupali Patel; Foran 372 (npatel@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

**Prerequisites (3 credits)**

01:830:101 General Psychology (3)*

**Required Courses (12 credits)**

11:776:201 People-Plant Relationships (3)*
11:776:225 Horticultural Therapy: Concept and Skills*
11:776:325 Horticultural Therapy Techniques and Programming (3)*
01:830:340 Abnormal Psychology (3)*

**Electives (6 credits)**

*(A) Horticulture electives (choose one from the list below):*
11:776:211 Introduction to Horticulture (3)*
11:776:302 General Plant Pathology (3)
11:776:310 Plant Propagation (3)*
11:776:391 Weeds, Diseases, and Insects of Plants or 11:370:350 Agricultural Entomology and Pest Management (3)*
11:776:439 Nursery Crop Production (3)

*(B) Human Science electives (choose one from the list below):*
01:830:271 Principles of Developmental Psychology (human life span development) (3)*
01:830:310 Neuropsychology (3)
01:830:333 Adolescent Development (3)
01:830:335 Adult Development and Aging (3)
01:830:346 Atypical Development of Childhood and Adolescence (3)
01:830:377 Health Psychology (3)

*Required courses in the Rutgers SEBS Horticultural Therapy Certificate Program (34-37 credits).

Certificate program is accredited by the American Horticultural Therapy Association (AHTA).

# Minor in Landscape Design (SEBS)

## Minor in Landscape Design

**Adviser:** Holly Nelson; Blake Hall Room 116 (holly.nelson@rutgers.edu)

**Program Webpage:** Here

The minor in landscape design focuses on both social and environmental aspects of landscape design. It is designed for students who are interested in design and issues related to how we form our landscapes. It is a great foundation for graduate school in design disciplines, providing grounding in architectural drawing and "reading" the landscape, and the student will develop an understanding of design thinking and how designers learn in a studio environment. The landscape design minor *is not* offered to students majoring in landscape architecture.

**Learning Objectives**

- Read the landscape, including the social and environmental forces that shape our world;
- Engage critically in the process of creative expression;
- Practice design as an iterative process and foster experimentation in the making of form; and
- Express design intentions through drawing, modeling, recording, and presentation.

**Requirements**

*Foundation: 3 credits*
11:550:101 Landscape Studies (3 credits + DIVERSITY CORE) *or*
11:550:230 Environmental Design Analysis (3 credits + CC CORE) *or*
11:550:250 History of Landscape Architecture (3 credits + HISTORY CORE)

*Environmental Issues and Social Approaches to Design: 3 credits*
01:082:275 Cinema and the City (3 credits)
01:082:101 Building the Future: An Introduction to Architecture (3 credits)
11:573:202 Environmental Issues (3 credits + CC CORE)
11:374:101 Introduction to Human Ecology (3 credits)
01:450:250 Cities (4 credits)
11:550:235 Herbaceous Plants (3 credits)

*Design classes: 12.5 credits minimum*
Studio Foundation classes:
11:550:237 Landscape Drawing and Drafting (3 credits + A+H CORE)
11:550:231 Introduction to Environmental Design (5 credits)*(Corequisite: 11:550:237)**
11:550:301 Social and Cultural Aspects of Design (3 credits)
11:550:238 2D Digital Design and Drafting (1.5 credits) *or*
11:550:339 2D Digital Design Communication (1.5 credits)*

**Total credits required: 18.5 minimum**

*Environmental planning majors need to take 11:550:232 Introduction to Environmental Design 2 or a Praxis Studio with the permission of the instructor.

*Additional Preapproved Studios for Environmental Planners*
11:550:439 Suburbia Transformed (3 credits) *or*
11:550:442 Sustainable Landscape Technologies (3 credits) *or*
10:832:202 Designing Healthy Cities (Bloustein studio-3 credits) *or*
11:550:333 Design Build Studio (5 credits)
11:550:340 Planting Design (4 credits)

# Minor in Leadership Skills (21-22 credits) (SEBS)

## Minor in Leadership Skills (21-22 credits)

**Adviser:** Lisa Brockenbrough Sanon-Jules, Civic Square Building Room 142, 848-932-5202

**Program Webpage**: http://sebs.rutgers.edu/minors/leadership-skills

Employers consistently report leadership as a key skill that is increasingly important in the workplace and increasingly difficult to find among job applicants. Prospective employees with knowledge and experience in leadership skills have an important competitive edge over others. Students who obtain the Minor in Leadership Skills will have that edge, setting them apart from others in their educational and professional endeavors.

Through the Minor in Leadership Skills, our students will develop and hone their knowledge and skills in critical areas including group processes, team dynamics, ethics, inclusivity, conflict management, communication, and advocacy. Students will develop a personal leadership philosophy, apply critical thinking skills, and cultivate their leadership style. Whether students decide to pursue advanced studies, enter the workforce, or choose other paths, they will have the knowledge, perspective, and skills to make a positive contribution as a leader.

The Minor in Leadership Skills consists of 18 credits of coursework offered through the School of Environmental and Biological Sciences. Principles of Leadership, Stewardship and Leadership, and Leadership and Social Change are 200-level courses which establish the foundation for the curriculum.

At the 300 level, Presentation Skills: Advocating for Change, Communication for Today's Leader, The Ethical Leader, and Conflict Management Practicum immerse students in the issues and challenges leaders face.

Group Process/Team Dynamics, International Relations: Leadership for Sustainable Development Practicum, Leadership Practical Applications, and Transformational Leadership are 400-level courses which expand the scope and further prepare students for working with and leading others. Leadership Skills for Facilitating Effective Meetings, Meeting Management/Parliamentary Procedures, and Emotional Intelligence provide additional skill development while engaging students in practical applications as they learn, practice, and process their experiences.

Through the Minor in Leadership Skills, students will integrate content knowledge and skills from their major with leadership knowledge and skills. They will gain the ability to apply these skills within the context of their community and workplace.

**Policy on Artificial Intelligence Technology**

Cultivating ethical leaders is the foundation of our work. Our coursework is rooted in the development of integrity, critical thinking, and personal growth. Intellectual honesty is vital in our courses and in our assessment of our students' work. While AI has revolutionized many fields, it is important to acknowledge that it is limited in contributing to students' academic and personal growth. As such, our expectation is that all work submitted through our courses is original work, completed in accordance with the Rutgers University Academic Integrity Policy. It is expected that students do not engage in unauthorized collaboration or make use of AI composition software such as ChatGPT for any of the assigned course work.

**Learning Objectives**

The Leadership Minor will:

- Introduce students to leadership theory, methods, and models as the underpinning to responsible leadership behavior.
- Provide students the opportunity to develop their interests, knowledge, and skills in leadership in addition to completing their major requirements.
- Prepare students to serve in formal and informal leadership positions.
- Enhance students' ability to think critically about leadership in various contexts.
- Develop students' personal leadership agenda for action and service.

- Engage students to effectively organize and lead others.
- Prepare students to serve as a responsible, ethical and inclusive leaders.

**Learning Goals**

As a result of completing the Leadership Skills Minor students will:

- Identify leadership philosophy, styles, and traits.
- Demonstrate effective leadership communication skills.
- Demonstrate effective conflict management skills.
- Analyze ethical leadership situations.
- Evaluate group process and team dynamics.
- Analyze leadership theories and models.

**Required Courses (15 credits)**
11:607:200 Principles of Leadership (3)
11:607:380 Communication for Today¿s Leader (3) or 11:607:381: Presentation Skills Advocating for Change (3)
11:607:382 Conflict Management Practicum (3)
11:607:385 The Ethical Leader (3)
11:607:485 Understanding Group Dynamics and Team Processes (3)

AND at least 3 credits from the following courses:

**Electives (3 credits)**
11:607:201 Stewardship and Leadership (3)
11:607:202 Leadership and Social Change (3)
11:607:204 Self Leadership (2)
11:607:211 Building Leadership Character (1.5)
11:607:250 The Cross Cultural Leader (3)
11:607:255 Inclusive Leadership (1.5)
11:607:380 Communication for Today's Leader (3) (if not taken as required course)
11:607:381 Presentation Skills: Advocating for Change (3) (if not taken as required course)
11:607:383 Meeting Management/Parliamentary Procedures (1.5)
11:607:384 Emotionally Intelligent Leadership (1.5)
11:607:388 Facilitating Effective Meetings (1.5)
11:607:486 Leadership in Practice: Designing Your Success (3)
11:607:487 Transformational Leadership (3)

# Minor in Marine Sciences (18 credits) (SEBS)

## Minor in Marine Sciences (18 credits)

**Adviser:** Silke Severmann; Marine and Coastal Sciences Building, Room 303D, 848-932-3488 (silke@marine.rutgers.edu)

**Undergraduate Program Webpage:** Here

A semester of introductory geology, two semesters of biology, calculus, chemistry, and physics are recommended and/or required for many of the courses in the program.

**Required Course (4)**

11:628:320 Dynamics of Marine Ecosystems (4)

**Electives (14)**

At least 14 credits from the following. At least 3 credits must be from marine sciences (628) courses.

01:375:444 Water Chemistry (3)
01:450:213 The Global Climate System (3)
01:450:313 Climate Change (3)
01:450:370 Climate Change and Society (3)
01:460:100 Planet Earth (3) OR 01:460:101 Introductory Geology (4)
01:460:212 Earth and Life Through Time (3)
01:460:300 Introduction to Sedimentary Geology (4)
01:460:303 Paleontology (4)
01:460:414 Hydrologic Processes (3)
01:460:417 Environmental Geochemistry (3)
01:460:451 Marine Geology (3)
01:460:480 Major Events in Earth History (3)
11:216:324 Invertebrate Zoology (4)
11:216:421 Wetland Ecology (3)
11:216:451 Global Change and Ecology (3)
11:628:120 Introduction to Oceanography (3)
11:628:204 The Water Planet
11:628:201-203 and 205-210 Topics in Marine Sciences (1.5)
11:628:221 Human Interactions with the Coastal Ocean (3)
11:628:317 Aquaculture (3)
11:216:309 Fishery Science (3)
11:628:321 Ichthyology (4)
11:628:340 Identification of Marine Invertebrates (2)
11:628:341 Hydrothermal Vents (3)
11:628:342 Marine Conservation (3)
11:628:363 or 364 Oceanographic Methods and Data Analysis (3)
11:628:402 The Role of Polar Regions in the Earth System (3)
11:628:405 Molecular Microbial Oceanography (3)
11:628:410 Biophysical Interactions: from Barnacles to Jellyfish (3)
11:628:451 Physical Oceanography (4)
11:628:452 Geophysical Data Analysis (3)
11:628:461 Biology of Living in the Ocean: Water Column Ecosystems (3)
11:628:462 Biology of Living in the Ocean: Boundary Ecosystems (3)
11:628:472 Chemical Oceanography (3)

11:628:474 Coastal Biogeochemical Cycles in a Changing World (3)
11:628:476 History of the Earth System (3)
11:628:497,498 Special Problems in Marine and Coastal Sciences (BA,BA)
11:670:323 Thermodynamics of the Atmosphere (3)
11:670:324 Dynamics of the Atmosphere (3)
11:670:451 Remote Sensing of the Atmosphere (3)
11:776:400 Fungi in the Environment (3)

# Minor in Medicinal and Economic Botany (18-19 credits) (SEBS)

## Minor in Medicinal and Economic Botany (18-19 credits)

**Adviser:** Nrupali Patel Foran 372 (npatel@sebs.rutgers.edu)

**Program Webpage**: Here

**Managing Department Webpage:** Here

**Recommended Prerequisites (depending on requirements for coursework)**
One semester of biology or adviser approval
One semester of general chemistry or adviser approval
11:776:242 Plant Science

**Required Courses (12)**
11:776:205 Introduction to Ethnobotany (3)
11:776:211 Introduction to Horticulture (3)
11:776:312 Medicinal Plants (3)
11:776:438 Plants and Human Health (3)

**Electives (6-7)**
11:776:221 Principles of Organic Crop Production (3)
11:776:310 Plant Propagation (3)
11:776:313 Medicinal and Aromatic Plants Laboratory (1)
11:776:321 Greenhouse Systems Management 3
11:776:341 Fruit Production (3)
11:776:390 Hemp and Medical Cannabis (3)
11:776:400 Fungi in the Environment (3)
11:776:415 Fungi and Human Health (3)
11:776:439 Nursery Crop Production (3)
11:776:442 Agroecology (3)
11:776:495,496 Special Problems in Plant Science (1-3)
11:020:255 Special Topics in Agriculture and Food Systems (1-3)
11:020:321 Principles and Practices of Small-Scale Organic Farming (3)

11:020:340 Indoor Cultivation of High Value Crops (4)
11:020:436 Sustainable Agriculture (3)
11:020:442 Entrepreneurial Agriculture (3)
11:216:411 Plant Diversity and Evolution (3)
01:450:211 Environment, Society, and Justice (3)
01:450:306 Global Ecosystems and Biodiversity (3)

or other adviser-approved electives: Here

# Minor in Meteorology (18 credits) (SEBS)

## Minor in Meteorology (18 credits)

**Adviser:** Steven Decker; Environmental Sciences Building, Room 227, 848-932-5750 (decker@envsci.rutgers.edu)

**Program Webpage:** Here

**Prerequisites**

Calculus I (01:640:151) (4)
Calculus II (01:640:152) (4)
Multivariable Calculus (01:640:251) (4)
Physics I (01:750:193 or [01:750:203 and 205] or equivalent) (4)
Physics II (01:750:194 or [01:750:204 and 206] or equivalent) (4)

**Required (12 credits)**

Introduction to Meteorology (11:670:101) (3)
Introduction to Climate Science (11:670:102) (3)
Meteorological Analysis (11:670:211) (3)
Thermodynamics of the Atmosphere (11:670:323) (3)

**Electives (6 credits) (Choose two courses from the following)**

Computational Methods for Meteorology (11:670:212) (3)
Dynamics of the Atmosphere (11:670:324) (3)
Hydrologic Processes (11:670:414) (3)
Physical Meteorology (11:670:431) (3)
Weather Analysis and Forecasting I: Synoptic Meteorology (11:670:433) (4)
Tropical Meteorology (11:670:444) (3)
Remote Sensing of Oceans and Atmosphere (11:670:451) (3)
Air Quality Modeling (11:670:453) (3)

# Minor in Microbiology (19-21 credits) (SEBS)

## Minor in Microbiology (19-21 credits)

**Adviser:** Dr. Ines Rauschenbach, Lipman Hall Room 215; 848-932-5635

**Program Webpage:** Here

**Prerequisites:** Students must have completed 01:119:115,116, and 117 General Biology (formerly 01:119:101-102) and 01:160:161-162 General Chemistry with grades of C or better.

**Required Courses:**

1. One course from the following list:

- General Microbiology 11:680:390 (4)

2. At least one course from the following list:

- Introductory Biochemistry and Molecular Biology 01:694:301 (3)
- Introductory Biochemistry 11:115:301 (3)
- General Biochemistry 11:115:403 (4)

3. At least one course from the following list:

- Microbial Genetics and Genomics 11:680:480 (3)
- Microbial Ecology and Diversity 11:680:491 (3) (91k PDF)
- Applied Microbiology 11:680:494 (4)

4. At least 9 credits from the following list:

- Comparative Virology 11:126:407 (3)
- Environmental Microbiology 11:375:411 (3)
- Food Microbiology 11:400:423 (3)
- Pathogenic Microbiology 01:447:392 (3)
- Fungi and Ecosystems 11:628:404 (3)
- Bacterial Physiology 11:680:481 (3) (56k PDF)

Any courses not taken from #3:

- Microbial Genetics and Genomics 11:680:480 (3)
- Applied Microbiology 11:680:494 (4)
- Microbial Ecology and Diversity 11:680:491 (3) (91k PDF)

- Microbial Ecology & Diversity Laboratory 11:680:492 (2)

# Minor in Nonprofit Leadership (23 credits) (SEBS)

## Minor in Nonprofit Leadership (23 credits)

**Coordinator:** Lisa Sanon-Jules, 306 Martin Hall, 732-735-2659 (leadershipdirector@njaes.rutgers.edu)

**Program Webpage:** Here

The curriculum for the minor in nonprofit leadership will prepare students for the unique functions and responsibilities of working and leading in the nonprofit arena. Courses cover the key elements including strategic planning; fundraising; lobbying and advocacy; recruiting, training, and managing a volunteer workforce along with managing salaried employees. Students develop knowledge and skills in basic principles of leadership; foundation skills for managing volunteers; communication skills for advocating for change; planning skills for both program and grant development and management; and relationship skills for building community partnerships. The capstone project is designed for students to integrate concepts from the required courses in nonprofit leadership, while using entrepreneurial skills to develop a hypothetical sustainable nonprofit organization in an area of their interest.

**Objectives**
As a result of completing the Nonprofit Leadership Minor/Certificate, students will:

- Identify leadership philosophy, styles and traits
- Demonstrate effective communication skills for advocating for change
- Identify skills necessary for recruiting, training and managing a volunteer workforce
- Demonstrate skills for developing strategic plans and building community partnerships within the nonprofit sector
- Develop skills for identifying, securing and administering grant funded initiatives
- Demonstrate skills for program design, implementation and evaluation
- Articulate skills for leading a nonprofit organizations

**Required Courses**

11:607:200 Principles of Leadership (3)
11:607:203 Foundations of Volunteer Management (3 )
11:607:364 Grant Development and Management (3)
11:607:381 Presentation Skills: Advocating for Change (3)
11:607:400 Leadership of Nonprofit Organizations (3)
11:607:401 Foundations of Program Planning (3)
11:607:402 Building Community Partnerships (3)
11:607:405 Establishing a Nonprofit--Capstone Experience (2)

# Minor in Nutrition (20-24 credits) (SEBS)

## Minor in Nutrition (20-24 credits)

**Adviser:** Malcolm Watford; Foran Hall, 848-932-6263 (mwatford@sebs.rutgers.edu)

**Program Webpage:** Here

**Prerequisites:** 01:160:161-162, 171, and 01:160:209 or 01:160:307-308

**Required Courses**

01:119:115-116 General Biology (4,4)

11:115:301 Introduction to Biochemistry (3) *or* 01:694:301 Introductory Biochemistry and Molecular Biology (3) *or* 01:694:407-408 Molecular Biology and Biochemistry (3,3) *or* 11:115:403-404 General Biochemistry (4,3)

11:709:255 Nutrition and Health (3)

11:709:400 Advanced Nutrition I: Regulation of Macronutrient Metabolism (3)

11:709:401 Advanced Nutrition II: Energy and Micronutrient Metabolism (3)

# Minor in Plant Science (18-20 credits) (SEBS)

## Minor in Plant Science (18-20 credits)

**Adviser:** Nrupali Patel; Foran 372 (npatel@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

**Prerequisites:** none

**Required Courses (6 credits)**

11:776:211 Introduction to Horticulture (3)

11:776:242 Plant Science (3)

**Electives (12-14 credits)**

Any four of the following courses for which prerequisites have been fulfilled:

11:550:233 Landscape Plants I (3) or 11:550:234 Landscape Plants II (3)

11:550:239 Planning and Planting the Residential Environment (3)

11:776:202 Applied Physiology of Horticultural Crops (3)

11:776:221 Principles of Organic Crop Production (3)

11:776:302 General Plant Pathology (3)

11:776:305 Plant Genetics (4)

11:776:310 Plant Propagation (3)

11:776:312 Medicinal Plants (3)

11:776:321 Greenhouse Systems Management (3)

11:776:341 Fruit Production (3)

11:776:391 Weeds, Diseases, and Insects of Plants (3)

11:776:402 Introduction to Weed Science and Management (3)

11:776:406 Plant Breeding (4)

11:776:439 Nursery Crop Production (3)

11:776:452 Plant Tissue Culture and Engineering (3)

Additional 11:776:xxx classes 200- or above or other adviser-approved electives

# Minor in Public Garden Management (SEBS)

## Minor in Public Garden Management

**Adviser:** Holly Nelson (hgrace@sebs.rutgers.edu)

**Program Webpage:** Here

The public garden management minor provides students in the School of Environmental and Biological Sciences with several options geared to employment opportunities in public horticulture such as public gardens administration, design, and installation, or aspects of planting materials management. Students take two fundamental courses and then choose one of three different tracks to reflect their interest: Garden Design; Planting Materials Management; Institutional People Skills and Management.

**Foundation Courses (Required, 6 Credits)**
11:550:240 Public Garden Management (3)
11:776:211 Introduction to Horticulture (3)

**Tracks (Choose One of the Following)**

**I. Garden Design (12 credits)**
This track includes aspects of public garden design such as development of outdoor displays and creation of attractive seasonal displays. Projects range from garden scale to the occasional landscape scale design.

*Learning Goals*

- Explore how to creatively design space and spatial relationships [creative thinking]
- Understand, analyze, and incorporate natural features and systems to create design solutions [critical thinking]

*Required (7 Credits)*
11:550:220 Public Garden Display-Case Studies (1)*
11:550:221 Design of Public Display Gardens (3)**
11:550:235 Herbaceous Plants in the Landscape (3)

*Choose a Minimum of 5 Credits from the Following:****
11:550:250 History of Landscape Architecture (3)
11:550:338 Introduction to Digital Design and Presentation (1.5)
11:573:445 Ecological Design and Stewardship (4)
11:573:415 Open Spaces Planning and Management (3)

*New course: taught second half of fall semester in conjunction with 11:550:235 Herbaceous Plants in the Landscape.
**Course redesigned and retitled from (previous) 11:550:221 Introduction to Site Design to refocus material to creating and building a garden in a public context.
***Note: The substitution of a 300- or 400-level class related to your interests is permitted with permission of the undergraduate program director.

**II. Planting Materials Management (Choose 12 Credits from the Following)**
This track includes selection, care, and pest management of plant material appropriate for use in public gardens.

*Learning Goals*

- Describe basic knowledge of horticultural principles, landscape/garden plant management, or pest management [technical proficiency]

*Choose 12 Credits from the Following:*
11:776:202 People-Plant Relationships (3)
11:766:210 Principles of Botany (3)
11:776:242 Plant Science (3)
11:776:310 Plant Propagation (3)
11:776:304 Turfgrass Management (3)
11:776:391 Weeds, Diseases, and Insects of Plants (3)
11:550:238 Landscape Management and Maintenance (3)
11:550:233 Landscape Plants I (3)
11:550:234 Landscape Plants II (3)
11:020:321 Principles and Practices of Small Organic Farming (3)

**III. Institutional People Skills and Management**
This track includes fundraising, volunteer management, budgets and accounting, community building, and leadership for students in the public gardens sphere.

*Learning Goals*

- Demonstrate effective leadership communication and conflict management skills [communication, context]
- Evaluate group process and team dynamics [context]

*Required (3 Credits)*
11:607:485 Understanding Group Dynamics and Team Processes (3)

*Choose 9 Credits from the Following:*
11:193:200 Community Gardening for Health and Wellness (3)
11:373:205 Small Business Essentials (3) *or* 33:010:272 Introduction to Financial Accounting (3) (credit will *not* be given for both)
11:550:436 Landscape Enterprise (3)
11:607:402 Building Community Partnerships (3)
11:607:203 Foundations of Volunteer Management (3)

# Minor in Science Communication (18 credits) (SEBS)

## Minor in Science Communication (18 credits)

**Adviser:** Mary L. Nucci, PhD (mnucci@sebs.rutgers.edu)

**Program Webpage:** Here

**Program Description**

The minor in science communication recognizes the pressing need in our technologically based society to understand and communicate science issues personally and professionally. Students in the minor will learn how to access, understand, and communicate evidence-based science information in the context of real-world problems. After completing the minor, students will be better prepared to understand and address the issues in communicating science effectively.

**Learning Goals**

After completing the program students will be able to:

1. recognize the need for understanding science and the scientific process for evidence-based decision-making;
2. make the connection between science and social science expertise on science communication;
3. realize alternative potentials/venues for careers postgraduation;

4. communicate effectively for careers in medical, dental, veterinary, nursing, or allied health fields;
5. effectively convey science information to the general public as well as to scientists; and
6. describe the role of science and scientists in society.

**Required Courses (9 credits)**

11:374:103 Introduction to science communication
11:374:240 Visualizing information: Storytelling with data
11:374:435 Advanced communication in the sciences OR 11:374:311 Environmental writing: Rhetorical strategies for complex ecological issues

**Non-course requirement**
Public presentation (participation in a course presentation, science café, poster session or conference presentation approved by the Program Advisor)

**Electives (9 credits required)**

*Biochemistry*
11:115:491 Biochemical Communication

*Communication*
04:567:340 Science and Health Journalism
04:192:407 Health Communication
04:192:307 Health Literacy
04:192:200 Communication Theory

*Genetics*
01:447:430 Effective Communication Skills in Genetics (Genetics majors only)
01:447:414 Thesis Writing and Communication in Genetics I (Genetics majors only)
01:447:415 Thesis Writing and Communication in Genetics II (Genetics majors only)

*History*
01:506:251 History of Science and Society

*Human Ecology*
11:374:350 Informal Science Education
11:374:430 Risk, Health and Safety
11:374:108 Processes of Human Ecology
11:374:227 Food for Thought: Agriculture and Food Issues in Contemporary Media
11:374:225 Environment in Society and Mass Media
11:374:310 Storytelling for Science Majors

*Marine and Coastal Studies*
11:628:330 Communicating Sciences to Informal Audiences
11:628:340 Communicating and Teaching Climate Science

*Meteorology*

Weather, Climate and Television 1 11:670:111 (1.5 credit)
Weather, Climate and Television II 11:670:112 (1.5 credit)

*Nutritional Sciences*
11:709:442 Nutrition Communication (prerequisites: 709:202, 255, 441)

*Philosophy*
01:730:249 Bioethics

*Psychology*
01:830:321 Social Psychology
01:830:377 Health Psychology

*Theater Arts*
07:965:330 Improving Communication Through Improv

*Women's, Gender, and Sexuality Studies*
01:988:240 Gender and Science

*Writing Program (English)*
01:355:302 Scientific and Technical Writing
01:355:342 Science Writing
01:355:355 Science in the Professions (Only sections: Writing in the Social Sciences, Writing in Medicine)
11:35:312 Writing in Biology
11:355:352 Writing as a Naturalist
11:355:425 Web Authoring

*Online Courses*
11:607:401 Foundations of Program Planning
11:607:402 Building Community Partnerships

# Minor in Sustainable Global Food Systems (18 credits) (SEBS)

## Minor in Sustainable Global Food Systems (18 credits)

**Advisers:** Xenia Morin; Foran Hall, Room 284 (xmorin@sebs.rutgers.edu) and Ethan Schoolman; Cook Office Bldg., Room 208 (ethan.schoolman@rutgers.edu)

**Program Webpage:** Here

The minor in sustainable global food systems (18 credits) is designed for students who wish to expand their understanding of issues and challenges facing food systems that bridge the boundaries of nations and continents. Through this minor program, students will explore how food systems on a global scale are shaped by social, cultural,

historical, political, environmental, and economic factors; and how global food systems in turn affect the environment and society. This option should be particularly useful to students who may pursue careers in the international arena.

Interested students should select a sequence of courses, one from each of four subject areas (I, II, III, IV), that relate to a particular topic, such as agriculture, health, food, or environmental management. The program also requires education in non-U.S. cultures and/or foreign language training (V) and practical experience (VI). Suggested courses that offer an international focus are listed for each of the subject areas below. Other courses may be substituted, in consultation with the directors of the program.

The minor program is administered through the Environmental Policy, Institutions, and Behavior (EPIB) curriculum in the Department of Human Ecology. Interested students should consult with their advisers and either Ethan Schoolman (Cook Office Building, Rm. 208, 848-932-9232; ethan.schoolman@rutgers.edu), or Xenia Morin (IFNH, Ste. 220, 848-932-3502; xmorin@sebs.rutgers.edu).

**Requirements:**

In fulfilling requirements for the minor, at least 3 credits must come from courses in the Department of Human Ecology, and at least 3 credits must come from courses in the Program in Agriculture and Food Systems.

*I. Fundamentals of Sustainable Food Systems (3 credits)*

Courses designed to give students a broad overview of the environmental, social, political, and economic characteristics of different ways of organizing how food is grown, processed, distributed, and consumed. Emphasis is placed in both these courses on models of sustainability. All students in the minor program must take at least one of the following two courses.

11:374:289 Sustainable Food: Politics, Policy, and Ethics (3; Human Ecology)
11:020:210 Introduction to Agriculture and Food Systems (3; Agriculture and Food Systems)

*II. Geography and the Physical Environment (3 credits)*

Courses relevant to understanding environmental systems and problems characteristic of a region, world area, or habitat outside of the United States.

11:374:108 Processes of Human Ecology (3; Human Ecology)
01:450:101 Earth Systems (3; Geography)
01:450:102 Transforming the Global Environment (3; Geography)
11:776:102 Soil and Society (3; Plant Biology)
11:020:492 Tropical Agricultural Systems (3; Agriculture and Food Systems)
11:020:337 Sustainability: Tackling Food Waste (3; Agriculture and Food Systems)

*III. Cultural and Historical Considerations (3 credits)*

Courses relevant to understanding cross-national comparative, historical, and/or sociocultural factors in examining issues related to the environment, food, health, population, and agriculture.

11:374:269 Population, Resources, and Environment (3; Human Ecology)
11:450:205 World Cultural Regions (3; Geography)
01:070:220 Food and Culture (3; Anthropology)
01:070:341 Language, Food, and Society (3; Anthropology)
11:709:363 World Food Customs and Nutrition (3; Nutrition)
11:709:364 Nutrition and Health in Developing Countries (3; Nutrition)

*IV. Political Economy (3 credits)*

Courses relevant to understanding international political and economic institutions, or to the comparative cross-national study of political and economic institutions outside the United States.

11:374:305 Globalization, Development, and Environment (3; Human Ecology)
11:374:279 Politics of Environmental Issues (3; Human Ecology)
11:374:314 Natural Resource Policy (3; Human Ecology)
11:373:371 Food Health and Safety Policy (3; Agriculture, Food, and Resource Economics)
11:776:478 China's Agricultural Challenges and Global Impacts (3; Plant Biology)
11:373:218 Sustainable Food Policy for Developing Countries (3; Agriculture, Food, and Resource Economics)

*V. Foreign Cultures and Languages (3-8 credits)*

Option 1. Completion of instruction, or evidence of its equivalent, in a modern, spoken language other than English for at least two semesters at the intermediate or advanced level. This may include enrollment in SEBS language engagement courses that are currently in development.

Option 2. Courses whose aim is to familiarize students with the history, culture, and politics of regions outside the United States. Some possible courses for completing this requirement are listed below. Students wishing to fulfill this requirement with a course not listed should speak directly to Professor Schoolman or Professor Morin.

01:595:297 Caribbean Societies (3; Latino and Caribbean Studies)
01:016:222 Modern Africa (3; African Studies)
01:508:335 Modern South Asia (3; South Asian Studies)
11:020:465 Special Problems in Environmental Sciences (3; Agriculture and Food Systems)

*VI. Practical Experience or Study Abroad (3 credits)*

This area comprises different ways of gaining insight into food systems outside of the normal classroom setting at Rutgers. Possible ways to fulfill this requirement include relevant research at home or abroad, overseas work, study and travel, employment, or a combination of these. Credits are gained through registration for curricular independent study, field study, research, and practicum courses or a SPIN (Student to Professional Internship Network) experience at the School of Environmental and Biological Sciences. Credits for this requirement must also be approved by either Professor Schoolman or Professor Morin, as the "practical experience" at hand must be substantially related to topics in global food systems.

11:374:490 Research and Practicum (credits by arrangement; Human Ecology)
11:374:492 Environmental Studies Internship (credits by arrangement; Human Ecology)
11:020:490 Practicum (credits by arrangement; Agriculture and Food Systems)

# Minor in Sustainability (SEBS)

## Minor in Sustainability

**Adviser:** Jack Harris (jackharr@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

After completing this sustainability minor program, students will gain competency in the following areas: 1. Foundation, 2. Areas of Inquiry, and 3. Practicum.

**Foundation (9 credits)**

11:373:202 Sustainability Decision Tools (3)
11:216:320 Sustainable Environmental Management (3)
11:374:299 Introduction in Sustainability (3)

**Areas of Inquiry (9 credits)**
One course from each area of inquiry (total of 9 credits) must be successfully completed by all students.

*Resource Management System (3 credits)*

01:450:101 Earth Systems (3)
01:450:102 Transforming the Global Environment (3)
01:450:211 Environment and Society (3)
01:450:213 The Global Climate System (3)
01:450:214 Conservation (3)
01:450:413 Climate System and Global Climate Change (3)
01:460:110 Sea Change: The Rise and Fall of Sea Level and the Jersey Shore (3)
01:460:212 Earth and Life through Time (3)
01:556:143 Energy and Climate Change (4)
11:216:217 Principles of Natural Resource Management (3)
11:216:317 Conservation Ecology (3)
11:216:415 Global Change and Ecology (3)
11:216:470 Conservation Techniques (3)
11:216:488 Restoration Ecology (4)
11:372:413 One Space Planning and Management (3)
11;372:444 Watershed Management: An Interdisciplinary Perspective (3)
11:375:103 Introduction to Environmental Health (3)
11:375:302 Elements of Water and Wastewater Treatment (3)
11:375:307 Elements of Solid Waste Management and Treatment (3)
11:375:421 Air Pollution (3)
11:375:423 Environmental Fate and Transport (3)
11:550:442 Sustainable Landscape Technologies and Systems Design (3)

*Governance (3 credits)*

01:450:370 Climate Change and Society (3)
10:762:480 Ethics in Planning and Public Policy (3)
11:372:202 Environmental Issues in the United States (3)
11:372:231 Fundamentals of Environmental Planning (3)
11:374:115 Water and Society (3)
11:374:279 Politics of Environmental Issues (3)
11:374:313 U.S. Environmental Policy (3)
11:374:314 Natural Resource Policy (3)
11:374:315 International Environmental Policy (3)
11:374:460 Environmental Law and Policy (3)

*Economics and Social Systems (3 credits)*

01:070:302 Culture and the Environment (3)
01:220:339 Economic Development (3)
01:450:103 Human Geography: Space, Place, and Location (3)
01:450:211 Environment and Society (3)
01:450:309 Economic Geography (3)
01:450:360 Cultural and Political Ecology (3)
01:450:370 Climate Change and Society (3)
01:460:203 Building and Maintaining a Habitable Planet (3)
10:832:240 Global Health Perspectives (3)
11:372:202 Environmental Issues in the United States (3)
11:373:101 Economics, People, and Environment (3)
11:373:362 Natural Resource Economics (3)
11:373:363 Environmental Economics (3)
11:374:225 Environment and Health in Society and the Mass Media (3)
11:374:269 Population, Resources, and Environment (3)
11:374:335 Communities and Environmental Change (3)
11:374:424 Segregation and Health (3)
11:550:301 Social and Cultural Aspects of Design (3)
37:575:110 Work, Society, and the Quality of Life (3)
37:575:363 Labor and the Global Economy (3)

**Practicum (3 credits)**
11:374:399 (BA)

# Minor in Urban Forestry (21 credits) (SEBS)

## Minor in Urban Forestry (21 credits)

**Urban Forestry Minor:** Urban and community forestry is the fastest growing segment of the forestry profession, especially in the Northeast, where the total expenditure of time and money on community forestry (nursery, planting, pruning, removals, and line clearance) exceeds that spent on woodlands. This certificate is designed to provide students with the necessary credentials for employment by providing the fundamental knowledge and expertise required for this field.

**Urban Forestry Minor Graduation Requirement (21 credits)**

*Required Courses (9-10 credits)*
11:776:413 Soil Quality (3) or 11:776:440 Soil Fertility (3)
11:573:202 Environmental Issues in the United States (3)
11:550:233 Landscape Plants I /Landscape Plants II (3) or 11:216:272 Dendrology (4)

*Plus 6-7 credits from*
11:216:456 Trees and the Environment (3)
11:216:403 Urban Forestry (3)
11:216:365 Arboriculture (4)

*Plus 3 credits from*
11:216:471 Silviculture (3)
11:776:391 Weeds, Diseases and Insects of Plants (3)
11:370:381 Insect Biology (4)

*Plus 3 credits from*

11:373:121 Principles and Applications of Microeconomics (3)
11:373:231 Introduction to Marketing (3)
11:373:492 Sustainability Decision Tools (3)
11:216:472 Forest Finance and Management (3)

# Certificate in Environmental Geomatics (19 credits) (SEBS)

## Certificate in Environmental Geomatics (19 credits)

The regional and global scope of environmental problems is now well established. Satellite remote sensing provides the only feasible means of monitoring large regions of the earth and its land and water resources in a timely fashion. Remotely sensed data can be combined with other resource data in a computerized geographic information system (GIS). The GIS provides a powerful set of tools to store, integrate, analyze, and graphically display vast amounts of

environmental data. The environmental geomatics certificate is designed to give students, regardless of major, an understanding and working knowledge of remote sensing and GIS technology and its application to environmental resource monitoring and management.

The certificate is administered through the Environmental Planning and Design curriculum. For further information, contact Dr. David Smith in Blake Hall, Room 113, 732-932-9317, or dave.c.smith@rutgers.edu.

**Program Webpage:** Here

**For the Certificate in Geomatics, the following courses are required:**

**Geomatics/GIS (7 credits)**
11:573:232 Fundamentals of Environmental Geomatics (3 cr)
11:573:233 Fundamentals of Environmental Geomatics Lab (1 cr)
11:573:362 Intermediate Environmental Geomatics (3 cr)

**Remote Sensing (3 credits):**
11:216:371 Introduction to Remote Sensing Image Analysis (3 cr)

**Quantitative Analysis (3 credits) - Pick One:**
11:216:369 Analytical methods for Ecol., Evol., & Nat. Res (3 cr)
01:960:401 Basic Statistic for Research (3 cr)

**Advanced Topics (3 credits) - Pick One:**
11:573:462 Advanced Environmental Geomatics (3 cr)
11:216:474 Advanced Remote Sensing Image Analysis (3 cr)

**Elective (3 credits) - Pick One:**
11:216:450 Landscape Ecology (3 cr)
11:573:444 Watershed Management (3 cr)
01:198:111 Introduction to Computer Science (4cr)
04:547:202 Object-Oriented Programming (3cr)
14:332:252 Programming Methodology and Lab 14:332:254 (4cr)
11:573:437 Spatial Data Visualization and Map Design (3 cr)
16:455:501 Seminar in Geospatial Information Science (3 cr)
Other Approved Elective

# Certificate in Environmental Planning (21 credits) (SEBS)

## Certificate in Environmental Planning (21 credits)

Environmental planning requires the integration of environmental information into the planning process and is concerned with the protection and enhancement of environmental systems while meeting demands for growth

and development. The environmental planning certificate program provides a basic introduction to the challenges of environmental planning and enables students from a variety of disciplines to pursue professional careers in planning.

The certificate is administered through the environmental planning and design curriculum. For further information, contact David Tulloch, 93 Lipman Drive, Rm 227, New Brunswick, NJ 08901-8524 or dtulloch@crssa.rutgers.edu.

**Managing Department Webpage:** Here
**Required Courses (12 credits)**

11:573:231 Fundamentals of Environmental Planning (3)

11:573:232 Fundamentals of Environmental Geomatics (3)

11:573:409 New Jersey Planning Practice (3)

11:573:411 Environmental Planning and the Development Process (3)

**Electives (9 credits)**

10:762:305 Principles of Public Policy (3)

10:762:306 Principles of Urban Planning (3)

10:762:315 Theory and Methods of Land-Use Planning (3)

10:762:316 Physical Design and Site Planning (3)

10:762:335 Administrative Issues in Environmental and Land-Use Planning (3)

10:762:420 GIS for Health and Planning (3)

10:762:440 Principles of Real Estate (3)

10:762:444 American Environmental History (3)

10:762:474 Tourism Planning (3)

10:762:481 Housing and Economic Analysis (3)

11:573:413 Open Space Planning and Management (3)

11:375:409 Environmental Statement and Impact (3)

adviser-approved course(s) in planning

# Certificate in Evolutionary Medicine (SEBS)

## Certificate in Evolutionary Medicine

The certificate in evolutionary medicine is intended for students planning or already pursuing careers in medicine and allied health professions, medical research, public health, or global development. It is anticipated that students may earn the certificate as part of premed preparation in the course of an undergraduate degree, in preparation for an advanced research-oriented degree, as a supplement to a degree in public health, or as continuing education for those pursuing careers in health policy or global development.

**Codirectors**

Siobain Duffy, Foran Hall 316, 848-932-6299 (siobain@rci.rutgers.edu)

Rob Scott, BIO 210 (robertsc@rutgers.edu)

**Program Webpage:** Here

**Prerequisites for Certificate Program:**

1. Complete one introductory evolution course with a grade of B or higher from among any one of the following:
   216:110 Evolution, Disease and Medicine
   216:251 Fundamentals of Evolution
   090:296 Genes and Evolution
   070:102 Introduction to Human Evolution
2. Complete one quantitative perspectives course with a grade of B or higher from among any one of the following:
   447:302 Quantitative Biology and Bioinformatics
   070:316 Quantitative Methods in Evolutionary Anthropology
   216:369 Analytical Methods in Ecology, Evolution and Natural Resources
   Another quantitative course approved by CEM Program Co-Directors
3. Register with either the SAS or SEBS Certificate in Evolutionary Medicine Program Co-Director

**Required Courses (minimum 13 credits):**
Students are encouraged to approach the directors about other courses qualifying for these areas as some honors seminars and special topic courses could be excellent fits.

**One genetics course (3-4 credits)**
447:380 Genetics
070:240 Introduction to Molecular Evolutionary Anthropology

**One course on diet, physiology or microbiome (3 credits)**
216:360 Animal Physiological Ecology
070:362 Evolution of Human Diet
070:409 Primate Nutritional Ecology
680:475 Microbiomes and Health

**One course on genetic variation and evolution in humans or infectious microbes (3 credits)**
216:405 Evolution of Infectious Disease
216:302 Parasite Ecology
216:469 Wildlife Diseases
070:356 Human Variation
447:392 Pathogenic Microbiology

**One advanced evolution or evolutionary medicine elective (3 credits)**
447:356 Evolutionary Medicine
447:470 Evolutionary Developmental Biology
070:325 Evolution and Culture
070:328 Evolution and Cooperation
070:422 Theories in Physical Anthropology
070:420: Evolutionary Genetics: Human and Other Primates
216:486 Principles of Evolution

*3 credits of research in evolutionary medicine (as approved by the co-directors) can be used to substitute for one of the latter three electives.*

**Capstone colloquium in evolutionary medicine (1 credit)**
070:491 Evolutionary Medicine Capstone Colloquium

# Certificate in Food Systems Education and Administration (21-22 credits) (SEBS)

## Certificate in Food Systems Education and Administration (21-22 credits)

This certificate program is designed to provide practical skills and experiences appropriate for employment in a wide range of careers involving the development, administration, and delivery of educational programs and services provided by both nonprofit and for-profit organizations. Recognizing that interpersonal skills and business savvy are often as important as solid technical and conceptual foundations in a discipline, the program is intended to supplement a variety of discipline-based major programs.

The program explores communication skills; management skills; experience and skill in the development of proposals and reports; the ability to design, implement, and assess educational programs, activities, and related budgets; and the ability to contribute to a program as both an individual and member of a team. An experience-based education component is an integral requisite for the certificate.

For more information, contact Isaav Vellangany, Cook Office Building, Room 118, 848-932-9132, or isaacv@sebs.rutgers.edu.

**Program Webpage:** Here

**Managing Department Webpage:** Here

The program requires at least 3 credits selected from each of the following areas:

**I. Food Systems/Policy (3 credits)**

11:373:218 Sustainable Food Policy for Developing Countries (3)

11:373:323 Public Policy toward the Food Industry (3)

11:373:331 Economics of Food Marketing Systems (3)

11:373:371 Food, Nutrition, and Health (3)

**II. Communication (3 credits)**

01:335:202 Technical Writing Essentials (3)

01:335:203 Business Writing Essentials (3)

01:355:302 Scientific and Technical Writing (3)

01:355:303 Writing for Business and the Professions (3)

01:355:402 Advanced Writing Workshop (3)

04:192:220 Fundamentals of Speaking and Listening (3)

04:192:380 Public Speaking (3) (for admitted communication majors only)

**III. Management (3 credits)**

11:373:241 Introduction to Management (3)

11:373:341 Management: Human Systems Development (3)

**IV. Interpersonal/Intercultural Relations (3 credits)**

01:512:___ An American history course emphasizing minority/gender issues (3)

01:830:___ A psychology course emphasizing minority/gender issues (3)

01:910:352 Groups at Risk in Contemporary Society (3)

01:920:306 Race Relations (3)

04:192:345 Intercultural Communication (3)

11:300:327 Applications of Psychology in Education (3)

11:374:101 Introduction to Human Ecology (3)

**V. Computer Applications (3-4 credits)**

01:198:110 Introduction to Computers and Their Application (3)

01:198:170 Computer Applications for Business (3)

11:373:210 Business Decision Computer Tools (4)

**VI. Accounting (3 credits)**

33:010:272 Introduction to Financial Accounting (3)

11:373:200 Agricultural Accounting

**VII. On-the-Job Experience (3 credits)**

An internship or cooperative education experience for at least one semester, enabling the students to learn about organizational structure, teamwork, the work ethic, and leadership. It also should provide experience in program planning and budgeting and expose the students to the technical areas in which they desire to work.

# Certificate in Horticultural Therapy (34-37 credits) (SEBS)

## Certificate in Horticultural Therapy (34-37 credits)

**Adviser:** Gary Altman, Foran 184 (gla32@sebs.rutgers.edu)

**Program Website:** Here

**Managing Department Webpage:** Here

**Required Courses (27 credits)**

*Group I: Horticultural Therapy Course Requirements (9)*
11:776:201 People-Plant Relationships (3)
11:776:225 Horticultural Therapy: Concept and Skills (3)
11:776:325 Horticultural Therapy Techniques and Programming (3)

*Group II: Human Sciences Course Requirements (9)*
01:830:101 General Psychology (3)
01:830:271 Principles of Developmental Psychology (human life span development) (3)
01:830:340 Abnormal Psychology (3)

*Group III: Horticulture Course Requirements (9)*
11:776:211 Introduction to Horticulture
11:776:310 Plant Propagation (3)
11:776:391 Weeds, Diseases, and Insects of Plants (3) OR Agricultural Entomology and Pest Management* (3)

**Electives (6-7 credits)**

*Group I Electives (choose one from the list below):*
01:830:371 Group Dynamics (3)
01:830:335 Adult Development and Aging (3)

*Group II Electives (choose one from the list below):*
11:776:302 General Plant Pathology (3)
11:776:321 Greenhouse Systems Management (3)
11:776:439 Nursery Crop Production (3)
11:550:235 Herbaceous Plants in the Landscape (3)
11:550:340 Planting Design (4)

**Internship (1-3 credits)**

11:776:425 Special Topics in Horticulture Therapy
11:776:495,496 Special Problems in Plant Science
11:776:427 Vocational Skills Training in Horticultural Therapy (3)

# Certificate in Medicinal and Economic Botany (25 credits) (SEBS)

## Certificate in Medicinal and Economic Botany (25 credits)

The medicinal and economic botany certificate is designed for students with an interest in the practical uses of plants, both known and yet to be discovered. The program requires a basic knowledge of biology and chemistry, but is available to students in a variety of majors, such as anthropology, conservation biology, or environmental education. The program emphasizes historical and cultural botany, modern medicinal plants, and practical plant production and concludes with research or field experience.

**Advisers:**
James E. Simon, Foran 396C (jimsimon@rutgers.edu)
Nrupali Patel, Foran 372 (npatel@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

**Recommended Prerequisites**
01:119:115,116,117 General Biology and Laboratory
01:160:161,162,171 General Chemistry and Laboratory

**Required Courses (13 credits)**
11:776:205 Introduction to Ethnobotany (3)
11:776:211 Introduction to Horticulture (3)
11:776:242 Plant Science (3)
11:776:312 Medicinal Plants (3)
11:776:313 Medicinal and Aromatic Plants Laboratory (1)

**Practical Experience (3 credits)**
11:776:495,496 Special Problems in Plant Science (by arrangement): an adviser-approved internship focusing on an area of medicinal or economic botany

**Electives (9 credits)**
11:776:221 Principles of Organic Crop Production (3)
11:776:302 General Plant Pathology (3)
11:776:310 Plant Propagation (3)
11:776:321 Greenhouse Systems Management (3)
11:776:341 Fruit Production (3)
11:776:390 Hemp and Medical Cannabis (3)
11:776:400 Fungi in the Environment (3)
11:776:415 Fungi and Human Health (3)
11:776:438 Plants and Human Health (3)
11:776:439 Nursery Crop Production (3)
11:776:440 Soil Fertility (3) or equivalent
11:776:442 Agroecology (3)
11:776:495,496 Special Problems in Plant Science (1-3)
11:020:255 Special Topics in Agriculture and Food Systems (1-3)
11:020:321 Principles and Practices of Small-Scale Organic Farming (3)
11:020:340 Indoor Cultivation of High-Value Crops (4)
11:020:436 Sustainable Agriculture (3)
11:020:442 Entrepreneurial Agriculture (3)
11:216:411 Plant Diversity and Evolution (3)
01:450:211 Environment, Society, and Social Justice (3)
01:450:306 Global Ecosystems and Biodiversity (3)

or other adviser-approved electives

# Certificate in Plant Biosecurity (25 credits) (SEBS)

## Certificate in Plant Biosecurity (25 credits)

**Adviser:** Rong Di (rongdi@sebs.rutgers.edu)

**Program Webpage:** Here

**Managing Department Webpage:** Here

**Required Courses (13 credits)**

11:776:242 Plant Science (3)
11:776:302 General Plant Pathology (3)
11:776:405 Plant Biosecurity Issues and Technologies (3)
11:370:381 Insect Biology (4)

**Electives (12 credits)**

*(A) 6 credits from the following courses:*
11:776:391 Weeds, Diseases, and Insects of Plants (3)
11:216:324 Invertebrate Zoology (4)
11:370:350 Agricultural Entomology and Pest Management (3)
11:370:409 Insect Classification (3)

*(B) 6 credits from the following courses:*
11:776:210 Principles of Botany (4)
11:776:221 Principles of Organic Crop Production (3)
11:776:311 General Plant Pathology Laboratory (1)
11:776:306 Weed Science Management (3)
11:776:408 Turfgrass Pest Science (4)
11:776:495,496 Special Problems in Plant Science (1-3)

or adviser-approved research or USDA-APHIS internship

# Turfgrass Science Certificate Program (25-28 Credits) (SEBS)

## Turfgrass Science Certificate Program (25-28 Credits)

**Advisers:**
Josh Honig, Foran 239 ( honig@sebs.rutgers.edu )

**Program Webpage:** Here

**Managing Department Webpage:** Here

**Recommended Prerequisites**
One semester of biology or adviser approval
11:776:382 Plant Physiology

**Plant Science Fundamentals (6 credits)**
11:776:302 General Plant Pathology (3)
11:776:306 Weed Science Management. (3)

**Soils (6-7 credits)**
11:776:440 Soil Fertility (3) or
11:375:360 Soils and Water (4)
and
11:776:404 Soil Management for Sports Fields and Landscapes (3)

**Required Turfgrass Classes (7 credits)**
11:776:304 Turfgrass Management (4)
11:776:408 Turfgrass Pest Science (3)

**Practical Experience (3 credits)**
11:776:495,496 Special Problems in Plant Science (by arrangement): an adviser-approved internship focusing on an area of turfgrass science

**Electives (3-5 credits)**
11:776:311 General Plant Pathology Laboratory (1)
11:776:389 Applications of Irrigation (2)
11:776:406 Plant Breeding (4)
11:370:350 Agricultural Entomology and Pest Management (3)
11:375:360 Soils and Water (4) (if not taken above)

or other adviser-approved electives

# Student to Professional Internship Network (SPIN) (SEBS)

## STUDENT TO PROFESSIONAL INTERNSHIP NETWORK

**Coordinator:** Kristen Lester; Martin Hall, Room 109, 848-932-3620 (kaf38@rutgers.edu)

The Student to Professional Internship Network (SPIN) at the School of Environmental and Biological Sciences is an academic program designed to supplement campus-based studies through the practical application of theory in full- and part-time field experiences related to students' majors or career interests. This blending of formal study and supervised employment in areas relevant to the educational and professional goals of the student is subject to the same advice and approval by appropriate members of the faculty as is the student's choice of programs and courses.

All students in the School of Environmental and Biological Sciences who are in good academic standing may enter the program upon completion of 24 credits. Non-matriculated, part-time, readmitted, and transfer students who are in good academic standing after completing at least 24 credits, 12 of which must be taken at the School of Environmental and Biological Sciences, also are eligible. Transfers from within the university are eligible immediately if they have completed the first year and are in good academic standing. Students who fail to maintain good academic standing are declared ineligible. Students also must be registered for at least 6 credits in the semester prior to cooperative education employment.

Internships typically provide experiences that are relevant to students' career interests and salaries that are commensurate with the position held. However, the emphasis is on the learning experience provided by the job rather than on preparation for a specific job upon graduation or on any single economic factor.

A maximum of 6 credits earned through the SPIN program may be applied toward graduation. Credits earned are for the educational benefits of the experience, not for having a job. Each student is required to establish an individualized learning contract under the direction of a faculty sponsor. This memorandum of understanding outlines the student's objectives and scholarly responsibilities, the work plan, the plan for evaluation, and the number of credits to be earned (3 credits for a part-time internship or 6 credits for a full-time co-op placement per semester).

An internship is one way of fulfilling the school's Experiential Learning requirement. Credit is awarded on a Pass/No Credit basis.

Students must apply for admission to the program through the office of the coordinator of the SPIN program. Subject to the approval of the coordinator and the student's faculty sponsor, the student registers for an internship (part-time) or cooperative education (full-time) placement as follows:

**11:902:300** ***SPIN Internship I (3)***
First internship registration.

**11:902:301** ***SPIN Internship II (3)***
Second internship registration.

**11:902:400** ***SEBS Coop (6)***
Cooperative education registration.

A maximum of 6 credits earned through participation in a cooperative education program at another institution may be accepted subject to the usual review of transfer credits.

For more information, see the website for the school's cooperative education program, here.

# Military Education (SEBS)

## MILITARY EDUCATION

See Military Education, Air Force, Military Education, Army, and Military Education, Naval in the Programs of Study and Courses for Liberal Arts and Sciences Students chapter of this catalog.

# Honors Programs (SEBS)

## HONORS PROGRAMS

Students applying to the School of Environmental and Biological Sciences may be eligible for the Honors College of Rutgers University-New Brunswick, a residential honors program that brings together the most high-achieving students from all disciplines. The Honors College welcomed its first class of students in the fall of 2015. In addition, the School of Environmental and Biological Sciences offers two schoolwide honors programs:

1. The **General Honors Program** is a four-year program for which university Presidential Scholars and selected high school seniors who apply to the School of Environmental and Biological Sciences prior to the application deadline are invited to compete. Students who join the program are awarded supplementary merit scholarships.

2. The **George H. Cook Scholars Program** is the senior honors thesis program of the School of Environmental and Biological Sciences. Students in the top 15 percent of their class in the fall semester of the junior year are automatically invited to participate, but juniors in the School of Environmental and Biological Sciences who are nominated by a faculty member may join the program in their final three semesters.

3. The **Clearing Corporation Charitable Foundation Agribusiness Scholars Program** is a leadership program of the School of Environmental and Biological Sciences for high achieving students in any of the school's majors aimed at developing future leaders in the global agribusiness sector. Eligible students will have a cumulative GPA of at least 3.0 and will have completed at least 24 credits of coursework by the end of their sophomore year.

Additionally, several departments offer departmental honors in the major program of study to students who fulfill department requirements, which typically include honors courses and/or independent research projects.



# General Honors Program of the School of Environmental and Biological Sciences

# General Honors Program of the School of Environmental and Biological Sciences

**Director:** David Tulloch, Waller Hall, Room 104, 848-932-9162 (tulloch@crssa.rutgers.edu)

Interested students first apply for admission to SEBS through the Office of University Undergraduate Admissions. Students who have been admitted and have indicated SEBS on the Rutgers University application form as their first or second choice among the colleges qualify for consideration to the General Honors Program. Invitations to the program are based on admissions ranking within the application year, considering SAT, class rank, cumulative average and student activities. Honors students participate in the four-year program that requires a 1 credit course in the first semester, two interdisciplinary honors seminars and 11 credits of graduated research prior to graduating. In addition, students must graduate the program with a GPA of 3.4 or higher.

The program includes a variety of social and academic activities throughout the year, recommended by both faculty and students in the program. The academic requirements of the program are as follows:

1. *First Year:* In the first semester, students are registered for an honors section of Exposition and Argument and a 1-credit Readings in Biology course, in addition to the courses they request. Students register for the interdisciplinary honors seminar in the spring semester. The honors seminars are team-taught and integrate formal presentations by faculty and students, reading, discussions, and individual and/or small group research projects. The additional courses selected in the first year will depend upon the curriculum in which the student intends to major. Qualifying students also may be invited by departments to take first-year honors courses.

2. *Sophomore Year:* Each semester, sophomores register for a 1-credit honors tutorial in which they work with a faculty member on a small independent study project that introduces them to research in their areas of interest. In the spring, sophomores also register for the honors seminar.

3. *Junior Year:* Students register for at least 3 credits of honors tutorial, an independent study program in which each student works with one faculty member. The remaining courses selected for the junior and senior years are determined by the curriculum in which the student is enrolled.

4. *Senior Year:* Each semester, students register for a 3- to 6-credit Honors Tutorial (11:554:497,498) or the George H. Cook Scholars Program (11:554:487,488).

In order to remain in the school's General Honors Program and continue to receive the scholarship award that accompanies participation, honors students must (1) enroll as full-time undergraduates and (2) maintain a cumulative grade-point average of 3.4 or better.

Honors Programs (SEBS)

# Clearing Corporation Charitable Foundation Agribusiness Scholars Program

# Clearing Corporation Charitable Foundation Agribusiness Scholars Program

**Directors:** Brian Schilling, Martin Hall Room 309, 848-932-3591, brischi@sebs.rutgers.edu; and Stephen Komar, 973-948-3040, komar@njaes.rutgers.edu

The Clearing Corporation Charitable Foundation Agribusiness Scholars Program is an endowed program at the School of Environmental and Biological Sciences with the purpose of developing future leaders in the global agribusiness sector. The program is available to junior and senior students enrolled in any of the school's major programs who will have completed a minimum of 24 credits by the end of their sophomore year with a cumulative average of 3.0 or have been nominated by a faculty member at the School of Environmental and Biological Sciences.

The scholars program will provide students with the applied knowledge, analytical skills, and experiences required for successful careers in the agribusiness sector. Through an integration of coursework, experiential learning, and engagement with agribusiness leaders, students will develop in-depth understanding of the domestic and international issues driving agricultural markets and the performance of the agribusiness sector.

Students accepted into the Agribusiness Scholars Program will complete 9 credits of required coursework. Students will also participate in academic enrichment, seminars, and networking events to allow interaction with leaders in the agribusiness sector and government.

**Courses Required for Program Completion: 9 credits**

11:373:241 Introduction to Management (3)

11:035:300 Critical Analysis of Issues in Agribusiness I (3) fall semester

11:035:400 Critical Analysis of Issues in Agribusiness II (3) spring semester

Honors Programs (SEBS)

# George H. Cook Scholars Program

# George H. Cook Scholars Program

**Director:** John Reinfelder, Environmental Science Bldg., Room 260, 848-932-5737

The George H. Cook Scholars Program is the senior honors thesis program of the School of Environmental and Biological Sciences. Working under the mentorship of an approved advisor, students in the program conduct original basic and applied research in the natural and health sciences, economics, and public policy majors. They design or evaluate environmental infrastructure or they produce original works in other areas of scholarship. Projects are planned and initiated by at least the end of the second semester of the junior year, and students present their results in a written thesis and orally at a program-wide symposium in the second semester of the senior year. Project advisors are typically members of the Rutgers faculty, but may also include academics and appropriate professionals from other institutions.

To be eligible, students must have achieved a cumulative grade-point average to be in the top 15 percent of their class in the fall of their junior year, and completed a minimum of 24 credits at Rutgers by the end of their junior year. Students with a GPA greater than 3.0 can be recommended to the Honors Committee by a faculty member of the School of Environmental and Biological Sciences. Students must indicate their interest in the program by submitting a pre-registration form during spring of the junior year and must enroll in 11:554:487, 488 GHC Honors Program for a total of 6 to 12 credits during their senior year.

Students submit written project proposals for approval by the Honors Committee at the end of the junior year followed by a brief oral proposal describing project goals at the beginning of their senior year.

Students who successfully complete the two-semester honors course (11:554:487, 488) prepare a thesis, present their work at the program-wide symposium, and are designated as George H. Cook Scholars at graduation.

Honors Programs (SEBS)

## Independent Study, Special Problems, and Departmental Honors

## Independent Study, Special Problems, and Departmental Honors

Specific requirements for participating in departmental honors, special problems, or independent study courses are based upon departmental procedures and individual faculty and program of study requirements. For additional information on these honors programs, contact the Office of Academic Programs, Martin Hall, Room 109, or the specific program in which you are enrolled.

# Study Abroad Programs (SEBS)

## STUDY ABROAD PROGRAMS

Rutgers offers a number of academic-year, semester, and short-term study abroad programs. Information about these programs may be obtained through Rutgers Global Study Abroad located at 102 College Avenue, New Brunswick, NJ 08901-8543; or at the website. Additional information may be obtained from the SEBS Office of Global Engagement. In order to assure optimum planning toward fulfilling major and degree requirements, it is strongly recommended that students contemplating studying abroad consult with both an academic advisor and a study abroad adviser at least 9 months in advance of their planned semester-based program or one semester in advance of short-term summer or winter programs.

# Educational Opportunity Fund (EOF) (SEBS)

## EDUCATIONAL OPPORTUNITY FUND (EOF)

The Rutgers School of Environmental and Biological Sciences (SEBS) Educational Opportunity Fund (EOF)

EOF S.T.A.R.T. U.P. Summer Institute

Solid GEMS Summer Institutes

Prospective Students

Current Students

**EOF Vision**

Promoting academic excellence by cultivating an appreciation for education that transcends the classroom into local and global communities.

**EOF Mission**

Focused on access, academic excellence, and research, the SEBS Educational Opportunity Fund (EOF) cultivates student capacity to make adaptive changes in their educational development and overcome historic socioeconomic factors that challenge their potential for success. SEBS EOF seeks to provide services that assist students in navigating the complexities of an academic and social climate, within a global environment; and, facilitate an understanding of what is required to succeed in college as a science major at Rutgers. Seeking to produce researchers, scientists, and health professionals, SEBS EOF promotes learning outcomes that positions the program to become a leading producer of first-generation graduates and high achieving STEM professionals.

**EOF Core Values: A.G.R.E.E.**

***Academic Research Training (A.R.T.):*** We promote the enhancement of individual analytical reasoning skills to encourage inquiry designed to engage each student's thoughtful approaches to addressing societal problems using scientific reasoning; with the expectation that students will enroll in graduate degree studies.

***Graduation:*** We support each student's desire for academic success creating an environment where educationally purposeful activities focus on removing distractions that hinder graduation.

***Retention:*** We engender an office climate that provides or directs students to resources that will assist with addressing those academic, social, and personal concerns that contribute to student attrition.

***EOF History:*** We promote student understanding of the founding principles and ideas of EOF, hoping to instill a feeling of confidence and sense of belonging for enrolled students.

***Excellence:*** We exude and expect honest, responsible, and ethical behavior as we develop course curriculum that supports student academic success leading to enrollment in graduate school studies.

Inquiries about the Educational Opportunity Fund (EOF) at the School of Environmental and Biological Sciences should be addressed to Jacqueline Moore, Ed.D., Assistant Dean, Educational Opportunity Fund (EOF), Rutgers, The State University of New Jersey, 88 Lipman Drive, New Brunswick, NJ 08901-8525 (848-932-3738).

# Preprofessional Programs (SEBS)

## PREPROFESSIONAL PROGRAMS

Preprofessional Programs (SEBS)

## Health Professions

## Health Professions

The Health Professions Office (HPO) is a full-time operation serving the needs of students and alumni of Rutgers University-New Brunswick who are planning to apply to schools of medicine, dentistry, and other graduate specialties. In addition to advising students, the office provides a variety of services including coordinating several health-related academic and clinical programs; maintaining an HPO database, website, listserv, and electronic files; digitizing and submitting letters of evaluation; coordinating workshops and various events; mentoring student

organizations; and generating a monthly newsletter of events and deadlines; and generating annual admission statistics. For further information, see their website or email the office at hpo@dls.rutgers.edu. The HPO is located at Nelson Biological Laboratories, 604 Allison Rd., Room A-207, Piscataway, NJ 08854.

Preprofessional Programs (SEBS)

# Veterinary Medicine

# Veterinary Medicine

New Jersey does not have a college of veterinary medicine. New Jersey residents who wish to become doctors of veterinary medicine and practice in the United States can obtain their professional education at one of the colleges of veterinary medicine accredited by the American Veterinary Medical Association (AVMA) after completing prerequisite course requirements. There are only 30 accredited veterinary schools in the United States, and three states have two schools: California, Tennessee, and Alabama. There are also AVMA accredited foreign veterinary schools in Canada (5), Australia (4), West Indies (2), Scotland (2), and one each in England, Mexico, the Netherlands, Ireland, and France.

Admission to veterinary school is based on a combination of grades (usually a GPA between 3.0 and 4.0 to even be considered), letters of recommendation from professors and veterinarians, experience in a veterinary practice and/or research, and performance on standardized tests (see below). To prepare for admission to a veterinary college, the student must have acquired a strong scientific and liberal arts background. Most veterinary colleges require at least one, often two, semesters of the following undergraduate subjects: biochemistry, biology, English, general chemistry, genetics, microbiology, organic chemistry and physics. In addition, some will also require courses in statistics, physiology, and even public speaking. The undergraduate program should also provide a broad and diversified background of experiential learning (practicums and internships) enabling students to achieve their full potential as an individual and a member of society. All of the colleges do require that the applicants have experience working with veterinarians in clinical and/or research settings, and some require documentation of the amount of time spent in veterinary practice and/or research. Graduate Record Examinations are required by most colleges of veterinary medicine, usually taken in the spring or summer before the student applies for admission.

Veterinary Aptitude Tests are required by a few schools. Since the prerequisites do differ among the colleges, applicants must check with the individual schools regarding specific course and test requirements. Most colleges of veterinary medicine require a minimum of three years of university-level study prior to admission. Most successful candidates for admission have completed a bachelor of science degree in biological, animal, or agricultural science programs. However, colleges of veterinary medicine do not dictate where or in what degree program applicants should be enrolled for preprofessional study. Most veterinary colleges recommend, however, that applicants pursue a baccalaureate degree in the area of their second choice of vocation. That way if the candidate is not admitted to a college of veterinary medicine, the time spent in preparatory studies may be applied to careers in related sciences, such as human medicine, animal science, biology, biotechnology, laboratory animal science, medical technology, or wildlife biology.

There is no contractual agreement between the New Jersey Higher Education Student Assistance Authority (HESAA) and out-of-state colleges of veterinary medicine for the acceptance of New Jersey residents.

However, qualified students from the School of Environmental and Biological Sciences have been admitted to veterinary medical programs at almost every AVMA-accredited college of veterinary, with many being admitted to more than one program. Further information on application procedures and the Veterinary Medical Education Contract Program are available in the Department of Animal Sciences, Bartlett Hall.

Preprofessional Programs (SEBS)

## Law

## Law

The prelaw advisers at the Office of Undergraduate Education counsel students interested in preparing for admission to law school. A library of law school catalogs and resource materials is available, as are statistics about applications and acceptances to law school. For further information, see here.

# Combined Degree Programs (SEBS)

## COMBINED DEGREE PROGRAMS

Students in the School of Environmental and Biological Sciences may participate in several programs that provide the opportunity to begin advanced degree work while completing a bachelor's degree.

- Joint Bachelor/Medical Degree Programs
- Five-Year B.A. or B.S./M.B.A. Program
- Five-Year B.A. or B.S./M.P.P. Program
- Articulated 3-1-1 Program B.S./M.P.H. or B.A./M.P.H.
- 5-Year BS/EdM Teacher Education Programs
- 4+1 BS/MBS (Master of Business and Science) Programs
- Accelerated Programs

# Joint Bachelor/Medical Degree Programs (SEBS)

## Joint Bachelor/Medical Degree Programs

These programs, offered through the Division of Life Sciences in collaboration with Rutgers Biomedical and Health Sciences, allow for specially selected premedical students early in their college career to begin medical or dental school courses while completing undergraduate courses and degrees. Students may apply to these programs in their sophomore year, and are selected and granted provisional admission into the medical or dental school at the conclusion of their fourth semester, with a second review of the student's credentials during the fourth year of the program.

Robert Wood Johnson Medical School in New Brunswick offers a joint bachelor/doctor of medicine (B.A./M.D.) program. This program is designed for high-achieving premedical students and gives them the opportunity to incorporate medical school courses into their undergraduate program of study in their junior and senior years.

New Jersey Medical School offers a seven-year bachelor/doctor of medicine (B.A./M.D.) program. This program is designed for high-achieving premedical students and gives them the opportunity to incorporate medical school courses into their undergraduate program of study in their senior year.

Rutgers School of Dental Medicine offers a joint bachelor/doctor of dental medicine (B.A./D.M.D.) degree program. This combined degree permits highly qualified students to complete the required courses for both baccalaureate and dental degrees in a seven-year sequence. It consists of three years of undergraduate study at Rutgers and four years of study in the D.M.D. degree program.

Rutgers School of Health Professions offers bachelor/master of science physician assistant program (B.A./M.S.). This program offers undergraduates an opportunity to enter the physician assistant program prior to their college graduation. This is a 3+3 program with the first three years spent as an undergraduate and the last three years spent in the professional graduate program.

For further information students may contact the Health Professions Office by emailing hpo@dls.rutgers.edu, or visiting the office a the Nelson Biological Laboratories
604 Allison Rd,  Room A-207, Piscataway, NJ 08854, and visiting the website. The descriptions of combined degree programs can be found under the Special Programs tab.

# Five-Year B.A. or B.S./M.B.A. Program (SEBS)

## Five-Year B.A. or B.S./M.B.A. Program

Offered in cooperation with Rutgers Business School: Graduate Programs-Newark and New Brunswick, this program allows specially selected students to earn both a bachelor's degree and a master of business administration (M.B.A.) degree in five years. Students must apply for this program in the spring semester of the junior year. If accepted, students will take graduate courses in their fourth year at Rutgers Business School.

Applicants must take the Graduate School Management Admissions Test (GMAT) in their junior year and have a cumulative grade-point average of at least 3.0.

For more information please visit here.

# Five-Year B.A. or B.S./M.P.P. Program (SEBS)

## Five-Year B.A. or B.S./M.P.P. Program

Offered in cooperation with the Edward J. Bloustein School of Planning and Public Policy, this program allows specially selected students to earn a master of public policy (M.P.P.) degree in five years by beginning graduate courses in their senior year and undertaking a summer internship after their fourth year. Students apply for admission in the junior year and have a cumulative grade-point average of at least 3.0.

For more information, please visit here.

# Articulated 3-1-1 Program B.S./M.P.H. or B.A./M.P.H. (SEBS)

## Articulated 3-1-1 Program B.S./M.P.H. or B.A./M.P.H.

This option allows exceptional, well-prepared students with an interest in a public health career to take up to 15 graduate core course credits at the Rutgers School of Public Health and earn both a bachelor's degree and a master of public health (M.P.H.) degree (here). The M.P.H. provides students with a clear understanding of the roles of the core disciplines of public health and specialized skills in at least one public health discipline. The articulated program is administered through the Edward J. Bloustein School of Planning and Public Policy and is open to all majors attending Rutgers University-New Brunswick. Applicants must have at least 60 credits and a cumulative GPA of 3.2.

# 5-Year BS/EdM Teacher Education Programs (SEBS)

5-Year BS/EdM Teacher Education Programs (SEBS)

## Agricultural Science Education (K-12)

## Agricultural Science Education (K-12)

Program Overview

The 5-year program with teacher certification in K-12 agricultural science education, offered jointly by the GSE and Rutgers' School of Environmental and Biological Sciences (SEBS), is designed to prepare students with a comprehensive understanding of agricultural science and content-specific teaching methods appropriate for the discipline. Successful completion of the program will lead to a bachelor's degree, master's degree in science education, and initial teacher certification in agricultural education. Individuals who enjoy working with plants and animals and sharing the importance of agriculture are encouraged to apply. Through required coursework and field placements, students will become familiarized with current standards surrounding agricultural science education, including the delivery of supervised agricultural experiences, and possess the ability to successfully integrate technology into their instruction to promote student learning.

To complete the program in 5 years, Rutgers SEBS undergraduates must complete specific pre-admission coursework and field placements during their sophomore and junior years. Students then apply for the 5-year program before the Spring semester of their junior year and if admitted, enter the professional education sequence in the summer before senior year. After senior year, students qualify to have their bachelor's degree awarded by SEBS and continue with the professional sequence in the summer after graduation. Students will return in the fall to complete a full-time student-teaching internship and continue with full-time graduate study, including a field-based research project in the spring.

After the master's degree is awarded, the GSE will make a recommendation to the New Jersey State Department of Education on behalf of the graduate to receive their Certificate of Eligibility with Advanced Standing (CEAS) as a teacher.

For more information about this program: Download the program guide (includes course list and application requirements) Visit the Rutgers University Agricultural Science Education webpage, Contact the program coordinator, Dr. Thomas Leustek.

5-Year BS/EdM Teacher Education Programs (SEBS)

# Biological Sciences Education (K-12)

# Biological Sciences Education (K-12)

Program Overview

The 5-year program with teacher certification in K-12 biological science education is designed to help students deepen their understanding of the learning and teaching of biological sciences, with a focus on inquiry-based teaching that is aligned with the Next Generation Science Standards (NGSS). Successful completion of the program will lead to a bachelor's degree, master's degree in science education, and initial teacher certification in biological science education. The program curriculum will provide students with exposure to fundamental courses related to education, including the Urban Social Justice Core classes, as well as program-specific coursework related to teaching biology at the middle and high school levels.

To complete the program in 5 years, undergraduate students must complete specific pre-admission coursework and field placements during their sophomore and junior years. Students then apply for the 5-year program before the Spring semester of their junior year and if admitted, enter the professional education sequence in the summer before senior year. After senior year, students qualify to have their bachelor's degree awarded by the undergraduate liberal arts college and continue with the professional sequence in the summer after graduation. Students will return in the fall to complete a full-time student-teaching internship and continue with full-time graduate study, including a field-based research project in the spring.

After the master's degree is awarded, the GSE will make a recommendation to the New Jersey State Department of Education on behalf of the graduate to receive their Certificate of Eligibility with Advanced Standing (CEAS) as a teacher.

For more information about this program, download the program guide (includes course list and application requirements) or contact the program coordinator, Dr. Ravit Golan Duncan.

5-Year BS/EdM Teacher Education Programs (SEBS)

# Physical Science and Physics Education (K-12)

# Physical Science and Physics Education (K-12)

Program Overview

The 5-year program with teacher certification in physical science and or physics education (K-12) is designed to help students deepen their understanding of the core principles surrounding physics and chemistry while developing content-specific teaching methods appropriate for the disciplines. Successful completion of the program will lead to a bachelor's degree, master's degree in science education, and initial teacher certification in physical science and or physics education. Research-driven coursework will provide students with a grounding in the historical and philosophical contexts of the physical sciences as well as with the practical knowledge and skills needed to develop effective student learning environments and to integrate technology into their instruction. As with all teacher preparation programs at the GSE, teacher candidates will exit this program as culturally responsive practitioners, trained to teach and advocate for diverse learners by fostering a deep understanding of students from historically underserved linguistic, economic, and cultural backgrounds and communities.

To complete the program in 5 years, undergraduate students must complete specific pre-admission coursework and field placements during their sophomore and junior years. Students then apply for the 5-year program before the Spring semester of their junior year and if admitted, enter the professional education sequence in the summer before senior year. After senior year, students qualify to have their bachelor's degree awarded by the undergraduate liberal arts college and continue with the professional sequence in the summer after graduation. Students will return in the fall to complete a full-time student-teaching internship and continue with full-time graduate study, including a field-based research project in the spring.

After the master's degree is awarded, the GSE will make a recommendation to the New Jersey State Department of Education on behalf of the graduate to receive their Certificate of Eligibility with Advanced Standing (CEAS) as a teacher.

For more information about this program, download the program guide (includes course list and application requirements) or contact the program coordinator, Dr. Robert Zisk.

# 4+1 BS/MBS (Master of Business and Science) Programs (SEBS)

## 4+1 BS/MBS (Master of Business and Science) Programs

Offered in cooperation with the Professional Science Master's Program, this option allows specially selected students to earn both a bachelor's degree and a master of business and science (M.B.S.) degree in five years. The M.B.S. is a hybrid degree combining courses from a master of science (M.S.) and a master of business administration (M.B.A.). Students choose an applied science concentration that is paired with a business curriculum. Several undergraduate programs at the School of Environmental and Biological Sciences have been paired in this way including biotechnology and genomics, food science, horticulture and turfgrass science, international agriculture, sustainability, and urban environmental analysis. Students apply to this program in their junior year, and if accepted, will complete their coursework in their fourth and fifth years of study. Applicants must have a GPA of 3.2 and must have completed 90 credits by the end of their sixth semester.

# Biotechnology and Genomics

# Biotechnology and Genomics

### Overview

The goal of the MBS Biotechnology & Genomics concentration is to educate and equip students with the knowledge, skills, and tools necessary to successfully lead and manage technical development and commercial applications in areas of molecular biological sciences - including proteomics, biochemistry, cell biology, system biology, and nanobiotechnology. In addition to fundamental scientific principles, students will gain comprehensive knowledge of key business areas including finance and accounting, entrepreneurship, marketing, communication and leadership, management and planning, intellectual property, ethics, and regulations.

### Skills Gained

Through expert instruction and experiential education, students will gain:

- Comprehensive understanding of rapidly evolving developments in structural and analytical methods
- Knowledge of state-of-the-art research methods
- Knowledge of current best practices and protocols in this field
- Computational approaches needed to handle large datasets

### Recommended Experience For Admission

Academic

- Students must have a bachelor's degree in biotechnology, genomics, genetics, biochemistry, biology, or a related field.
- Prerequisite coursework includes two semesters of biology, two semesters of general chemistry, two semesters of organic chemistry, one semester of calculus, and one semester of genetics.
- For students without laboratory experience, the following course is recommended: 11:126:482 Molecular Genetics Laboratory

Professional

- All professional experience will be considered as part of the application process.

Applicants who are unsure of their eligibility for this concentration should schedule an appointment with an enrollment specialist.

# Food Science

# Food Science

### Overview

The goal of the MBS Food Science concentration is to educate and equip students with the skills and tools necessary to successfully manage both technical developments and commercial applications in the food industry and related consumer-driven industries. Students will not only learn fundamental principles and applications of food science and technology, but will gain fundamental knowledge of key business areas including finance and accounting, entrepreneurship, marketing, communication and leadership, management and planning, intellectual property, ethics, and regulatory.

### Skills Gained

Through expert instruction and experiential education, students will:

- Gain comprehensive knowledge of food science and technology as well as food safety
- Gain fundamental knowledge of key industry-related business areas
- Learn state-of-the-art scientific methods, processes, and applications
- Gain an overview of the commercialization process
- Learn about the guiding principles and best practices for product commercialization

### Preferred Academic or Professional Experience

Academic

- Applicants should have a bachelor's degree in one of the following areas: food science, chemistry, biochemistry, microbiology, engineering, or related fields.
- A course in organic chemistry is preferred. Students without organic chemistry experience will be required to complete a course in their first semester.

Professional

- All professional experience will be considered as part of the application process.

Applicants who are unsure of their eligibility for this concentration should schedule an appointment with an enrollment specialist.

# Geospatial Information Systems & Technology

# Geospatial Information Systems & Technology

**Overview**

The goal of the MBS Geospatial Information Systems & Technology (GIS&T) concentration is to equip students with the knowledge, tools, and technological skills necessary to succeed in this emerging, multidisciplinary field. In addition to examining the theoretical basis and the societal and environmental impacts of GIS technology, students will gain fundamental understanding of key business areas including finance and accounting, marketing, communication and leadership, management and planning, intellectual property, ethics, and regulatory.

**Skills Gained**

Through expert instruction and experiential education, students will:

- Gain broad, in-depth knowledge of the diverse applications of GIS technology
- Become skilled in a variety of geospatial technologies
- Gain fundamental understating about use of GIS&T in science, government, and commerce
- Learn about guiding principles and best practices related to GIS&T

**Preferred Academic or Professional Experience**

Academic

- An undergraduate degree in a science-specific discipline is preferred, and applicants should have as solid background in and deep understanding of calculus and statistics. If necessary, students can take calculus and/or statistics courses while earning their MBS degree.

Professional

- All professional experience will be considered as part of the application process.

Applicants who are unsure of their eligibility for this concentration should schedule an appointment with an enrollment specialist.

4+1 BS/MBS (Master of Business and Science) Programs (SEBS)

# Global Agriculture

# Global Agriculture

**Overview**

The goal of the MBS Global Agriculture concentration is to educate and equip students with the skills, tools, and knowledge necessary to emerge as leaders within the global green industry. In addition to gaining a deep understanding of foundational aspects of agriculture including plant pathology, environmental sustainability, and crop management students will gain comprehensive knowledge of key business areas including finance and accounting, entrepreneurship, marketing, communication and leadership, management and planning, intellectual property, ethics, and regulatory.

**Skills Gained**

Through expert instruction and experiential education, students will:

- Gain a thorough understanding of the international agricultural industry
- Gain fundamental, working knowledge of agriculture industry production and management processes
- Gain broad-based knowledge about environmental conservation and the role agricultural enterprises play in maintaining a healthy global environment
- Gain a fundamental overview of key business areas that both impact and are impacted by the international agricultural industry

**Preferred Academic or Professional Experience**

Academic

- It is strongly recommended that students have a bachelor's degree in a science-related field, and that they have completed the following academic requirements: two terms/one year of general biology (with laboratory); two terms/one year of general chemistry with laboratory; two courses in Math (Statistics and Calculus). In certain cases, course requirements can be modified or waived.

Professional

- All professional experience will be considered as part of the application process.

Applicants who are unsure of their eligibility for this concentration should schedule an appointment with an enrollment specialist.

4+1 BS/MBS (Master of Business and Science) Programs (SEBS)

# Global Food Technology and Innovation

# Global Food Technology and Innovation

**Overview**

The goal of the MBS Global Food Technology & Innovation concentration is to educate and equip students with the knowledge, skills, and tools necessary to successfully understand and manage ongoing technical developments and commercial applications in the global food industry. In addition to learning fundamental principles and applications

of food science and technology, students will gain comprehensive knowledge of key business areas including finance and accounting, entrepreneurship, marketing, communication and leadership, management and planning, intellectual property, ethics, and regulatory.

**Skills Gained**

Through expert instruction and experiential education, students will:

- Gain comprehensive knowledge of food science and technology, as well as food safety and management
- Gain broad-based knowledge of key business skills relevant to the global food industry
- Gain in-depth understanding of end-to-end commercialization and innovation processes, as well as the guiding principles and best practices for product commercialization
- Learn to successfully integrate their scientific background and business knowledge to create and convert new ideas into commercially viable applications
- Learn to leverage their integrated science and business knowledge for complex problem-solving.

**Preferred Academic or Professional Experience**

Academic

- Applicants should have a bachelor's degree in one of the following areas: food science, chemistry, biochemistry, microbiology, engineering, or related fields.
- Students without organic chemistry experience will be required to complete this chemistry course in their first semester.

Professional

- All professional experience will be considered as part of the application process.

Applicants who are unsure of their eligibility for this concentration should schedule an appointment with an enrollment specialist.

4+1 BS/MBS (Master of Business and Science) Programs (SEBS)

# Horticulture and Turfgrass Science

# Horticulture and Turfgrass Science

**Overview**

The goal of the MBS Horticulture & Turfgrass concentration is to educate and equip students to work as private consultants or to be directly hired by institutions to design, manage, and provide direct services related to horticulture, landscaping, agriculture, commercial horticulture, and turf management. In addition to gaining advanced, hands-on scientific knowledge, students will gain fundamental knowledge of key business areas including finance and accounting, marketing, communication and leadership, ethics, intellectual property, regulatory, and entrepreneurship.

**Skills Gained**

Through expert instruction and experiential education, students will:

- Gain thorough understanding of horticulture and related career areas
- Gain fundamental, working knowledge of production and management processes
- Gain a fundamental overview of key business areas that both impact and are impacted by the international agricultural industry

**Preferred Academic or Professional Experience**

Academic

- It is strongly recommended that applicants possess a bachelor's degree in biological sciences or human science area (social work, psychology or related fields).
- It is also recommended that students have completed one year of general biology, one year of general chemistry, and one year of plant science and/or botany.

Professional

- All professional experience will be considered as part of the application process.

Applicants who are unsure of their eligibility for this concentration should schedule an appointment with an enrollment specialist.

4+1 BS/MBS (Master of Business and Science) Programs (SEBS)

# Sustainability

# Sustainability

**Overview**

The goal of the MBS Sustainability concentration is to educate and equip students with the skills and tools necessary to identify, analyze, and better understand connections among social, environmental, technological, and economic systems environmental, social, and governance (ESG) as well as the forces driving these systems. In addition to learning state-of-the art methods to successfully measure, predict, and influence key processes that influence sustainability, students gain fundamental business knowledge in areas including finance and accounting, marketing, communication and leadership, ethics, intellectual property, regulatory, and entrepreneurship.

**Skills Gained**

Through expert instruction and experiential education, students will:

- Learn a systems-based problem-solving approach to envision and forecast how individual and local actions can affect the function of larger ecosystems, structures, organizations, and/or processes

- Gain fundamental understanding of the interactions of social, environmental, and economic systems
- Learn to propose and promote strategies that meet short-term organizational needs while promoting long-term, sustainable outcomes
- Gain fundamental knowledge of key business areas related to sustainability, as well as the impact of sustainability efforts on these areas

**Preferred Academic or Professional Experience**

Academic

- It is strongly recommended that applicants possess at least a bachelor's degree in a scientific or engineering discipline. In some cases, promising students without science or engineering degrees may be accepted to the program.
- It is also recommended that students have completed: one semester of calculus, one year of chemistry, one year of another science (e.g., environmental science, ecology, biology, physics, meteorology, air or water pollution, geology), and one semester of statistics.

Professional

- All professional experience will be considered as part of the application process.
- Previous education in environmental sciences is not required.

Applicants who are unsure of their eligibility for this concentration should schedule an appointment with an enrollment specialist.

# Accelerated Programs (SEBS)



# Bioenvironmental Engineering

# Bioenvironmental Engineering

**Combined B.S. - M.S. Degree Program for Bioenvironmental Engineering - Program Description**

**Overview**
The Graduate Program in Bioenvironmental Engineering (BEE) and the Undergraduate Programs in Environmental Engineering (EnvE) offer a Combined B.S. - M.S. (4+1) Program enabling qualified BEE/EnvE undergraduate students to be accepted into the BEE graduate program in an expedited way, thus providing those students the possibility to earn an M.S. degree in a shortened time frame.

Recent alumni surveys of BEE/EnvE graduates have shown that approximately 50% of B.S. graduates have gone on to obtain Professional Engineering (PE) licenses. State PE licensing boards are considering a Graduate Studies requirement for all new PEs (in fact, The American Society of Civil Engineering's (ASCE) Policy Statement 465 directly addresses this). Thus, a seamless process leading directly to an M.S. degree is of major benefit to qualified BEE/EnvE students.

In addition, approximately 25% of BEE/EnvE graduates have found employment in the government sector. Some government agencies, including the United States Environmental Protection Agency, regard the M.S. degree as a professional credential with recipients eligible for salary increases.

**Eligibility**

BEE/EnvE undergraduates who have attained an overall GPA of 3.2 or higher and have completed (or are completing) the second semester of their junior year are eligible to apply to the 4+1 program. Students usually apply during their sixth semester or right before their seventh semester. Applicants apply through the Graduate School application portal. The application fee is waived. The interested student must have completed 90 credits of coursework by the end of their sixth semester of undergraduate study. They will be granted conditional admission while they are still undergraduates and be formally admitted to the M.S. program once they have successfully completed all the requirements for their undergraduate degree. Students are encouraged to discuss with their undergraduate advisor and the directors of the graduate and undergraduate programs, how to best plan their courses during their senior year.

Consistent with School of Graduate Studies policy and other Rutgers Engineering Programs, the GRE requirement is waived for students applying for the 4+1 program. However, it is still recommended that the GRE exam be taken, as it is required for many applications for national fellowships, as well as by many graduate programs at other universities.

**Study Program**

The traditional BEE M.S. program offers two plans: (A) 24-25 credits of coursework, 6 credits of research, and a comprehensive oral examination that includes the defense of a written thesis; or (B) 30 credits of coursework, submission of an approved critical essay, and a comprehensive oral examination. It is typically completed over a 1.5-year to 2-year time period. The B.S. - M.S. (4+1) program also offers two plans and provides students with the opportunity to earn a Master's degree within an expedited time frame. This becomes possible by taking one or more graduate-level courses in the senior year in addition to completing the undergraduate degree requirements.

The following description is a recommended study sequence for the 4+1 Plan B program:

- Senior year: During the Spring Semester the student takes at least one graduate course in addition to the remaining B.S. courses.
- Summer after Senior Year: Consult with advisor to define topic and scope of critical essay.
- Fifth year Fall Semester: The student takes four 3-credit graduate courses, a one-credit graduate seminar (16:116:611 or 16:375:613) and Special Problems in Bioenvironmental Engineering (16:116:697) for one credit for preparation of the critical essay.
- Fifth year Spring Semester: The student takes four 3-credit graduate courses. In addition, the student takes Special Problems in Bioenvironmental Engineering (16:116:698) for one credit for completion of the critical essay.
- Summer following fifth year: The student finalizes the critical essay and takes the comprehensive final exam.

Alternatively, the following is a recommended study sequence for a Plan A (research) program. This program is suggested for students who will be starting or have been conducting research as part of the Slade or George H. Cook Scholars Programs:

- Senior year: Enroll in Slade Scholars or George H. Cook Honors Program. Take six credits of Honors Research (e.g., 650:491 and 650:492 for Slade Scholars), which count as course credits towards the B.S. Honors research can become the thesis topic for the M.S. degree. Students take 2 graduate courses, if prepared, but can take up to 3 graduate courses. Please note that courses used to satisfy B.S. requirements may not be used to satisfy M.S. requirements (i.e., no "double counting").
- Fifth year: Three graduate courses and three credit hours of research each semester. A one-credit graduate seminar is taken during the fall semester.
- Summer (and perhaps fall) following fifth year: Write M.S. thesis and defend.

Note: Students can change advisors at the end of their fourth year. The Honors research topic does not necessarily have to be the M.S. thesis topic.

Accelerated Programs (SEBS)

# Environmental Science

# Environmental Science

**Co-terminal (4+1) BS/MS Environmental Science**

GPD: Lisa Rodenburg (lisa.rodenburg@rutgers.edu) 848-932-5774

For more information, click here.

**Overview**
The Graduate Program in Environmental Science is pleased to announce the creation of a 4+1 BS+MS program in Environmental Science (ES). Advantages to students pursuing the BS to MS co-terminal degree include: the possibility of pursuing graduate studies at a top-ranked university, the possibility of continuing undergraduate research projects and transforming them into graduate-level research, the option to complete graduate studies in a reduced timeframe and with cost-effective fee structure, and the possibility to have the GRE application requirement waived.

**Resources and logistics**
The curriculum for the "+1" MS degree is the same as the general MS curriculum. Currently, we offer both the plan A (thesis) and plan B (non-thesis) MS degree. We expect that most 4+1 students will choose the plan B option, but the plan A will also be available to 4+1 students. We expect that students who have performed undergraduate research, especially those that have done this research as part of a George H. Cook Honors Thesis, will continue this research and expand it into their plan A master's thesis.

**Procedures and Policies for Admission**
Admission to the program is requested by the student in January of their Junior year through the Graduate School application portal. At the time of application, the student should have completed at least 75 course credits toward their BS. They will be granted conditional admission while they are still undergraduates, and be formally admitted

to the MS program once they have successfully completed all the requirements for their undergraduate degree. Students will have to explain in their application how they plan to complete requirements for the BS and MS during their senior year, and will be encouraged to plan for this in conversation with the Directors of the undergraduate and graduate ES programs, and their undergraduate advisor.

Applications to this track will be reviewed by the admissions committee along with all other applicants to the ES MS and PhD programs. The deadline for admissions to all of these programs for a Fall semester start is January 15th. By allowing 4+1 students to apply during their junior year, a full year before they would apply to outside programs, we can ensure that they receive an admissions decision by May 1, well before they need to think about applying to other graduate programs. The GRE requirement is waived for students with a GPA of 3.0 or above in their ES major.

As with all MS students, 4+1 students accepted into the MS program have the option of switching to the PhD program subject to the approval of the Graduate Director. Students may choose to earn the MS degree on the way to the PhD, or may go directly to the PhD program.

Accelerated Programs (SEBS)

# Food and Business Economics

# Food and Business Economics

**Environmental and Business Economics 5-year B.S./M.S Program**

This 5-Year BS/MS program allows students to earn both a bachelor's degree in any of the majors at Rutgers University and a master's degree in Food and Business Economics in five years rather than the usual six years (4+2=6). Students must apply while they are in their junior year (see To Apply below). Students who are not Environmental and Business Economics (EBE) majors but interested in the program would also be able to take advantage of this program provided they have the required preparation in economics.

This program recognizes that both bachelor's and master's degrees offered by DAFRE follow rigorous curricula and reside within one of the most prestigious professional schools at Rutgers University - the School of Environmental and Biological Sciences (SEBS). Many SEBS undergraduates, particularly those who major in EBE, seek careers in the region's financial, pharmaceutical, and food industries as well as careers with marketing and consulting firms. These students have an opportunity to attain a MS degree where they will obtain high levels of quantitative and analytical skills in the economics of biotech/pharmaceutical sectors, production and marketing of agricultural and food products, land/environmental policy and management, and international development.

The proposed 3-1-1 program also provides an excellent alternative to the typically more expensive M.B.A. program. In addition, this program will equally prepare those who seek to pursue doctoral programs in the fields of agricultural and resource economics, economics, agribusiness, and public policy. View our brochure.

**BS/MS Admissions Requirements**

- Students should discuss the program with the Graduate Program Director, Graduate Program in Food & Business Economics, Department of Agricultural, Food & Resource Economics. Contact information for the GPD: Dr. Isaac Vellangany, Associate Professor, isaacv@sebs.rutgers.edu; Tel: 848-932-9131.
- Minimum 3.0 GPA or better is required at the time of application.

- Students must successfully complete either Intermediate Microeconomics (01:220:203) or Demand and Price (11:373:422) no later than Spring Semester of their junior year.
- Students should apply to the program in the Spring Semester (May 31st deadline) of their junior year (need to make sure that they are applying to the 3-1-1/MS program and not to the traditional MS program).

**To Apply to the BS/MS Program**

- Fill out the B.S./M.S. degree application form.
- Attach a copy of your transcript (downloadable copy is acceptable)
- Submit a personal statement, i.e., statement of purpose, explaining why you would like to pursue this program
- Three letters of recommendations

Once a student is admitted and he/she maintains the requirements discussed earlier, then during Spring semester of senior year the student will submit a formal application to the Rutgers Office of Graduate and Professional Admissions. The student will use the personal statement submitted (mentioned earlier) in this formal application. The Graduate Program in Food & Business Economics will forward the recommendation letters submitted by the student earlier to the Graduate Admissions office on his/her behalf.

**A Typical Program of Study for the B.S./M.S. Program in Food and Business Economics (full-time) will be as follows:**

SENIOR YEAR (FOURTH YEAR)

Fall:

1. Econometric applications (11:373:425), or Econometrics (01:220:322) (This course should ideally be taken by interested students in an earlier fall semester, and must not count towards their B.S. degree requirements.)
2. Research methods (16:395:503)
3. Micro theory w/app (16:395:505)

Spring:

1. Applied econometrics (16:395:506)

FIFTH YEAR

Fall:

1. Graduate elective courses 9 Credits for those in the thesis option. 12 Credits for those in the Plan B option.

Spring:

1. Graduate elective courses:3 Credits for those in the thesis option. 12 Credits those in the Plan B option.
2. Research in Food & Bus Econ (16:395:702) 6 Credits for those with thesis option
3. Indep. Study in Food & Bus Econ (16:395:620) 3 Credits for those with Plan B option

*For those in the thesis option, write M.S. thesis and defend. For those in Plan B, write the Plan B paper and defend.*

*To successfully complete the M.S. program in Food & Business Economics, a student must complete either 24 course credits and 6 research credits (thesis option), or 30 course credits and 3 independent study credits (non-thesis option).*

Accelerated Programs (SEBS)

# Landscape Architecture

# Landscape Architecture

**BSLA + MLA Dual-Degree 5 Year Program**

**OVERVIEW**
The dual degree program provides academic space and instruction for students to develop the rigor of independent graduate research and design and enhance their preparation for professional or academic careers.

**BENEFITS OF A DUAL DEGREE**

- Pursue your career goals and passions with original research and design projects that align with your interests.
- Address contemporary challenges engaging in interdisciplinary research with faculty and advisors across departments and schools at Rutgers.
- Enhance your professional practice and community work experience by building relationships with municipalities, ecological groups, and community organizations.
- Focus discussions about equity and inclusion in the practice of landscape architecture by challenging established disciplinary norms.

**APPLY TO THE DUAL DEGREE PROGRAM**
Undergraduate BSLA candidates apply for admission to the Dual Degree MLA program in February of their junior year. A call for applications is announced at the beginning of the Spring semester and the application requirements include:

- Portfolio
- Personal Statement (Why do you want to pursue a masters in Landscape Architecture? What are your career goals?)
- Unofficial Transcript
- 2 Academic Letters of Recommendation. Recommenders email directly to: Gail McKenzie
- Optional supplementary letters from non-academic connections (employer, non-profit, volunteer position). Email directly to: Gail McKenzie

Email your application documents to: Gail McKenzie.

If you have any questions, contact Richard Alomar, Graduate Program Director.

More information about coursework

Accelerated Programs (SEBS)

# Meteorology

# Meteorology

**4+1 Program in Meteorology/Atmospheric Science (BS/MS)**

**General Information**
The 4+1 Program in Meteorology/Atmospheric Science (BS/MS) allows Rutgers SEBS students to obtain both BS (Meteorology) and MS (Atmospheric Science) degrees in five years by taking some graduate-level courses in their fourth year.

**How to Apply**
Students wishing to complete the 4+1 program should apply by sending a personal statement to the Undergraduate Program Director by the end of the spring semester of their second year of post-secondary study.

**Requirements**
*Automatic Admission*
Students who apply and meet the following requirements will be automatically accepted into the program:

- The following prerequisites completed (with C's or higher) by end of the spring semester:
    - 11:670:101 Introduction to Meteorology
    - 11:670:102 Introduction to Climate Science
    - 11:670:211 Meteorological Analysis
    - 11:670:212 Computational Methods for Meteorology
    - 01:640:151¿152 Calculus for Mathematical and Physical Sciences
    - 01:640:251 Multivariable Calculus
    - 01:750:203¿204 General Physics
    - 01:750:205¿206 General Physics Laboratory
- 11:670:323 Thermodynamics of the Atmosphere on fall schedule
- No more than 30 transfer credits
- Cumulative GPA of 3.30 or higher (including spring and summer courses of second year)

*Other Scenarios*
Should an applicant not meet the requirements for automatic admission, the Graduate Program in Atmospheric Sciences Admissions Committee will consider the applicant's personal statement and all other pertinent information and make a decision on admission to the 4+1 program.

**Decision Timing**
All applicants will be notified about acceptance into the program by the end of August.

**For more information, click here.**

# Explanatory Note (SEBS)

## EXPLANATORY NOTE

Each course at Rutgers University is given a unique eight-digit number, which precedes the course name in the following listing. The first two digits are the administrative code (standing for the faculty or school offering the course), the next three digits are the subject code for the course, and the final three digits are the actual course number.

*Administrative Codes.* The administrative code for the School of Environmental and Biological Sciences is 11. For a complete list of administrative codes, see the beginning of the Programs of Study and Courses for Liberal Arts and Sciences Students section in this catalog.

*Subject Codes.* A subject code comprises the third through fifth digits in all course numbers and indicates the subject matter of the course. Courses with the following subject codes are listed in this chapter. (Subject codes are not necessarily major programs of study and do not always have the same code numbers as the curricula.)

015 Environmental and Biological Sciences

020 Agriculture and Food Systems

035 Agriculture and Natural Resource Management

067 Animal Science

115 Biochemistry

117 Bioenvironmental Engineering

126 Biotechnology

193 Community Health Outreach

216 Ecology, Evolution, and Natural Resources

364 Educational Opportunity Fund

370 Entomology

373 Environmental and Business Economics

374 Environmental Policy, Institutions, and Behavior

375 Environmental Sciences

400 Food Science

550 Landscape Architecture

554 Interdisciplinary Studies

573 Environmental Planning

607 Leadership Skills

628 Marine Sciences

670 Meteorology

680 Microbiology

709 Nutritional Sciences

776 Plant Biology

902 Student to Professional Internship Network (SPIN)

*Course Numbers.* The sixth, seventh, and eighth digits comprise the course code in all course numbers. Two course codes separated by a comma indicate that each semester may be taken independently of the other (example: 11:015:483,484). Two course codes separated by a hyphen indicate that satisfactory completion of the first semester is a prerequisite to the second semester (example: 01:119:101-102); however, credit may be earned for the first semester without registration for the second. In general, course numbers beginning with "1" or "2" (e.g., 101; 210) are intended for students in their first or second year of study at the university, while course numbers beginning with "3" or "4" (e.g., 325; 432) are more advanced courses intended for students in their third or fourth year of study at the university.

*Course Credits.* Credits awarded for the successful completion of each course are indicated in parentheses following the course title. The credit-prefix E indicates that the credits are not included in the calculation of credits required for graduation ("degree credits"). The notation BA indicates that the number of credits is determined by arrangement with the department offering the course. The notation P/NC indicates that the course is graded on only a Pass/No Credit basis.

*Hours of Attendance.* Unless otherwise indicated, a course normally meets for a number of lecture hours per week equal to the number of credits to be earned. Special hours or modes of class other than lecture (e.g., recitation; laboratory), are usually indicated below the course description.

Consult the Schedule of Classes for the name(s) of the faculty member(s) currently offering each course.

# Agriculture and Food Systems 020 (SEBS)

## AGRICULTURE AND FOOD SYSTEMS 020

**11:020:205** ***Careers in Agriculture, Food, Natural Resources, and the Environment (1)***
This survey course will introduce students to career opportunities in the areas of agriculture, food systems, and natural resources through invited guests and analysis of career trends. Students will learn to research a career path and present their research to the class. The final assignment is to create a cover letter and resume for a summer job. Attendance is required in all classes.

**11:020:210** ***Introduction to Agriculture and Food Systems (3)***
The online course examines the challenges faced by humanity to produce enough food for a growing world population, which is expected to exceed 9 billion by 2050, including risks from weather events, soil degradation and water shortages, pest and disease pressure, dwindling genetic diversity, and increasing energy demands. The course will also examine the controversies over adoption of technologies as well as social justice and ethical considerations. Potential solutions are examined including sustainable agriculture and the role that consumers can have through the food choices they make.

**11:020:215** ***Applied Practical Applications in Agriculture and Food Systems (3)***
Students will learn qualitative and quantitative problem-solving skills focusing on applied practical applications in agricultural and food enterprises. These are skills that must be mastered to be successful, accurate, efficient, and safe when working.
***Prerequisite: 11:020:210 or permission of instructor.***

**11:020:255** ***Special Topics in Agriculture and Food Systems (3)***
In this lecture class students will analyze current topics in agriculture and food systems. A different special topic will be analyzed each time the course is offered and will be made available at the time of registration. The course is designed for nonmajors as well as majors.
***Prerequisite: Enrollment by permission of the instructor.***

**11:020:296** ***Honors Seminar (3)***
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
***Open only to honors students (SEBS Honors Program, SAS Honors Program, and Honors College) or by permission of instructor.***

**11:020:305** ***Starting and Managing a Small Farm (3)***
This course takes a case study approach drawing from a variety of farm types. Students will examine the basics of traditional and organic farming systems and learn about resources and strategies to get started running their own farm business. Topics include horticultural crop and/or animal selection, business and economic assessment of the markets in the Northeast, farm management tools, and regulatory requirements.
***Prerequisite: 11:020:210 or by permission of the instructor.***

**11:020:315** ***Direct Farm Marketing and Agritourism (3)***
This course prepares students to successfully develop and manage agricultural enterprises in urbanized areas where farming opportunities involve direct retail sales to customers via community farmers markets and agritourism venues. Students will prepare, present, and evaluate enterprise development projects.

**11:020:321** ***Principles and Practices of Small-Scale Organic Farming (3)***
Through hands-on learning in the field, students will gain an understanding of organic food production and will improve their agricultural literacy and ability to work collaboratively with peers and community members.

**11:020:333** ***Community Food Justice and Advocacy (3)***
This course will focus on building student's knowledge and skills in advocacy in order to help promote healthier, more sustainable, and more equitable food systems. Students will be introduced to the concepts of food justice and

food sovereignty, and introduced to the value of individual and community-level advocacy and action as means to achieving them.
***Prerequisite: 11:020:210 or by permission of the instructor.***

**11:020:337** ***Sustainability: Tackling Food Waste (3)***
Students will develop analytical skills and experience to help them be part of the solution to the food waste problem. Students will learn about sustainability and food waste through case studies, and will consider various opportunities, methods, and scales of action that can contribute to food waste reduction. One or more field trips.
***Prerequisite: 11:020:210 or 11:374:299 or 11:374:298 or permission of instructor.***

**11:020:340** ***Indoor Cultivation of High-Value Crops (4)***
Investigates the use of emerging greenhouse technologies for agribusiness production of high-value crops. Students will gain hands-on training with commercial mini-model hydroponic, geoponic, and aeroponic indoor growth systems and the development of a production, business, and marketing plan.
***Open to sophomores, juniors, and seniors.***

**11:020:425** ***Developing Ideas in Agricultural Education (3)***
This course develops the core concepts covered in agricultural K-12 education. Design and development of curricula and curriculum evaluation procedures appropriate to agricultural/extension education. Principles and techniques for developing leadership skills: interpersonal influence, commitment, goals, and power for effective leaders. Issues and problems facing leadership in agriculture.

**11:020:426** ***Teaching Agriculture and Food Systems (3)***
Pedagogical content knowledge and skills for teaching in agricultural/extension education. Analysis of the agricultural/extension education curriculum; development of teaching strategies and adjustments for different students; lesson planning; design of formative and summative assessment tools.

**11:020:436** ***Sustainable Agriculture (3)***
Through class participation and field trips to a variety of New Jersey farm operations (including farms in the Pine Barrens), this course will explore sustainability challenges facing U.S. farmers in relation to farming and soil practices, struggles for economic profitability, and public policies. Topics include cover crops and rotations, agricultural chemical benefits and risks and integrated pest management, industrial animal farms and food safety, genetically modified organisms (GMOs), cost-price squeeze, etc.

**11:020:442** ***Entrepreneurial Agriculture (3)***
Principles of identifying and pursuing business opportunities in production agriculture. The course focuses on development of business and marketing plans and farm management skills.

**11:020:455** ***Advanced Topics in Agriculture and Food Systems (3)***
This advanced seminar class challenges students to use their analytical and critical thinking skills to analyze and assess important topics in agriculture and food systems. A field trip is included. Topics change regularly.
***Prerequisite: Enrollment by permission of the instructor.***

**11:020:460** *Applied Analysis of Successful Agricultural Enterprises (3)*
Students will learn about major agricultural production systems throughout the state and region through discussions and visits to successful farm operations. Program emphasis will include analysis of management practices and total business skills, attitudes and approaches that separate mediocre and highly successful agricultural enterprises.

**11:020:465** *Feeding America's Cities (3)*
This seminar course will focus on a deep analysis of the food systems of cities and build critical thinking, writing, and presentation skills.
*Prerequisite: 11:020:210 or permission of instructor*

**11:020:490** *Agriculture and Food System Practicum (3)*
This course allows student to gain experience-based education in consultation with a faculty adviser. A learning contract is agreed upon at the start of the project. A report must be submitted by the student at the end of the practicum.
*Prerequisite: Enrollment by permission of the instructor.*

**11:020:492** *Tropical Agricultural Systems (3)*
Analysis of tropical agriculture systems: climatic parameters, major and important crops, animals, cropping systems, social and technical constraints, and methods of analysis.
*Prerequisite: Enrollment by permission of the instructor.*

**11:020:495,496** *Special Problems in Agriculture and Food Systems (3)*
Projects in agriculture and food systems with assigned reading, laboratory work, and conferences.
*Prerequisite: Enrollment by permission of the instructor.*

# Agriculture and Natural Resource Management 035 (SEBS)

## AGRICULTURE AND NATURAL RESOURCE MANAGEMENT 035

**11:035:200** *Quantitative Methods for Program Evaluation (3)*
This course introduces students to the summary and analysis of evaluation data from community education and outreach programs in environmental, youth development, community healthy, and agriculture disciplines. Students will develop skills in appropriate data analysis, interpretation of statistics, and presenting this information in written and graphical form.

**11:035:215** *Spanish Language and Culture for the Agricultural Professional (1.5)*
Students will engage in beginning, conversational Spanish designed specifically for a supervisor of an agricultural workforce. Students will also explore the cultural diversity of the Spanish-speaking world.

**11:035:250** *Topics in Digital Photography (2)*
Students will learn how to properly use an advanced digital camera equipped with various camera lenses to achieve desired photographic outcomes and to use basic concepts of photographic composition. Students will become proficient in the use of Adobe Photoshop CS6 for digital photo editing. The course is taught online, and is "hands

on" with assignments focused on taking photographs and correcting/enhancing them. Students must have a digital camera available for the course.
***Students must have a digital camera available for the course.***

**11:035:258** ***Field Identification of Birds for Use in Land Management (1)***
Field identification of birds by sight, sound, habitat, and flight pattern; natural history, preferred habitats, and migration timeline along the Eastern Flyway in New Jersey.

**11:035:268** ***Environmental Pollution - Issues in Agriculture, Industry, and Communities (2)***
Evidence-based analysis of real-world problems of air, water, and land pollution on the local, state, national, and international arenas. This online course offers extensive opportunities for active discussion threads.

**11:035:272** ***River and Stream Ecology (1)***
This online course is a broad introduction to the chemical, physical; and biological processes of rivers and streams. Students will gain an appreciation of these water bodies as dynamic and constantly evolving ecosystems while acquiring skills to conduct and analyze scientific methods and data related to river and stream management issues.

**11:035:274** ***Organic Farming and Gardening (2)***
This online course is an introduction to organic farming and gardening from the perspective of both agricultural professionals and home gardeners. After completing the course students will be able to plan and design an organic garden using concepts of soil fertility, composting, plant growth measurements, data collection, pest management, natural landscapes, and rain gardens.

**11:035:280** ***American Lawns and Turfgrass (1.5)***
This online course presents a chance for students to explore the environmental, social, and economic aspects of lawns and turfgrass through a variety of readings. Contemporary issues for New Jersey will also be investigated, including pollution in Barnegat Bay and the state law regulating fertilizer applications to turf for homeowners and professional landscapers.

**11:035:288** ***Edible Gardening for Enrichment and Education (2)***
Preparation and maintenance of residential/community/educational edible gardens.

**11:035:300** ***Critical Analysis of Issues in Agribusiness I (3)***
Students will develop skills needed to critically analyze current issues driving the performance and trajectory of the agribusiness sector. This course prepares students for careers by blending experience-based learning with traditional coursework. Through business meetings with industry and public sector leaders, students gain hands on business experience. Topics and field trips will vary by semester.
***Requires admission into the Clearing Corporation Charitable Foundation Agribusiness Scholars Program. Special Permission number required to register.***

**11:035:400** ***Critical Analysis of Issues in Agribusiness II (3)***

Students will develop skills needed to critically analyze issues driving the performance and trajectory of the agribusiness sector. This course prepares students for careers by blending experience-based learning with traditional coursework. Through business meetings with industry and public sector leaders, students gain hands on business experience. Topics and field trips will vary by semester.

*11:035:300 and admission into the Clearing Corporation Charitable Foundation Agribusiness Scholars Program. Special Permission number required to register.*

# Animal Science 067 (SEBS)

## ANIMAL SCIENCE 067

**11:067:101** *Careers in Animal Science (3)*
Career opportunities in the field of animal science. Professional skills development emphasized.

**11:067:142** *Animal Science (3)*
Fundamental principles and functions important in animal science and zoology; emphasis on growth, nutrition, reproduction, lactation, and heredity in domestic animals.

**11:067:150** *Introduction to Animal Handling (1)*

The Introduction to Animal Handling course aims to equip students with fundamental skills and knowledge in handling various animal species. Throughout the semester, students will have the opportunity to work with pigs, sheep, goats, cows, horses, and poultry, gaining hands-on experience and practical insights into their handling techniques and behavior.

**11:067:175** *Animal Handling, Fitting, and Exhibition (1)*
Experience in the handling (using a halter, leading, displaying), fitting (clipping, grooming, cleanliness), and exhibiting (showmanship) of large animals.

**11:067:176** *Animal Handling and Fitting Supervisor (1)*
Experience-based education course that focuses on expanding experience handling, fitting, and working with livestock as well as developing teaching skills.
***Prerequisite: 11:067:175 or permission of instructor.***

**11:067:201** *Cattle Practicum (2)*
Practical experience is provided in the daily care of beef cattle. Formal lectures on animal products/production, nutrition, reproduction, behavior/welfare, and health/diseases. Field trips supplement and enhance the practical experience.

**11:067:202** *Small Ruminant Practicum (2)*
Practical experience is provided in the daily care of sheep and goats. Formal lectures on animal products/production, nutrition, reproduction, behavior/welfare, and health/diseases. Field trips supplement and enhance the practical experience.

**11:067:203** *Swine Practicum (2)*
Practical experience is provided in the daily care of swine. Formal lectures on animal products/production, nutrition, reproduction, behavior/welfare, and health/diseases. Field trips supplement and enhance the practical experience.

**11:067:205** ***Laboratory Animal Practicum (2)***
The student, under the guidance of the animal facility supervisor, performs all tasks necessary to provide animal care in a facility and program accredited by the Association for the Assessment and Accreditation of Laboratory Animal Care.
***Pre- or corequisite: 11:067:275 or permission of the instructor.***

**11:067:207** ***Horse Practicum (2)***
The students assist with the daily care (feeding, stall cleaning, grooming) of the research/teaching horses on campus and routine health management (farrier, vaccinations, deworming, treatment of wounds or injuries) of the herds. The students also are assigned to assist in the care and training of a weanling/yearling horse and may be asked to assist with research projects.

**11:067:210** ***Introduction to Veterinary Technology (3)***

The Introduction to Veterinary Technology (IVT) course offers a comprehensive introduction to the field of veterinary technology. Students will learn about the scope of the Veterinary Technician and Technologist profession and gain knowledge in husbandry, common companion animal diseases, behavior, triage, dentistry, and elements of veterinary nursing.

**11:067:250** ***Companion Animal Science (3)***
Overview of the human-animal bond, responsibilities of animal care and ownership in current society. Course topics include: domestication, behavior, physiology, nutrition, health, and diseases of companion animals.

**11:067:260** ***Animal Evaluation and Selection (3)***
Overview of livestock operations and judging of various livestock species. Field trips to different locations occur throughout the semester.
***Prerequisite: 11:067:142.***

**11:067:275** ***Laboratory Animal Science: Management and Techniques (3)***
Principles and practices of laboratory animal science; emphasis on animal care and various animal research techniques.
***Lec. 2 hrs., lab. 3 hrs.***

**11:067:300** ***Integrative Physiology (4)***
Physiological basis of animal function: membranes; homeostasis; endocrine/neural communication; cardiovascular, respiratory, renal, and reproductive systems; and animal production (meat, milk, eggs, and fiber).
***Two 80-min. lec.; one 80-min rec. Prerequisites: 01:119:115-116; 01:160:161-162, 171.***

**11:067:310** ***Domestic Animal Behavior and Welfare (3)***
Animal welfare is becoming an increasing concern for producers as consumers are requiring a higher level of accountability for animals to be ethically raised. This class will provide a forum for discussion of current topics concerning animal scientists, veterinarians, and livestock producers. Normal and stereotypical behaviors will be discussed, along with behavior modification techniques. Students will learn to evaluate animal welfare in a real-world setting using scientific techniques. Training techniques allowing them to work safely around animals will also be covered.
***Prerequisite: 11:067:142.***

**11:067:322** ***Dairy Cattle Artificial Insemination (P/NC1)***
Anatomy and physiology of the reproductive tract. Training and practical experience in artificial insemination and semen handling.
***Prerequisites: 11:067:142 and 11:067:327. Three-day workshop held off campus during spring break. By special permission only.***

**11:067:327** ***Animal Reproduction (3)***
Anatomy and physiology of reproductive organs; reproductive processes including female cycles, pregnancy, parturition, and lactation; fertility control with particular emphasis on domestic animals.
***Prerequisites: 01:119:115-116.***

**11:067:328** ***Animal Genetics (3)***
Introduction to mechanisms of heredity and evolution, Mendelian inheritance, meiosis, recombination, gene mutation and mapping, epigenetics, quantitative and population genetics, with an emphasis on animal models. Students will learn the logic of genetics problem solving.
***Prerequisites: 01:119:115-116 and 11:067:142.***

**11:067:330** ***Animal Nutrition (3)***
Application of nutritional principles to livestock feeding. Nature of nutrients, their metabolism, and physiological function. Factors influencing nutrient requirements for various aspects of production.
***Prerequisites: 01:119:115-116, 01:160:161-162, and 11:067:142.***

**11:067:331** ***Animal Nutrition Laboratory (1)***
Laboratory to accompany animal nutrition for on-campus students.
***Pre- or corequisite: 11:067:330.***

**11:067:336** ***Production Animal Management (3)***
Management practices in livestock industries: animal evaluation and selection, reproduction techniques (AI, ET), birthing/newborn care, milking, tail docking/castration, shearing, health and disease, animal behavior, feed formulation/production studies, record keeping.
***Prerequisites: 11:067:142***

**11:067:384** ***Horse Management (3)***
Breeding, feeding, and management of horses, with emphasis on behavior, physiology, nutrition, anatomy, and routine care.
***Prerequisite: 11:067:142 or permission of instructor.***

**11:067:390** ***Equine Nutrition (3)***
Nutritional requirements and feeding by type and age; evaluation of feedstuffs and rations; feed and pasture management; nutritional diseases and the nutritional management of certain diseases.
***Prerequisites: 11:067:330 and 11:067:384, or permission of instructor.***

**11:067:391** ***Comparative Mammalian Anatomy (3)***
This course will cover basic mammalian anatomy and anatomical terminology, the diversity of animal body structure and its relationship to comparative physiology among mammalian species, and the structural differences among the anatomies of selected mammals.
***Prerequisites: 01:119:115-116. Open to juniors and seniors only.***

**11:067:395** *Animal-Assisted Therapy (3)*
This course will provide students with an overview of animal-assisted therapy and its relevance as an alternative treatment modality for common psychological disorders. Information regarding the history and evolution of animal-assisted therapy in counseling, common therapeutic animals and techniques, ethical concerns when using animals in therapy, and the use of therapy animals with special populations will be covered.
*Prerequisites: 01:119:115-116.*

**11:067:398** *Advanced Equine Health Care and Management (3)*
A systems-based approach to common medical conditions and ailments affecting horses. The foundations of anatomy and physiology are reinforced while presenting clinical situations observed in horses. The course is recommended for students with a medical science interest, are equine enthusiasts, and managers/owners of equine facilities.

**11:067:401** *Topics in Equine Science (3)*
Reports and discussions in selected areas relating to equines.
*Open to juniors and seniors only.*

**11:067:402** *Equine Exercise Physiology (3)*
Survey and critical evaluation of current concepts regarding the physiological and environmental factors associated with exercise in the horse.
*Prerequisites: Course in physiology (11:067:300 or 01:146:356) or permission of Instructor.*

**11:067:404** *Animal Diseases (3)*
The biology of parasites (viruses, bacteria, protozoa, helminths, and arthropods) and the pathogenesis of their associated diseases. Current concepts of prevention and control of common diseases.
*Prerequisites: 01:119:115-116. Open to juniors and seniors.*

**11:067:406** *Farm Productivity Analysis (3)*
Productivity analyses of livestock farms. On-farm visits, problem solving, diagnostic analysis, and development of management recommendations.
*Open to juniors and seniors only.*

**11:067:410** *Neuroendocrinology (3)*
Comprehensive coverage of the interrelationships between the central nervous system and the endocrine system in the mammal.
*Open to juniors and seniors only.*

**11:067:411** *Studies in Animal Science (BA)*

Provides credits for students engaged in educational activities that differ from research activities. By arrangement credits for faculty-supervised student projects that are not considered research (literature searches, topic reviews, and written reports).

**11:067:414** *Teaching in Animal Science (BA)*
Experience-based education course designed to provide credits for students engaged in educational activities that differ from research activities. The course focuses on expanding knowledge and experience working with livestock as well as building teaching skills.

*Prerequisites: Students are eligible to register for this course if (1) they are under the guidance of a faculty member; and (2) serving as an undergraduate teaching assistant for a course (such as Animal Nutrition Laboratory and Animal Practicums). By arrangement credit given 1.5, 2.0, or 3.0.*

**11:067:415** *Leadership in Animal Science (BA)*
Experience-based education course designed to provide credits for students engaged in educational activities that differ from research activities. The course focuses on expanding knowledge and skill handling and fitting livestock, as well as building leadership skills associated with animal handling and fitting coordinator/supervisor positions.
*By arrangement credit given 1.5 or 2.0.*

**11:067:416** *In Vivo Lab Animal Techniques (3)*
The in vivo lab animal techniques (IVT) is an intensive EBE training course for students to gain proficiency in lab animal rodent concepts and techniques used in research labs. Students will develop hands-on expertise in rodent handling, dosing, blood collection, anesthesia, analgesia, use of surgical equipment, survival surgery techniques, and necropsy. Students will gain knowledge in laboratory animal diseases, health surveillance, transgenic animals, and other pertinent topics in laboratory animal medicine
*Prerequisite: 11:067:275*

**11:067:430** *Animal Microtechniques and Tissue Culture (4)*
Microscopic, cytological, and cell culture techniques as used in modern research laboratories. Emphasis on aseptic techniques for animal cell culture; requirements for growth in vitro; mechanisms for cellular differentiation; immunohistochemistry; in situ hybridization; expression of transfected DNA.
*Prerequisites: 01:119:151-117; and two semesters of general chemistry.*

**11:067:450** *Endocrinology (4)*
Endocrinology and neuroendocrinology of animals, including humans. Structure and function of the endocrine glands, including the hypothalamus, and the biosynthesis and chemistry of hormones.
*Prerequisites: 01:119:115-116. Recommended: Courses in physiology and organic chemistry. Open to juniors and seniors only. Credit not given for both this course and 01:146:450.*

**11:067:460** *Animals and the Law (3)*
This online course is designed to show students how farm and companion animals are treated in the legal system in relationship to all of these issues. Through case law, statutes, scholarly articles, and class discussion, we will explore the history of animal law in the United States and its common law tradition, legislation on the state and federal level, numerous legal issues regarding the treatment of farm and companion animals, and the legal consequences.

**11:067:461** *Topics in Companion Animal Science Issues: Animals and Health (2)*
This course will explore various topics pertaining to the health of companion animals with an emphasis on dogs and cats. The format of the course will consist of in-class lectures and discussions, hands-on demonstrations, oral presentations, quizzes, and exams.
*Prerequisites: 01:119:116 and 01:160:162*

**11:067:490** *Pathophysiology (3)*
This comprehensive course will review and discuss pathophysiological processes in all body systems in both humans and animals.
*Prerequisite: 11:067:300 or 01:146:356.*

**11:067:491** *Reproductive and Developmental Toxicology (3)*
Application of toxicological principles in reproductive studies and instruction on the effects of toxicants on male and female reproduction, and on the developing embryo/fetus.
*Prerequisites: 11:067:300 or 01:146:356 or 11:704:360 or 11:067:327 or 11:115:422 or 11:115:434.*

**11:067:492** *Molecular and Cellular Physiology (3)*
This course will provide a solid understanding of the molecular basis of eukaryotic cell function within the context of whole organisms.
*Prerequisites: 01:119:115-117, 01:160:307-308, or permission of instructor.*

**11:067:493,494** *Research in Animal Science (BA,BA)*
Individual animal science projects with faculty guidance.
*Prerequisite: Permission of instructor.*

# Arts and Sciences 090 (SEBS)

## ARTS AND SCIENCES 090

**11:090:101** *The Byrne Seminars (1)*
Focusing on the research and interests of the faculty and introducing students to the range of intellectual and career possibilities offered to them at Rutgers.
*For first-year students. Graded Pass/No Credit.*

**11:090:120** *First-Year Interest Group Seminar (FIGS) (1)*
Highly interactive seminars on selected topics focusing on career goals/potential majors of first-year students. Analysis and discussion of presentations by a broad spectrum of faculty and alumni speakers; introduction to and utilization of university resources. Each seminar is led by a peer instructor closely supervised by the FIGS curriculum coordinator.
*Open to first-year students only. Graded Pass/No Credit. May not be repeated for credit.*

**11:090:124** *First-Year International Transition (RU-FIT) (1)*
Introduction to undergraduate academic study at American research universities. Designed to assist students in the adjustment to Rutgers and to promote academic success; topics may include time management, successful study habits, academic integrity practices, long-term goal planning, presentation skills, group work, and accessing university resources.
*Must be an international student. Special permission required. Graded Pass/No Credit.*

# Biochemistry 115 (SEBS)

## BIOCHEMISTRY 115

**11:115:100** *The Molecules of Life: Biochemistry for Everyone (3)*
Introductory biochemistry for nonscience majors, this lecture and discussion-format course presents the

biochemistry of human health through the lens of current topics including metabolism, the microbiome, genetic engineering, and everyday pharmaceuticals. Through independent learning students will delve into current topics that are of particular interest to them through in-class active learning exercises.

**11:115:110** *Experiments with Green Fluorescent Protein (3)*
An introduction to protein biochemistry and protein purification using green fluorescent protein (GFP) as a teaching tool.

**11:115:201** *Contemporary Issues in Biochemistry (2)*
Topics to be covered in this course include the role of biochemistry in stem cell research; genetically modified microorganisms, plants, and animals; drug development; and disease progression. Students will be introduced to these topics by directed reading from current literature, interactive lectures, and class discussion. In addition, some amount of class time will be devoted to introducing students to laboratory research to prepare them to be productive participants in the laboratory. Students will be expected to be active participants in the class discussions and will also be required to submit short essays on the selected topics throughout the semester.

**11:115:301** *Introductory Biochemistry (3)*
The chemistry and metabolism of proteins, carbohydrates, lipids, nucleic acids, and other biologically important compounds.
*Prerequisites: 01:160:209 or 307-308 or 315-316.*

**11:115:313** *Introductory Biochemistry Laboratory (1)*
Techniques used in research, clinical, and food laboratories, including tests of biological materials, methods of separations, and determinations of enzyme activities.
*Lab. 3 hrs. Prerequisites: 01:160:209 or 307-308 or 315-316*

**1:115:321** *Ethics in Biochemical Research (3)*
Exploration of ethical issues in biochemistry, genetics, and molecular biology including recombinant DNA technology, genetically modified organisms, stem cell research, scientific patents, and DNA databases.
*Prerequisites: 01:119:115-116,117*

**1:115:403,404** *General Biochemistry (4,3)*
A comprehensive survey of the chemistry and metabolism of biological compounds, including proteins, polysaccharides, lipids, and nucleic acids. Enzyme kinetics, bioenergetics, organelles, and cellular organization. Expression and processing of biological information, including DNA replication; transcription into RNA; translation into protein, regulation, and recombinant DNA techniques. A detailed computer laboratory study of structural biology, including protein and nucleic acid three-dimensional structures and the interactions between these and ligands.
*Prerequisites: 01:160:307-308 or 315-316 with grades of C or better. Prerequisite for 11:115:404 is 11:115:403.*

**11:115:406** *Problem Solving in Biochemistry (2)*
Modern instrumentation and analytical techniques used in biochemistry research.

**11:115:409** *Principles of Biophysical Chemistry (3)*
An extensive treatment of thermodynamics as it applies to matters such as protein stability, allostery, ligand binding to receptors, membrane formation and others. Areas of spectroscopy routinely used in biochemistry include

absorption, fluorescence and circular dichroism. Advanced kinetics including transition state theory is covered.
***Prerequisites: General Biochemistry 11:115:403 and one year of Calculus. A year of Physics and a year of Biology are strongly recommended.***

**11:115:413,414** ***Experimental Biochemistry (3,3)***
Isolation, characterization, and quantitative determination of biological compounds. Spectrophotometric and titrimetric analyses; chromatography and gel electrophoresis; high performance liquid chromatography. Isolation and characterization of enzymes, nucleic acids, and lipids. Graphing and statistical treatment using computers.
***Lec. 1 hr. (for 413), 55-min. (for 414), lab. 4.5 hrs (for both 413 and 414). Corequisites: 11:115:403,404. Recommended: 01:447:380.***

**11:115:421** ***Biochemistry of Cancer (3)***
DNA damage/repair mechanisms; oncogenes/tumor suppressor genes; signaling pathways; apoptosis/cell death; the cell cycle; metastasis-cell, cell contact, and protease activation; tumor growth and angiogenesis; genetic events; genetic polymorphisms; chemical carcinogenesis; chemotherapeutic targeting.
***Prerequisites: 11:115:403-404.***

**11:115:422** ***Biochemical Mechanisms of Toxicology (3)***
General principles and mechanisms of biochemical toxicology, including pharmacokinetics and pharmacodynamics. Examples of metabolism of industrial compounds, organic agrichemicals, and carcinogens.
***Prerequisites: 01:119:115-116,117 (formerly 01:119:101-102), 01:160:307-308 or 315-316. Pre- or corequisites: 11:115:403,404 or equivalent. Recommended: 01:146:356 or equivalent.***

**11:115:423** ***Fundamentals of Genomics (3)***
This course will provide an introduction to genome science to undergraduate and graduate students with a variety of backgrounds such as biochemistry, microbiology, animal, and plant science who are confronted with the growing influence of this field in their work but may not be knowledgeable in its uses and limitations. The lectures will provide an overview of genomics technology and provide real-life examples in the life sciences.
***Prerequisite: 01:119:102 or 01:119:116. Formerly 11:216:423.***

**11:115:436** ***Molecular Toxicology Laboratory (3)***
Techniques currently applied in public and private toxicology laboratories.
***One 80-min. pre-lab., one 3-hr. lab.***

**11:115:485** ***Advanced Methods for 3-D Structure Determination of Biomolecules (3)***
This course is a survey of advanced techniques for the determination of biomolecular structure and will include in-depth discussions of cryo-EM, NMR, and X-ray crystallography as well as other emerging techniques.
***Prerequisites: 11:115:403/404 or permission of instructor.***

**11:115:491** ***Seminar: Biochemistry Communication (3)***
Practice in techniques for oral presentation of scientific reports and reviews, based on search of research literature in biochemistry and, where applicable, the student's own research results.
***Pre- or corequisites: 11:115:403,404. Open only to senior biochemistry majors.***

**11:115:493,494** ***Research Problems in Biochemistry (BA,BA)***
Research projects under the guidance of faculty members.
***Prerequisite: Permission of department.***

# Bioenvironmental Engineering 117 (SEBS)

## BIOENVIRONMENTAL ENGINEERING 117

**11:117:100** ***Introduction to Bioenvironmental Engineering (1)***
Overview of specializations within bioenvironmental engineering. Expanding role of biological and environmental sciences in engineering. Analysis of selected problems. Review of professional opportunities.

**11:117:296** ***Honors Seminar in Bioenvironmental Engineering: Building and Using Sensors (3)***
Students enrolled in this course will use the Raspberry Pi computer platform to develop sensing systems that can operate autonomously based on preprogrammed software instructions. They will receive a set of hardware components and will be tasked to design and construct their own sensing systems. They will be writing their own software programs using the Python programming language. There will be an opportunity to fly the sensing systems on a drone allowing for aerial data collection.

**11:117:323** ***Environmental Fate and Transport for Engineers (3)***
Fundamental principles of physical and chemical processes including mass and energy balance approaches, phase partitioning, reaction kinetics, mass transfer, advection and dispersion. Topics include: (1) toxicity and risk assessment; (2) systems and processes characterization; (3) chemical thermodynamics and kinetics; (4) diffusion and mass transfer; (5) continuity equations; (6) transport in surface water and groundwater systems. It emphasizes how to simplify extremely complex systems so that solutions and conceptual design can be obtained.
***Prerequisites: 01:640:251; 01:750:227; 11:375:202; or permission by instructor.***

**11:117:333** ***Environmental Engineering Analysis Tools (3)***
This course applies state-of-the-art environmental engineering tools in analyzing problems and creating solutions and designs. Tools include, as examples, measurement tools and techniques, programming languages and software for graphics, statistical analysis and modeling. Tools may vary with current engineering practice.
***Prerequisites: 14:440:127; 14:180:215 or 14:180:216.***

**11:117:413** ***Unit Processes in Environmental Engineering I (3)***
Physical and chemical processes and operations commonly applied for water and wastewater treatment, including coagulation, flocculation, sedimentation, filtration, adsorption, ion exchange, membrane separation, precipitation, oxidation, and disinfection; principles of chemical reaction kinetics, modeling of ideal and non-ideal batch and flow-through reactors.
***Prerequisites: 01:640:244; 11:117:323 (or 11:375:203).***

**11:117:414** ***Unit Processes in Environmental Engineering II (3)***
Biological principles and operations for wastewater treatment, bioremediation, and energy production including: microbial ecology; energetics, stoichiometry, and kinetics of microbial growth; kinetics of pollution degradation; modeling of ideal bioreactors; design criteria for specific wastewater treatment processes; and new developments in use of microorganisms in bioenvironmental engineering.
***Prerequisites: 11:375:201, 11:117:413; or permission of instructor.***

**11:117:423** ***Unit Processes in Environmental Engineering Laboratory I (1)***
Demonstration of physicochemical operations used in drinking water and wastewater treatment, including reactor design and residence time distribution, coagulation, flocculation, sedimentation, filtration, carbon adsorption, chemical oxidation. and oxygen transfer.
***Corequisite: 11:117:413.***

**11:117:424** ***Unit Processes in Environmental Engineering Laboratory II (1)***
Demonstration and investigation of biological processes used in the treatment of wastewater, including: natural biological processes in biotreatment ponds; biodegradability and biodegradation kinetics; activated sludge reactors; anaerobic digestion for bioenergy production; use of laboratory methods and analytical equipment to assess biological processes; and introduction to activated sludge simulation software.
***Prerequisites: 01:160:171, 01:160:211; Corequisites: 11:117:414.***

**11:117:450** ***Applied Instrumentation and Control (4)***
This class will develop an understanding of how to conduct experiments involving the collection of field data and the various tools and techniques required to do so.
***Prerequisite: 11:375:203.***

**11:117:462** ***Design of Solid Waste Treatment Systems (3)***
Analysis and design of integrated solid waste management systems, including waste minimization, quantity estimates, waste characteristics, life-cycle thinking in waste management, collection, composting, materials recovery, recycling, incineration, and landfilling.
***Prerequisites: 01:640:152, 11:375:201, and 14:180:215.***

**11:117:468** ***Hazardous Waste Treatment Engineering (3)***
Engineering and process design aspects of hazardous waste management and remediation of hazardous waste sites, waste reduction and recovery, regulatory process, case studies and engineering solutions to model hazardous waste problems.
***Prerequisite: 11:117:413 or permission of instructor.***

**11:117:474** ***Air Pollution Engineering (3)***
Engineering design techniques for air quality control. Control of particulate and gas emissions from stationary sources. Control of mobile source emissions. Design for indoor air quality and regional air quality control.
***Prerequisite: 14:180:387 or 14:650:312.***

**11:117:488** ***Environmental Engineering CAPSTONE Design I (2)***
Design morphology. Case studies and special design problems. Solutions developed using creative design processes that include analysis, synthesis, and iterative decision making. Safety and professional ethics.
***Open only to seniors in bioenvironmental engineering and environmental engineering.***

**11:117:489** ***Environmental Engineering Capstone Design II (2)***
Completion of bioenvironmental engineering senior design project. Evaluation. Presentation of final report.
***Prerequisite: 11:117:488. Open only to seniors in bioenvironmental engineering and environmental engineering.***

**11:117:492** *Energy Conversion for Biological Systems (3)*
Principles of energy conversion techniques and their application to various biomechanical systems including solar energy systems, composting, methane and alcohol production, and the internal combustion engine.
*Prerequisite: 14:650:351.*

**11:117:494** *Contaminant Hydrogeology Engineering (3)*
Principles of groundwater hydrology and pollution. Development of mathematical formulations for describing pollutant movement in groundwater systems. Examination of control measures. Discussion of case studies. Introduction to and application of MODFLOW.
*Prerequisite: 11:375:423 or permission by instructor.*

**11:117:495** *Surface Water Quality Modeling (3)*
Formulation and solution of mathematical models as applied to surface water quality systems. Techniques of simulation and validation using case studies.
*Prerequisite: 11:375:423 or permission by instructor.*

**11:117:496** *Planning and Design of Land Treatment Systems (3)*
Engineering design of land treatment systems for municipal and industrial wastewater, including spray irrigation, overland flow, infiltration/percolation, and subsurface soil adsorption systems. Facilities planning.
*Prerequisite: 14:180:387.*

**11:117:497,498** *Special Problems in Environmental Engineering (BA,BA)*
Studies of special interest in some selected area of environmental engineering.
*Prerequisite: Permission of undergraduate program director.*

# Biotechnology 126 (SEBS)

## BIOTECHNOLOGY 126

**11:126:111** *Ethical and Scientific Challenges in Biotechnology (3)*
Applications and implications of biotechnology, including ethical and social controversies. Two 80-minute lecture periods, a large portion of which is discussion and student presentations and includes invited expert speakers.

**11:126:296** *Honors Seminar (3)*

**11:126:383** *Nucleotide Sequence Analysis (3)*
Introduction to DNA, RNA, and amino acid sequence analysis using publically available and web-based tools such as Blast, Clustal, etc. and biological databases such as NCBI, Genbank, and OMIM. Exercises in genetic manipulation, recombinant DNA technology, and restriction mapping using programs like NEBcutter, Net Primer, and Primer 3Plus.
*Prerequisites: 01:160:308 and 01:447:380. Offered spring and fall semesters.*

**11:126:401** *Seminar in Biotechnology (1.5)*
Development of communication skills needed by professionals in the field of biotechnology through student oral presentations and facilitated discussion. Topics include current scientific advances in biotechnology and the social impact of biotechnology.
*One 80-min. lec. Open only to seniors majoring in biotechnology.*

**11:126:407** *Comparative Virology (3)*
Biology of viruses and approaches to control through antivirals and genetic engineering. Genome organization, gene expression, replication, movement, and transmission across kingdoms.
*Prerequisites: 01:119:115-116,117 (formerly 01:119:101-102), 01:160:308. Offered in odd-numbered years in the fall semester.*

**11:126:410** *Process Biotechnology (3)*
Survey of the applications of biotechnology, emphasizing the pharmaceutical industry and the operation of fermentation systems. Case studies of downstream separation and purification protocols employed on an industrial scale.
*Prerequisites: 11:680:390, one semester of 11:115:403 or 01:694:407. Offered in odd-numbered years in the spring semester.*

**11:126:413** *Plant Molecular Biology (3)*
Fundamental and applied aspects of plant molecular biology: structure, expression, and isolation of plant nuclear genes; molecular biology of plant development, plant organelles, and plant-microbe interactions; and plant biotechnology.
*Prerequisites: 01:447:380 and 11:126:481 or 11:115:404 or 01:694:408. Offered in even-numbered years in the spring semester.*

**11:126:427** *Methods and Applications in Molecular Biology (4)*
Introduction to techniques and experimental approaches used in eukaryotic molecular biology.
*One 80-min. lec., one 80-min. rec., one 280-min. lab. Prerequisites: 01:447:380 and completion of 11:126:481 and 482 with grades of C or better. Offered fall semesters.*

**11:126:434** *Molecular Delivery Applications in Biotechnology (3)*
Applications and mechanisms-of-action of formulated and natural biological delivery systems--liposomes, carbon-based nanostructures, polymeric complexes, dendrimers, viruses, extracellular vesicles, etc. A broad range of applications from agricultural to pharmaceutical.
*Two 80-min. lec., including class discussion and presentations. Prerequisites: 01:160:308 and 11:680:390; 11:115:403 or 01:694:407 highly recommended. Offered spring semesters.*

**11:126:444** *Advanced Technologies in Biosciences (3)*
Lecture and demonstration of advanced instrumentation and other advanced technologies in bioscience. Includes demonstration of each instrument, detailed description of data analysis and interpretation of results. Methods include confocal microscopy, surface plasmon resonance detection, quantitative PCR, mass spectroscopy, flow cytometry/cell sorting, genotyping, TNO intestinal models.
*Two 80-min. periods of lectures and demonstrations. Prerequisite: 11:115:403 or 01:694:407 or 11:126:481. Offered spring semesters.*

**11:126:481** *Molecular Genetics (3)*
Principles of genetics at the molecular level, including the chemical nature of hereditary material. The genetic code, regulatory mechanisms, the molecular basis of mutation, DNA replication and recombination.
*Prerequisites: Organic chemistry and completion of 01:447:380 with a grade of C or better. Offered fall semesters.*

**11:126:482** *Molecular Genetics Laboratory (4)*
Biochemical and molecular aspects of gene function and gene recombination.
*One 280-min. lab., one 80-min. lab., one 80-min. lec. Prerequisites: Completion of 11:126:481 with grade of C or better and 11:680:390. Offered spring semesters.*

**11:126:484** *Bioinformatics (3)*
The course introduces: (a) various biological metadatabases such as NCBI, Ensembl, UCSC-Genome browser, TAIR, etc.; (b) methods of DNA sequencing and sequence analysis; (c) methods of RNA expression analysis; (d) protein families and domains; (e) protein structure prediction and three-dimensional structure of proteins; (f) significance of mutations, single nucleotide polymorphisms, and biomarkers in disease characterization; (g) tools used in structural bioinformatics; and (h) *in silico* drug design and discovery.
*Prerequisite: 01:126:481 or 11:126:383.*

**11:126:486** *Functional Genomics for Research (3)*
Focuses on execution of tools and protocols used to elucidate the biology, ecology, and life histories of organisms through analysis of their genomes using algal genomes as models.
*Prerequisites: One semester biology (01:119:115 or equivalent) and (11:216:251/486 or 01:447:380 or 11:115:301/403 or 01:694:315/407).*

**11:126:497,498** *Research in Biotechnology (BA,BA)*
Independent research projects in biotechnology under the guidance of a faculty member.
*Prerequisites: Permission of undergraduate program director and faculty adviser.*

# Community Health Outreach 193 (SEBS)

## COMMUNITY HEALTH OUTREACH 193

**11:607:200** *Principles of Leadership (3)*
An introduction to leadership. Topics covered include developing leadership skills, creating a vision, and overcoming obstacles.

**11:193:232** *Community Gardening for Health and Wellness (3)*
This course emphasizes the nutritional and social health benefits of community gardening with an added focus on developing agricultural and community leadership skills. Topics include soil, plant, and pollinator health; garden design, marketing, and financial management; human nutrition and food security; and the social implications of community gardening. Course includes hands-on field experience and field trips to gardens in the New Brunswick area.

**11:193:255** ***Integrated Nutrition, Health, Environment and Agricultural Systems (3)***
This course examines the movement of food from seed to table. Students will explore local food systems; sustainability; food-related issues that impact agriculture, health, and community; successful programs; and challenges to improving food system, food, and health.

**11:193:259** ***Cooking Healthy, Economical Meals on a College Budget (1)***
Basic principles of food safety, nutrition, meal preparation, and food choices on well-being and pocketbook; nutritional value, balanced meal plans, food handling, and cooking techniques.

**11:607:381** ***Presentation Skills: Advocating for Change (3)***
This course will strengthen student presentation and public speaking skills with the leadership focus on advocating for change, participating in civic engagement, and promoting community service.

**11:607:401** ***Foundations of Program Planning (3)***
Students develop the skill set to methodically design, develop, implement, and evaluate educational programs that are effectiveness-based and impact-driven. This course is beneficial for students pursuing careers in health care, public health, human services, education, community development, nongovernmental organizations (NGO), faith-based organizations, nonprofits, government (local, state, federal), foundations, and businesses and corporations.

**11:607:402** ***Building Community Partnerships (3)***
This course presents key elements for building collaborative partnerships. Students examine various coalition/ community partnership frameworks and models and develop leadership skills necessary to initiate, build, evaluate, and sustain durable coalitions and community partnerships. This course is beneficial for students pursuing careers in health care, public health, human services, education, community development, nongovernmental organizations (NGO), faith-based organizations, nonprofits, government (local, state, federal), foundations, and business and corporations.

**11:193:413** ***Community Interventions in Obesity (3)***
The course examines the multifactorial aspects of obesity, maintenance of healthy weight, the relationship of weight status and chronic disease prevention, and provides an overview of obesity and its relationship to public health. Traditional and novel nutrition and exercise theories as well as current popular diet and exercise trends will also be discussed. The course also introduces assessment of obesity, dietary habits, and physical activity and interventions to improve health at both individual and environmental levels.

**11:193:421** ***Wellness Behavior (3)***
In today's world, health and wellness are headline news. What can you do to change your behavior to ensure a long and healthy life along with helping to improve the health of those people around you? Getting and staying well is a worthwhile goal no matter where you are right now. You can make positive changes for yourself and you can be an agent for change for your family, friends, and community.

**11:193:438** ***Women, Food, and Health (3)***
Women have a complex relationship with food and there are many factors that influence this relationship. In this course students will explore the various aspects of women's relationship with food and the impact on health. Themes that will be addressed include: changing nutrition needs over the life span; emotional, societal, and cultural influences on food choice; the role of nutrition in the causation, prevention, and treatment of diseases and health conditions that are prevalent in women of all cultures; historical trends in nutrition and food; marketing food to women; body image and eating disorders; and the link between women, poverty, food, and health.

**11:193:440** *Community Health Outreach Practicum (1)*
Students will participate in a community health outreach experience-based practicum. Students will gain knowledge, skills, and practical hands-on experience in community health outreach.

# Ecology, Evolution, and Natural Resources 216 (SEBS)

## ECOLOGY, EVOLUTION, AND NATURAL RESOURCES 216

(All 704 courses are now 216 courses, effective spring 2014.)

**11:216:101** *Introduction to Ecology and Evolution (3)*
This course provides the basic foundations for understanding evolutionary and ecological processes. The course covers natural selection, basic evolutionary theories, human evolution, population ecology, community ecology, biodiversity, biogeochemical cycling, global climate, and conservation biology.
*Two 80-min. lecs. This course meets the Core Curriculum requirement for natural sciences.*

**11:216:104** *Topics in Ecology, Evolution, and Natural Resources (1)*
Seminar-type presentations by faculty members in the ecology and natural resources curriculum designed to introduce students to the curriculum's faculty and their areas of experience in conducting research and applying their research findings, and the importance of their research to society.
*Not open to seniors. Open to ecology, evolution, and natural resources students only.*

**11:216:110** *Evolution, Disease, and Medicine (3)*
Together with 01:119:101, this course will fulfill the nonscience majors SEBS life science requirement. Basic concepts in the theory of evolution will be introduced and applied in the context of discussion of human and animal disease and the medical treatment thereof. The course will cover infectious and noninfectious diseases and real-world applications of evolutionary theory to the practice of medicine.
*One 80-min. lec. This course meets the Core Curriculum requirement for natural sciences.*

**11:216:115** *Evolution of Sex and Gender in Animals (3)*
This course will examine the biological basis of sex determination and resultant gendered behavior in all animals, including humans. We will discuss how and why sex evolved, how different organisms express, and often change, their gender and the selection pressures involved.
*Two 80-min. lec. This course meets the Core Curriculum requirement for natural sciences and Contemporary Challenges (CCO-2)*

**11:216:199** *Trees and the Environment (3)*
This is an introductory course examining tree structure and function as part of complex forest ecosystems. Concepts from population, community and landscape ecology, succession, soil structure, biological diversity, biogeochemical cycling, and sustainability will be incorporated from the point-of-view of trees. Topics from disturbance ecology (fire, drought) to climate change and the role of forest management will be discussed in relationship to forest ecology.
*Two 80-min. lec. This course meets the Core Curriculum requirement for natural sciences.*

**11:216:210** ***Nature Journaling (3)***
Students will explore, learn about, and understand everyday biodiversity, environment, and organism structures through lectures, discussions, and hands-on nature journaling, developing creative, written, visual, and quantitative ways to communicate facts/observations.
***One 160-min. lec.***

**11:216:217** ***Principles of Natural Resource Management (4)***
The course will introduce students to the applied discipline of natural resource management. The course will require students to complete team projects at the Rutgers University Ecological Preserve.

**11:216:240** ***Behavioral Biology (3)***
Basic principles of animal behavior, including social behavior, animal communication, and physiological mechanisms underlying behavior. Topics include ethology, aggression, displays and communication, territoriality, and ethological view of human behavior. Motion pictures observe the behavior of fish, birds, reptiles, and primates.
***Two 80-min. lecs. and one 80-min. rec. Prerequisite: 01:119:102 or 116.***

**11:216:251** ***Fundamentals of Evolution (3)***
The course will introduce students to the breadth of evolutionary biology, from micro to macroevolution, and cover topics from molecular evolution to the fossil record. Through lectures and readings, students will gain a basic and fundamental understanding of the evolutionary forces that have shaped all life on earth.
***Two 80-min. lecs. Prerequisite: 01:119:102 or 116.***

**11:216:252** ***Fundamentals of Evolution Lab (1)***
Provides students with hands-on experiences related to generation, analysis, and evaluation of evolutionary data, from populations to macroevolution. Skills developed in the lab include DNA extraction, PCR, sequence alignment and phylogenetic analysis, DNA barcoding, population genetics calculations, and many other aspects of evolutionary research.
***One 3-hr. lab. Prerequisite: 01:119:102 or 116. Corequisite: 11:216:251.***

**11:216:269** ***Evolution of Animal Behavior (3)***
Broad exposure to evolutionary theory and natural selection using examples from animal behavior. Not intended to be comprehensive in either evolutionary theory or in animal behavior, but rather to engender understanding of the principles of evolution, the basic terms and concepts in animal behavior, and the evolutionary and ecological processes that shape it.
***One lec. 3 hrs. Prerequisites: 01:119:101,102 or 103 or 115-116 or 11:216:101.***

**11:216:272** ***Dendrology (4)***
Nomenclature, identification, ranges, and habitats of important native and naturalized trees of North America. Shrubs and vines important as wildlife food and cover. Forest regions and types, emphasizing the Middle Atlantic area.
***One 80-min. lec., one 280-min. lab. Not open to first-year students. Prerequisite: 01:119:102 or 116.***

**11:216:274** ***Field Techniques in Ecology and Natural Resources (4)***
One lecture per week followed by a two-week field course; the latter runs five days a week, all day for two weeks following the close of the spring semester (starting on a Monday). Students are immersed in two different

ecosystems and learn fundamental aspects of forestry, field ecology, wildlife biology, entomology, remote sensing, and natural resource management.
*One 80-min. lec. and two weeks of fieldwork.*

**11:216:296** *Honors Seminar (03*
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
*Open only to honors students (SEBS Honors Program, SAS Honors Program, and Honors College) or by permission of instructor.*

**11:216:302** *Parasite Ecology (4)*
The ecology and evolution of animal parasites, focusing on the ecology of disease, transmission dynamics, and parasite roles in community regulation and conservation biology.
*Two 80-min. lecs. Prerequisite: 01:119:102 or 116.*

**11:216:314** *Forest Measurements (4)*
The purpose of this course is to introduce students to the most common methods of and process for quantitative assessment of forest resources. Students will take part in field and computational exercises which will be supported by lectures and readings.
*Two 80-min. lecs. One 3 hr lab. Prerequisites: 01:119:116 General Biology II AND (11:216:272 Dendrology OR 11:550:233 Landscape Plants)*

**11:216:315** *Conservation Techniques (3)*
Introduction to the application of conservation and management theory. Online lecture material will present the principles and review the methods used for each approach. Case studies will illustrate how conservation actions were developed and applied. Discussions will evaluate the merits and limitations for each approach in theory and practice.
*Online course.*

**11:216:317** *Conservation Ecology (3)*
Effects of technology and population growth on species, ecosystems, and human communities. Environmental impact of agricultural and industrial systems. Global environmental change. Biological and social underpinnings of conservation. Extensive scientific and nonscientific readings.
*Lec. 3 hrs. Prerequisites: 01:119:102 or 116 or equivalent, and permission of instructor. This course meets the Core Curriculum requirement for Contemporary Challenges and Writing and Communication.*

**11:216:320** *Controversies in Sustainability (3)*
Sustainable environmental management is the dominant economic, environmental, and social issue of the 21st century. This course will use online materials (articles, papers, podcasts, video, etc.) to examine controversial topics like climate change, natural gas drilling, renewable energy, and others. Discussions will provide a forum for debate and further examination of the issues.
*Online course.*

**11:216:323** *Ornithology (4)*
The biology, ecology, and field identification of birds of the region. Weekly field trips and two all-day field trips.
*Two 80-min. lecs., lab. 3 hrs. Prerequisite: 01:119:102 or 116*

**11:216:324** ***Invertebrate Zoology (4)***
Comparative study of some representative invertebrates as a basis for understanding the interrelationship between the physiological activity and the structure of organisms.
***Lec. 3 hrs., lab. 3 hrs. Prerequisite: 01:119:102 or 116.***

**11:216:325** ***Vertebrate Zoology (4)***
The classification, evolution, ecology, and life histories of the order and families of the vertebrates, especially of the eastern United States. Seven field trips required, including one two-day weekend trip and one evening trip.
***Two 80-min. lecs., lab. 3 hrs. Prerequisites: 01:119:102 or 116 and 117.***

**11:216:332** ***Plant Ecology (4)***
Study of plant life histories, populations, communities, and plant-animal interactions (pollination, dispersal, herbivory). Evolutionary basis for plant ecological traits. Weekly field trips to representative habitats in the state, including a weekend trip. Lab includes greenhouse, field experiments, and library reports.
***Lec. 3 hrs., lab. 3 hrs., field trips. Prerequisites: 01:119:102 or 116 and 117.***

**11:216:334** ***Aquatic Ecology (3)***
This online course focuses on the study of inland waters including lakes, wetlands, rivers, and streams. Foundational concepts will be covered through online lectures, exercises, discussions, and quizzes embedded in videos. Concepts will include how waterbodies form, organisms that live in aquatic environments, and implications of policy and conservation decisions on water quality and quantity.
***Prerequisite: 01:119:102 or 116. Credit not given for both this and 11:216:335.***

**11:216:335** ***Freshwater Ecology (4)***
Freshwater Ecology is the study of inland waters including lakes, wetlands, rivers and streams. Theoretical and applied concepts will be covered through lectures, exercises, and labs including several field trips.
***Lec. 3 hrs., lab. 3 hrs. Prerequisite: 01:119:102 (General Biology) or 01:119:116 (General Biology II) or 28:120:205 (Foundations of Biology: Ecology and Evolution Lecture-Newark) or 50:120:102 (General Biology II-Camden). Credit not given for both this and 11:216:334.***

**11:216:351** ***Principles of Ecology (3)***
Concepts underlying the organization of living systems. Environmental adaptations of species, population, and community dynamics, energetics, nutrient flux. Practical applications of ecological concepts.
***Two 80-min. lecs. Prerequisite: 01:119:102 or 116 or equivalent.***

**11:216:352** ***Principles of Ecology Lab (1)***
This laboratory course is required for the 216 (Ecology, Evolution, and Natural Resources) and 628 (Marine Sciences) majors and is an option elective for all others. The laboratory course does not simply reinforce the lecture course but instead extends its scope. Principles of Ecology Lab incorporates critical analyses of seminal ecological publications and the collection, analysis, and graphical presentation of ecological data, both descriptive and experimental. Laboratory exercises will introduce students to observational and experimental methods and procedures in ecology.
***One 3-hr. lab. Prerequisite: 01:119:102 or 116 (117 can be taken concurrently). Corequisite: 11:216:351.***

**11:216:353** ***Experimental Evolution (4)***
Evolution in action: students are introduced to the vibrant field of experimental evolution while themselves evolving a bacterial virus (RNA phage phi6), sequencing the evolved populations, and presenting their results.
***Combined lecture/lab. Prerequisites: 01:119:102 or 01:119:116/117, and 01:447:380.***

**11:216:360** ***Animal Physiological Ecology (3)***
The course addresses physiological topics from the perspectives of comparative, ecological, environmental, evolutionary, integrative, and organismal issues. Objectives are to understand: the diversity of life, with a particular focus on physiological functions that allow animals to live and thrive in in a range of environments; the breadth of the discipline of physiology and the importance of integrating physiology with ecology and behavior, and with cellular and molecular biology; and that evolution is the fabric of biology.
***Two 80-min. lecs. Prerequisites: 11:119:102 or 116 and 117.***

**11:216:365** ***Arboriculture (4)***
This course considers the relationship of tree biology and management of trees in the developed landscape. Field exercises will complement lectures for practical applications. We will discuss the theory and practice of managing individual trees in developed landscape and field assignments provide hands-on and realistic perspectives in the practice of professional tree care.
***Two 80-min. lecs, one 80-min lab. Taught in even-numbered years. Prerequisite: 01:119:102 or 116.***

**11:216:369** ***Analytical Methods in Ecology, Evolution, and Natural Resources (3)***
To familiarize students with common (and a few not-so-common) statistical/quantitative techniques and data analysis procedures used by professionals in ecology, natural resource management, and land-use management, and to introduce computer programming using the R language.
***This course meets the Core Curriculum requirement for Quantitative & Formal Reasoning [QQ].***

**11:216:370** ***Freshwater Ecology (3)***
Freshwater Ecology is the study of inland waters including lakes, rivers, and streams. Foundational concepts will be covered through online lectures, exercises, discussion, and quizzes embedded in videos. Concepts will include how water bodies form, organisms that live in aquatic environments, and implications of policy and conservation decisions on water quality and quantity.
***Online. Prerequisite: 01:119:102 or 01:119:116.***

**11:216:371** ***Introductory Remote-Sensing Image Analysis (3)***
Interpretation and analysis of aerial photography and remotely-sensed imagery for environmental and natural resource management. Photogrammetry, mapping, geology, land forms, hydrology, soils, vegetation, and cultural features.
***Prerequisite: 11:573:232.***

**11:216:376** ***Practicum in Fisheries Management (BA)***
Practical experience in fishery management under the direction of faculty mentors, fishery scientists of N.J. Division of Fish, Game, and Wildlife; National Marine Fisheries Service; or other appropriate state or federal agencies. Students will learn hands-on experience in the management of fisheries resources that are essential for careers at the regional, state, and federal level in sustainable management of U.S. fisheries.

**11:216:377** ***Practicum in Forest Management (BA)***
Practical experience in forest management under the direction of foresters working for private industry; local, state, and federal government agencies; and in consulting capacities for landowners.
***Open only to majors in ecology, evolution, and natural resources.***

**11:216:401** ***Evolution of Eukaryotes (3)***
This course will discuss the recent advances in our understanding of eukaryote origins and evolution. Phylogenetics, genomics, the role of horizontal gene transfers, and the endosymbiotic origin of mitochondrion and plastid are some of the issues that will be examined in detail as they relate to ecology and evolution of eukaryotic organisms.
***Two 80-min. lecs. Prerequisites: 01:119:102 or 116 and 11:216:251 or equivalent.***

**11:216:403** ***Urban Forestry (3)***
Benefits and costs of trees, planning and design, soils, tree selection and nursery stock, IPM, composting, removal, wildlife, laws, finance, inventories, maintenance scheduling, planting. Field trips.
***One 80-min. lec., one 180-min. lab. Prerequisite: 11:216:272 or permission of instructor.***

**11:216:405** ***Evolution of Infectious Disease (3)***
This course surveys how pathogenic microorganisms have evolved, with an emphasis on understanding how the same evolutionary principles that we infer from large eukaryotic species can be concretely observed in viruses, bacteria, and eukaryotic parasites.
***Two 80-min. lecs. Prerequisite: 01:447:380 or equivalent or permission of instructor.***

**11:216:411** ***Plant Diversity and Evolution (4)***
An overview of the evolution and diversity of vascular plants, from ferns to conifers and flowering plants. Field identification, morphology, principles of classification, and basic concepts in evolutionary research.
***Two 80-min. lecs., lab. 3 hrs. Prerequisites: 01:119:102 or 116.***

**11:216:421** ***Wetland Ecology (4)***
An overview of the ecology, management, and function of wetlands. Current issues of wetland management and biological features of wetlands will be covered through classroom exercises and case studies.
***Lec. 3 hrs., lab 3 hrs. Taught in odd-numbered years. Prerequisite: 01:119:102 or 01:119:116 or 01:119:103 or 28:120:205 or 50:120:102.***

**11:216:422** ***Soil Organismal Diversity (3)***
A hybrid course on soil biotic diversity and function. Students will attend lectures, read scientific articles, interpret data, and understand how soil biota relates to natural- and agro-ecosystem functioning.
***Prerequisite: 01:119:116.***

**11:216:431** ***Fundamentals of Ecological and Environmental Modeling (4)***
This course will review the background mathematical and statistical tools necessary for students interested in pursuing ecological and environmental modeling, and will discuss general model formulation, validation, hypothesis testing, nonlinear phenomena, and forecasting. Topics include linear algebra, differential equations, statistical tools, regression and curve fitting, box models, and population dynamics models. General model formulation, validation, hypothesis testing, nonlinear phenomena, and forecasting. Review of necessary mathematical and statistical tools. Recommended for advanced ecosystem modeling courses.
***Two 80-min. lecs. Taught in odd-numbered years. Prerequisites: : 01:640:135 or 01:640:151, statistics, or permission of instructor.***

**11:216:440** ***Practical Experience in Ecology, Evolution, and Natural Resources (3)***
Practical Experience will be divided into Section 01 for hands-on experience in ecology, evolution, and natural resources under the guidance of faculty members. Section 02 is for student TAs who will assist/teach a lab section of a course under the guidance of faculty members.
***Prerequisite: Permission of faculty adviser.***

**11:216:441** ***Animal Behavior (3)***
Physiological foundations and principles of animal behavior, with particular emphasis on mechanisms underlying sexual behavior, feeding aggression, and behavioral development.
***Lec/rec. 3 hrs. Prerequisites: 01:119:102 or 116 or permission of instructor.***

**11:216:450** ***Landscape Ecology (3)***
Landscape ecology is a sub-discipline of ecology that focuses on spatial relationships and the interactions between patterns and processes. The course is an introduction to the field coupling theoretical concepts with applications through modeling projects and hands-on practical experience with landscape analysis tools and ideas.

**11:216:451** ***Climate Change Ecology (3)***
Analysis of the major global changes based on principles of ecosystems ecology; carbon, nutrient, and pollution cycling mechanisms and budgets; the methods used to study these phenomena.
***Lec. 3 hrs. Taught in even-numbered years. Prerequisite: 11:216:351 or equivalent.***

**11:216:454** ***Molecular Ecology (3)***
This course will explore how new tools from genetics and genomics are revolutionizing our understanding of ecology. We will learn how to use DNA to infer behavior, kinship, historical demography, dispersal patterns, natural selection, community composition, and conservation genetics, among other topics. The emphasis of the course will be on giving students the theoretical understanding and practical skills they need to apply these cutting-edge tools themselves.
***Two 80-min. lecs. Prerequisite: 01:119:102 or 116.***

**11:216:461** ***Field Ecology (2)***
Concepts of ecological organization developed through field experience in the principal habitat types of New Jersey. Emphasis on field application of ecological knowledge.
***One 320-min. lab. Prerequisite: 11:216:351.***

**11:216:464** ***Wildlife Ecology and Conservation (3)***
Quantitative analysis and understanding of the ecology, management, and conservation of game and nongame wildlife (terrestrial and aquatic). Population censusing and dynamics, harvesting, habitat requirements and fragmentation, migration, conservation genetics, and managing protected areas.
***One 80-min. lec., one 280-min. lab. Prerequisite: 01:119:116.***

**11:216:469** ***Wildlife Diseases (3)***
In this course, the diseases of wildlife will be examined with emphasis on causes and mechanisms of disease, and epidemiology and population significance of disease. The goal of the class is to provide a comprehensive and up-to-date understanding of the causes and consequences of infectious disease at the levels of whole organisms, populations, communities, and ecosystems.
***Two 80-min. lec. Prerequisite: 01:119:102 or 116.***

**11:216:474** ***Advanced Remote-Sensing Analysis (3)***
Principles of satellite remote-sensing and digital image analysis for environmental and natural resource applications. Instruction in state-of-the-art digital image processing/analysis software.
***Prerequisites: 11:573:369 and 11:216:371.***

**11:216:475** ***Winter Field Ecology (P/NC, 1)***
A one-week, off-campus field experience in January, exploring the adaptations of temperate plants and animals to the harshness of winter.
***Prerequisite: Permission of instructor.***

**11:216:476** ***Ecology: Natural, Shallow, Social, and Deep (3)***
A junior/senior colloquium. The goal of this course is to explore the relationships between scientific knowledge and social perceptions of the environment.

**11:216:477** ***Forest Management Applications (4)***
This capstone course brings together the policies, ethics, values, and data used in the creation of forest management plans that help foster sustainable forests and the benefits they provide.
***Two 80-min. lecs. One 3 hr lab. Pre-Requisite: 11:216:471 Silviculture.***

**11:216:484** ***Research Problems in Ecology, Evolution, and Natural Resources (BA,BA)***
Research projects in applied ecology under the guidance of faculty members.
***Prerequisite: Permission of faculty adviser.***

**11:216:486** ***Principles of Evolution (3)***
Theories, principles, and mechanisms of the evolution of cellular and organismic systems, with some attention to human evolutionary studies.
***(Formerly 01:119:484). Prerequisites: 01:160:161-162; 01:447:280. Not open to students who have taken 01:119:485.***

**11:216:487** ***Urban Ecology (3)***
Urban Ecology is a seminar course where we will focus on the processes determining patterns of abundance and distribution of organisms in urban ecosystems, the interactions among organisms in the urban environment, the interactions between humans (and societies) and nature in urban environments, and some aspects of urban planning as it relates to ecology and the environment.
***11:216:332 or 11:216:351 or equivalent***

**11:216:488** ***Restoration Ecology (4)***
Study of the ecological processes that underlie the re-creation of a natural community. Habitat characteristics, life histories, reproductive ecology, biological invasions, mutualism, societal laws, and attitudes toward restoration. Field trips to representative restored habitats.
***(Formerly 01:119:488). Lec. 3 hrs., lab. 3 hrs. Pre-or corequisites: 11:704:351 and one course in plant or animal organismic biology (e.g., mammology, principles of botany, insect biology, etc.).***

**11:216:499** ***Senior Capstone in Ecology, Evolution, and Natural Resources (1)***
This course will help students review, synthesize, and articulate their academic and professional experience. In addition, Senior Capstone will help prepare students for the transition into the real world of finding jobs and dealing with llfe after graduation.
***One 80-min. lec. Ecology, evolution, and natural resources students only.***

# Educational Opportunity Fund 364 (SAS)

## EDUCATIONAL OPPORTUNITY FUND 364

**11:364:106** ***First-Year Student Success Seminar I: College Exploration (1)***
The course is designed to assist incoming freshman with a successful transition to collegiate life through class assignments, readings, and projects. Sessions will build upon each student's individual skills as determined by discussions, academic performance, and observed social skills. The curriculum will integrate various subject matter, along with the student's personal life, to promote and develop cognitive study skills necessary for coursework in mathematics and science. Collaborations with university departments and community organizations will offer an adaptive instructional pedagogy that will encourage student self-directed learning. Seminars and out-of-class experiences will enhance the student's ability to connect classroom activities with real-life situations to develop communication and leadership skills, adding to their personal and intellectual growth.

**11:364:107** ***First-Year Student Success Seminar II: Career Exploration (1)***
A continuation of academic sessions designed to facilitate entering student's successful transition to collegiate life. In addition to readdressing selected topics from SSS I in the fall semester, topics of graduation/career planning, financial literacy, and the history of higher education access will be incorporated using both in-class and online sessions. Each session will build upon each student's individual skills as determined by discussions, academic performance, and observed social skills. The curriculum will promote and develop cognitive study skills necessary for coursework in mathematics and science. Collaborations with university departments, academic/community organizations, and alumni will offer an adaptive instructional pedagogy that will encourage student self-directed learning. Seminars and out-of-class excursions will enhance student's ability to connect classroom activities with real-life situations to develop communication and leadership skills, adding to their personal and intellectual growth.

**11:364:108/109** ***Transfer Student Seminar (TSS) (1)***
This course engages students, new to Rutgers University and the School of Environmental and Biological Sciences (SEBS), in learning about the processes by which individuals learn in class and, ultimately, achieve academic success. The course is geared toward transfer students in a semi-individualized, small discussion/seminar format. Transfer students will gain a clear understanding of SEBS and Rutgers University program policies; stay connected to the Office of Academic Programs, Educational Opportunity Fund (EOF) and academic advisers and be more aware of resources offered; find and create peer support networks within the SEBS and EOF community; and experience a smoother transition into Rutgers developing into EOF scholars within SEBS.

**11:364:110** ***Emerging Topics in Environmental Science (2)***
This course is designed to foster understanding of societal vulnerabilities and being resilient as essential tools when transforming our lives and practices in the 21st century to be competitive and successful individuals. Concepts have interdisciplinary components, which can make the class attractive to students in other programs. This course is shorter than the courses provided during the spring and fall semesters. It provides an introductory understanding of the importance of new topics, including resiliency, and areas of transformation as needed for tomorrow's world.
***Online. Summer Session.***

**11:364:254** ***Critical Thinking in the Sciences (1)***"
Critical Thinking in the Case of Learning the Water-Energy-Food Nexus Seminar" provides an introductory understanding of the importance of conscious thinking, developing and using potential intellect, and applying

critical thinking to important scientific and social matters. Most people unconsciously absorb and adopt the thinking of the people around them, in the media, and social media. They don't develop their own intellect or use it very effectively to rationalize or justify their infantile or egocentric thoughts including the matters related to the environment, food, energy, health, and ethics. Learning to be a critical thinker is going to help students to ask the right questions at the right time with correct skills and to practice skills that enable a student to learn quickly and speak and decide factually. This class will teach students to learn to engage in good and efficient disagreement which is a skillful critical thinking tool. These skills will help students learn how to build strong arguments and to evaluate the strength of arguments made by others. These skills will also help students in the short term in achieving academic success and in the long term to think consciously, deliberately, and skillfully in ways that transform them into strong and secure persons who not only learn to agree to disagree but also dare to disagree with relevant supporting knowledge.

# Entomology 370 (SEBS)

## ENTOMOLOGY 370

**11:370:202** ***The World of Insects (3)***
The diversity, nature, and importance of insects that affect our lives and the environment through competition for food, nuisance, and disease transmission.

**11:370:250** ***Insects and the Environment (3)***
An overview of insects and their role in our environment and how biodiversity and disease vectors are impacted due to pollution and global warming.

**11:370:308** ***Apiculture (3)***
Management, honey and wax production, bee language, social behavior, and pollination ecology. For students with or without a background in science who are interested in keeping bees or crop pollination

**11:370:350** ***Agricultural Entomology and Pest Management (3)***
Recognition and ecology of plant pest species; sampling and survey techniques; pest management methods and the environmental impact of control procedures; integrated control.

**11:370:352** ***Toxicology of Insects (3)***
Effects, side effects, history, hazards, and usefulness of synthetic pesticides essential for the long-term production of food and fiber.

**11:370:355** ***Applied Acarology (3)***
The goals of this course are to learn the biology, diversity, and phylogeny of mites and ticks as well as the economic impact that mites have in agriculture and human health.

**11:370:380** ***Insect Biotechnology (3)***
Insect Biotechnology focuses on the technologies that have allowed us to understand insect genetics and the regulation of genes and how we have utilized this to help solve problems in insect control through gene editing systems. The study of these is new and rapidly evolving. This course requires a background in genetics, biochemistry or entomology.

**11:370:381** ***Insect Biology (4)***
A survey of insects; their structure, function, behavior, evolution, diversity, and effect on agricultural production, as well as on people and animals.

**11:370:402** ***Aquatic Entomology (3)***
Identification, classification, morphology, and natural history of aquatic insects. Fieldwork emphasizing aquatic insects of New Jersey.

**11:370:403** ***Insect Structure and Function (4)***
Insect physical features, including exoskeleton, body regions (head, thorax, abdomen, and appendages), nervous system, digestive system, respiratory system, circulatory system, endocrine system, reproduction system.

**11:370:406** ***Medical and Veterinary Entomology (3)***
Insects and other arthropods in relation to human and animal annoyance and disease.

**11:370:407** ***Careers and Professional Development in Entomology (1)***
This course will provide professional development opportunities in entomological fields and prepare students for the transition to employment. The course will also cover entomological communication skills and presentation components. Students will be expected to incorporate information learned in other classes within the Department of Entomology.

**11:370:409** ***Insect Classification (4)***
For students interested in insect diversity and evolution. Life histories and sight recognition of major families, especially those of economic or medical importance.

**11:370:414** ***Forensic Entomology (3)***
Exposes students to forensically important insects by discussing their biology, collection and preservation techniques, and how the information they provide relates to criminal investigations and legal proceedings.

**11:370:416** ***Forensic Entomology Lab (1)***
An applied approach to forensic entomology that engages students in hands-on data collection at a decomposition site.

**11:370:417** ***Insect-Plant Biochemical Interactions (3)***
The biochemistry of interactions between herbivorous insects and their host plants, coevolutionary adaptations to toxic phytochemicals and pollination. Descriptive chemistry of plant compounds and explanation of biological activity features of the molecules, the metabolic and physiological defense mechanisms of insects, and the mode of action and molecular features of the target physiological insect systems.

**11:370:425** ***Insect Behavior (3)***
Insect behavior from a functional standpoint: stimuli and responses; adaptive significance and evolutionary context; underlying physiological mechanisms.

**11:370:430** ***Urban Entomology (3)***
Learn about common insects and other arthropods in urban environments. This course will introduce their biology, ecology, health risks, and management strategies.

**11:370:493,494** ***Research Problems in Entomology (1-4,1-4)***
Research projects in entomology under the guidance of faculty members.
***Prerequisite: Permission of adviser.***

**11:370:495** ***Seminar in Entomology (1)***
This course is designed to expose students to current topics in entomology via the seminar format. Students will be required to attend and participate in departmental seminars, meet with seminar speakers, and develop/present a mini-seminar on an entomological subject of their choosing.

# Environmental and Biological Sciences 015 (SEBS)

## ENVIRONMENTAL AND BIOLOGICAL SCIENCES 015

**11:015:100** ***Introduction to Making: Access to Tools (1)***
Introduces first-year SEBS students to the process of making objects that solve specific problems, using the tools available in an academic Makerspace. Students will identify specific individual or societal problems, design objects that address these problems, and make these objects through an iterative process. Students will gain experience using the tools available in the Cook campus Makerspace to make novel 2D (primarily planar) and 3D objects with defined functions that solve specific problems.
***First semester undergraduate at SEBS, including freshman and transfers.***

**11:015:112** ***Academic Mentoring (1)***
Development of study skills for matriculating freshman in their first semester.

**11:015:113** ***Portals to Academic Success (1)***
Development of study skills for freshman in their second semester.

**11:015:120** ***International Independent Study (BA)***
This course offers the opportunity to earn credit for internships carried out internationally. Students should consult with their major adviser or major program director.

**11:015:205** ***Internship in the Life Sciences (3)***
This purpose of this course is to provide students with the opportunity to develop experience and knowledge regarding the expectations, qualifications, competencies, and responsibilities of professionals working within the life sciences through an internship experience with academic component. Students will integrate knowledge from their life science coursework to the internship experience, develop new skills, and reflect on their learning experience.
***Declared biological sciences majors or by special permission of the instructor. Cumulative GPA of 2.0.***

**11:015:230** ***Fundamentals of Agroecology (3)***
Introduction to concepts of agroecology, including human interactions with the environment, agricultural plants, and animal-plant interactions.

**11:015:273** *Wine Insights (1)*
This course is about the biology of wine, not about the marketing of wine. It covers grape growing, wine making, wine tasting techniques, wine and health issues, and wine and food matches.
*Prerequisites: 21 years of age and senior undergraduate*

**11:015:395** *Exploring Graduate School (1)*
This course describes the basics of selecting, applying to, and attending graduate school. It will help students prepare a competitive application for admission to the graduate school of their choosing.
*Registration by special permission number only. Contact Dr. Suzanne Sukhdeo at ssukhdeo@sebs.rutgers.edu.*

**11:015:483,484** *Research Problems: Agriculture and Environmental Science (BA,BA)*
Original work in the student's major field.
*Credits and hours by arrangement with a faculty adviser, the appropriate curriculum coordinator, and the Office of Academic Programs and Research.*

# Environmental and Business Economics 373 (SEBS)

## ENVIRONMENTAL AND BUSINESS ECONOMICS 373

**11:373:101** *Economics, People, and Environment (3)*
Applications of economic concepts to problems related to environmental and other social problems. Topics include opportunity cost, marginal analysis, supply and demand, cost-benefit analysis, fiscal and monetary policies, and international trade.
*Not open to students who have completed a semester of microeconomics or macroeconomics.*

**11:373:121** *Principles and Applications of Microeconomics (3)*
Economic principles, laws, processes, and institutions of a free-enterprise economy with applications to contemporary economic life. Emphasis on individuals and firms within the economic system that bring about resource allocation.

**11:373:122** *Principles and Applications of Macroeconomics (3)*
Applications of economic concepts to the general economy. Topics include inflation, unemployment, economic growth, economic recessions, budget deficits, international trade, and fiscal and monetary policies.
*Prerequisites: 01:640:111, 112 or 115.*

**11:373:200** *Agricultural Accounting (3)*
The course introduces general accounting concepts and offers instruction into how an accounting system is constructed and operated, with a specific focus on the basic financial infrastructure governing modern agricultural production. The course pays particular attention to using accounting methods to evaluate and manage agricultural business risks, financing alternatives, hedging strategies, cooperatives, government programs and financial statement preparation.

**11:373:201** *Corporate Social Responsibility (3)*
Investigation of ethical issues facing businesses including acceptable risk, workers rights, economic sustainability and inclusivity, outsourcing, whistle-blowing, and ethical issues in marketing and biotechnology.
*Prerequisite: 11:373:121 or 01:220:102.*

**11:373:202** *Sustainability Decision Tools (3)*
This course is designed to engage students in the practical and theoretical aspects of sustainability, and prepare them for careers such as corporate sustainability officer, green supply chain manager, environmental policy analyst, energy or materials accountant/auditor, utilizing life cycle and carbon footprint analysis.

**11:373:205** *Small Business Essentials (3)*
Focuses on the design and management of all aspects of a business, such as bookkeeping, inventory management, customer experience, pricing, marketing, and benchmarking. Emphasis is placed on providing the knowledge base and skills to succeed in small business administration.
*Prerequisite: A basic math class is recommended.*

**11:373:210** *Business Decision Computer Tools (4)*
Applied business decision making, using computer technology to set up, analyze, solve, and communicate results, using databases, spreadsheets, graphics, word processing, and communication techniques.
*Lec. 80 min., lab. 160 min. Prerequisite: 11:373:121 or 01:220:102.*

**11:373:211** *Applications of Mathematical Concepts in Agricultural Economics (4)*
Applications of mathematical concepts to business and economics. Topics include economic applications of equilibrium, slopes and derivatives, differentials, optimization, constrained optimization, discounting, compounding, and solving linear equations using methods of matrix algebra and linear programming.
*Prerequisite: 01:640:111, 112, or 115.*

**11:373:215** *Applications of Statistics in Business Economics (3)*
Applications of descriptive and inferential statistics necessary for effective interpretation of data used in business decision making.
*Prerequisite: 01:640:115.*

**11:373:218** *Sustainable Food Policy for Developing Countries (3)*
This course provides an overview of the food problem in the developing world and examines the social, political, and economic reasons for population growth, poverty, malnutrition, food insecurity, underemployment, under development, and gender inequality, and the role of agriculture in economic development.
*Open to sophomores and above.*

**11:373:220** *Introduction to Environmental Valuation (3)*
This course will provide students the knowledge and skill set to extend and integrate economic systems to biophysical and ecological environments.

**11:373:231** *Introduction to Marketing (3)*
Introduction to marketing in business and the food industry with emphasis on the economics, institutions, and policies of the food marketing system. Consumer behavior, marketing strategies, cooperatives, food markets, and computer applications.
*Prerequisite: 11:373:121 or equivalent.*

**11:373:241** *Introduction to Management (3)*
General application of basic concepts, functions, and tools of management that contribute to success and improve individual performances in decision making and other situations and problems in the field of management.
*Prerequisite: 11:373:121 or equivalent.*

**11:373:242** *Customer Relationship Management (3)*
This course examines business relationships with customers from acquisition, retention, and development, and focuses on the strategic, operational, and analytical aspects that are central to successful customer relations.
*Prerequisite: 11:373:121 or 01:220:102.*

**11:373:296** *Honors Seminar (3)*
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
*Open only to honors students (SEBS Honors Program, SAS Honors Program, and Honors College) or by permission of instructor.*

**11:373:319** *Corporate Sustainability Reporting (3)*
How do we know if an organization is sustainable or not? This course helps students understand the reporting needed to communicate an organization's sustainability activities to its key stakeholders.
*Open to Sophomores, Juniors, and Seniors. Crosslisted with 11:374:319.*

**11:373:321** *Economics of Production (3)*
Production theory (factor-product, factor-factor, product-product relationships) and its application to farms, business firms, and industries. Derivation of cost functions, product supply functions, and resource demand functions and their use in constructing theories of value, resource pricing, and distribution. Provides an overall perspective of operations management within the context of a business organization.
*Prerequisites: 11:373:121 or equivalent, 11:373:210 or equivalent computer course, a semester of calculus or equivalent, or permission of instructor.*

**11:373:323** *Agricultural and Food Policy (3)*
The nature, importance, and economic consequences of U.S. agricultural and food policies. Commodity price examination of the major public policies influencing the relationships between business and consumers. Appraisal and analysis of antitrust legislation, consumer protection, and state and federal regulations.
*Prerequisite: 11:373:121 or equivalent. Open only to juniors and seniors.*

**11:373:331** *Food Marketing Management (3)*
The structure and workings of the U.S. food marketing system, including effects on farmers, consumers, processors, wholesalers, retailers, and food services, and the forces shaping this dynamic market.
*Prerequisites: 11:373:210, 231.*

**11:373:341** *Organizational Dynamics (3)*
Integration and application of behavioral and managerial sciences to promote processes by which individuals, groups, and organizations work together for common goals and mutual success.
*Prerequisite: 11:373:101 or a semester of microeconomics.*

**11:373:351** *Business Finance I (3)*
Concepts and practices of financial management. Analysis of financial position, working capital management and budgeting, cost of funds and capital structure, and financial instruments and institutions, with applications to emerging issues.
*Prerequisites: A semester of microeconomics, a semester of accounting, 11:373:210, 01:960:211 or 285.*

**11:373:352** *Economics of Futures Markets (3)*
Development, functions, operation, and importance of futures markets. Mechanics of trading futures contracts for hedging and speculative purposes. Use of futures contracts as instruments of financing business activities.
*Prerequisite: 11:373:210. Open only to juniors and seniors.*

**11:373:353** *Personal Finance (3)*
Overview of the financial planning process, goal setting, cash flow management, financial statements and ratios, income taxes, credit and debt, identity theft, time value of money and compound interest, investing, retirement planning, and estate planning.
*Prerequisites: Micro- and macroeconomics; 11:373:351; 33:010:272.*

**11:373:355** *Energy Economics and Policy (3)*
Examination of the history of oil, economics of petroleum and petroleum products, natural gas, coal, and unconventional fossils. Economics of renewables and socioeconomic origins of energy problems. Emphasis placed on energy-related policies in the areas of transportation, power, heat, and electricity.
*Prerequisite: 11:373:121 or 01:220:102.*

**11:373:361** *Land Economics (3)*
Application of economic principles to utilization of land resources. Physical and institutional factors affecting land use. Emphasis on real property rights, economics of conservation, the valuation process, cash flow analysis, and public policy.
*Prerequisite: 11:373:121 or equivalent.*

**11:373:362** *Natural Resource Economics (3)*
Market/nonmarket decision-making structure regarding natural resource use and policy implications, with emphasis on public choice. Benefit-cost analysis and market failure as these apply to natural resource use.
*Prerequisite: 11:373:121 or equivalent.*

**11:373:363** *Environmental Economics (3)*
The economics of pollution. Socioeconomic origins of environmental problems, failures of market economy and property rights systems, public policies to protect environmental quality. Emphasis on economic incentives as a means of control.
*Prerequisite: 11:373:121 or equivalent.*

**11:373:371** *Food, Nutrition, and Health (3)*
The nature, importance, and economic consequences of U.S. agricultural and food policies. Commodity price supports, supply controls, marketing orders, soil and water conservation, food subsidies, food safety, agricultural research, taxation, and macroeconomic policies.
*Prerequisite: 11:373:121 or equivalent.*

**11:373:402** *Global Marketing (3)*
The sociocultural, economic, and geopolitical environments in which strategies and programs are formulated, the cumulative impact on marketing opportunities and threats, and the management skills relevant to global planning and expansion.
*Prerequisites: Microeconomics and 11:373:231 or equivalent. Nonmajors only by permission of instructor.*

**11:373:403** *Innovation and Entrepreneurship (3)*
Methods and procedures for selecting, planning, financing, organizing, and operating a small business. Emphasis on commercializing innovations derived from research and technology development, including academic entrepreneurship.
*Prerequisites: Micro- and macroeconomics; 11:373:231; 373:241; 373:351; 33:010:272; or permission of instructor.*

**11:373:404** *Bioscience Policy (3)*
Policy needs of the biotechnology industry: public sector research and private technology development; intellectual property and its influence on innovation; regulation of research and technology development; government procurement and federally financed research.
*Prerequisites: Open to juniors and seniors in the 373 and 126 majors; others by permission; 11:373:101 or microeconomics.*

**11:373:422** *Demand and Price Analysis (3)*
Advanced analysis of consumer behavior, market demand, producer behavior, and price determination under alternative market structures. Introduction to empirical price analysis.
*Prerequisites: 01:220:103, 11:373:210, a semester of calculus, a semester of statistics.*

**11:373:425** *Econometric Applications (3)*
Applications of econometrics to problems in environmental and business economics. Estimation techniques, model specification, problem diagnostics, and forecasting.
*Prerequisites: Micro- and macroeconomics; a semester of calculus; a semester of statistics.*

**11:373:431** *International Trade Policy (3)*
This course focuses on the political economy of trade in agricultural products, trade policies and practices of import and export nations, trade negotiations, and current developments in agricultural trade from a multidisciplinary perspective.
*Prerequisite: 11:373:121 or 01:220:102.*

**11:373:451** *Business Finance II (3)*
Efficient capital markets, asset pricing models, risk, return, portfolio theory, equity valuation; fixed-income and derivative investment instruments, with emphasis on practical application of theoretical concepts.
*Prerequisites: 11:373:210 or equivalent computer course; 11:373:351 or equivalent; Calculus I; a semester of statistics.*

**11:373:465** *Applied Marketing Research (4)*
Marketing Research is an important tool in the real world of business and marketing management. It is a systematic inquiry of challenges facing businesses in the real world in order to provide information that guides managerial decision making.
*Two 80-min. lecs., one 55-min. rec. Prerequisites: (01:960:285 INTRODUCTORY STATISTICS FOR BUSINESS or 11:373:215 APPL STAT BUS ECON) AND (11:373:231 INTRO TO MARKETING).*

**11:373:491** *Applied Research in Economics (3)*
Research problems and independent projects under guidance of faculty members.
*Prerequisite: Permission of adviser.*

**11:373:492** *Business Issues (3)*
Research problems and independent projects under guidance of faculty members.
*Prerequisite: Permission of adviser.*

**11:373:495** ***Issues in Agricultural, Environmental, and Business Economics (3)***
Senior seminar on major current issues in environmental and business economics. Emphasis on the total system in evaluating rational approaches to issues. Problem solving using best allocation of resources. Debate and discussion.
***Prerequisite: Permission of instructor. Open only to juniors and seniors.***

# Environmental Planning 573 (SEBS)

## ENVIRONMENTAL PLANNING 573

**11:573:202** ***Ecological History of North America (3)***
Almost all of North America today is shaped by human activity. Despite this, the continent still has a wealth of natural resources and harbors large biodiversity. This class will explore why North America has special ecologies. By exploring the biological history of the continent from pre-human times to today (and even beyond), this class is investigating how the biota (flora and fauna) of the continent developed over the millennia and arrived at its current status. The class ranges from topics such as paleontology, archaeology, and historical and bio-geography to urban ecology and conservation biology. The topic will be approached using lectures, field trips, student-facilitated discussion, and paper presentations.

**11:573:231** ***Fundamentals of Environmental Planning (3)***
Principles of environmental planning related to the planning process. Special emphasis on natural principles, policy issues, and social concerns impacting land-use outcomes.

**11:573:232** ***Fundamentals of Environmental Geomatics (3)***
New technologies to make better use of geospatial data for environmental and natural resource analysis and management. Basic concepts, definitions, and examples of different applications used in an environmental planning and management context.

**11:573:233** ***Fundamentals of Environmental Geomatics Laboratory (1)***
An optional laboratory to accompany 11:372:323. Experience in the basics of geographic information systems (GIS) using ArcView.

**11:573:296** ***Honors Seminar (3)***
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
***Open only to honors students (SEBS Honors Program, SAS Honors Program, and Honors College) or by permission of instructor.***

**11:573:302** ***Ecological History of North America (3)***
Almost all of North America today is shaped by human activity. Despite this, the continent still has a wealth of natural resources and harbors a large biodiversity. This class will explore why North America has special ecologies. By exploring the biological history of the continent from pre-human times to today (and even beyond), this class is investigating how the biota (flora and fauna) of the continent developed over the millennia and arrived at its current status. The class ranges from topics from such as paleontology, archaeology, historical and bio-geography to urban ecology and conservation biology. The topic will be approached using lectures, field trips, student facilitated discussion and paper presentation.

**11:573:362** *Intermediate Environmental Geomatics (3)*
Concepts and techniques for the manipulation and analysis of geospatial data. Emphasis on environmental and natural resource management applications. Instruction in desktop geographic information system software.
***Prerequisite: 11:372:232 or by permission.***

**11:573:409** *Challenges and Opportunities in Environmental Planning (3)*
Practice of planning, including land use, environmental, transportation, and other planning fields; structure of planning for all levels of government, covering planning history, legislation (with a focus on the Municipal Land Use Law), intergovernmental relationships, and the various participants in the planning process. Includes a team-based field project.
***Prerequisite: 11:372:231 or equivalent.***

**11:573:411** *Environmental Planning and the Development Process (3)*
Comprehensive examination of the relationship of environmental planning to land development; fundamental principles of environmental planning and assessment; analysis of environmental considerations critical to the land-development process using case studies. Includes a team-based field project.
***Prerequisites: 11:372:231 and 232, or equivalent.***

**11:573:413** *Open Space Planning and Management (3)*
Through lecture, case studies, and hands-on projects, this course will examine the social and economic drivers behind the move to protect land, the planning processes most often used, and the best management practices most often employed.

**11:573:437** *Spatial Data Visualization and Map Design (3)*
While we often work with complex overlay analyses, geostatistical modeling, and other rich analytical methods, the creation and interpretation of maps remain as important to understanding spatial information as it has for thousands of years. This course introduces students to the fundamental concepts of cartography, the science and art of making maps. Students will be able to design effective and sophisticated maps and have the ability to interpret and critically evaluate the many maps.
***Prerequisites: 11:573:232 and 233 or permission of instructor.***

**11:573:444** *Watershed Planning and Management: An Interdisciplinary Approach (3)*
Problems and challenges of watershed management with respect to particular New Jersey watersheds. Review of current comprehensive watershed management and storm water management policy.
***Open only to juniors and seniors.***

**11:573:445** *Ecological Design and Stewardship (3)*
The application of environmental principles and research is essential to sustainable planning, design, and management of land. The goal of this course is to teach students, who would like to include land planning, design, or management in their future career, how to be an effective end user of environmental science.
***Prerequisite: 01:119:103 or 01:119:115 or equivalent.***

**11:573:462** *Advanced Environmental Geomatics (3)*
Advanced and applied analysis of geospatial data. Emphasis on environmental and natural resource management applications. Instruction in state-of-the-art geographical information system software.
***Prerequisites: 11:372:362 and 369.***

**11:573:493,494** ***Special Problems in Environmental Planning (BA,BA)***
Special problems in environmental resources involving original work.
***Prerequisite: Permission of the environmental planning and design curriculum coordinator.***

# Environmental Policy, Institutions, and Behavior 374 (SEBS)

## ENVIRONMENTAL POLICY, INSTITUTIONS, AND BEHAVIOR 374

**11:374:101** ***Introduction to Human Ecology (3)***
The study of complex and varied patterns of interaction between people and the environment, with special attention to concepts, concerns, and methods of human ecology.

**11:374:103** ***Introduction to Science Communication (3)***
This survey course is as an introduction to the field of science communication. Students will learn the ways that science is communicated including through research articles, mass media, films, museums, and social media.

**11:374:108** ***Processes in Human Ecology (3)***
Examination of the interplay of natural and social science processes and drivers of human ecology.

**11:374:110** ***Theories and Reasoning in Human Ecology (3)***
Theories in human ecology and methods of reasoning in the social sciences.
***Students are encouraged to take this course before taking Research Methods in Human Ecology 11:374:201.***

**11:374:115** ***Water and Society (3)***
Fundamentals of water resources issues in the United States and the world, and how they affect the development, design, evolution, and sustainability of societies and economic viability.

**11:374:120** ***Waste and Society (3)***
Course covers waste, its production, and its management in socio-political processes. Students will evaluate modes of waste management and how they connect to policy, industry, and personal behavior.

**11:374:141** ***Health and Society (3)***
The sociocultural factors affecting health status and disease frequency in human populations.

**11:374:175** ***Energy and Society (3)***
Main sources, transfers, and losses of energy in the biosphere; how they relate to human resources and enter the immediate environments of humans and other organisms.

**11:374:201** ***Research Methods in Human Ecology (3)***
The basic research techniques used by social scientists, planners, and others in writing social impact statements, evaluating programs, and carrying out basic research on human problems.
***Students are encouraged to take Theories and Reasoning in Human Ecology 11:374:110 before taking this course.***

**11:374:210** ***Nature Journaling: Discovering Biodiversity and Nature in Everyday Life (3)***
In this course students will use nature journaling (writing, drawing) to observe the world around them, and in the process develop and/or strengthen their understanding of the role and importance of biodiversity in our everyday lives.

**11:374:220** ***Environmental Solutions (3)***
The complex causes of environmental problems and the full range of nonregulatory approaches to improving the environment. By focusing on understanding the causes and contexts of environmental problems along with innovative environmental solutions, the class aims to provide students an understanding of under what conditions various environmental solutions are appropriate and should be applied.

**11:374:225** ***Environment in Society and Mass Media (3)***
Detailed introduction to the patterns and styles of mass media coverage of environmental issues.

**11:374:227** ***Food for Thought: Agriculture and Food Issues in Contemporary Media (3)***
This course examines current issues in U.S. agriculture and food systems in contemporary media from the position that what we communicate and how we communicate makes meaning, which is translated into decision-making and behavior.

**11:374:240** ***Visualizing Information: Storytelling with Data (3)***
Students will build skills in developing visual ways to tell a science story with data in effective forms to use outside of higher education. We will expand our abilities to engage more effectively and improve our science communication skills (general and technical). We will practice many types of visualizations, develop a final portfolio of visual written products, and deliver a presentation, relevant to a current research project. We will focus on scientific and nonscientific audiences.
***Open to sophomores, juniors, and seniors.***

**11:374:250** ***Environmental Justice (3)***
Seminar examining unequal exposure to environmental harms and demands for environmental justice, including access to environmental goods.

**11:374:269** ***Population, Resources, and Environment (3)***
The interaction between populations, resources, and the environment in the developed and developing worlds.

**11:374:269** ***Population, Resources, and Environment (3)***
The interaction between populations, resources, and the environment in the developed and developing worlds.

**11:374:280** ***Careers in Environmental Policy, Institutions, and Behavior (3)***
Career-making and job-seeking skills and knowledge related to the environmental policy, institutions, and behavior major in fields such as law, communication, health, government, industry, advocacy, andeducation. Topics include résumé writing, internships, and the job interview process.

**11:374:289** ***Sustainable Food: Politics, Policy, and Ethics (3)***
How can food systems be made more sustainable and socially just? We examine four food-related social movements: organic farming, local food, fair trade, and animal welfare. For each, we ask: Where does it come from? What are its goals? What is working and what is not? And what should be the focus of 21st-century food politics and policy?

**11:374:296** ***Honors Seminar (3)***
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
***Open only to honors students (SEBS Honors Program, SAS Honors Program, and Honors College) or by permission of instructor.***

**11:374:299** ***Introduction to Sustainability (3)***
Introduction to sustainable practices across sectors.
***Required for the sustainability minor (962).***

**11:374:302** ***Data Analysis for Human Ecology (3)***
Data analysis for social sciences focusing on the human dimensions of environmental issues including quantitative and qualitative measures.
***Prerequisite: 11:374:201.***

**11:374:305** ***Globalization, Development, and Environment (3)***
The management, use, and protection of the global environment in the face of globalization and development.

**11:374:306** ***Appraising Sustainability: Modeling the Value of Ecosystems Services (3)***
This course introduces students to the evolving field of Ecosystems Services Value Modeling. Ecosystems Services Valuation can support decisions at scales as small as backyard plantings or as large as regional land use and environmental planning. Ecosystems Services Valuation Modeling provides mathematically supported methods of evaluating land use choices applicable in engineering, planning, advocacy, and public finance assessments among others.

**11:374:307** ***Experiencing Sustainability in Action (1)***
Communicating about sustainability as it relates to the mission of the organization. Students will explore sustainability missions of organizations and, using effective communication techniques, will develop a proposal to advance a culture of sustainability at Rutgers.

**11:374:310** ***Storytelling about Scientists (3)***
Students will develop science writing and communication skills for both the academic and public context and hone their critical reading skills. Course topics will include: knowing your audience, reading like a writer, unpacking structure, staging uncertainty, delivering a pitch, research techniques, and working responsibly with sources.
***Prerequisite: 01:355:101 Expository Writing.***

**11:374:311** ***Environmental Writing: Rhetorical Strategies for Complex Ecological Issues (3)***
This course examines the range of rhetorical strategies that writers have used to create a sense of urgency in the face of environmental disaster. Our overarching question will be: What is effective environmental writing? Students will write and revise two short essays over the course of the semester and an extended research essay on an environmental topic of the student's choice. Students will present their final work in a class conference.
***Prerequisite: 01:355:101 Expository Writing.***

**11:374:312** ***Environmental History (3)***
Historical aspects of environmental use and change in relation to present-day problems in sustaining the productivity of physical and biological systems.

**11:374:313** ***U.S. Environmental Policy (3)***
Political, scientific, and economic dimensions of resource and environmental policy development. Emphasis on the U.S. experience.

**11:374:314** ***Natural Resources Policy (3)***
Application of theory and methods of social science, particularly the study of common property theory, to problems in natural resource management. Focus on water use, forestry, rangelands, and fisheries.

**11:374:319** ***Corporate Sustainability Reporting (3)***
How do we know if an organization is sustainable or not? This course helps students understand the reporting needed to communicate an organization's sustainability activities to its key stakeholders.
***Open to Sophomores, Juniors, and Seniors. Crosslisted with 11:373:319***

**11:374:322** ***Behavior and the Environment (3)***
Why people engage in environmentally helpful or destructive behaviors, and how to change their behavior.

**11:374:335** ***Communities and Environmental Change (3)***
Analysis of people's responses to environmental stresses or disturbances and the ways in which response patterns change.

**11:374:350** ***Informal Science Education: Learning and Teaching Science outside of the Classroom (3)***
This course focuses on the teaching and learning of science in out-of-school contexts. These contexts are widely referred to as "informal learning" contexts and include: zoos, aquariums, science centers, natural history museums, docent-led walks/tours, after-school programs, and eco/enviro-tours. Learning theory in this area draws heavily from sociocultural perspectives on knowing and learning, and the class will discuss its influence, along with cognitive and educational psychology, on the teaching and learning of science in out-of-school contexts.

**11:374:399** ***Practicum in Sustainability (3)***
Students will apply didactic training in environmental studies, economics, and sociology to one of three community projects with a sustainability perspective: 1) governmental (improvement of New Brunswick city's sustainability); 2) academic institution (Rutgers campus sustainability initiative); or 3) nonprofit organization (the Lower Raritan Watershed initiative or the Sustainable Raritan initiative). Students will focus on problem identification, problem solving, working with stakeholders, budgeting, and producing deliverables.

**11:374:416** ***Environmental Education (3)***
Development and integration of environmental education programs for use in existing K-12 curricula. Use of audiovisuals, applied research, evaluation, and other pertinent resources.

**11:374:418** ***Social-Ecological Research: Mongolia (1)***
Understanding the multiple components of and how they interact in social-ecological systems is imperative in our growing complex and globalized world. Learn with undergraduate and graduate students from throughout the United States and Mongolia. Design collaborative research projects for field-based research within a discipline (e.g., ecology, anthropology, sociology), as well as across disciplines. This distributed seminar course will be focused around the exemplar of the social-ecological impacts of hydropower development in the Selenge River Watershed, Mongolia.

**11:374:424** ***Segregation and Health (3)***
Patterns of settlement by race and income and health outcomes associated with those patterns, social responses, and policies.

**11:374:426** ***Climate Change Policy (3)***
Topics in social, economic, legal and political aspects of policy for climate change mitigation and adaption at international, national and subnational levels.

**11:374:428** ***Marine Fisheries Policy (3)***
International and national policies on marine fisheries management.

**11:374:429** ***Agrarian Landscapes (3)***
Multidisciplinary approach to understanding modern transformations of agrarian, or agricultural, landscapes, with a focus on small-scale agricultural systems.

**11:374:430** ***Risk, Health, and Safety (3)***
Toxicological and epidemiological concepts, psychological aspects of risk perception and coping, and influences on self-protective behavior. Media reporting on risk and health, and how to communicate with the public about risks.

**11:374:431** ***New and Reemerging Diseases (3)***
Social and physical conditions contributing to the emergence or reemergence of diseases, disease behaviors, and control.

**11:374:437** ***Culture and Health (3)***
Understanding of the role of culture in health and health care; cultural competence in health care settings intended to improve health care.

**11:374:438** ***Health in the Latino Community (3)***
Health issues in the Latino community; social and environmental factors that affect the health of Latinos in the United States; and how cultural competence efforts can improve health care for Latinos.

**11:374:440** ***Race and the Environment (3)***
The ways in which racial categories, racism, environmental care, and environmental destruction have all shaped and informed each other.

**11:374:460** ***Environmental Law and Policy (3)***
Introduction to U.S. law and policy governing air, water, and other natural resources; species and public health; and the human activities that affect them and are influenced by them.
***Prerequisite: 11:374:279.***

**11:374:462** ***International Environmental Law and Policy (3)***
The role of formal and informal law in the management of international environmental problems.

**11:374:481** ***Internships in Watershed Management (3)***
Internships in the watershed management or water resources field with internship mentors from sponsoring organizations and agencies. Includes classes with a cohort of interns.

**11:374:490** ***Research and Practicum in Human Ecology (3)***
Advanced interdisciplinary reading and independent research in human ecology under the guidance of a faculty member.
***Prerequisite: By permission only.***

**Capstone Experience: Seniors Only**

Students will create a capstone project that demonstrates skills in research and analysis and knowledge of human ecology that they have gained through their work on the major. Requirement may be fulfilled through one of three options: a) George H. Cook Honors Paper 11:015:497 [498] (3 or more credits); b) Capstone in Human Ecology, Independent Study 11:374:491; or c) Capstone in Human Ecology 11:374:499.

**11:374:491** ***Capstone in Human Ecology, Independent Study (3)***
A solo, independent study capstone project completed under the guidance of a faculty member.
***Prerequisite: Seniors only.***

**11:374:492** ***Environmental Studies Internship (BA)***
Internships involving environmental research and policy at Rutgers, other institutions, public agencies, nongovernmental organizations, or businesses.
***Prerequisite: By permission only.***

**11:374:499** ***Capstone in Human Ecology (3)***
Students in this course will complete individual capstone projects related to a particular research topic defined by the instructor.
***Prerequisite: Seniors only.***

# Environmental Sciences 375 (SEBS)

## ENVIRONMENTAL SCIENCES 375

**11:375:101** ***Introduction to Environmental Sciences (3)***
The impact of physical, chemical, and biological assaults on man and environment in air, water, wastewater, streams, noise, occupational health, and solid wastes.

**11:375:201** ***Biological Principles of Environmental Sciences (3)***
Hazardous agents, pollution, population interactions and dynamics; biogeochemical cycles in damaged and remediated ecosystems; environmental risk, management, and remediation; human health impacts.
***Prerequisites: 01:119:115-116 or 01:119:103, 01:160:161.***

**11:375:202** ***Chemical Principles of Environmental Sciences (3)***
Introduction to chemical processes in Earth's atmosphere and natural waters, and their modification by human activity.
***Prerequisite: 01:160:160 or 01:160:162 or 01:160:164***

**11:375:203** ***Physical Principles of Environmental Sciences (3)***
Physical properties of water, air, and soils; energy and water in the earth system; kinetic and potential energy; and soil/plant/atmosphere relations.
***Prerequisites: 01:750:193 or 01:750:203 or 01:750:123 and 124. Corequisite: 01:750:194 or 01:750:204 or 01:750:227.***

**11:375:302** ***Water and Wastewater Treatment (3)***
Introduction to unit operations that constitute the state-of-the-art of water and wastewater treatment.
***Prerequisite: Calculus 1 and 01:160:162.***

**11:375:303** ***Numerical Methods in Environmental Science (3)***
Formulation and solution of environmental science problems by applying analytical and numerical techniques. Principles of data analysis. Generation and solution of mass and energy balances.
***(Formerly 11:375:437) Prerequisite: 01:640:135 or 151.***

**11:375:307** ***Solid Waste Management and Treatment (3)***
The generation, storage, transport, processing, ultimate disposal, and regulation of municipal solid wastes, including discussion of agricultural and hazardous wastes and recovery of resources.
***Prerequisites: 11:375:202 and 01:750:193 or 01:750:123. Corequisite: 01:750:194 or 01:750:204.***

**11:375:310** ***Analytical Environmental Chemistry Laboratory (3)***
Analysis of environmental samples; environmental sampling procedures; experimental ethics; data analysis; HPLC; GC; and atomic adsorption spectroscopic analysis of organic and inorganic substances.
***Prerequisite: 11:375:202.***

**11:375:312** ***Environmental Microbiology Laboratory (2)***
Hands-on introduction to microbiological techniques related to environmental issues. Bacterial growth and nutrition, nutrient cycles, waste treatment, and water quality testing.
***Pre- or corequisites: 11:375:201,202.***

**11:375:322** ***Energy Technology and Environment (3)***
Critical consideration of energy technology acceptable in a world faced with global warming, environmental pollution, and declining supplies of oil. Examines traditional (oil, natural gas, coal, nuclear), renewable (solar, wind, biomass), and reduced carbon emission sources (co-generation, fuel cells).
***Prerequisite: 01:640:135 or 137 or 151.***

**11:375:340** ***Environmental Applications of Organic Chemistry (3)***
Concepts from organic chemistry applied to environmental systems: physico-chemical properties; acid-base, nucleophilic substitution, and redox reactions; prediction of lifetimes of organic chemicals in the environment; whether chiral compounds (PCBs, pesticides) have undergone biotransformation.
***Prerequisite: 01:160:209 or 01:160:308.***

**11:375:346** ***Introduction to Atmospheric Chemistry (3)***
This course covers the principles of atmospheric chemistry and the environmental implications of changing atmospheric composition. Students will learn about the components of the atmosphere, the processes within, and

how the atmosphere interacts with the earth's surface and outer space. Topics include the Antarctic ozone hole, ozone smog, acid rain, air toxics, greenhouse gases, and aerosols.
*Prerequisites: 01:160:161 (Chemistry 1) AND 01:640:135 (Calculus 1)*

**11:375:360** *Soils and Water (4)*
Physical and chemical properties of soils, soil-water interactions, erosion, etc. Soil properties important to environmental planning. Soil survey interpretation and use.
*Lec. 3 hrs., lab. 3 hrs. Prerequisite: 01:460:101 or 01:160:161 or equivalent.*

**11:375:380** *Tropical Environments and Society (3)*
This course addresses a range of topics focusing on key contemporary challenges facing the environments and people of the tropics including threats to ecosystem function and biodiversity as a result of climate change, deforestation, and land use changes. In addition to the regular lecture, students will participate in a field component during Spring Break during which students will engage in targeted research to gain a deeper appreciation of the challenges and opportunities in tropical systems.

**11:375:390** *Careers in Environmental Science (1)*
This course prepares students for a professional life after Rutgers. Students will learn about different employment options in environmental science by speaking directly with past alumni and professionals working in the field. Students will learn how to present themselves and their accomplishments in a professional matter orally and in writing to build their confidence when applying for graduate school and future employment.
*Open to Environmental Science majors in junior or senior year, or by permission of instructor.*

**11:375:407** *Environmental Toxicology (3)*
Basic principles and applications of toxicology to environmental problems.
*Prerequisite: An organic chemistry course.*

**11:375:411** *Environmental Microbiology (3)*
Microorganisms in carbon, nitrogen, sulfur cycling, biogeochemical processes, and water and wastewater treatment systems; biodegradation strategies and pathways; and bioremediation of toxic contaminants in the environment.
*Prerequisite: One semester of introductory microbiology or bacteriology.*

**11:375:421** *Principles of Air Pollution (3)*
Fundamental factors of atmospheric contamination; effect of pollution on man and environment; principles of measurement and survey; methods of control; air cleaning; legal aspects.
*Prerequisite: 01:160:162*

**11:375:423** *Environmental Fate and Transport (3)*
The fate and transport of chemicals to determine chemical exposures in aquatic systems and predict future conditions. Emphasis on water quality problems introduced by addition of nutrients, metals, and toxic organic chemicals to water, soil, and air.
*Prerequisites: 11:375:203 and one semester of calculus.*

**11:375:424** ***Air Sampling and Analysis Techniques (3)***
Theory and laboratory experience in ambient and indoor air sampling. Calibration, classical air sampling, direct-reading instrumentation. Measurement and analysis of airborne nanoparticles and biological agents.
***Prerequisite: 11:375:421 or equivalent or permission.***

**11:375:430** ***Hazardous Wastes (3)***
Hazardous waste management: case studies, RCRA and other legislation and regulations, treatment and disposal technology, sampling and analysis, fate in the environment, site cleanup.
***Prerequisites: 11:375:302 and 11:375:307.***

**11:375:431,432** ***Special Problems in Environmental Science/Studies (BA,BA)***
Conferences; library and laboratory work on assigned topics.
***Prerequisites: Permission of adviser and program director of environmental sciences.***

**11:375:434** ***Principles of Industrial Hygiene (3)***
Identification, evaluation, and control of chemical and physical stresses of an industrial environment. Gases, aerosols, nonionizing radiation, noise, lighting, ergonomics, industrial ventilation, heat, and health standards.
***Prerequisites:01:119:115 OR 01:119:103.***

**11:375:444** ***Water Chemistry (3)***
Quantitative examination of the thermodynamics and kinetics controlling the speciation of inorganic solutes in natural, contaminated and engineered waters.
***Prerequisites: 01:160:160 or 01:160:162 or 01:160:164 and 01:640:135 or 01:640:151.***

**11:375:450** ***Terrestrial Carbon Cycle (3)***
This course discusses the major land processes that affect the amount of carbon in the global atmosphere. Topics will include a simplified global carbon cycle, general land use change, wetlands, peatlands, "blue carbon", de-/re-forestation, carbon offset schemes, agricultural practices, and urban landscapes all through the lens of carbon cycle impacts.
***Prerequisites: 1 semester each of biology (01:119:115 or 01:119:103) AND chemistry (01:160:161).***

**11:375:453** ***Soil Ecology (3)***
Soil microbial contribution to ecosystem function, microbial diversity, nutrient cycling, soil enzymes, fate of soil amendments, soil flora and fauna, energy cycling, quantification of soil biological processes.
***Prerequisites: 01:119:115-116 or 01:119:103 and 01:160:159, 161, 163, or 165 are acceptable.***

**11:375:474** ***Coastal Biogeochemical Cycles in a Changing World (3)***
Coastal environments are dynamic zones where terrestrial and marine environments meet. They are high-productivity regions of intense biogeochemical cycling that are increasingly challenged by anthropogenic changes including: sea-level rise, ocean acidification, and eutrophication. We will explore four coastal environments from the poles to the tropics while building skills in analysis software.
***Prerequisites: (11:375:201 and 11:375:202) or (11:375:444 and 01:119:115 or 01:119:103) or (11:628:320 and 01:160:161 and 01:119:115 or 01:119:103) or permission of the instructor.***

**11:375:487,488** ***Internship Experience (BA,BA)***
Supervised internship in environmental science.
***Prerequisites: Permission of adviser and program director of environmental sciences.***

**11:375:497,498** *Research in Environmental Science (BA,BA)*
Supervised research experience in environmental science.
***Prerequisites: Permission of adviser and program director of environmental sciences.***

**11:375:499** *Environmental Science Senior Survey (0)*
Registration for this course by environmental science majors in their final semester ensures completion of the departmental Senior Survey.

# Food Science 400 (SEBS)

## FOOD SCIENCE 400

**11:400:103** *Science of Food (3)*
Overview of major food components (carbohydrates, fats, proteins, vitamins, and minerals); process of digestion; major food-related diseases in the United States; the bases for food preservation, including processing, food legislation, and current food issues, such as the use of food additives, irradiation, and genetic engineering.
***Intended for all students; no previous science required.***

**11:400:104** *Food and Health (3)*
Personal nutrition and its relationship to health by way of food and nutraceuticals.
***Intended for all students; no previous science required.***

**11:400:106** *Food as Medicine (3)*
Focuses on the emerging fields of food microbial ecology, food pharmacology, nutrigenomics, and nutraceuticals. Topics covered include probiotic and prebiotic foods and their use in chronic disease prevention (e.g., obesity, hypertension, high cholesterol, and digestive disorders). Intended for nonfood science majors, the course will include lectures from leading experts in the field.
***Intended for all students; no previous science required.***

**11:400:107** *Foods from Field to Table (3)*
Open to all majors, students will discover food science from the conversion of raw agricultural commodities to processed foods and the associated water and energy resource costs.
***Intended for all students; no previous science required.***

**11:400:201** *Principles of Food Science (3)*
Introduction to foods as chemical systems; structure-function relationships of water, protein, lipids, carbohydrates, minerals, and natural products in foods; food safety fundamentals; preservation methods and effects on food quality.
***Prerequisites: General Chemistry I and II (01:160:161 and 162) and General Biology I and II (01:119:115 and 116). Elementary Organic Chemistry 01:160:209 or Organic Chemistry I 01:160:307 must be taken as a co-requisite or completed as a pre-requisite.***

**11:400:202** *Principles of Food Science Laboratory (2)*
Fundamental roles of physical properties and chemical reactions of proteins, lipids, and carbohydrates in food systems; principles underlying food function and stability; analysis of food properties.
***Lab./rec. 4 hrs. Corequisite 11:400:201.***

**11:400:301** *Food Processing Technologies (4)*
Methods and techniques used to transform raw ingredients into food for consumption by humans. Principles of operation and design of industrial equipment used in processing, storage, and packaging of foods. Food quality and food safety as related to food processing equipment. Classification and description of food processing equipment.
*Lecture and integrated lab. Prerequisite: Physics I 01:750:193 or 201 or 203 & 205 Calculus I 01:640:135 or 151.*

**11:400:302** *Food Process Engineering (4)*
Engineering principles of food processing and preservation. Laboratory experiments designed for hands-on experience using state-of-the-art equipment to understand the engineering principles associated with food processing and preservation taught in lectures. Material balances, gas and vapors, psychrometry, energy balances, fluid mechanics, heat and mass transfer, and dehydration.
*Lecture and integrated lab. Prerequisite: Food Processing Technologies 11:400:301*

**11:400:304** *Food Analysis (4)*
Modern methods of analytical chemistry, with emphasis on chromatography. Application of analytical methodology to lipids, amino acids, carbohydrates, and other food components. Importance of precision, accuracy, and significance of results.
*Prerequisite: Elementary Organic Chemistry 01:160:209 or Organic Chemistry I 01:160:307 and Principles of Food Science 11:400:201.*

**11:400:305** *Food Analysis Laboratory (1)*
Food analysis laboratory complements the lecture course and gives students experiences in performing food analysis experiments, analyzing data, and reporting their findings. Identification and critical assessment of the most appropriate and applicable analytical methods for analyzing the properties of a particular food product will be emphasized.
*Co-requisite: Food Analysis 11:400:304*

**11:400:314** *Current Issues in Food Science and Food Law (2)*
An interactive discussion-facilitated course covering topics including current food safety controversies, obesity, nutrition, consumer knowledge, food laws of the United States and their impact, and the role of federal regulatory agencies in the administration of law.
*Prerequisite: 11:400:201.*

**11:400:315** *Study Abroad in Thailand - Food and Sustainability (3)*
This course presents the nexus of food sustainability, food security, and food safety. Students will learn the pathway of foods from: farm to processing, warehousing to transport, and retail to table.

*Prerequisites: General Biology and General Chemistry (minimum one semester of each).*

**11:400:316** *Embedded Study Abroad course in Ireland - Sustainable Food Production (3)*
This course is designed to understand small batch production of artisan foods using locally sourced ingredients keeping in mind sustainability, food safety, and circular food systems.
*Co-requisite: Black pudding to Irish Cream - Sustainable Foods of Ireland 01:959:210*

**11:400:350** ***Wine Basics from Field to Glass (1.5)***
This course provides a brief overview of grape growing and wine history, culture, and making. Global grape varieties and wine styles will be evaluated in instructor-led tasting workshops. All students must be 21 years to take the course and IDs will be checked on the first day of class.

**11:400:405** ***Sensory Evaluation of Foods (3)***
Experience in using the senses as analytical tools. Principles of sensory evaluation of foods, including sample presentation, data recording and analysis, and report writing.
***Prerequisite: Statistics 01:960:211 OR 01:960:285 OR 01:960:401 OR 11:373:215 OR 11:216:369.***

**11:400:410** ***Nutrigenomics and Nutraceuticals (3)***
This course explores the science of nutrigenomics and focuses on plant and animal nutraceuticals and bioactives that provide important health, wellness, and comfort benefits.
***Prerequisites: General Chemistry (01:160:162) AND General Biology (01:119:116) AND Food and Health (11:400:104) or Nutrition and Health (11:709:255).***

**11:400:411** ***Food Chemistry (3)***
Chemical/biochemical reactions of carbohydrates, lipids, proteins, and other constituents in fresh and processed foods are discussed with respect to food quality.
***Prerequisite: Principles of Food Science 11:400:201; Must have previously taken Biochemistry (11:115:301 or 403) or be registered the same semester.***

**11:400:412** ***Food Product Development (3)***
A comprehensive consideration of food product development, including fact finding, prototype and process development, shelf life, technical and financial feasibility, distribution, and consumer acceptance.
***Prerequisites: Food Processing Technologies (11:400:301), Current Issues in Food Science and Food Law (11:400:314), Food Chemistry (11:400:411), Sensory Evaluation of Foods (11:400:405) and Food Microbiology (11:400:423).***

**11:400:413** ***Food Chemistry Laboratory (1)***
Students perform experiments that demonstrate the chemical/biochemical reactions of carbohydrates, lipids, proteins, and other constituents in fresh and processed foods with respect to food quality. Reaction conditions and processes that affect color, flavor, and texture of food are emphasized.
***Co-requisite: Food Chemistry 11:400:411***

**11:400:419** ***Food Physical Systems (3)***
The physical chemistry of foods and food ingredients; microscopic properties of foods in terms of molecular structure and physical principles; properties of aqueous solutions, colloids, biopolymers, and crystalline and amorphous solids; effects of temperature, pressure, water activity, solvent, and matrix properties.
***Prerequisite: Biochemistry (11:115:301 or 403)***

**11:400:422** ***Food Safety: Fads, Facts, and Politics (3)***
Dynamic interactions of science, law, agribusiness interests, and consumer concerns. Case studies and participatory exercises to explore a variety of issues.
***Open to all majors, Juniors and Seniors only.***

**11:400:423** *Food Microbiology (3)*
The role of microorganisms in food processing and preservation and health promotion. The relation of microorganisms to food spoilage, food-borne illness and intoxication, and general food quality.
*Prerequisites: Elementary Organic Chemistry (01:160:209) OR Orgo I (01:160:307) OR Introduction to Microbiology (11:680:201) OR General Microbiology (01:447:390/11:680:390). Open to juniors and seniors only.*

**11:400:424** *Food Microbiology Laboratory (1)*
Methods of microbiological analysis of foods. Identification of food-related microorganisms and fermentation processes.
*Corequisite: 11:400:423.*

**11:400:493** *Research-Based Learning (1-6;BA)*
Research projects in food science under the guidance of the faculty.
*Prerequisite: Permission of adviser.*

**11:400:494** *Internship-Based Learning (1-6;BA)*
Internship projects in food science under the guidance of the faculty.
*Prerequisite: Permission of adviser.*

# Interdisciplinary Studies 554 (SEBS)

## INTERDISCIPLINARY STUDIES 554

**11:554:111** *Readings in Biology (1)*
For first-year students in the SEBS General Honors Program.
*Open only to first-year students in the General Honors Program of the School of Environmental and Biological Sciences.*

**11:554:196** *Honors Seminar I (3)*
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
*Open only to first-year students in the General Honors Program of the School of Environmental and Biological Sciences.*

**11:554:296** *Honors Seminar II (3)*
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
*Open only to sophomores or juniors in the General Honors Program of the School of Environmental and Biological Sciences.*

**11:554:297,298** *Honors Tutorial I,II (1,1)*
An independent study project on a topic agreed upon by the student and the cooperating faculty member. Short written report required at the end of each semester.
*Open only to sophomore students in the General Honors Program of the School of Environmental and Biological Sciences.*

**11:554:301** *Aresty Research Assist (1.5)*
The Aresty Research Assistant (RA) program matches students who are new to research to professors' current research projects for an academic year. Students develop problem-solving skills in research environments, learn to communicate research to diverse audiences, and build confidence in the social environment of research.

**11:554:302** *Aresty Research Assist (1.5)*
The Aresty Research Assistant (RA) program matches students who are new to research to professors' current research projects for an academic year. Students develop problem-solving skills in research environments, learn to communicate research to diverse audiences, and build confidence in the social environment of research.

**11:554:347** *Environmental Photography (4)*
Lecture/laboratory course that emphasizes the development of skills necessary for the production of photographic documents on environmental themes while exposing students to the history and traditions of photographic documentation in science and art. Students are required to provide their own digital camera, preferably with camera raw capability.
*Lec. 3 hrs., lab. 3 hrs.*

**11:554:391,392** *Independent Study (BA,BA)*
Individualized research project under the direction of one or more faculty members.

**11:554:397,398** *Honors Tutorial III,IV (BA,BA)*
An independent study project in the student's field of interest, carried out with a cooperating faculty member. Written report required at the end of each semester.
*Open only to sophomores or juniors in the General Honors Program of the School of Environmental and Biological Sciences.*

**11:554:487,488** *George H. Cook Scholars Program (3-6,3-6)*
A two-semester independent research project, culminating in an oral presentation at a program-wide symposium and a written thesis.
*Open only to George H. Cook Scholar candidates.*

**11:554:491,492** *Independent Study (BA,BA)*
Individualized research project under the direction of one or more faculty members.

**11:554:497, 498** *Honors Tutorial V,VI (BA)*
Senior-year tutorials (3-6 credits/semester) are taken only by students who, for a variety of reasons, have opted not to undertake The George H. Cook Scholars (senior honors thesis) Program. The Tutorial Advisor should, however, expect the same level of initiative and independence as an honors thesis candidate, but no actual "thesis," "defense" or "committee" is required: Tutorials V and VI are simply independent study projects developed by the student.
*Open only to seniors in the General Honors Program of the School of Environmental and Biological Sciences.*

# Landscape Architecture 550 (SEBS)

## LANDSCAPE ARCHITECTURE 550

**11:550:101** *Landscape Studies (3)*
This course introduces the idea of landscape as a cultural phenomenon that represents how society views nature and the built world and how this changes over time. We study how people interact with their environment to create meaning that is often unconscious or assumed. It is about the shaping of our everyday landscape, both as a nation and in our daily routine.
*Field trips required.*

**11:550:133** *Architectural Design (3)*
Concepts of architectural and urban design process, systems, and practice. Built environments in relation to human functions, perception, and needs. Space and form design and sketch studies.
*One 80-min. lec., lab. 3 hrs. Additional field trips by arrangement.*

**11:550:220** *Case Studies of Public Garden Displays (1)*
Travel to three public gardens with vastly different display styles and learn how the garden designers explain the thought process that went into the development of that garden. Archival access to designs complements conversation with garden staff. Case studies compare/contrast garden elements.

**11:550:221** *Design of Public Garden Displays (3)*
The course will focus on pulling together successful combinations of color, texture, line, height, and sequence to craft a garden of primarily herbaceous plants at Rutgers Gardens that will enhance the visitor experience. The final project is the installation of the garden design.
*This course has a construction component.*

**11:550:230** *Environmental Design Analysis (3)*
Explores the meanings, values, and processes that shape our everyday environments and what it means to enable more sustainable solutions. Design, by its very nature, is multidisciplinary, incorporating the creative arts, social science, environmental science, political science, and other perspectives. Sustainability--both ecological and social--involves not only understanding environmental conditions but also the necessary social engagement to encourage better practices and stewardship. Environmental and social justice are central to accessing resources, enabling choice, and enabling civic activism.

**11:550:231** *Introduction to Environmental Design I (5)*
Design fundamentals and creativity through design process; application to fundamental landscape architecture at small-site scale. Graphic skills and techniques. Impact of environmental design on people and nature.
*Two 80-min. lecs. Studio 6 hrs. Not open to first-year students. Prerequisite: Permission of department.*

**11:550:232** *Introduction to Environmental Design II (5)*
Refinement of design process and graphic skills, including perspective and paraline drawing, through projects of increasing complexity and magnitude. Site planning, principles of auto and pedestrian circulation, behavioral aspects of design, basic landform manipulation.
*Two 80-min lecs. Studio 6 hrs. Prerequisite: 11:550:231.*

**11:550:233-234** *Landscape Plants I,II (3,3)*
Identification, environmental requirements, and landscape assets and liabilities of ornamental plants. First semester: fall aspects of deciduous trees and shrubs. Second semester: the broadleaf and narrow-leaf evergreens and the spring aspects of deciduous trees and shrubs.
*One 80-min. lec., lab. 3 hrs. Additional field trips by arrangement.*

**11:550:235** *Herbaceous Plants in the Landscape (3)*
Identification, uses, and care of herbaceous plants in private gardens and public spaces: annuals, herbaceous perennials, ornamental grasses, herbs, and plants for ponds and pools.
*Additional field trips by arrangement.*

**11:550:237** ***Landscape Drawing & Drafting (3)***
An introduction to graphic techniques for representing the landscape, including free-hand sketching, perspective drawing, and drafting plans and sections. This course serves two purposes: it prepares students for landscape design coursework, and it provides an introduction to the art and craft of landscape representation.

**11:550:238** ***Landscape Management and Maintenance (3)***
Maintenance and culture of landscape plantings, including sustainable landscape stewardship.
***Additional field trips by arrangement.***

**11:550:240** ***Public Garden Management (3)***
Offered as the accompanying colloquium to the Rutgers Gardens/Central Park summer internship program, this course provides an understanding of the planning and maintenance objectives of public gardens and parks. This will include an analysis of organizational structures and economic issues along with addressing management of plant materials in respect to safety and proper visitor experience.

**11:550:241** ***Construction 1: Site Engineering (4)***
Site engineering principles; grading, drainage, earthwork, and road alignment; their integration with landscape architecture design.
***Lec./rec. 2 hrs., studio 3 hrs.***

**11:550:250** ***History of Landscape Architecture (3)***
Historical analysis of landscape design theory and practice; design as a physical expression of environmental and cultural determinants.

**11:550:271** ***Agriculture and the Landscape (3)***
Explores the relationships of the farmer to his or her land, and how these relationships alter the physical landscape at a variety of scales, accentuating the human scale. The class often collaborates with local nonprofits in a service-learning context. Experiential learning, field trips, and a humanities-based lens provide the tools for reading the landscape. Additional field trips by arrangement.

**11:550:275** ***Architecture, Inequality, and Landscapes of Justice (3)***
Gain an understanding of how the built environment is created and learn to see the stratified composition of the contemporary city. Explore the production of the city's physical terrain (housing, public space, environmental systems, transportation, and other infrastructure). Form a connection between these material manifestations and social justice issues by exploring how the city constructs inequality, disparity, access, wealth, safety, health, and identity.

**11:550:296** ***Honors Seminar in Landscape Architecture (3)***
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
***Open only to honors students (SEBS Honors Program, SAS Honors Program, and Honors College) or by permission of instructor.***

**11:550:301** *Social and Cultural Aspects of Design (3)*
Addresses the design and use of everyday environments as expressions of individual, community, and civic society. Topics include environment-behavior research, community-based design, and ethical debates related to inclusion, participation, diversity, and sustainability. Students learn methods, such as observation, interviewing, and surveying, and then apply them as part of team and individual projects.

**11:550:331** *Environmental Planning Studio (5)*
Analysis and interpretation of the physical environment with emphasis on methodologies such as geographic information systems (GIS), suitability mapping, and visual resource management as applied to land planning, design, and management problems.
*Two 80-min. lecs. Studio 6 hrs. Prerequisites: 11:573:232, 11:573:233.*

**11:550:332** *Junior Praxis Studio I (5)*
A vertical landscape architecture studio with projects of varied thematic content.
*Two 80-min. lecs. Studio 6 hrs. Prerequisites: 11:550:231 and special permission number.*

**11:550:333** *Design Build Studio (3)*
Development of a set of design strategies for a specific site or sites, given consideration to the community, context, and reuse of site materials that culminates in the construction of the proposed design. Likely includes community engagement and outreach.
*Prerequisite: 11:550:232.*

**11:550:338** *Visualization 2A - Introduction to Digital Design and Presentation (1.5)*
Introduction to fundamental principles of graphic design and to Adobe Design CS, a suite of graphic design programs--software, techniques, and products appropriate for presenting conceptual illustrative graphics to sell ideas to clients and to other professionals. This course expands upon the drawing and drafting fundamentals acquired in Landscape Drawing 11:550:237.
*One 80-min. lec., lab. 3 hrs. This is a half-semester course. Prerequisite: 11:550:237 or permission of the instructor.*

**11:550:339** *Visualization 2B - Introduction to Digital Drafting (1.5)*
Introduction to AutoCAD, the industry standard for computer drafting, bridging landscape architecture, architecture, and engineering and allowing for a seamless exchange of ideas and output. Essential computer-aided design (CAD) tools for the landscape architect for effectively communicating with fellow professionals and clients. This course expands upon the drawing and drafting fundamentals acquired in Landscape Drawing 11:550:237.
*One 80-min. lec., lab. 3 hrs. This is a half-semester course. Prerequisite: 11:550:237 or permission of the instructor.*

**11:550:340** *Planting Design (4)*
Plants as design elements affecting function, comfort, energy efficiency, and aesthetic quality. Selection of plants to serve functional and aesthetic purposes. Specification for planting design.
*Two 80-min. lecs., studio 3 hrs. Prerequisites: 11:550:231 and 233.*

**11:550:341** *Construction 2: Materials & Assemblies (4)*
Introduction to properties of construction materials, structural principles, and methods of construction.
*Lec. 3 hrs. Prerequisite: 11:550:241 Construction 1: Site Engineering AND 11:550:237 Landscape Drawing & Drafting; Corequisite: 11:550:338 2D Digital Design and Drafting.*

**11:550:345** *2D Digital Design and Drafting (1.5)*
Introduction to AutoCAD, the industry standard for computer drafting, bridging landscape architecture, architecture, and engineering and allowing for a seamless exchange of ideas and output. Essential computer-aided design (CAD) tools for the landscape architect to effectively communicate with fellow professionals and clients. This course expands upon the drawing and drafting fundamentals acquired in Landscape Drawing 550:237.
***Prerequisite: 11:550:237 (Landscape Drawing & Drafting)***

**11:550:347** *2D Digital Design Communication (1.5)*
Introduction to fundamental principles of graphic design and to Adobe Design CS, a suite of graphic design programs--software, techniques, and products appropriate for presenting conceptual illustrative graphics to sell ideas to clients and to other professionals. This course expands upon the drawing and drafting fundamentals acquired in Landscape Drawing 11:550:237.
***Prerequisite: 11:550:237 (Landscape Drawing & Drafting)***

**11:550:350** *3D Digital Design & Communication (3)*
Introduction to the use of computer-aided design (CAD) as a design and graphics tool in landscape architecture.
***Lec. 2 hrs., lab. 3 hrs. Prerequisite: 11:550:345 (2D Digital Design & Drafting) or 11:550:339 (Visualization 2B - Introduction to Digital Drafting).***

**11:550:360** *International Studies in Landscape Architecture (BA)*
An opportunity to study in a landscape architecture program abroad with which the department has established an articulated exchange agreement. Course equivalences will be determined upon completion of the program.
***Prerequisite: Special permission number.***

**11:550:430** *Advanced Landscape History Seminar (3)*
History of gardens in Italy, France, England, or the United States from the Renaissance to the present. Emphasis on form and meaning of garden design and widespread influence of this genre.
***Prerequisite: 11:550:330 or permission of instructor.***

**11:550:431** *Advanced Landscape Architecture I (5)*
Advanced landscape architecture theory with application to problems of increasing scope and complexity. Social and cultural contexts, with emphasis on design sites for housing and community design.
***Two 80-min. lecs. Studio 6 hrs. Prerequisites: 11:550:332, 11:550:341.***

**11:550:432** *Senior Praxis Studio (5)*
A vertical landscape architecture studio with projects of varied thematic content.
***Two 80-min. lecs. Studio 6 hrs. Prerequisite: 11:550:331.***

**11:550:435** *Professional Practice (1)*
Survey of general professional practice, office management, client relationships, collaborative practice, contracts, and specifications.
***Lec. 1.5 hrs.***

**11:550:436** *Landscape Enterprise (3)*
Understanding the business management side of the landscape profession (applicable to design firms, landscape construction, landscape maintenance, design build), especially for those interested in starting or owning their own company. Topics include: general business practices; licenses, regulations, and best management practices and standards specific to the industry and green technology.

**11:550:437** *Special Problems in Landscape Architecture (BA)*
Independent projects. Terminal comprehensive project, research of appropriate scope and complexity, or community involvement in environmental design problems.
*Open only to majors in the landscape architecture program; others by permission of instructor.*

**11:550:438** *Material Tectonics (3)*
Approaches architecture as a material practice and investigates the evolution of computer aided design (CAD) technologies toward the generation of material effects.
*Prerequisite: 11:550:350.*

**11:550:439** *Suburbia Transformed: Residential Design in the Age of Sustainability (3)*
Residential design in the age of sustainability explores how contemporary green strategies, tactics, and technologies can be employed in redesigning an existing small-scale suburban house and garden, thus contributing to the transformation of suburbia, one domestic property at a time.
*Prerequisite: 11:550:231 or permission of the instructor.*

**11:550:440** *Case Studies in Landscape Architecture: 1850 to the Present (3)*
Research seminar: engage historical and theoretical underpinnings of landscape architecture, relating the profession to concepts of nature, landscape, science, art, and social justice as conceived by the protagonists in the field.
*Two 80-min. lectures.*

**11:550:441** *Construction 3: Design Implementation and Practice (4)*
Introduction to the construction implementation process; development of technical competence; integration of sustainable design principles; communication through technical documentation. Additional topics related to professional practice.
*Two 80-min. lectures. Studio 1-3 hrs. Prerequisites: 11:550:341 and 11:550:350, and 01:640:115 or 01:640:111/112.*

**11:550:442** *Sustainable Landscape Technology (3)*
Integration of specific sustainable practices and technologies can prepare a site to function efficiently and sustainably in the design and construction of landscape architectural projects. Consideration includes siting of features, integration with existing site systems, design for energy/climate, and reuse of site materials.
*Prerequisite: 11:550:341.*

**00:550:443** *Summer Studio Abroad (5)*
Landscape architecture relying on an international setting for case studies and field investigations of landscape planning, design, and management issues.
*Prerequisite: Special permission number.*

**11:550:460** *Field Study in Landscape Architecture (1-5 BA)*
Case study and field investigation of landscape planning, design, and management issues.
***Open only to landscape architecture majors; others with departmental permission.***

**11:550:461** *Field Study in Landscape Architecture (3)*
Case study and field investigation of landscape planning, design, and management issues.
***Open only to landscape architecture majors; others with departmental permission.***

**11:550:480** *Topology and Design (3)*
The term "topology" derives from the Greek words for "place," "space," and "study," "word," "sense". It comprises a theory of place (concept of "genius loci") and a method of presenting arguments in a discourse. As a design approach, topology advocates to pay attention to deeper spatial, physical, poetic and philosophical values in a long tradition of designed nature.

**11:550:497** *Senior Thesis Preparation (1)*
Development of independent research and comprehensive design project proposal, including literature review and research methodology, to be submitted to the departmental faculty for approval.
***Prerequisite: Departmental approval.***

**11:550:498** *Senior Thesis in Landscape Architecture (4-5)*
Execution of the project proposed in 11:550:497. May not be used in conjunction with the George H. Cook Scholars Program or a cooperative education course.
***Prerequisites: 11:550:497 and departmental approval.***

**11:550:499** *Landscape Architecture Senior Survey (0)*
Every senior majoring in landscape architecture must complete this 0-credit survey class in order to graduate. This senior survey is necessary for program accreditation and for students to be permitted to take the licensure examination.
***Registration by special permission. Graded P/NC.***

**11:550:550** *Common Lecture (0)*
This course is a corequisite for all landscape architecture studios.
***Corequisites:11:550:231, 11:550:232, 11:550:331, 11:550:332, 11:550:431, 11:550:432.***

# Leadership Skills 607 (SEBS)

## LEADERSHIP SKILLS 607

**11:607:101** *Introduction to Leadership Studies (1.5)*
Students learn about leadership theories, styles, and practices; the importance of social, emotional, and cultural intelligence and communication skills; and the ethical dilemmas that leaders face.
***Prerequisites: By permission of instructor.***

**11:607:200** *Principles of Leadership (3)*
An introduction to leadership. Topics covered include developing leadership skills, creating a vision, and overcoming obstacles.

**11:607:201** ***Stewardship and Leadership (3)***
An introduction to the concept of stewardship and leadership styles. Topics covered include problem solving and decision making, influence, and community development. This course fulfills the SEBS ethics requirement.

**11:607:202** ***Leadership and Social Change (3)***
Students examine the theory and practice of service learning as it relates to their academic studies. Students engage in service learning activities within the community.

**11:607:203** ***Foundations of Volunteer Management (3)***
Students will compare several models for volunteer management and apply one to examine an organization that depends upon volunteers. Course readings and activities will address how organizations recruit, train, utilize, and recognize their volunteers. Each student will develop a small case study examining the volunteer management in one organization and making recommendations based on the theories and practices studied in class.

**11:607:204** ***Self-Leadership (2)***
Self-leadership is the sense of who you are, what you can do, and where you are going coupled with the ability to influence your communication, emotions, and behaviors to get there.

**11:607:211** ***Building Leadership Character (1.5)***
Developing character requires an understanding of ourselves and others. The course will build student's knowledge and skills and put character in the context of leadership and ethical decision-making.

**11:607:250** ***The Cross-Cultural Leader (3)***
The purpose of this course is to provide students with the purpose, understanding, value, and applicability of building cross-cultural competencies in order to become effective cross-cultural leaders.

**11:607:255** ***Inclusive Leadership (1.5)***
This course provides the knowledge and skills needed to demonstrate inclusion that not only creates organizational growth and success, but also fosters belonging and engagement.

**11:607:280/281** ***Special Topics in Leadership (BA,BA)***
This course will explore special topics in leadership.

**11:607:364** ***Grant Development and Management (3)***
Careers in the nonprofit or governmental (local, state, federal) sectors will likely require a skill set in grant development and management. After completion of this course students will be able to identify grant opportunities, develop a viable proposal, prepare a formal application for funding, and manage a funded project including fiscal and legal responsibilities.
***Prerequisite: 01:355:101.***

**11:607:380** ***Communication for Today's Leader (3)***
Students explore leadership and communication from a theoretical, as well as a practical, hands-on perspective. Course includes application of leadership theories and principles to personal leadership experiences.

**11:607:381** ***Presentation Skills: Advocating for Change (3)***
This course will strengthen student presentation and public speaking skills with the leadership focus on advocating for change, participating in civic engagement and promoting community service.

**11:607:382** *Conflict Management Practicum (3)*
Students learn conflict management skills including consensus building, negotiation, and mediation. Conflict theory is explored as a precursor to understanding and enhancing individual conflict management skills.

**11:607:383** *Meeting Management/Parliamentary Procedures (1.5)*
Key concepts of parliamentary procedure, the foundation for decision making, and meeting management are covered. Students learn meeting management techniques and facilitation skills.

**11:607:384** *Emotionally Intelligent Leadership (1.5)*
This course enables students to understand and develop the skills needed to foster emotionally intelligent leadership. Students explore their experiences in leadership with a focus on learning one's strengths and limitations. Students apply critical thinking skills through essays, case study, analyses, and reflective discussion questions.

**11:607:385** *The Ethical Leader (3)*
Students explore the inextricable need for ethics within the realm of leadership. Topics addressed include power and self-interest, the influence of values on leadership, leaders and followers, and leadership for the greatest good.

**11:607:388** *Facilitating Effective Meetings (1.5)*
Ineffective meetings translate into lost time and opportunity, which can result in reduced motivation and erode the leader's credibility. Through effective facilitation skills, leaders establish a sense of common purpose, enhance collegiality, and move the agenda forward. This course will cover the key concepts of meeting management and effective facilitation skills for presenting content, and dealing with challenging participants and unpopular topics.

**11:607:400** *Nonprofit Organization Leadership (3)*
Regardless of title or role, there are ample opportunities to serve in a leadership capacity while working at a nonprofit organization. Whether coordinating a project, chairing a committee, or managing a team, the goal is always to lead effectively. This course will focus on effective leadership for the nonprofit sector. Students will learn about their personal leadership style and develop goals to improve it. Strategic planning, fundraising, lobbying, and advocacy along with managing employees in the nonprofit sector will be addressed.
*Prerequisites: 11:607:200 and 203.*

**11:607:401** *Foundations of Program Planning (3)*
Students develop the skill set to methodically design, develop, implement, and evaluate educational programs that are effectiveness-based and impact-driven. This course is beneficial for students pursuing careers in health care, public health, human services, education, community development, nongovernmental organizations (NGO), faith-based organizations, nonprofits, government (local, state, federal), foundations, and businesses and corporations.

**11:607:402** *Building Community Partnerships (3)*
This course presents key elements for building collaborative partnerships. Students examine various coalition/community partnership frameworks and models and develop leadership skills necessary to initiate, build, evaluate, and sustain durable coalitions and community partnerships. This course is beneficial for students pursuing careers in health care, public health, human services, education, community development, nongovernmental organizations (NGO), faith-based organizations, nonprofits, government (local, state, federal), foundations, and business and corporations.

**11:607:405** *Capstone Experience in Nonprofit Leadership (3)*
Intended as a capstone to the nonprofit leadership minor, in this course students will use their prior knowledge, skills, and key competencies along with entrepreneurial skills as they develop an organizational business and strategic plan needed for a successful and sustainable nonprofit organization.
***Prerequisites: 11:607:200, 203, 381, 386, 400, 401, 402.***

**11:607:484** *Practical Leadership Applications in Agricultural Science (4)*
Provides students with relevant knowledge and skills related to agricultural work environment. Classroom instruction coupled with an intensive field experience in the Netherlands provides international perspective while preparing students to be productive contributors in the workplace. Students apply and integrate classroom-taught theories, principles, and skills to authentic situations encountered beyond the classroom. Establishing contacts and developing rapport with agricultural leaders further enhances student growth, development, and opportunities.
***Prerequisite: At least one animal science course, plant science course, or general biology; or permission of instructor.***

**11:607:485** *Group Process/Team Dynamics (3)*
Presents an introduction to the knowledge, attitudes, and skills needed to become effective team members through the examination of group dynamics and team processes. This course is a junior/senior colloquium.

**11:607:486** *Leadership in Practice: Designing Your Success (3)*
This course is an exploration of leadership from a practical perspective. Theoretical underpinnings, leadership models, styles, and skills of leadership are reviewed. Students develop skills in networking, problem solving, public speaking, and influence. This course is a junior/senior colloquium.

**11:607:487** *Transformational Leadership (3)*
This course presents a critical analysis of the concepts, principles, and practices of transformational leadership and the implications for developing leadership capacity, serving as role model, and influencing decisions and organizational change.

**11:607:488** *International Relations: Leadership for Sustainable Development Practicum--Travel Seminar (4)*
This course is an introduction to leadership and sustainable development within a developing country. Students examine the interrelationship of multiple groups working to build stronger communities. This course is a junior/senior colloquium.

# Marine Sciences 628 (SEBS)

## MARINE SCIENCES 628

**11:628:100** *Oceanography House (1.5)*
This first-year seminar introduces students to the application of technologies used in ocean observing systems. Students work in small groups mentored by undergraduates with prior observing system experience and participate in ongoing research and development.
***Intended for all students; no previous science required.***

**11:628:114** *Science, Pseudo-Science, and Society (3)*
Science has transformed society's understanding of the natural world. This course will introduce students to the process and use of science. It highlights how scientific understanding sometimes goes against current belief, leading to so-called "controversies."

**11:628:120** *Introduction to Oceanography (3)*
An exploration of the world's ocean and all its complex interactions with the planet. This course touches on a variety of disciplines including biology, geology, chemistry, and environmental sciences.
***Intended for all students; no previous science required. Credit not given for both this course and 01:460:120.***

**11:628:130** *Sea Monsters and Weird Biology in Earth's Oceans (3)*
The ocean is full of giant sharks, mythic squids, gargantuan worms, and microbes that shape the planet. Biology is continually adapting and evolving, driven by the environment in which it lives. This class uses the ocean to explore how biology adapts and evolves. We will also explore how the ocean shapes our views of nature, assess how the ocean is changing, and consider how sustainable it will be in the future. Our goal is to increase the biological and ocean literacy of students.

**11:628:201-203, 205-210** *Topics: Marine Sciences (1.5)*
Led by faculty in the Center for Ocean Observing Leadership. Specific topics depend on ongoing research on expanding and applying ocean observation technologies.

**11:628:204** *The Water Planet (3)*
Survey of the science, environmental impact, and resource allocation of water on the Earth. Characteristics of water: hydrologic cycle, runoff and erosion, river systems, past and present climates, water quality, political and economic aspects of water.
***Intended for all students; no previous science required. Credit not given for both this course and 01:460:204.***

**11:628:221** *Human Interactions with the Coastal Ocean (3)*
Study of the processes governing change in the oceans, with emphasis on basic scientific principles and the ways that scientific knowledge can be used to resolve environmental problems.
***Intended for all students; no previous science required.***

**11:628:230** *Basic SCUBA Diving (1.5)*
This course introduces students to the fundamental academic concepts and practical skills of SCUBA diving as described by PADI (Professional Association of Dive Instructors) standards. The course provides students with the entry-level knowledge and skills necessary to safely participate in SCUBA dives to a depth of 60 feet (18 meters), or shallower.

**11:628:309** *Fishery Science (3)*
Marine and freshwater, commercial and recreational fisheries; behavior of fish populations, fishers, and management institutions as well as the emergent properties of the entire system.
***Prerequisite: Permission of the instructor.***

**11:628:317** *Aquaculture (3)*
Aquaculture production methods, fish and shellfish growth and reproduction, nutrition, genetics, disease control, economics, environmental consequences, and public policy issues.
***Prerequisites: 01:119:115-116,117 and 01:160:161-162. Class meets intensively for 10 days in January at the Haskin Shellfish Research Lab at Bivalve, in Port Norris, New Jersey.***

**11:628:320** *Dynamics of Marine Ecosystems (3)*
Overview of the fundamental processes in the marine environment with emphasis on interdisciplinary linkages in the functioning of marine ecosystems. Dynamics in the physics, chemistry, and biology of the oceans will be emphasized.
***Prerequisites: 01:640:135 and any ONE of the following courses in biology, chemistry, or physics: 01:119:116; 01:160:162; 01:750:194; 01:750:204.***

**11:628:321** *Ichthyology (4)*
The biology of fish with emphasis on functional morphology, ecology, and behavior. Laboratory exercises will center on the identification and anatomy of New Jersey marine and estuarine fishes.
***Prerequisite: 01:119:116.***

**11:628:341** *Hydrothermal Vents (3)*
Composition and dynamics of deep-sea hydrothermal vent communities and the geology of seafloor spreading centers.
***Prerequisites: 01:119:116 and 01:640:135.***

**11:628:345** *Scientific Diving I (3)*
Introductory course designed to provide the student with the academics, practical skill applications, and SCUBA diving training to become competent and confident divers. Training will be conducted under the minimum standards of both the American Academy of Underwater Sciences (AAUS) and applicable recreational training agencies toward achieving AAUS Scientific Diving certification.
***Prerequisites: Medical statement with medical clearance for scuba diving as needed. Students must demonstrate satisfactory swimming ability, physical stamina, and emotional stability to instructor during the course.***

**11:628:346** *Scientific Diving II (3)*
This is the second course of the American Academy of Underwater Science (AAUS) Scientific Diver Certification designed to provide the student with the academic, practical, and SCUBA skills training to meet and exceed AAUS minimum standards for Scientific Diving certification.
***Prerequisite: 11:628:345.***

**11:628:363** *Oceanographic Methods and Data Analysis: Biology and Chemistry (3)*
Basic techniques to collect, analyze, report, and interpret biological and chemical oceanographic data.
***Prerequisite: 11:628:320.***

**11:628:364** *Oceanographic Methods and Data Analysis: Physical Processes (3)*
A field and laboratory course in the analytical tools of oceanography, focusing on navigation, GPS, instrumentation for in situ and remote collection of physical and chemical properties of the ocean.
***Prerequisite: 11:628:320.***

**11:628:401** *Science in Shoreline Management (3)*
Examination of coastal environments based on the use of science in the management of shoreline resources, culminating in a student project evaluating the conversion of shoreline by direct and indirect human action.

**11:628:402** *The Role of Polar Regions in the Earth System (3)*
The polar regions are a central to the Earth system, playing an outsized role in regulating the planet's climate, chemistry, and ecosystems. The polar regions are changing rapidly in response to global warming, with far-reaching impacts on sea level rise, carbon cycling, and other global dynamics. Processes in the Arctic and Antarctic are central to understanding past and future climate variations, biodiversity and marine resources. In this course, we will build on fundamental physical and biological principles to understand the links between the cryosphere, ocean, atmosphere and biosphere in the polar regions. We will explore the drivers of polar change, and the ramifications of these changes for the Earth system and climate.
***Prerequisite: 11:628:320 Dynamics of Marine Ecosystems***

**11:628:405** *Molecular Microbial Oceanography (3)*
This course will highlight emerging efforts to elucidate the activity, diversity, and evolution of microbial genes and link them to key oceanic ecosystem and biogeochemical processes by merging biochemistry, molecular biology, and genome-based approaches with innovative instrumentation.
***Prerequisites: 01:119:116 and (11:628:320 or 11:216:351).***

**11:628:410** *Biophysical Interactions: From Barnacles to Jellyfish (3)*
Focuses on understanding how organisms interact with and are affected by their physical fluid environment, including life at low Reynolds numbers, biomechanics, benthic boundary layers, diffusion, and dispersal. Many principles that are relevant for algae and benthic invertebrates also apply to microbes, terrestrial plants and animals, and chemical tracers.
***Prerequisite: 11:628:320 and 01:640:136***

**11:628:421** *Advanced Geographic Information Systems (3)*
Research and applications in Geographic Information Systems; geodesy and georeferencing; uncertainty and error propagation; multicriteria/multiobjective decision-making; introduction to surface analysis and spatial pattern analysis; change/time series analysis; GIS and society.
***Prerequisite: 01:450:321 Introduction to Geographic Information Systems.***

**11:628:451** *Physical Oceanography (4)*
Principles of ocean physics. Mass, momentum, heat, and freshwater conservation and atmospheric exchange. Influence of Earth's rotation. The ocean's role in climate. Tides, waves, and currents. Effects of ocean circulation on its biology and chemistry.
***Prerequisite: 01:640:136***

**11:628:452** *Geophysical Data Analysis (3)*
Quantitative analysis and display of spatial and time series data, filters, spectral analysis, covariance, coherence, confidence intervals, goodness-of-fit, optimal interpolation of unequally spaced data, empirical orthogonal functions, harmonic analysis. Practical exercises in Matlab analysis. Individual projects and presentations.
***Prerequisite: 01:640:252.***

**11:628:461** *The Biology of Living in the Ocean: Water Column Ecosystems and Processes (3)*
Processes that regulate the biology of the plankton and fish, which drives the community ecology for ocean ecosystems. It covers ecological themes such as the acquisition and transformation of energy and materials, population regulation, competition/predation dynamics, population connectivity, and marine food webs. Also highlights approaches and technologies used to make measurements in the ocean.
*Prerequisite: 11:628:320.*

**11:628:462** *The Biology of Living in the Ocean: Boundary Ecosystems and Processes (3)*
Processes that regulate the biology, productivity, populations, and communities of organisms at ocean boundaries, including intertidal zones, estuaries, salt marshes, coral reefs, hydrothermal vents, and the sea floor. This course covers ecological themes such as the acquisition and transformation of energy and materials, population regulation, competition/predation dynamics, population connectivity, and marine food webs.
*Prerequisite: 11:628:320.*

**11:628:472** *Chemical Oceanography (3)*
Chemical description of the sea and how the distributions of chemical species in the world ocean are related to physical, chemical, biological, and geological processes.
*Prerequisites: 01:160:162 and 11:628:320.*

**11:628:474** *Coastal Biogeochemical Cycles in a Changing World (3)*
Coastal environments are dynamic zones where terrestrial and marine environments meet. They are high-productivity regions of intense biogeochemical cycling that are increasingly challenged by anthropogenic changes including: sea-level rise, ocean acidification, and eutrophication. We will explore four coastal environments from the poles to the tropics while building skills in analysis software.
*Cross-listed with 11:375:474. Prerequisites: 11:628:320 or permission of instructor.*

**11:628:476** *History of the Earth System (3)*
The Earth as an evolving physical/biological system; physical and biogeochemical processes that have shaped the environment over geologic time.
*Prerequisites: Any three of the following: 01:119:116, 01:160:162, 01:750:204, 01:460:101; or permission of instructor.*

**11:628:497 (Fall), 498 (Spring)** *Special Problems in Marine and Coastal Sciences (BA,BA)*
Practical field/laboratory experience with faculty in the Institute of Marine and Coastal Sciences.
*Prerequisite: Permission of instructor.*

# Meteorology 670 (SEBS)

## METEOROLOGY 670

**11:670:101** *Introduction to Meteorology (3)*
Overview of current weather maps. Structure of the atmosphere and the role of moisture in the development of dew, clouds, and precipitation. Air masses, fronts, cyclones, thunderstorms, tornadoes, and hurricanes. Elements of forecasting, instrumentation, and communication.
*This course satisfies the SAS Natural Sciences [NS] and the SEBS [NS - physical science] Learning Goals.*

**11:670:102** *Introduction to Climate Science (3)*
Major mechanisms influencing climate, including Earth's energy balance, water cycle, and atmospheric circulation; spatial distribution of climate and climate classification; natural climate variability, including El Niño; post climate variations; and the carbon cycle and human-induced climate change.
*This course satisfies the SAS Natural Sciences [NS] and the SEBS [NS-environmental science] learning goals.*

**11:670:111,112** *Weather, Climate, and Television (1.5,1.5)*
Provides a theoretical foundation of television broadcasting and meteorology to supplement the hands-on television experience gained from the WeatherWatcher Living-Learning Community. By examining the history and characteristics of television, critical analyses of news and weather-related programming, and special topics pertaining to meteorology, students will gain a rounded understanding of the medium and its impact on the field of meteorology and broadcasting. This WeatherWatcher Living-Learning Community academic course is required of all first-year residents.
*Pre- or corequisite for 111: 11:670:101. Prerequisite for 112: 11:670:111.*

**11:670:211** *Meteorological Analysis (3)*
Surface observation codes. Preparation of surface, upper air, and sounding charts. Forecast guidance, weather map interpretation, and preparation of weather forecasts. Map discussions.
*Pre- or corequisite: 11:670:101.*

**11:670:212** *Computational Methods for Meteorology (3)*
Introduction to the basic concepts of programming and computation for meteorology and earth science students. Elements of compiled and interpreted languages. Development of skills necessary for the reading, analyzing, and plotting of meteorological and climatic data.
*Prerequisite: 11:670:211 or permission of instructor.*

**11:670:296** *Honors Seminar (3)*
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
*Open only to honors students (SEBS Honors Program, SAS Honors Program, and Honors College) or by permission of instructor.*

**11:670:323** *Thermodynamics of the Atmosphere (3)*
Thermodynamics of the atmosphere, energy conservation, ideal gas law, water and its transformations, moist air, aerosols, hydrostatic stability and convection, vertical motion, cloud formation, and precipitation.
*Prerequisites: A grade of C or better in 01:640:151 and 01:640:152 and [11:750:193 or (11:750:203 and 11:750:205)] and [11:750:194 or (11:750:204 and 11:750:206)]*

**11:670:324** *Dynamics of the Oceans and the Atmosphere (3)*
Hydrodynamics of the atmosphere. Equations of motion on rotating earth. Vorticity, potential vorticity, and divergence. Boundary layer dynamics.
*Prerequisites: 11:670:323; a grade of C or better in 01:640:251.*

**11:670:325** *Special Topics in Meteorology (BA)*
Topics selected to meet specific needs.

**11:670:334** *Severe Weather Forecasting Field Trip (3)*
Techniques for the forecasting and safe observation of severe convection; case study analysis of observed events. Two-week field trip required.
*Prerequisites: 11:670:211 and permission of the instructor.*

**11:670:414** *Hydrologic Processes (3)*
Physical processes governing the occurrence and movement of water through the atmosphere, lithosphere, and biosphere. Techniques for collecting and analyzing hydrologic data and predicting the hydrologic states of particular systems.
*Open only to Junior/Senior students. Prerequisites: 01:640:151 and (01:750:201 or 01:750:203).*

**11:670:431** *Physical Meteorology (3)*
Atmospheric optics; atmospheric radiation and applications to climate; atmospheric convection; cloud and precipitation formation; turbulence and boundary layer processes; atmospheric electricity.
*Prerequisites:11:670:323; a grade of C or better in 01:640:251.*

**11:670:433** *Weather Analysis and Forecasting I: Synoptic Meteorology (4)*
Dynamics and thermodynamics of the atmosphere applied to current weather situations and case studies. Cyclone and frontal theory, jet streams, and quasi-geostrophic diagnostics. Weather discussions, map analysis, and forecast preparation.
*Lecture and laboratory. Prerequisites: 11:670:211 and 324.*

**11:670:434** *Weather Analysis and Forecasting II: Mesoscale Meteorology (3)*
Real-time analysis and nowcasting of mesoscale atmospheric phenomena, including heavy snow, cold-air damming, severe weather, and flash floods. Case studies and weather discussions.
*Laboratory. Prerequisite: 11:670:433.*

**11:670:444** *Tropical Meteorology (3)*
The dynamics and thermodynamics of the tropics, including regional and large-scale tropical circulations and their role in the global general circulation, tropical wave dynamics, convection and convective systems, synoptic, intraseasonal, and seasonal variability; monsoons, the El Niño/Southern Oscillation, tropical cyclones, and hurricanes.
*Prerequisite: 11:670:324.*

**11:670:451** *Remote Sensing of the Oceans and Atmosphere (3)*
Methods and instruments of observation of the ocean (temperature, salinity, currents, sea state, turbidity, and pollutants) and atmosphere (temperature, water vapor, ozone, clouds, and wind).
*Prerequisites: 01:640:251; 01:750:194 or equivalent.*

**11:670:453** *Air Quality Modeling (3)*
A theoretical foundation to understand the principles and governing equations regarding chemical transformation and transport of atmospheric pollution; introduction to and practice in computer programming and numerical techniques as used in approaches to study the atmosphere.
*Prerequisites: 01:640:251 and (01:160:160 or 01:160:162 or [(01:160:159 or 01:160:161) and 11:670:212])*

**11:670:461** *Climate Dynamics (3)*
The climate system and how it is changing due to natural and human causes, including past climate variations, El Niño, global warming, climate modeling, nuclear winter, mitigation options, and geoengineering.
*Prerequisites: 11:670:324 and 431.*

**11:670:481** *Applications in Industrial Meteorology (1)*
The applied research and project management skill sets used in industrial meteorology. Weather and climate effects on financial markets. Small applied research exercises that simulate authentic industry experiences. Critical appraisals of the methods used to apply weather and climate information in industry. Guest speakers from relevant weather-impacted industries and the Rutgers Business School-Newark and New Brunswick are typically included. Course may be repeated for additional credit.
*Prerequisite: 11:670:212.*

**11:670:493,494** *Research Problems in Meteorology (BA,BA)*
Independent study on atmospheric projects. Topic and requirements to be determined individually with the supervising instructor.

# Microbiology 680 (SEBS)

## MICROBIOLOGY 680

**11:680:101** *Living in the Microbial World (3)*
This course examines the impact of the microbial world on humankind. Students will be introduced to microorganisms from the beginning of life on a young and very different earth than we see today and follow the evolutionary journey that has shaped the modern world.
*This is a lecture course for undergraduates with little or no science background. There are no prerequisites for the course.*

**11:680:103** *Microbiology of Agricultural Products in New Jersey (3)*
Explores the science and culture of agricultural products, food and beverage fermentations, such as cheese production, wine and beer fermentation, fermented sausages, and mushroom cultivation. Students will study the complex chemical and biological processes that create different fermented foods, with techniques that blend modern scientific knowledge with traditional values and practices.

**11:680:104** *Introduction to Microbiomes (3)*
This introductory course describes principles of host-associated microbiomes (microbial ecosystems living on humans and animals), including their development, functions, and roles on health. Students will be required to present recently published works on microbiomes.

**11:680:201** *Introduction to Microbiology (3)*
Presents the basic principles of microbiology and examines the microbes that inhabit our planet and their effect on the biosphere. Students will assess the influence of microbiology and 21st-century challenges and opportunities that arise from our changing relationship with and understanding of microbes.
*Prerequisites: Two semesters of biology and two semesters of chemistry.*

**11:680:202** ***Introduction to Microbiology Laboratory (1)***
Introduction to Microbiology Laboratory is a 1-credit course with one three-hour lab per week. The course will be taught by faculty of the Department of Biochemistry and Microbiology, SEBS. This laboratory course will serve as a companion course to Introduction to Microbiology Lecture (11:680:201). It is designed to reinforce the concepts taught in the lecture course and will allow students to apply the knowledge in practice to various microbiology lab topics.
***Corequisite: 11:680:201.***

**11:680:390** ***General Microbiology (4)***
Basic principles of microbiology. An introduction to the physiology, morphology, pathogenicity, and genetics of groups of microorganisms.
***Lec. 3 hrs., lab. 3 hrs. Prerequisites: 01:119:115,116, and 117 (formerly 01:119:101-102); 01:160:161-162, 171, and 307.***

**11:680:395** ***Peer Mentoring in Microbiology (BA)***
The objective of the class is to provide mentorship and guidance in teaching, leadership, and research pertaining to microbiology. Microbiology faculty will serve as mentors to undergraduate students. Students will receive instruction on implementing effective mentoring and teaching strategies that will directly translate to career-oriented skills and skills that can be applied to post-secondary programs. Students will be able to participate in the microbiology course of their choice (from an approved list) and support the faculty with active learning activities, class discussions, or lab demonstrations. Students will also be able to implement their own active learning activity during the last part of the semester. This will fulfill the experiential learning requirement for SEBS and may be used as elective course for the microbiology major.
***Prerequisite: 11:680:390 (General Microbiology) with a grade B or higher or equivalent; by permission of instructor.***

**11:680:401** ***Ethics and Issues in Microbiology (1)***
Discussion of ethical conduct and scientific integrity in relation to the practice of microbiology.
***Prerequisite: 11:680:390. Open to microbiology majors. Others by special permission.***

**11:680:475** ***Microbiomes and Health (3)***
This course provides an overview on the role of microbiome in human health and disease. It focuses on conceptual framework and technologies for understanding how particularly the gut microbiome impacts human health.
***Prerequisites: 11:680:390 or 01:447:390 General Microbiology with a C or better; 11:680:201 with a grade of B or better; or permission of the instructor.***

**11:680:480** ***Microbial Genetics and Genomics (3)***
Applications of genetics and genomics to fundamental biological functions at the molecular and cellular levels in archaeal and bacterial prokaryotes. Recent developments in horizontal gene transfer, quorum sensing, stationary-phase induced mutagenesis, and prokaryotic genome evolution.
***Prerequisites: 01:447:380; 11:680:390 or equivalent.***

**11:680:481** ***Microbial Physiology (3)***
An intensive course with the goal of integrating biochemistry and genetics to enhance the understanding of the microbial cell and the robust and diverse nature of life. This course is intended to be a capstone class for the microbiology major. It will provide the instructors with the opportunity to re-address the learning goals of the microbiology major and address general scientific misconceptions before student graduation.

*This course is targeted to advanced juniors or seniors majoring in microbiology, biochemistry, biotechnology, and related fields, as well as graduate students. Prerequisites: Biochemistry: (11:115:403, 11:115:301, 01:694:301, or 01:694:407) and General Microbiology 11:680:390.*

**11:680:486** *Analytical Methods in Microbiology (3)*
Hands-on training in the use of analytical instrumentation in microbiological research and applications, including biotransformations and fermentations, biodegredation, and identification of bacteria and fungi.
*One 80-min. lec. and one 180-min. lab. Prerequisite: 11:680:394 or 11:115:403 or lab experience by permission.*

**11:680:491** *Microbial Ecology and Diversity (3)*
Ecological determinants; characteristics of aquatic and terrestrial ecosystems; nature and activity of microbial populations; biogeochemical cycles and energy flow; microbial interactions and community structures.
*Two 80-min. lecs., one 180-min. lab. Prerequisite: 01:447:390 or 11:680:390.*

**11:680:492** *Experiments in Microbial Ecology and Diversity (3)*
Combines lectures and laboratory experiments with hands-on training in microbial community structure and function analyses including experimental design in microbiological research and applications. Analytical methods that are introduced include sampling design, extraction of DNA/RNA from environmental samples and their preparation for high throughput sequencing, bioinformatics (QIIME) analyses, design and set up of enrichment cultures, and respiration rate measurements.
*Prerequisite: 11:680:491 or equivalent laboratory experience by permission of the instructor.*

**11:680:494** *Applied Microbiology (4)*
Microorganisms in foods; their application in industry, agriculture, environment, and medicine. Physical and chemical factors of growth and control in relation to industrial and natural processes.
*Lec. 3 hrs., lab. 3 hrs. Prerequisite: 11:680:390 or equivalent.*

**11:680:495** *Seminar in Microbiology (1)*
Practice in techniques for oral presentation of scientific reports and reviews, based on search of research literature in microbiology and, where applicable, the student's own research results.
*Open only to senior microbiology majors.*

**11:680:497,498** *Research in Microbiology (BA,BA)*
Research projects in microbiology under the guidance of faculty members.
*Prerequisite: Permission of instructor.*

**11:680:499** *Microbiology Senior Exit Survey (0)*
This is a 0-credit Pass/Fail course for graduating microbiology seniors. The exit survey will allow for seniors to evaluate their experience in the major, including coursework and research opportunities, and share their future career plans.

# Nutritional Sciences 709 (SEBS)

## NUTRITIONAL SCIENCES 709

**11:709:102** *Careers in Nutrition (1)*
Exploration of current and emerging career paths in food and nutrition. Development of professional skill portfolio for successful career preparation and entry.

**11:709:201** *Culinary Nutrition (3)*
Exploration of the science of food principles and application of culinary food preparation principles.

**11:709:202** *Laboratory for Culinary Nutrition (1)*
Culinary nutrition skill development through laboratory experiences focused on food nutritional and sensory quality and ingredient functions & interactions.
***Pre- or corequisite: 11:709:201. White lab coat required.***

**11:709:235** *Introduction to Sports Nutrition (3)*
An introduction to nutrition for health and athletic performance. This course addresses the process for developing a nutritionally appropriate meal plan for exercise and training.

**11:709:245** *Food Customs and Nutrition Equity (3)*
Exploration of the diverse cultural, migration and acculturation, religious, gender, economic, political, geographic, and climate influences that shape food availability, patterns, customs, and nutrition justice and nutritional health equity.

**11:709:255** *Nutrition and Health (3)*
Introduction to fundamental human nutrition concepts (nutrients, digestion, absorption, metabolism) and the scientific process for creating evidence-based nutrition recommendations.

**11:709:296** *Honors Seminar (3)*
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
***Prerequisite: Open only to honors students (SEBS Honors Program, SAS Honors Program, and Honors College) or by permission of instructor.***

**11:709:301** *Food Safety and Sanitation in Food Service (2)*
Fundamentals of food safety and sanitation, microbiological and environmental food pathogens, foodborne disease prevention in commercial and non-commercial food operations, and food safety guidelines, regulations, and management systems. Hazard analysis of food preparation and processing activities, determination of critical control points, and monitoring procedures and corrective actions to ensure food safety.
***Prerequisites: 11:709:201, 11:709:202***

**11:709:345** *Nutrition through the Life Span (3)*
Exploration of how nutritional needs change and vary from before and after conception, through gestation, early childhood, adolescence, adulthood, and older age.
***Prerequisite: 11:709:255 (Nutrition and Health).***

**11:709:400** *Advanced Nutrition: Macronutrients (3)*
Analysis of biochemical and metabolic pathways essential for nutritional homeostasis with a focus on macronutrient metabolism. Integration of genomic science with nutrition and application of biochemical and metabolic pathways in patients with nutrition-related disease states.
***Prerequisites: Biochemistry (11:115:403, 11:115:404, 01:694:301, 01:694:407, 01:694:408, or 11:115:301 )All prerequisite courses must be completed with a grade of C or better.***

**11:709:401** *Advanced Nutrition: Energy and Micronutrients (3)*
Analysis of biochemical and metabolic pathways essential for nutritional homeostasis with a focus on micronutrients and energy metabolism. Integration of genomic science with nutrition and application of biochemical and metabolic pathways in patients with nutrition-related disease states.
***Prerequisites: Biochemistry (11:115:403, 11:115:404, 01:694:301, 01:694:407, 01:694:408, or 11:115:301 ). All prerequisite courses must be completed with a grade of C or better.***

**11:709:402** *Advanced Nutrition: Readings in Macronutrients (1)*
Discussion of problems set by instructors of Advanced Nutrition I to develop understanding of the topics covered.
***Corequisite: 11:709:400 (Advanced Nutrition: Macronutrients).***

**11:709:403** *Advanced Nutrition: Readings in Energy and Micronutrients (1)*
Discussion of problems set by instructors of Advanced Nutrition II to develop understanding of the topics covered.
***Corequisite: 11:709:401 (Advanced Nutrition: Energy and Micronutrients).***

**11:709:404** *Advanced Nutrition: Clinical Research Practicum (1)*
Critical review of evidence-based literature that informs nutrition and dietetic practice guidelines. Interpretation of nutrition guidelines to lay audiences.
***Corequisite: 11:709:400***

**11:709:410** *Dietetics in Professional Practice (3)*
Preparation for post-baccalaureate programming required for the Registered Dietitian Nutritionist credential, including exploration of the RDN pathways, clarification of career goals, and professional practice in dietetics.
***Prerequisite: 11:709:102***

**11:709:427** *Obesity: Biology, Behavior, and Management (3)*
The causes of human obesity, trends in its prevalence, and how it is influenced by biology, society, and public policy.
***Prerequisite: 11:709:255. Only open to juniors and seniors.***

**11:709:440** *Contemporary Issues in Nutritional Sciences (1-3)*
Investigations of recent trends and issues in nutrition and development.
***Prerequisite: Open only to junior and senior majors; others by permission of instructor.***

**11:709:441** *Community Nutrition (3)*
The study of teaching, science, evaluation, and politics of community nutrition. Exploration of programs and agencies designed to improve the nutritional status of various populations. Field experience involving community nutrition program needs assessment for diverse cultures.
***Prerequisites: 11:709:345***

**11:709:442** ***Nutrition Education and Communication (3)***
Exploration and application of behavior change theories and models, health communication, education, and evaluation strategies for evidence-based nutrition education and communication in diverse settings. Critical review and interpretation of evidence-based nutrition literature for lay audiences.
***Prerequisites:11:709:441 (Community Nutrition).***

**11:709:443** ***Methods in Sensory Analysis (3)***
Provides a basic background in human orosensory physiology and sensory testing methods.
***Prerequisites: 11:709:201 and 255.***

**11:709:445** ***Problem Solving with Food, Nutrition, and Business Information (3)***
Teamwork is used to solve actual problems encountered by industry partners using information resources.
***Prerequisite: Either 11:709:255, 11:400:201, or 11:373:121. Cross-listed as junior/senior colloquium.***

**11:709:448** ***Food Production and Management (3)***
Application of quantity food production principles in commercial and non-commercial food service operations. Emphasis is on integration of menu creation and analysis; recipe development, HACCP, and costing; budgeting; food procurement; food production; customer service; and management theories.
***Prerequisites: 11:709:201, 202, 301 Corequisite: 11:709:449***

**11:709:449** ***Food Service Lab (1)***
Laboratory experience in a commercial food service operation, with an emphasis on quantity food production and evaluation skill development.
***Corequisite: 11:709:448***

**11:709:475** ***Nutrition and Fitness (3)***
Interactions between nutrition and exercise are examined by integrating metabolism and physiology concepts in the context of recreational physical fitness training. Topics include fluid, macronutrient, and micronutrient requirements for sport and the specific roles that carbohydrates, fats, proteins, vitamins, and minerals play in fueling the body for exercise. Additional topics include nutritional concerns of athletes and dietary supplements.
***Prerequisites: 01:119:115-116 and 11:709:255. Open only to juniors and seniors. Credit not given for this course and 01:377:475.***

**11:709:481** ***Seminar in Nutrition (1.5)***
Review of nutrition journals, critical reading in topics in the history of nutrition, and specific nutrition problems of current interest.

**11:709:483** ***Medical Nutrition Therapy I: Nutrition Assessment & Diagnosis (3)***
Introduction to evidence-based methods for assessing nutritional status and diagnosing nutrition-related conditions via application of the Nutrition Care Process. Critical analysis of anthropometric, biochemical, clinical diet, and environmental measurements during nutrition-focused exams.
***Prerequisites: 11:115:301 or equivalent Corequisite: 11:709:484***

**11:709:484** ***Nutrition Therapy Lab (1)***
Application of nutrition assessments and counseling skills through simulations and/or standardized patients.
***Corequisite: 11:709:483***

**11:709:485** ***Medical Nutrition Therapy II: Intervention, Monitoring, & Evaluation (3)***
Integration of disease pathophysiology and functional nutrition for major nutrition-related disease states that will inform nutritional and pharmacological interventions, monitoring, and evaluation of diverse patients using the Nutrition Care Process.
***Prerequisites: 11:709:410, 483, and 484***

**11:709:489** ***Experimental Foods (4)***
Physical, chemical, sensory, and enzymatic properties of foods; laboratory investigation of effects of alteration in preparation on quality and acceptability.
***Lec./lab. Prerequisites: 11:709:202 and 01:160:209 or 308 and 01:960:211 or 401. White lab coat required.***

**11:709:493,494** ***Research in Nutrition (BA,BA)***
Special problems in the field of nutrition.
***Prerequisite: Permission of instructor.***

# Plant Science 776 (SEBS)

## PLANT SCIENCE 776

**11:776:102** ***Soil and Society (3)***
An introduction to soil processes, their role in the ecosystem, basic management concerns, soil quality, human health, and global processes.

**11:776:112** ***Introduction to Bioenergy Technologies (3)***
Introductory understanding of biomass and biomass to low-carbon energy systems including biopower, bioheat, and biofuels, with a scientific examination of feedstocks, conversion technologies, and scale up for industrial production, end products, and their applications. The course will also provide understanding of the concepts of sustainability, systems thinking, and Life Cycle Analysis (LCA).

**11:776:170** ***Plants and People (3)***
The influence of plants on the economic, social, and cultural history of man, especially as sources of food, shelter, clothing, drugs, and industrial raw materials. Current problems of agriculture, plant industry, medicine, and conservation.

**11:176:201** ***People-Plant Relationships (3)***
Examines the roles and meanings of plants and vegetated settings in human well-being and social development. The framework is provided by the four broad areas of: plants and the individual; plants and communities; plants and human culture; and horticultural therapy. This is a hybrid (mostly online) course.
***Formerly 11:776:432***

**11:776:202** ***Applied Physiology of Horticultural Crops (3)***
The physiology of plants and regulation of their growth. Emphasis on the environmental and developmental aspects of plant physiology that allow plants to survive, grow, and reproduce despite transient and seasonal periods of environmental stress.
***Prerequisite: One semester biology (01:119:115 or equivalent) or 11:776:242.***

**11:776:205** ***Introduction to Ethnobotany (3)***
Broad overview of the science of ethnobotany (how people use plants), with emphasis on current research and issues. This is a hybrid (mostly online) course.
***Prerequisite: One semester biology (01:119:115 or equivalent) or 11:776:242.***

**11:776:210** ***Principles of Botany (3)***
Genetics, stresses and stress responses, classification and taxonomy, diversity, reproduction, ecology and evolution in the plant kingdom.
***Prerequisite: One semester biology (01:119:115 or equivalent) or 11:776:242.***

**11:776:211** ***Introduction to Horticulture (3)***
The art and science of horticulture: its historical impact, biology, technology, and industry. Laboratory exercises applying horticultural techniques to growing plants.
***Lecture/Lab.***

**11:776:221** ***Principles of Organic Crop Production (3)***
Cultural management practices that form the basis for organic crop production: soil stewardship, plant health, and avoiding competition without synthetic chemicals. Implementation of cropping techniques and emerging technologies.

**11:776:225** ***Horticultural Therapy: Concepts and Skills (3)***
This foundational course discusses concepts and skills in horticultural therapy (HT), including history and theory. Students will learn about services, settings, and populations pertaining to HT, and learn various horticultural therapy techniques to achieve specific goals within treatment, rehabilitation, or vocational plans.

**11:776:242** ***Plant Science (3)***
Fundamentals of structure, function, growth and development, metabolism, reproduction, ynamics, manipulation, biotechnology, and the development of new characteristics in plants.

**11:776:257** ***Edible and Poisonous Fungi (1)***
Classification of mushrooms with a focus on edible and poisonous types and the use of fungi by human cultures.

**11:776:296** ***Honors Seminar in Plant Science (3)***
The topic for each semester addresses current issues from the perspectives of the humanities, sciences, and social sciences.
***Prerequisite: Open only to honors students (SEBS Honors Program, SAS Honors Program, and Honors College) or by permission of instructor.***

**11:776:302** ***General Plant Pathology (3)***
The occurrence, economic importance, symptoms, causes, diagnosis, and control of plant diseases.
***Prerequisites: One semester biology (01:119:115 or equivalent).***

**11:776:304** ***Turfgrass Management (4)***
Growth, development, adaptation, and selection of the major turfgrass species. Principles of establishment, mowing, nutrition, irrigation, and pest control of home lawn, athletic field, golf, and utility turfs.
***Lecture/Lab. Recommended: Classes in soils and plant science.***

**11:776:305** *Plant Genetics (4)*
Heritable variation, strategies, and consequences of sexual/asexual reproduction, inbreeding and outbreeding. Chromosome structure, behavior, and mapping. Uses of tissue culture and recombinant DNA techniques in plant genetic manipulation.
*Prerequisites: General Biology 01:119:115, 116, 117 or equivalent.*

**11:776:306** *Weed Science and Management (3)*
Basic principles of weed ecology, management, and economic impact in agriculture, turfgrass, and ornamental landscapes.
*Prerequisites: 11:776:242 Plant Science or one semester of Biology (01:119:115 or equivalent)*

**11:776:310** *Plant Propagation (3)*
Theory and practice of multiplying plants by seeds and vegetative means such as cuttings, grafts, buds, and layers.
*Lecture/Lab. Prerequisite: 11:776:211 or 242.*

**11:776:311** *General Plant Pathology Laboratory (1)*
An optional laboratory course utilizing specific techniques and plant diseases to illustrate the basic principles of plant pathology.
*Pre- or corequisite: 11:776:302.*

**11:776:312** *Medicinal Plants (3)*
Use of plants for medicinal and other purposes; poisonous plants; cross-cultural aspects; chemistry and biological significance of natural products; natural products from higher plants in modern medicine.
*Prerequisite: One semester biology (01:119:115 or equivalent) or 11:776:242.*

**11:776:313** *Medicinal and Aromatic Plants Laboratory (1)*
Use of plants for medicinal and other purposes; poisonous plants, cross-cultural aspects, chemistry and biological significance of natural products, and natural products from higher plants in modern medicine are discussed.
*Pre- or corequisite: 11:776:312.*

**11:776:321** *Greenhouse Systems Management (3)*
The greenhouse environment, its manipulation and control in the production of plants. Principles of various technologies, including greenhouse computer control systems and management skills needed to operate greenhouses.
*Prerequisite: One semester biology (01:119:115 or equivalent) or 11:776:211 or 242.*

**11:776:325** *Horticulture Therapy: Techniques and Programming (3)*
Use of adaptive devices and enabling tools. Methodologies for program evaluation and for documentation of program effectiveness.
*Prerequisite: 11:776:225 or permission of instructor.*

**11:776:341** *Fruit Production (3)*
The growing of small fruits and grapes. Varieties, fruit-growing systems, and harvesting methods involved in grapes, strawberries, blueberries, brambles, and cranberries.
*Prerequisite: One semester biology (01:119:115 or equivalent) or 11:776:242 or permission of instructor. Recommended: 11:776:210 or 211.*

**11:776:382** *Plant Physiology (4)*
Water relations, photosynthesis, inorganic nutrition, metabolism of organic materials, and plant growth regulation. Emphasis on environmental factors in the physiology of plants.
*Lecture/Lab. Prerequisites: General Biology 01:119:115,116, 117 or equivalent; and General Chemistry 01:160:161,162,171 or equivalent; and 11:776:242. Recommended: Organic Chemistry.*

**11:776:390** *Hemp and Medical Cannabis (3)*
The historical, horticultural, economic, legal, and regulatory aspects of plants, and their products, in the genus *Cannabis*.
*Prerequisite: One semester biology (01:119:115 or equivalent) and 11:776:211 or 242.*

**11:776:391** *Weeds, Diseases, and Insects of Plants (3)*
Study of the common weed, insect, and disease problems that occur during the production and maintenance of plants in production fields, greenhouses and nurseries, residential properties, parks, recreational areas, and forested sites in a plant health care or integrated pest management context.
*Prerequisites: 11:776:302 or 11:370:381 or equivalents. Additional coursework in entomology, plant pathology, and the plant sciences is recommended.*

**11:776:400** *Fungi in the Environment (3)*
Identification, ecology, and biodiversity of fungi. Laboratory includes sampling techniques, identification and descriptive procedures, culture collections, mycological herbaria, and field trips.
*Prerequisites: One semester biology (01:119:115 or equivalent).*

**11:776:404** *Soil Management for Sports Fields and Landscapes (3)*
Principles of turf soil science and management. Managing soils for plant nutrition, manipulation for water supply and drainage, efficient irrigation, and use of poor quality water.
*Prerequisite: Soils (11:776:102 or 11:375:360 or equivalent).*

**11:776:405** *Plant Biosecurity Issues and Technologies (3)*
Introduces the plant health policies and regulations safeguarding agriculture and environmental resources, the interrelationship between risk assessment, risk management and risk communication for plant pests, and plant pest management and eradication measures. Biosecurity technologies for plant pest monitoring and detection including surveillance, bioinformatics, microscopy, Lucid keys for visual identification of pests, ELISA, PCR, and real-time PCR will be introduced accompanied by laboratory exercises.
*Prerequisites: One semester biology (01:119:115 or equivalent) and 11:776:242. Recommended: 11:776:302, 11:776:391, and/or 11:370:381.*

**11:776:406** *Plant Breeding (4)*
History, theory, and practice of plant breeding.
*Prerequisite: One semester biology (01:119:115 or equivalent) and 11:776:242.*

**11:776:408** *Turfgrass Pest Science (4)*
Biology, etiology, and management of major turfgrass pests, including fungal, bacterial, and viral pathogens; insects, nematodes, vertebrates, and weeds. Includes a laboratory in diagnostics.
*Prerequisites: General Biology 01:119:115,116, 117 or equivalent and 11:776:304; or by permission.*

**11:776:410** *Plants and Innovative Technologies for Bioenergy (3)*
Bioenergy and various renewable energy sources from biomass. Associated agronomic and bioenergy traits from biomass sources, and conversion technologies from different biomass sources.
*Prerequisites: One semester biology (01:119:115 or equivalent). Recommended: 11:776:242.*

**11:776:415** *Fungi and Human Health (3)*
The impact of fungi on human health, nutrition, and drug discovery.
*Prerequisites: General Biology 01:119:115, 116, 117 or equivalent.*

**11:776:425** *Special Topics in Horticulture Therapy (1-3)*
Independent research in the area horticultural therapy.
*Prerequisite: Permission of instructor.*

**11:776:427** *Vocational Skills Training in Horticultural Therapy (1-3)*
An internship course will provide students with foundational knowledge of the vocational rehabilitation service system and the skills necessary to provide green-industry job training to individuals with disabilities.
*Prerequisites: 11:776:225 Introduction to Horticultural Therapy and/or 11:776:325 Horticultural Therapy Techniques and Programming; or permission of instructor.*

**11:776:438** *Plants and Human Health (3)*
The role of plants in human health and nutrition. Plant-based medicinal and dietary supplements and the underlying bioactive compounds are examined as well as associated toxicity and assessment for efficacy and safety.
*Recommended: Prior coursework in nutrition, physiology, chemistry, medicinal plants, or related courses.*

**11:776:439** *Nursery Crop Production (3)*
Principles, practices, and production of temperate-zone woody ornamental plants. Both field and container growing considered.
*Prerequisite: 11:776:211 or 242.*

**11:776:440** *Soil Fertility (3)*
Soil-plant relationships in the field and methods of diagnosing deficiencies in soils and plants.
*Prerequisite: 11:375:360 or permission of instructor.*

**11:776:442** *Agroecology (3)*
Introduces various topics of agroecology including traditional and organic farming, plant and animal production, energy, pest management, specialized and controlled environment agriculture, and sustainable practices.

**11:776:452** *Plant Tissue Culture and Engineering (3)*
Principles and culture techniques of cells, callus, organs, pollen, anthers, embryos, and protoplasts. The applications in clonal propagation and research in breeding, physiology, and pathology.
*Prerequisites: One semester biology (01:119:115 or equivalent) or 11:776:210, 211, or 242.*

**11:776:495,496** *Special Problems in Plant Science (BA,BA)*
Out-of-classroom or extracurricular activities that combine technical knowledge of the plant science disciplines with practical skill development in the laboratory, greenhouse, or field. Students enroll in Special Problems to receive credit for the experienced-based education requirement for the plant science major.
*Prerequisites: Permission of instructor and special problems adviser.*

# Student to Professional Internship Network (SPIN) 902 (SEBS)

## STUDENT TO PROFESSIONAL INTERNSHIP NETWORK (SPIN) 902

**11:902:300** ***SEBS Internship I (3)***
First internship registration.
***Prerequisite: Permission of director.***

**11:902:301** ***SEBS Internship II (3)***
Second internship registration.
***Prerequisites: 11:902:300 and permission of director.***

**11:902:400** ***SEBS Coop (6)***
Full-time cooperative education registration.
***Prerequisite: Permission of director.***

# Administration (SEBS)

## ADMINISTRATION

**Laura J. Lawson, Ph.D. - Executive Dean of Agriculture and Natural Resources**

**Office of the Executive Dean**

Joyce Carlson - Senior Executive Assistant

**Executive Leadership Team**

Ann Brooks Gould - Dean of Academic Programs

Margaret (Peggy) Brennan-Tonetta - Senior Associate Director, NJAES; Director, Office of Resource and Economic Development

Wendie Cohick - Dean of Research and Graduate Programs, School of Environmental and Biological Sciences; Director of Research, NJAES

Lauren Errickson - Director of Rutgers Gardens and Stewardship, Rutgers Gardens

Megan Francis - Director, Office of Global Engagement

Carl Lelkhram - Senior Director, Office of Public Outreach and Communication

Gabrielle Peterson - Senior Director of Development

Troy Roepke - Associate Dean, Office of Diversity, Equity, and Inclusion

Brian Schilling - Senior Associate Director, NJAES; Director, Cooperative Extension

Mazen Shehat - Senior Associate Dean of Finance and Administration

**Graduate Program Directors**

Atmospheric Science - Anthony Broccoli

Bioenvironmental Engineering - Uta Krogmann

Ecology and Evolution - Rachael Winfree

Endocrinology and Animal Biosciences - Carey Williams

Entomology - Anne Nielsen

Environmental Sciences - Lisa Rodenburg

Food and Business Economics - Sanjib Bhuyan

Food Science - Beverly Tepper

Landscape Architecture- Richard Alomar

Microbial Biology - Gerben Zylstra

Nutritional Sciences - Carol Byrd-Bredbenner

Oceanography - Yair Rosenthal

Plant Biology - Bingru Huang

**Undergraduate Program Directors**

Agriculture and Food Systems - Xenia Morin

Animal Science - Aparna Zama

Biochemistry - Lori White

Biotechnology - Paul Meers

Ecology, Evolution, and Natural Resources - Kim Russel

Entomology - Chloe Hawkings

Environmental and Business Economics, Isaac Vellangany

Environmental Engineering - A.J. Both

Environmental Planning - Frank J. Gallagher

Environmental Policy, Institutions, and Behavior - Cara Cuite

Environmental Sciences - Jeffra Schaefer

Food Science - Chitra Ponnusamy

Landscape Architecture - Arianna Lindberg

Marine Sciences - Silke Severmann

Meteorology - Steven G. Decker

Microbiology - Ines Rauschenbach

Nutritional Science - John Worobey

Plant Science - Nrupali Patel

# Campus Centers (SEBS)

## CAMPUS CENTERS

**On-Campus Centers**

**Center for Deep-Sea Ecology and Biotechnology**
Richard Lutz, Director

**Center for Urban Environmental Sustainability**
Wolfram Hoefer, Director

**Center for Vector Biology**
Dina Fonseca, Director

**Chrysler Herbarium**
Lena Struwe, Director

**Cook Animal Farm/Animal Care Program**
Clint Burgher, Farm Supervisor

**Equine Science Center (NJAES)**
Karyn Malinowski, Director

**Floriculture Greenhouse**
Nicoletta Graff, Supervisor

**Food Innovation Center - New Brunswick**
Nolan Lewin, Director

**Grant F. Walton Center for Remote Sensing and Spatial Analysis**
Richard Lathrop, Director

**Hort Farm 3 and Research Greenhouses**
Joe Florentine, Director

**New Jersey Institute for Food, Nutrition, and Health**
Wendie Cohick, Acting Director

**Rutgers Against Hunger**

**Rutgers Center for Lipid Research**
George M. Carman, Director

**Rutgers Center for Ocean Observing and Leadership (RUCOOL)**
Scott Glenn and Josh Kohut, Codirectors

**Rutgers Ecological Preserve**
Richard Lathrop, Director

**Rutgers Gardens**
Lauren Errickson, Director

**Turfgrass Center**
Jim Murphy, Director

**Water Resources Research Institute (NJAES)**
Chrisopher Obropta

**Off-Campus Centers**

**Clifford E. and Melda C. Snyder Research and Extension Farm (NJAES)**
Peter Nitzsche, Director

**Food innovation Center, South**
Nolan Lewin, Director

**Haskin Shellfish Research Laboratory (NJAES)**
David Bushek, Director

**Hutcheson Memorial Forest Center (SEBS)**
Myla Aronson, Director

**Jacques Cousteau National Estuarine Research Reserve (NJAES)**
Michael De Luca, Manager

**Philip E. Marucci Center for Blueberry and Cranberry Research & Extension (NJAES)**
Peter Oudemans, Director

**Rutgers Agricultural Research & Extension Center, Upper Deerfield, NJ (NJAES)**
Daniel Ward, Director

**Rutgers EcoComplex (NJAES)**
Serpil Guran, Director

**Rutgers Specialty Crop Research and Extension Center (NJAES)**
Mark Robson, Director

**Youth Center for Outdoor Education, Lindley G. Cook 4-H Camp (NJAES)**
Ben Clawson, Director

# Faculty (SEBS)

## FACULTY



## Department of Agricultural, Food, and Resource Economics

## Department of Agricultural, Food, and Resource Economics

**Chair:** Ramu Govindasamy, Cook Office Building

**Professors:**

Sanjib Bhuyan, B.Sc., Assam Agricultural (India); M.Sc., Asian Institute; M.S., Nebraska; Ph.D., Connecticut

Michael Camasso, B.A., King College; M.A., Virginia; M.S.W., Marywood; Ph.D., Pennsylvania State

Carl E. Pray, B.A., Carlton, Ph.D., Pennsylvania

Ramu Govindasamy, B.S., Tamil Nadu Agricultural (India); M.S., Ph.D., Iowa State; M.B.A., Newport

Gal Hochman, B.A., Ben Gurion, M.A., Tel Aviv (Israel); M.Phil., Ph.D., Columbia

Yanhong Jin, B.A., M.S., Renmin (China); M.A., M.S., Ph.D., California (Berkeley)

Edmund M. Tavernier, B.S., Tuskegee; M.S., Ph.D., Minnesota

**Associate Professors:**

Paul D. Gottlieb, A.B., Harvard; M.P.A., Ph.D., Princeton

Brian Schilling, Director of Rutgers Cooperative Extension, B.S., M.S., Ph.D., Rutgers

Isaac Vellangany, B.A, Sacred Heart college, B.Ed., St. Xavier's College; B. Phil., Gnanadeepa Vidyapeeth; M.A., Ph.D., Baroda (India); M.B.A., Rutgers

Faculty (SEBS)

# Department of Animal Sciences

# Department of Animal Sciences

**Chair**: Nicholas Bello, Bartlett Hall, Room 106

**Distinguished Professors:**

Dipak K. Sarkar, B.Sc., M.Sc., Ph.D., Calcutta; D.Phil., Oxford

**Professors:**

Carol A. Bagnell, B.A., Glassboro State; M.S., West Virginia; Ph.D., Georgia

Nicholas T. Bello, B.S., Pennsylvania State; M.S., Drexel College of Medicine; Ph.D., Pennsylvania State

Wendie S. Cohick, B.S., Cornell; M.S., Illinois (Champaign-Urbana); Ph.D., Cornell

Karyn Malinowski, B.S., M.S., Ph.D., Rutgers

Kenneth H. McKeever, B.S., California State Polytechnic (Pomona); M.S., Fresno State; Ph.D., Arizona

Michael L. Westendorf, B.S., Idaho; M.S., Ph.D., Kentucky

Carey A. Williams, B.S., Colorado State; M.S., Ph.D., Virginia Tech

**Associate Professors:**

Troy A. Roepke, B.S., Long Island (Southampton College); M.A., San Francisco State; Ph.D., California (Davis)

Elizabeth M. Snyder, B.S., Western Washington;Ph.D., Washington State

Mehmet Uzumcu, D.V.M., Ankara (Turkey); M.S., Ph.D., Ohio State

Aparna M. Zama, B.Sc., Osmania (India); M.Sc., Hyderabad (India); Ph.D., University of Georgia

**Assistant Professors:**

Igor O. Shmarakov, B.S., M.S., Ph.D., Yuriy Fedkovich Chernivtsi National (Ukraine); Sc.D., Taras Shevchenko Kyiv National (Ukraine)

Tess C. Stahl, B.S., Delaware Valley; M.S., Ph.D., New Hampshire

**Teaching Instructors:**

Henry Bignell, B.S., North Carolina State; M.S., Rutgers

Taylor Ross, B.S., M.S., Nebraska (Lincoln); Ph.D., Texas A&M

Faculty (SEBS)

# Department of Biochemistry and Microbiology

# Department of Biochemistry and Microbiology

**Chair:** Max Häggblom, Lipman Hall Room 121

**Distinguished Professors:**
Debashish Bhattacharya, B.S., M.E.S., Dalhousie (Canada); Ph.D., Simon Fraser (Canada)
G. Charles Dismukes, B.S., Lowell Technical Institute; Ph.D., Wisconsin (Madison)
Max M. Häggblom, B.S., M.S., Lic. Ph., Ph.D., Helsinki (Finland)
Gerben J. Zylstra, B.S., Calvin College (Grand Rapids, MI); Ph.D., Michigan (Ann Arbor)

**Professors:**
Yana Bromberg, B.A., SUNY (Stony Brook); M.Phil., Ph. D., Columbia
Keith R. Cooper, B.S., William & Mary; M.S., Texas A&M (Galveston); Ph.D., Rhode Island; M.S., Thomas Jefferson
Maria Gloria Dominguez Bello, B.S., Simón Bolívar (Venezuela); M.S., Ph.D., Aberdeen (Scotland)
Costantino Vetriani, M.S., Rome La Sapienza (Italy); Ph.D., Rome Tor Vergata (Italy)
Ning Zhang, B.S., Shandong (China); M.S., Chinese Academy of Sciences; Ph.D., Louisiana State
Liping Zhao, B.S., Shanxi Agricultural, (China); Ph.D., Nanjing Agricultural (China)

**Associate Professors:**
Jeffrey Boyd, B.S., Iowa State; Ph.D., Utah State
George Pieczenik, B.A., Harvard; M.S., Miami; Ph.D., New York
Lori A. White, B.A., M.S., Maine; Ph.D., Dartmouth

**Assistant Professor:**
Arkadiusz (Arek) Kulczyk, M.S., Jagiellonian (Poland); Ph.D., Cambridge

**Assistant Teaching Instructor:**
Kyle Murphy, B.S., Ph.D., Rutgers
Ines Rauschenbach, PhD. Rugers
Natalya Voloshchuk, B.S., CUNY (Brooklyn); M.Ph., Ph.D., CUNY (New York)

**Teaching Instructors:**
Sharron Crane, B.A., Rider; Ph.D., Rutgers
Karla Esquilín-Lebron, B.S., Puerto Rico; Ph.D., Wisconsin-Madison
Ramaydalis Keddis, B.S., Puerto Rico; Ph.D., Rutgers
Kessler McCoy-Simandle, B.S., Pittsburg; Ph.D., Northwestern

Faculty (SEBS)

# Department of Ecology, Evolution, and Natural Resources

# Department of Ecology, Evolution, and Natural Resources

**Chair:** Siobain Duffy, Foran Hall, Room 316

**Professors:**

Joanna Burger, B.S., SUNY (Albany); M.S., Cornell; Ph.D., Minnesota

Siobain Duffy, B.A., Rutgers; M.S., Ph.D., Yale

Robert M. Goodman, B.S., Ph.D., Cornell

Jason Grabosky, Ph.D., Cornell

Henry John-Alder, B.A., Franklin and Marshall College; M.S., Pennsylvania State; Ph.D., California (Irvine)

Richard G. Lathrop Jr., B.A., Dartmouth; M.S., Ph.D., Wisconsin (Madison)

Julie Lockwood, B.S., M.S., Georgia Southern; Ph.D., Tennessee

Peter J. Morin, B.S., Trinity College; Ph.D., Duke

Lena Struwe, B.Sc., Stockholm; Ph.D., Minnesota

Rachael Winfree, B.A. Dartmouth, Ph.D., Princeton

**Associate Professors:**

Juan Bonachela B.S., M.S., Ph.D., University of Granada

Brooke Maslo, B.S., Maryland; Ph.D., Rutgers

John Wiedenmann, B.S., New Hampshire; M.S., Washington; Ph.D., California (Santa Cruz)

**Assistant Professors:**

Myla Aronson, B.S., Cornell; M.S., Ph.D., Rutgers

Chi Chen, B.E., Wuhan University; MA, Ph.D., Boston University

**Associate Teaching Professors:**

Marci S. Meixler, B.S., B.A. Rutgers; Ph.D., Cornell

Kimberly N. Russell, B.A., Colgate; Ph.D., Tennessee (Knoxville)

Suzanne Sukhdeo, B.Sc., British Columbia (Canada); M.Sc., McGill (Canada); Ph.D., Toronto (Canada)

**Assistant Teaching Professors:**

**Allyson Salisbury,** B.S., Susquehanna University; M.S., Rutgers University; Ph.D., Rutgers University (New Brunswick)

**Research Associates:**

Michael Allen, B.S., Rutgers University, Ph.D., Rutgers University (New Brunswick)

Faculty (SEBS)

# Department of Entomology

# Department of Entomology

**Chair:** Dina Fonseca

**Professors:**
Lena B. Brattsten, M.S., Lund's (Sweden); Ph.D., Illinois

Dina Fonseca, B.A., Coimbra (Portugal); M.S., Central Michigan; Ph.D., Pennsylvania

George Hamilton, B.A., Eastern Connecticut State; M.S., Missouri; Ph.D., Rutgers

Albecht Koppenhöffer, B.S., M.S., Friedrich-Wilhelms(Germany); Ph.D., Geissen (Germany)

Cesar Rodriguez-Saona, B.A., Universidad Nacional Agraria (Peru); M.S., Oregon State; Ph.D., California (Davis)

**Associate Professors:**
Anne Nielson, B.S. Virginia Tech; M.S., Ph.D., Rutgers

Dana Price, BS. Rutgers; Ph.D. Rutgers

Changlu Wang, B.S., Beijing Forestry (China); M.S., Chinese Academy of Forestry (China); Ph.D., West Virginia

**Assistant Professors:**
Chloe Hawkings, B.S. Swansea (UK); M.S. Florida; Ph.D. Texas

Alvaro Toledo, Universidad Complutense de Madrid (Spain)

Faculty (SEBS)

# Department of Environmental Sciences

# Department of Environmental Sciences

**Chair:** Anthony Broccoli, Environmental and Natural Resource Sciences Building, Room 252A

**Professors:**

A.J. Both, B.S., M.S., Wageningen (Netherlands); Ph.D., Cornell

Anthony J. Broccoli, B.S., M.S., Ph.D., Rutgers

Enrique Curchitser, B.S., M.S., Ph.D., Rutgers

Donna F. Fennell, B.S., Arkansas; M.S., Ph.D., California (Davis)

Daniel Gimenez, B.S., National University of Tucuman (Argentina); M.S., Agricultural Wageningen (Netherlands); Ph.D., Minnesota

Weilin Huang, B.S., Zhongshan (China); Ph.D., Institute of Geochemistry (China); Ph.D., Michigan

Uta Krogmann, B.S., M.S., Rhenish Westphalian Technical (Germany); Ph.D., Technical University of Hamburg-Harburg (Germany)

Benjamin Lintner, B.S., Texas A&M; Ph.D., California (Berkeley)

Gediminis Mainelis, M.S., Vilnius (Lithuania); Ph.D., Cincinnati

Mark Miller, B.S. Ohio; M.S., Ph.D., Pennsylvania State

Christopher Obropta, B.S., M.S., New Jersey Institute of Technology; Ph.D., P.E., Stevens Institute of Technology

John Reinfelder, B.A., Johns Hopkins; Ph.D., Stony Brook University

Ying Fan Reinfelder, B.S., Beijing Institute of Civil Engineering (China); M.S., Utah; Ph.D., Utah State

Alan Robock, B.A., Wisconsin; S.M., Ph.D., Massachusetts Institute of Technology

Lisa Rodenburg, B.A., Wittenberg; Ph.D., Johns Hopkins

Peter F. Strom, B.S., Massachusetts Institute of Technology; M.S., Ph.D., Rutgers

Christopher Uchrin, B.E., M.E., Manhattan College; Ph.D., Michigan

Nathan Yee, B.Sc., McGill (Canada); Ph.D., Notre Dame

Lily Young, B.A., M.S., Cornell; Ph.D., Harvard

**Assistant Professors:**

Katherine Dawson, B.A., Goucher; Ph.D., Pennsylvania State

Mary Whelan, B.A., New College of Florida; Ph.D. California (Berkeley)

**Associate Research Professor:**

Robert Miskewitz, B.S., Pennsylvania State; M.S., Ph.D., Stevens Institute of Technology

Jeffra Schaefer, B.A., California (Berkeley); Ph.D., Rutgers

**Assistant Research Professors:**

Taewon Han, B.E., M.A., Keimyoung (South Korea); M.S., Ph.D., Texas A&M

Dujuan Kang, Ph.D., Stanford

Beth Ravit, Ph.D., Rutgers

**Teaching Professor**

Craig Phelps, B.S., Cornell; M.S., Ph.D., Rutgers

**Associate Teaching Professors:**

Steven G. Decker, B.S., Iowa State; M.S., Ph.D., Wisconsin

**Assistant Teaching Professors:**

Abigail Porter, B.S., Rutgers; Ph.D., Cornell

Faculty (SEBS)

# Department of Food Science

# Department of Food Science

**Chair:** Donald W. Schaffner, Food Science

**Professors:**

George Carman, B.A., William Paterson; M.S., Seton Hall; Ph.D., Massachusetts

Michael Chikindas, B.S., M.S., Yerevan (Armenia); Ph.D., All Union Research Institute of Genetics (Moscow)

Chi-Tang Ho, B.S., National Taiwan; M.S., Ph.D., Washington (St. Louis)

Qingrong Huang, B.S., Shanghai University of Science and Technology; M.S., Ph.D., Nebraska (Lincoln)

Mukund Karwe, B.S., IIT (India); M.S., Ph.D., Rutgers

Karl Matthews, B.S., Iowa State; M.S., Ph.D., Kentucky

Loredana Quadro, M.S., Ph.D., University of Naples (Italy)

Donald W. Schaffner, B.S., Cornell; M.S., Ph.D., Georgia

Beverly J. Tepper, B.S., Northeastern; M.S., Ph.D., Tufts

Kit L. Yam, B.S., M.S., Ph.D., Michigan State

**Associate Professors:**

Diana Roopchand, B.Sc, Ph.D., McGill (Canada)

Karen M. Schaich, B.S., Purdue; Sc.D., Massachusetts Institute of Technology

Paul Takhistov, B.S., National Technical University of the Ukraine; M.S., Notre Dame; Ph.D., Academy of Science of the USSR

**Adjunct Member:**

Thomas Hartman, Ph.D., Rutgers

**Teaching Assistant Professor:**

Chitra Ponnusamy, M.Sc., Ph.D., SNDT Women's University (India)

Faculty (SEBS)

# Department of Human Ecology

# Department of Human Ecology

**Chair:** Rachael Shwom, Cook Office Building, Room 202

**Professors:**

William K. Hallman, B.S., Juniata; M.A., Ph.D., South Carolina

Pamela McElwee, B.A., Kansas; M.Sc., Oxford; Ph.D., Yale

Rachael Shwom, B.A., Syracuse; M.A., Duke; Ph.D., Michigan State

**Associate Professors:**

Karen O'Neill, B.A., San Francisco; M.A., Ph.D., California (Los Angeles)

Cymie R. Payne, M.A., Fletcher School of Law and Diplomacy; J.D., Berkeley School of Law

Ethan Schoolman, B.A., University of Chicago; M.A. Princeton; Ph.D., University of Michigan

**Associate Extension Specialist::**
Cara L. Cuite, B.A., Union; M.A., Ph.D., Rutgers

**Associate Teaching Professor:**

Mary L. Nucci, A.B., Mount Holyoke; M.A., Ph.D., Rutgers

**Assistant Professors:**

Victoria Ramenzoni, B.A. Universidad de Buenos Aires; M.A., Ph.D. University of Georgia

**Assistant Teaching Professors:**

Jack L. Harris, B.A. Rutgers; MCIS Rutgers; Ph.D Rutgers.

**Professors Emeritus:**

Caron Chess, B.A., New York; M.S., Michigan; Ph.D., SUNY

George F. Clark, B.A., Rutgers; M.A., Maine; Ph.D., Rutgers

Peter J. Guarnaccia, B.A., Harvard; M.A., Ph.D., Connecticut

Bonnie J. McCay, B.A., Portland State; M.Phil., Ph.D., Columbia

Thomas K. Rudel, B.A., Princeton; M.Phil., Ph.D., Yale

Neil Weinstein, B.S., Wisconsin; Ph.D., Harvard

Faculty (SEBS)

# Department of Landscape Architecture

# Department of Landscape Architecture

**Chair:** Richard Alomar, RLA

**Distinguished Professor, Executive Dean:**

Laura J. Lawson, B.S., California (Santa Cruz); M.L.A., Ph.D., California (Berkeley)

**Professors:**

Anette Freytag, B.A. , M.A., Austria (University of Vienna), Ph.D., ETH Switzerland

David Tulloch, B.S.L.A., Kentucky; M.L.A., Louisiana State; Ph.D., Wisconsin

**Associate Professors:**

Jean Marie Hartman, B.S., M.S., Wisconsin; Ph.D., Connecticut.

Richard Alomar, B.S., University of Puerto Rico at Mayaguez ; M.L.A., Louisiana State

Wolfram Hoefer, Dr.-Ing., Technische Universität München (Germany)

Kathleen John-Alder, B.A., Oberlin; B.S., Rutgers; M.S., Pennsylvania State; M.E.D., Yale

**Assistant Professors of Practice:**

Frank Gallagher, B.A, Rutgers; M.A., Montclair State; Ph.D., Rutgers

Holly Grace Nelson, B.A., Yale; M.L.A., Virginia

**Assistant Teaching Professors:**

Anita Bakshi, B.A., Illinois (Chicago); M. Arch., California (Berkeley); Ph.D., Cambridge

Arianna Lindberg, B.A., Hope; M.L.A., Rutgers

Vincent Javet,  B.U.R.P.I,, Toronto Metropolitan; M.L.A., University of Toronto

David Smith, B.A., Antioch; M.S., Rutgers

Faculty (SEBS)

# Department of Marine and Coastal Sciences

# Department of Marine and Coastal Sciences

**Chair:** Oscar Schofield, Marine and Coastal Sciences, Room 104 F

**Professors:**

Kay D. Bidle, B.S., Maryland; Ph.D., California (San Diego/Scripps)

David Bushek, B.S., Ohio State; M.S., Houston; Ph.D., Rutgers

Robert J. Chant, B.S., SUNY (Buffalo); Ph.D., SUNY (Stony Brook)

Paul G. Falkowski, B.S., M.A., CUNY (City College); Ph.D., British Columbia (Canada)

Scott M. Glenn, B.S., Rochester; Sc.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution

Ximing Guo, B.S., Qingdao Ocean (China); M.S., Ph.D., Washington

Lee J. Kerkhof, B.S., California (Berkeley); Ph.D., California (San Diego/Scripps)

Josh Kohut, B.S., College of Charleston; Ph.D., Rutgers

Richard A. Lutz, B.A., Virginia; Ph.D., Maine

James R. Miller, B.S., Massachusetts Institute of Technology; M.A., Ph.D., Maryland

Yair Rosenthal, B.Sc., M.S., Hebrew (Jerusalem); Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution

Oscar M. Schofield, B.A., Ph.D., California (Santa Barbara)

Robert M. Sherrell, B.A., Oberlin; Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution

Elizabeth Sikes, B.A., Wesleyan; Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution

John L. Wilkin, B.E., Auckland (New Zealand); Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution

**Associate Professors:**

Heidi Fuchs, B.S., Wyoming; Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution

Daphne Munroe, B.S., Simon Fraser; Ph.D., British Columbia

Grace Saba, B.S., UC California (Santa Barbara); Ph.D., William and Mary

Silke Severmann, B.S., Albrechts Universitat Kiel (Germany); M.S., Ph.D., Southampton

**Assistant Professors:**

Juan Bonachela, B.S., M.S., Ph.D., Granada (Spain)

Benedict Borer, B.S., ETH Switzerland, M.S., Imperial College London, Ph.D., ETH Switzerland

Travis Miles, B.S., M.S., North Carolina State; Ph.D., Rutgers

Fiorella Prada, B.S., M.S., University of Parma (Italy), Ph.D., University of Bologna (Italy)

Danielle Santiago Ramos, B.A. Amherst; Ph.D. Princeton

**Associate Teaching Professors:**

Daniel Barone, B.S., M.A., Stockton University, Ph.D., Rutgers

**Assistant Teaching Professor:**

Alex Lopez, B.S, M.A.T., College of New Jersey, Ph.D., Rutgers

**Research Professors:**

Maxim Y. Gorbunov, M.S., Ph.D., Moscow State

**Associate Research Professors:**

Thomas Grothues, B.A., UC California (Santa Barbara); Ph.D., SUNY (Stony Brook)

Julia Levin, B.S., Moscow Oil and Gas Academy; M.S., Ph.D., Columbia

Kim Thamatrakoln, B.S., Ph.D., UC California (San Diego)

**Assistant Research Professors:**

Javier Zavala-Garay, B.S., Universidad Autonoma de Baja California (Mexico); Ph.D., Colorado

**Research Associate:**

Karen Bemis, B.A., Rice; M.S., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution; Ph.D., Rutgers

L. Fernado Pareja, B.S., Universidad de los Andes, Colombia, M.S., Universidad Nacional de Colombia, Ph.D., Rutgers

**Presidential Postdoctoral Researchers:**

Corday Selden, B.S., Eckerd College, Ph.D., Old Dominion University

**Assistant Research Professors:**

Kaixuan Bu, B.E., M.S., Donghua University, Ph.D., University of Mississippi

Lisa Auermuller, M.S., UNC Chapel Hill

**Scuba Instructors:**

Deborah Miller, B.A., University of Pittsburgh, M.S.W., Rutgers PADI Course Director, DAN, ASDI & HSA Instructor, Program Coordinator, Dive Safety Officer

Faculty (SEBS)

# Department of Nutritional Sciences

# Department of Nutritional Sciences

**Chair:** Joshua Miller, Food Science and Nutritional Sciences Building, Room 107

**Undergraduate Curriculum Coordinator:** John Worobey, Davison Hall, Room 208

**Professors:**

Tracy Anthony, B.S., Virginia Tech; M.S., Ph.D., Illinois (Urbana-Champaign)

Dawn Brasaemle (Emeritas), B.S., Maine; Ph.D., Wisconsin

Paul Breslin, B.A., M.A., Ph.D., Pennsylvania

Carol Byrd-Bredbenner, B.S., M.S., Florida State; Ph.D., Pennsylvania State

Mackenzie Ferrante, B.S., University of Washington; M.S., University of Idaho; Ph.D., Colorado State Univeristy

Hans Fisher (Emeritus), B.S., Rutgers; M.S., Connecticut; Ph.D., Illinois

Peter Gillies (Emeritus), B.Sc., Ph.D., McMaster

Daniel J. Hoffman, B.S., St. John's; M.S., Catholic; M.P.A, Boston; Ph.D., Tufts

Debra Palmer Keenan (Emeritas), B.S., M.Ed., Cincinnati; Ph.D., Pennsylvania State

Joshua Miller, B.A., Swarthmore College; M.S., Ph.D., Tufts

Sue A. Shapses, B.S., Syracuse; M.S., Ph.D., Columbia

Judith Storch, B.A., Brooklyn College; M.S., Ph.D., Columbia

Malcolm Watford, B.S., Trent Polytechnic (UK); D.Phil., Oxford (UK)

John Worobey (Emeritus), B.A., Rutgers; M.S., Ph.D., Pennsylvania State

**Associate Professors:**

Joseph Dixon, B.S., SUNY (Binghamton); M.S., Ph.D., Wisconsin

Nurgül Fitzgerald, M.D., Hacettepe (Turkey); M.A., Simmons College; Ph.D., Connecticut

Harini Sampath, B.S., New Hampshire; Ph.D., Wisconsin

**Assistant Teaching Professors:**

Pinkin Panchal, B.S., Rutgers; M.S., UMDNJ

Salome Papaspyrou Rao, B.Sc., California (Berkeley); M.Sc., Cornell; Ph.D., Rutgers

Virginia Quick (Dietetics Director), B.S., M.S., Ph.D., Rutgers

**Instructor of Supervised Practice**

Sarah Cullen, MHS, RD

Faculty (SEBS)

# Department of Plant Biology

# Department of Plant Biology

**Chair**: Donald Kobayashi, Foran Hall, Room 338

**Distinguished Professors:**

Bingru Huang, B.S., Hebei (China); M.S., Shandong (China); Ph.D., Texas Tech

Eric Lam, B.S., SUNY (Stony Brook); Ph.D., California (Berkeley)

Pal Maliga, M.S., Eötvös Loránd (Hungary); Ph.D., József Attila (Hungary)

Ilya Raskin, B.S., Brandeis; Ph.D., Michigan State

Mark G. Robson, B.S., M.S., MPH, PhD, Rutgers

James Simon, B.S., Empire State; M.S., Oregon State; Ph.D., Massachusetts

Nilgun Tumer, B.A., Agnes Scott; Ph.D., Purdue

**Professors:**

Stacy Bonos, B.S., Gettysburg; M.S., Ph.D., Rutgers

Andrea Gallavotti, B.S., Ph.D., Milan (Italy)

Thomas Gianfagna, B.S., Cornell; M.S., Virginia Polytechnic; Ph.D., Cornell

Joseph R. Heckman, B.S., Ohio State; M.S., Maryland; Ph.D., North Carolina State

Donald Y. Kobayashi, B.S., Washington; Ph.D., California (Riverside)

Thomas Leustek, B.A., M.S., Ph.D., Rutgers

James Murphy, B.S., Western Illinois State; M.S., Ph.D., Michigan State

Peter Oudemans, B.S., New Brunswick (Canada); M.S., Guelph (Canada); Ph.D., California (Riverside)

Lena Struwe, B.S., Ph.D., Stockholm (Sweden)

James F. White, B.S., M.S., Auburn; Ph.D., Texas

Ning Zhang, B.S., Shandong (China); M.S., Systematic and Lichenology Laboratory, Institute of Microbiology, Chinese Academy of Sciences; Ph.D., Louisiana State

C. Andrew Wyenandt, B.S., Cornell; M.S., The Ohio State; Ph.D., The Ohio State

**Associate Professors:**

Faith Belanger, B.A., Rochester; Ph.D., Illinois

Thierry E. Besancon, B.S., Lorraine (Nancy, France); M.S., Rhone-Alpes Higher Institute of Agriculture (Lyon, France); Ph.D., North Carolina State

Raul I. Cabrera, B.S., Ingeniero Agrónomo en Horticultura (México); M.S., Ph.D., California (Davis)

Edward F. Durner; B.S., Maryland; M.S., Virginia Tech; Ph.D., North Carolina State

Matthew Elmore, B.S., Penn State; M.S., Ph.D., Tennessee

Joseph Goffreda, B.S., Rutgers; Ph.D., Cornell

Ann Brooks Gould, B.S., M.S., Illinois State; Ph.D., Kentucky

Michael Lawton, B.S., Bristol (UK); Ph.D., Oxford (UK)

Thomas Molnar, B.S., Ph.D., Rutgers

Xenia Morin, B.S., Toronto (Canada); M.S., Ph.D., Cornell

Daniel L. Ward, B.S., Ohio State; M.S., Southern Illinois; Ph.D., Virginia Tech

Qing-Li Wu, B.S., Anhui College of Traditional Chinese Medicine (China); M.S., Ph.D., Beijing Union Medical College and Chinese Academy of Medical Sciences (China)

**Assistant Professors:**

Sonia Arora, B.S., M.S., Delhi (India); Ph.D., Rutgers

Ming-Yi Chou, B.S., National Taiwan; M.S. Ecole Superieure De Commerce De Dijon (France); Ph.D., Cornell

Rong Di, B.S., South China College of Tropical Crops; M.S., Ph.D., Iowa State

Joshua A. Honig, B.S., M.S., Ph.D., Rutgers

John McLaughlin, B.S., Moravian College; M.S., Ph.D., Minnesota

Paul Meers, B.A., Illinois Wesleyan; Ph.D., Cornell

Nrupali Patel, B.S., Rhodes (South Africa); M.S., Tennessee; Ph.D., North Carolina State

Gina M. Sideli, B.S., Stony Brook; M.S., California State (Chico); Ph.D., California (Davis)

Mark Zander, B.S., Ph.D., Georg-August (Germany)

**Instructors:**

Gary L. Altman, B.A., Rowan; M.S., Rutgers

# History and Aims of the School (MGSA)

## HISTORY AND AIMS OF THE SCHOOL

Established in 1976, Mason Gross School of the Arts at Rutgers, The State University of New Jersey, comprises a vibrant community of nearly 1,200 creators--dancers, filmmakers, musicians, theater artists, visual artists, and designers unafraid to take risks as they collaborate with our renowned faculty of professional working artists. Mason Gross graduates emerge, not merely with a degree, but with a commitment to making innovative and purposeful contributions to the wider community--onstage, backstage, in the gallery, the classroom, the studio, and beyond. Mason Gross School of the Arts nurtures **curiosity**, **skill**, **critical thought**, and **innovation** in creating art and scholarship that touches hearts, challenges minds, imparts joy, and awakens a sense of shared humanity. We uphold the highest standards of inclusive excellence in artistry, pedagogy, and scholarship while affirming the role of the arts in shaping the world around us.

Mason Gross offers undergraduate and graduate degrees in art & design, dance, filmmaking, music, and theater, as well as courses and programs in the arts for the wider university and public programming for the community at large. Our faculty are leading the way in creating challenging, rewarding curricula that celebrate the diversity of the arts and prepare students for a wide range of career paths.

Situated just 45 minutes from New York City and a little over an hour from Philadelphia, Mason Gross serves as the flagship public arts conservatory at Rutgers, a Big Ten research university serving more than 66,000 students. Rutgers is the nation's eighth-oldest institution of higher learning and a member of the prestigious Association of American Universities. Students at Mason Gross benefit from our distinctive identity as an arts conservatory within a leading public research university in a richly diverse region with a robust arts scene. Our students have access to major research collections in the Rutgers University Libraries and a vast array of extra- and co-curricular activities.

Courses in the arts are taught on the New Brunswick and Piscataway campuses and online.

# Admission (MGSA)

## ADMISSION

All applicants to Mason Gross School of the Arts must complete two applications: the Rutgers University application AND the Mason Gross talent assessment. The talent assessment collects applicant talent through audition, interview, or portfolio. An additional submission fee, separate from the Rutgers University application fee, is required on the Mason Gross talent assessment. Mason Gross applicants are reviewed by faculty members for both admission and merit scholarship based on the Mason Gross talent assessment. Applicants receive information on how to access the Mason Gross talent assessment **after** the Rutgers University application is submitted. For deadlines, submission fees, and audition/portfolio requirements, visit here.

Regardless of U.S. residency status, an English proficiency examination is required of all applicants whose secondary schooling has been outside of the U.S. in a country where English is not the principal language. Score reports must be from tests taken within the past two years and submitted directly to us from the testing service. To review acceptable exams and minimum scores, visit here.

For any questions about the application and admissions process, contact admissions@mgsa.rutgers.edu.

# Scholarships (MGSA)

## SCHOLARSHIPS

Students are selected for these awards by the Mason Gross School of the Arts Scholarship Committee. Inquiries should be addressed to the Office of the Dean.

***Jozefa Kwapinska Anshutz Endowed Music Scholarship.*** Awarded to a full-time undergraduate student majoring in music; based on academic merit and financial need.

***William G. Becker Scholarship.*** Awarded to a full-time undergraduate student majoring in any string instrument demonstrating high musical and academic promise with financial need.

***Joe and Nancy Benincasa Scholarship***. Awarded to a full-time undergraduate student majoring in any string instrument demonstrating high musical and academic promise with financial need.

***John I. Bettenbender Theater Arts MFA Award.*** Awarded to full-time M.F.A. students enrolled in design, stage management, costume technology, directing, or playwriting; established in line with the university's mission for diversity. Based on academic merit and financial need.

***The Barbara and James Betts Scholarship in the Visual Arts.*** Awarded to undergraduate or graduate visual arts student(s) based on financial need and artistic excellence.

***Linda and Jim Bodycomb Endowed Scholarship.*** Up to two (2) scholarship awards may be made each year among full-time or part-time undergraduate or graduate students based on financial need. Preference will be given to students studying theater at the Mason Gross School of the Arts with technical concentrations which include but are not limited to costume design, set design, sound and lighting.

***Ralph Bown Jass Studies Scholarship***. Awarded to part-time or full-time undergraduate or graduate students studying Jazz based on academic merit and financial need.

***Carla Allen Caesar Endowed Memorial Scholarship.*** Awarded to full-time undergraduate or graduate students majoring in Theater at the Mason Gross School of the Arts. Preference will be given to female students with artistic merit as determined by the program administrator.

***Colonel Robert B. and Charlotte M. Craig Glass Armonica Fellowship.*** Awarded to full-time students pursuing a terminal degree in music with an interest in learning to play the glass armonica; based on academic and artistic merit.

***Lyda J. Craig Endowed Fund.*** Awarded to a student studying visual arts at Mason Gross School of the Arts, with a preference given to a student with a concentration in painting, sculpture, or ceramics.

***Anna J. Cramer Music Scholarship.*** Awarded to a full-time undergraduate student based on academic merit. Preference will be given to those who are music majors with a concentration in performance.

***Mary Elizabeth Davison Music Scholarship.*** Awarded to a worthy music student with financial need for the study of voice or an instrument.

***Malcolm Dodds Music Scholarship.*** Awarded to full-time undergraduate or graduate students. Preference to an African-American student enrolled in music. Based on academic merit.

***Florence Schnepf Domeshek Memorial Merit Scholarship.*** Awarded to full-time undergraduate or graduate dance majors based on artistic and academic merit.

***David Drinkwater Endowed Scholarship.*** Awarded to students majoring in keyboard with a preference for students studying organ. Recipients may be encouraged to give a recital at the end of the year.

***Electronic Theatre Controls Scholarship in Lighting Design***. Awarded to part-time or full-time undergraduate students studying lighting design based on academic merit and financial need.

***William Esper Endowed Scholarship.*** Awarded to full-time students enrolled in the acting program at Mason Gross School of the Arts.

***William B. Fielder Endowed Jazz Scholarship.*** Awarded to music students studying primarily jazz, trumpet, and classical trumpet. Based on academic merit and artistic talent, with a preference given to those exhibiting financial need.

***Charlotte Durham Frazier Scholarship.*** Awarded to an undergraduate or graduate student studying organ (preferably), otherwise any keyboard instrument or choral conducting with financial need.

***Lolita Cabrera Gainsborg Memorial Scholarship.*** Awarded to encourage undergraduate or graduate students to reward and encourage students to study piano. Based on academic merit.

***Leila Durham Gladwell Memorial Scholarship.*** Awarded to an undergraduate or graduate student studying organ (preferably), otherwise any keyboard instrument or choral conducting.

***Penelope Dara Genesin Memorial Scholarship.*** Awarded to full-time or part-time undergraduate or graduate students based on academic merit and financial need. Preference will be given to students majoring in Music focusing on applied music, composition, or conducting; and/or students majoring in Theater Arts who play a principal role in a performance.

***Leon Golub Scholarship.*** Awarded to first- or second-year graduate students enrolled in the visual arts program at Mason Gross School of the Arts.

***Elliot and Janet Greene Scholarship.*** Awarded to full-time undergraduate students majoring in theater. Based on academic merit and financial need. Recipient should be a New Jersey resident.

***Hamangia Foundation Annual Fellowship.*** Awarded to full-time graduate students of art and design studying ceramic sculpture. Based on academic merit and financial need.

***Regina B. Heldrich Endowed Scholarship.*** Scholarships are to be awarded to undergraduate or graduate music majors studying voice or classical instrumental performance.

***Gregory Hines Dance Power Endowed Scholarship.*** 1) Awarded to students in dance or theater arts; based on artistic merit. 2) Full-time undergraduate minority student enrolled in dance or theater based on merit.

***Hanya Holm Scholarship Fund.*** Recognizes outstanding work by a B.F.A. junior or senior in dance. This award will be given to help defray tuition expenses.

***Jane C. Inge Scholarship.*** Awarded to students majoring or active in the field of drama; based on financial need.

***Sylvia S. Kapp Memorial Scholarship.*** Awarded to music majors from Middlesex County, NJ, with preference to residents of East Brunswick; based on academic excellence.

***Henry W. and Helen S. Kaufmann Music Scholarship.*** Awarded to graduate students for the study of music at Mason Gross School of the Arts.

***John Kazanijan Fellowship Fund for Mason Gross School of the Arts.*** Awarded to students who are matriculated in degree programs in music at Mason Gross School of the Arts, maintain a 3.0 or higher GPA, and may be engaged in research or performance.

***Dan Kluchinski Memorial Endowed Scholarship.*** Awarded to full-time undergraduate students based on financial need who have the equivalent number of credits to be considered in their third or junior year, who are members of the Glee Club, studying one of the 21 majors offered at the School of Environmental and Biological Sciences as of the Fall Semester 2017, and exhibiting evidence of commitment and leadership in the musical life and/or management of the Glee Club.

***Professor Eric Krebs and Suzanne Krebs Endowed Scholarship.*** Awarded to full-time or part-time undergraduate students to support and encourage students of theater.

***Kelly Kriedeman Endowed Scholarship.*** Awarded to graduate students, preferably female, in the fall of their final year of the acting program.

***Irene Messner Laureyns Opera Scholarship.*** Awarded to full-time undergraduate or graduate students enrolled in the Department of Music at Mason Gross School of the Arts, based on academic merit. Recipients must have a particular interest in opera performance and/or opera production, majoring in voice performance and participating in an opera production, or be participants in the Opera Institute at the Mason Gross School of the Arts.

***Philip and Janice Levin Mason Gross Scholarship.*** Awarded to students majoring in drama and the theater arts program associated with the the Levin Theater.

***Eugene H. and Lois A. Lockfield Scholarship.*** Awarded to undergraduate or graduate students studying jazz based on academics and financial need.

***Dr. Debra Lynch and Paul Sypchala Scholarship***. Awarded to undergraduate or graduate students studying theater based on academic merit and financial need.

***Marching Band Scholarship.*** Awarded to students participating in the marching band.

***Stephanie Morris Marryott Scholarship.*** Awarded to undergraduate or graduate students based upon faculty evaluation or relevant application materials such as an audition in the case of performance, jazz, or music education students; based upon financial need.

***Edna S. Mason Scholarship.*** Awarded to talented and worthy students pursuing a professional degree in music, with preference given to those pursuing a career in piano.

***Victoria J. Mastrobuono Memorial Opera Scholarship.*** Awarded to full-time undergraduate or graduate students interested in opera performance and/or opera production at Mason Gross School of the Arts.

***Victoria J. Mastrobuono Memorial Scholarship.*** Awarded to full-time undergraduate or graduate students enrolled at Mason Gross School of the Arts.

***Victoria J. Mastrobuono Memorial Theater Scholarship.*** Awarded to full-time undergraduate or graduate students majoring in theater at Mason Gross School of the Arts.

***Patricia Mayer Scholarship.*** Awarded to incoming first-year students who demonstrate outstanding talent as dancers to help defray tuition expenses.

***Steven J. Mento Ph.D Marching Band Endowed Scholarship.*** Awarded to full-time undergraduate students in the Mason Gross School of the Arts based on academic merit and financial need. Student recipients must be a current member of the marching band.

***Monmouth Arts Foundation Endowed Scholarship.*** Awarded to students from Monmouth County, New Jersey, on a rotating basis in classical piano, visual or performing arts, or jazz or jazz composition.

***Robert E. Mortensen Endowed Fellowship Fund.*** Financial aid for a graduate student in choral conducting or undergraduate students in the Mason Gross School of the Arts registered in both the Glee Club and Kirkpatrick Choir (or other mixed ensemble at the direction of choral activities).

***NOE Memorial Scholarship.*** Provides financial assistance to students majoring in music.

***Frank P. and Lilly A. Novak Endowed Scholarship.*** Awarded to full-time students in visual arts, with a preference given to students studying painting, sculpture, or ceramics.

***Presser Foundation Scholarship.*** Awarded to an outstanding music major at the end of his or her junior year.

***Edward W. Price Scholarship.*** Awarded to a Rutgers University Marching Band member.

***Louis T. Rege and Lou Costello Endowed Scholarship.*** Awarded to students enrolled in the Department of Theater Arts at Mason Gross School of the Arts; preference given to students who reside in the state of New Jersey.

***Pee Wee Russell Scholarship.*** Awarded to students with financial need and demonstrated musical proficiency in jazz.

***Rutgers Class of 1953 Endowed Scholarship.*** Awarded to full-time undergraduate students in any of the four departments of Mason Gross School of the Arts based on academic merit and artistic talent.

***Rutgers Class of '79 Merit Scholarship.*** Awarded to an undergraduate who was in the top 10 percent of his or her secondary school and maintains at least a B (3.0) cumulative average during matriculation at the university.

***Catherine Mortola Saldarini Memorial Scholarship.*** Awarded to undergraduate or graduate students studying classical piano; based upon academic merit and artistic ability.

***Ron Sauers Endowed Scholarship.*** Awarded to full-time or part-time undergraduate or graduate students studying the arts at Mason Gross School of the Arts, based on academic merit and financial need.

***W. Robert and Leona Schare Music Scholarship.*** Awarded to a full-time student with a preference to those who demonstrate excellence in performances and are enrolled in a program which results in a degree in music; financial need is considered.

***Edie Schlosser Memorial Art Scholarship***. Awarded to undergraduate students majoring in Visual Arts based on financial need.

***Jean V. Shaw Estate Organist Scholarship.*** Awarded to a student studying organ.

***Jean V. Shaw Estate Pianist Scholarship.*** Awarded to a student studying piano.

***Liu Shiming Art Foundation Endowed Visual Arts Scholarship***. Awarded to part-time or full-time undergraduate or graduate students studying sculpture or drawing based on academic merit and financial need.

***Fran and Ray Stark Film Prize.*** Awarded to an undergraduate or graduate students pursuing filmmaking (film concept, teleplay, screenplay, or computer generated material).

***Peter Stroud Scholarship.*** Awarded to first- or second-year graduate students enrolled in the visual arts program at Mason Gross School of the Arts.

***Percy Such Cello Scholarship.*** Awarded to a string player.

***Anne Moreau Thomas Endowed Scholarship.*** This award supports the Rutgers University Glee Club with a scholarship fund for students needing financial aid; preference is given to those studying music at Mason Gross.

***Paul Trilling Scholarship.*** Awarded to minority music majors at Mason Gross School of the Arts. Preference will be given to students majoring in violin, viola, or cello; other instruments may be considered.

***Margery Turner Endowed Scholarship Fund in Dance.*** Awarded to a full-time undergraduate student based on talent and potential in the field as determined by the program and financial need as demonstrated by the Office of Financial Aid.

***University DanceWorks Scholarship.*** Awarded to incoming first-year students who demonstrate outstanding talent as dancers to help defray tuition expenses.

***Deborah B. Waksman Scholarship.*** Awarded to a music student.

***Allan E. Warner Scholarship.*** Awarded to a music student.

***Robert Watts Memorial Graduate Scholarship.*** Awarded to students entering the M.F.A. program in visual arts who have an impact on the development of contemporary art and demonstrate financial need.

***Stanley West MGSA '70 Annual Music Scholarship.*** Scholarship recipients will be selected among full-time undergraduate or graduate students based on academic merit, as determined by the program administrator, and financial need, as determined by the Office of Financial Aid.

# Facilities (MGSA)

## FACILITIES

The administrative offices of the Mason Gross School of the Arts and those of the art & design department and the Rutgers Filmmaking Center are located in the Civic Square Building in New Brunswick. Art & Design studios and classrooms also are located in the Livingston Art Building on the Livingston campus.



# Art and Design

# Art and Design

The Department of Art & Design's facilities are in downtown New Brunswick and on the Livingston campus in Piscataway. These two campuses house studio classrooms, fabrication workshops, computer labs, seminar rooms, lecture halls, and the Mason Gross Galleries at Civic Square.

Most art and design classes meet in the Civic Square Building (CSB), in which there are project spaces, critique rooms, a woodshop, and a lighting studio for students to photograph artwork. CSB's five Mac computer labs are equipped with workstations, scanners, and printers tailored to the specific requirements of our specialized areas. Additionally, the photography area has black and white darkrooms and large-scale digital printers, and the media area maintains audio and video recording and editing facilities with the latest software programs. There is also a dedicated room with a wall-sized green-screen for chromakeying photo and video. CSB also houses FORUM, a multi-purpose lecture, performance and critique space, and CHANNEL, a time-based media exhibition gallery.

The Livingston Arts Building (LAB) houses the department's sculpture facilities, including workshops for wood, metal, and ceramics. Individual studios, a gallery, and space for students to work outdoors are also found at LAB. Across the street from LAB, Art & Design students also have access to the Rutgers Makerspace workshop that includes 3D printers, digital plotters, laser-cutters, and other digital fabrication equipment. Studio spaces for M.F.A. students and some advanced B.F.A. undergraduates are available at both CSB and LAB.

The spacious Mason Gross Galleries in the Civic Square Building (4200 square-feet) present nine annual exhibitions by students, alumni, faculty, and staff. All exhibits are free and open to the public.

Facilities (MGSA)

# Dance

# Dance

The dance department is housed on the Douglass campus in New Brunswick. The Nicholas Music Center contains dance studios, faculty and staff offices, student locker rooms, a student lounge, and the Soma Center, which operates as a fully equipped Pilates, conditioning, and rehabilitation center.

The Victoria J. Mastrobuono Theater is a 335-seat proscenium theater used for the presentation of productions featuring the work of guests, faculty, and student artists.

The Loree Dance Theater is a 220-seat black box theater used for daily dance technique classes, as well as for performances by students, faculty, and visiting guest artists.

Mortensen Hall houses the dance department executive offices, a large public atrium, and the Kevin Goetz Studio for Theater and Dance. Corwin Lodge is also used for dance classes and student rehearsals.

Facilities (MGSA)

# Filmmaking

# Filmmaking

The Rutgers Filmmaking Center offers students access to large-sensor, high-end digital cameras, such as the Black Magic URSA Mini Pro 4.6k, with the use of interchangeable lenses, as well as professional audio and lighting equipment. The center also has a 4K color Correction Suite with DaVinci Resolve and a Surround Sound Mixing Suite. Classrooms are equipped with Adobe Creative Suite, ProTools, and 2-D and 3-D animation software. Facilities feature a suite of classrooms that include a production studio with lighting grid, a green screen cyclorama, and a 24-hour access editing lab.

For our full list of equipment and facilities, please click here.

Facilities (MGSA)

# Music

# Music

The Department of Music facilities is a part of the Mason Gross Performing Arts Center on the Douglass campus.

The Marryott Music Building is the department's main administrative building and features the Schare Recital Hall, a 100-seat intimate recital venue.

Robert E. Mortensen Hall opened in fall 2013 and includes the Richard H. Shindell Choral Hall, a state-of-the-art recording studio, the Presser Foundation Practice Suite, the Bauer Music Room, the Kevin Goetz Studio for Theater and Dance, and an atrium with a café where students can congregate and enjoy refreshments.

The Department of Music's primary performance venue is Nicholas Music Center, a beautiful 740-seat concert hall. Performances also take place at Voorhees Chapel on the Douglass campus and in Kirkpatrick Chapel on the College Avenue campus.

The New Brunswick Performing Arts Center, which opened in fall 2019, is the newest Mason Gross School of the Arts facility. This venue houses two theaters of 465 and 253 seats, and an 86-foot stage, equipped with an orchestra pit. The Performing Arts Center partners with the George Street Playhouse, Crossroads Theater, American Repertory Ballet, New Brunswick Cultural Center, and Mason Gross School of the Arts to accommodate musicals, drama, dance, opera, lectures, and other musical events.

The Blanche and Irving Laurie Music Collection, housed adjacent to the department in the Mabel Smith Douglass Library, includes a major collection of books, scores, recordings, and other resources for the scholar and the performing musician. The Mabel Smith Douglass Library is also home to the Performing Arts Seminar Room, a state-of-the-art space for graduate and undergraduate classes, and the Sharon A. Fordham Computer Lab, which serves as the department's computer lab.

The Department of Music facilities include classrooms, performance and rehearsal spaces, studios, faculty offices, and practice rooms.

Facilities (MGSA)

# Theater

# Theater

Each season our students, often joined by professional theater artists and sometimes on their own, study, facilitate, design, build and perform seven to ten productions. These productions are presented in unique theater spaces that afford the students a wide variety of experiences.

Performance facilities include the Philip J. Levin Theater, a flexible black box theater with 200 seats; the Victoria J. Mastrobuono Theater, a state-of-the-art, 335-seat proscenium theater; and the intimate, 60-seat Jameson Studio Theater.

The department has well-equipped production facilities, including a scene shop, a property shop, a costume production shop, and a sound studio.

Teaching facilities include a costume teaching shop, a lighting laboratory, a computer-assisted design laboratory, two design studios, a movement studio, and three acting/rehearsal studios.

# Requirements (MGSA)

## REQUIREMENTS

Please consult the Mason Gross School of the Arts website for updated program information, including departmental handbooks and curricular checklists.

Requirements (MGSA)

## Credits and Residency

## Credits and Residency

The total number of credits required for graduation is a minimum of 120 credits and can exceed that depending on the student's major program. In no instance may a student graduate with fewer than 120 credits and a cumulative grade-point average of less than 2.0.

Incoming first-year students starting a bachelor's degree in art and design, dance, filmmaking, music, and theater should expect to spend a minimum of four years in resident study. These residency requirements are applicable even if college credit was completed during high school.

Transfer students entering Mason Gross programs are subject to review by the departments, which will determine the length of time required to graduate. Transfer students should expect a minimum of two years, but in most instances, will require three or more years to complete their degree.

Each candidate for the bachelor's degree must earn a minimum of 30 of the last 42 credits at Rutgers. Individual programs may have minimum grade requirements for core courses in the degree.

For students transferring to the Department of Music at Mason Gross, although course credits for applied music (performance) courses may transfer, the applied music performance level at Mason Gross is determined by placement from the department.

Requirements (MGSA)

## Liberal Arts Requirements

## Liberal Arts Requirements

In addition to completing the prescribed program of study in their major as outlined in the Programs of Study chapter later in this section, students must take courses in the following liberal arts categories:

*Natural Sciences:* life sciences, chemistry, geological sciences, marine and coastal sciences, meteorology, physics and astronomy, anthropology*, cognitive sciences*, exercise science*, sport management*, geography*, School of Environmental and Biological Sciences*
*Not all courses in these departments fulfill this requirement.

*Social Science and History:* communication, criminal justice, economics, education, environmental policy, exercise and sports science, information technology and informatics, labor studies and employment relations, Latin American studies, political science, Africana studies, African area studies, American studies, Asian studies, history, Latino and Caribbean studies, medieval studies, Middle Eastern studies, South Asian studies, women's and gender studies, planning and public policy, psychology, public health, sociology, anthropology*, European studies*, geography*, Jewish studies*, journalism and media studies*
*Not all courses in these departments fulfill this requirement.

*Humanities:* archaeology, African, Middle Eastern, and South Asian languages and literatures, American Sign Language, Armenian, Catalan, Chinese, classics, comparative literature, French, German, Greek, Hindi, Hungarian, Italian, Japanese, Korean, Latin, philosophy, Polish, Portuguese, religion, Russian, Spanish, Ukrainian, American studies*, art history*, cinema studies*, English*, European studies*, Jewish studies*, journalism and media studies*, linguistics*, Middle Eastern studies*, South Asian studies*
*Not all courses in this department fulfill this requirement.

*Second Writing Intensive or Literature*: English, comparative literature, foreign language literature (original or translation, check with your adviser before you enroll)

*Quantitative/Technical Skills:* mathematics, computer science, statistics, research methods in a department, 01:355:415 Information Design, 01:355:425 Web Authoring, 04:547:320 Web Design, 01:730:201 Introduction to Logic, 01:615:201 Introduction to Linguistic Theory, 01:070:335 Analysis of Archaeological Data, 01:070:395 Quantification of Archaeological Data, 04:192:300 Communication Research, 01:202:307 Criminal Justice Research Methods, 01:377:275 Basic Statistics for Exercise Science, 14:440:127 Introduction to Computers for Engineers, 14:440:221 Engineering Mechanics: Statistics, 01:450:319 Quantitative Methods, 01:450:320 Spatial Data Analysis, 01:450:330 Geographical Methods, 01:711:295 Introductory Topics in Operations Research, 10:762:205 Basic Statistical Methods for Policy, Planning, and Health, 01:790:300 Introduction to Political Science Methods, 01:830:200 Quantitative Methods in Psychology, 01:920:311 Introduction to Social Research, 01:920:312 Computer Analysis of Social Science Data, 04:189:103 Information Technology and Information, 07:577:201 Practical Finance for Entrepreneurial Creatives

**Mason Gross Liberal Arts Core Requirements**

**Part One: Areas of Inquiry (24 credits)**
This area allows students to encounter multiple modes of scholarship, research, analysis and synthesis.

*A. Natural Science (Minimum 3 credits)*

Learning Goals

- Understand and apply basic principles and concepts in the physical or biological sciences
- Explain and be able to assess the relationship among assumptions, method, evidence, arguments, and theory in scientific analysis

*B. Social Science and History (Minimum 3 credits*)

Learning Goals

- Understand the bases and development of human and societal endeavors across time and place
- Explain and be able to assess the relationship among assumptions, method, evidence, arguments, and theory in social and historical analysis
- Understand different theories about human culture, social identity, economic entities, political systems, and other forms of social organization
- Identify and critically assess ethical issues in social science and history

*C. Arts and Humanities (Minimum 3 credits*)

Learning Goals

- Examine critically philosophical and other theoretical issues concerning the nature of reality, human experience, knowledge, value, and/or cultural production
- Analyze arts and/or literatures in themselves and in relation to specific histories
- Understand the nature of human languages and their speakers
- Engage critically in the process of creative expression

*D. Liberal Arts Elective (to reach a total of 24 credits)*

**Part Two: Cognitive Skills and Processes (9 credits)**

This area provides undergraduates with a solid foundation in areas that are critical for success in academic study and research.

*A. Writing (3 credits): College Writing 101*

Learning Goals

- Communicate complex ideas effectively in standard written English to a general audience and respond effectively to editorial feedback from peers, instructors, and/or supervisors through successive drafts and revision.

*B. Literature or Second Writing-Intensive Course (3 credits)*

Learning Goals

- Communicate effectively in modes appropriate to a discipline or area of inquiry
- Evaluate and critically assess sources and use the conventions of attribution and citation correctly
- Analyze and synthesize information and ideas from multiple sources to generate new insights

*C. Quantitative/Technical Skills (3 credits)*

Learning Goals

- Employ current technologies to access information, to conduct research, and to communicate findings
- Analyze and critically assess information from traditional and emergent technologies

- Understand the principles that underlie information systems

*Total Credits: 33*

Where permitted by the department, students may count up to 12 credits already required by the major.

**Changes in Basic Skills Requirements**

* All students are required to take both the English and the math placement tests.

The **Liberal Arts Core Requirements** listed above form a framework that has been approved by the Mason Gross Curriculum Committee. Students must consult the Assistant Dean for Advising and Student Success and/or their departmental Advisor and Student Success Counselor to learn how these requirements are to be fulfilled. The guidelines for fulfillment vary by department.

**Dance**

*Part I (24 credits)*

A. Natural Science (3): 07:206:325 Kinesiology

B. Social Science and History (6)

*General Psychology (01:830:101) is required for students tracking into the Ed.M. program in Dance Education)

C. Arts and Humanities (6)

D. Liberal Arts Electives (9)

*Part II (9 credits)*

A. Writing and Communication (3): 01:355:101 College Writing

B. Literature or Second Writing Intensive Course (3): 01:355:201 Research in Disciplines

C. Quantitative/Technical Skills (3): 07:206:237 Dance Production

*Total Credits: 33*

**Design**

*Part I: Areas of Inquiry (24 credits)*

A. Social Science and History (6)

B. Arts and Humanities (12)

01:082:105 Art History 105

01:082:106 Art History 106

01:XXX:XXX Art History or Cinema Studies elective

One Contextual Studies course; choose **one** from below:

04:189:152 The Structure of Information

04:567:275 Social Media and the Participatory Culture

11:550:133 Architectural Design

04:567:333 Media and Popular Culture

C. Liberal Arts Electives (6)

*Part II: Cognitive Skills and Processes (9 credits)*

A. Writing and Communication (3): 01:355:101 Expository Writing

B. Literature/Writing Contemporary Art (3)

07:081:200 Seminar in Contemporary Art A

**or**

01:355:201 Research in the Disciplines

C. Quantitative/Technical Skills (3)

*Total Credits: 33*

**Filmmaking**

*Part I (24 credits)*

A. Natural Science (6)

B. Arts and Humanities (12)

01:082:106 Introduction to Art History

01:175:201 Introduction to Film I

01:175:202 Introduction to Film II

01:175:XXX Cinema Studies Elective

C. Social Science and History (6)

*Part II (9 credits)*

A. Writing and Communication (3): 01:355:101 College Writing

B. Literature or second Writing Intensive (3)

C. Quantitative/Technical Skills (3)

*Total Credits: 33*

**Music (Composition)**

*Part I: Areas of Inquiry (21 credits)*

A. Natural Science (3)

B. Social Science and History (3)

C. Arts and Humanities (3)

D. Liberal Arts Electives (12)

*Part II: Cognitive Skills and Processes (9 credits)*

A. Writing and Communication (3): 01:355:101 College Writing

B. Literature or second Writing Intensive (3)

C. Quantitative/Technical Skills (3)

*Total Credits: 30*

**Music (Music Education)**

*Part I: Areas of Inquiry (21 credits)*

A. Natural Science (3)

B. Social Science and History (12)

01:830:101 General Psychology

01:830:331/333 Infant and Child Development or Adolescent Psychology

05:300:306 Educational Psychology

05:300:383 Introduction to Special Education

C. Arts and Humanities (6)
XX:XXX:XXX Music in Historical and Cultural Context Elective
05:300:401 Individual/Cultural Diversity in the Classroom

*Part II: Cognitive Skills and Processes* (9)
A. Writing and Communication: 01:355:101 College Writing
B. Literature or second Writing Intensive (3)
C. Quantitative/Technical Skills (Math, 01:640:100-level or above) (3)

*Total Credits: 30*

**Music (Jazz, Performance)**

*Part I: Areas of Inquiry (24 credits)*
A. Natural Science (3)
B. Social Science and History (3)
C. Arts and Humanities (3)
D. Liberal Arts Electives (15)

*Part II: Cognitive Skills and Processes (9 credits)*
A. Writing and Communication (3): 01:355:101 College Writing
B. Literature or second Writing Intensive (3)
C. Quantitative/Technical Skills (3)

*Total Credits: 33*

**Theater (Acting)**
*Part I: Areas of Inquiry (27 credits)*
A. Social Science and History (3): 07:966:417 British Art and Culture
B. Arts and Humanities (3): 07:966:281 Theater History
C. Liberal Arts Electives (21)
07:965:282 Theater History II
07:965:370 Global Theater I
07:965:473 Clothing and Culture I
Liberal arts electives (12)

*Part II: Cognitive Skills and Processes (6 credits)*
A. Writing and Communication (3): 01:355:101 College Writing
B. Literature (3): 07:966:427 Shakespeare's Plays

*Total Credits: 33*

**Theater (Design)**
*Part I: Areas of Inquiry (24 credits)*
A. Social Science and History (3): 07:966:417 British Art and Culture
B. Arts and Humanities (3)
07:965:281 Theater History
C. Liberal Arts Electives (18)

07:965:282 Theater History II
07:965:370 Global Theater
01:082:106 Art History
01:082:EC Art History elective
Liberal arts electives (6)

*Part II: Cognitive Skills and Processes (9 credits)*
A.Writing and Communication (3): 01:355:101 College Writing
B. Literature (3)
07:966:427 Shakespeare's Plays
C. Quantitative/Technical Skills (3)
07:966:243 Elements of Design

***Total Credits: 33***

**Theater (Stage Management)**
*Part I: Areas of Inquiry (24 credits)*
A. Social Science and History (3)
B. Arts and Humanities (3)
07:965:281 Theater History I
C. Liberal Arts Electives (18)
07:965:282 Theater History II
07:965:370 Global Theater I
07:965:473 Clothing and Culture
07:557:201 Practical Finance for Entrepreneurship Creatives Online
Liberal arts elective (6)

*Part II: Cognitive Skills and Processes (9 credits)*
A.Writing and Communication (3): 01:355:101 College Writing
B. Literature or second Writing Intensive (3)
C. Quantitative/Technical Skills (3)
07:966:251 Fundamentals of Drafting

***Total Credits: 33***

**Theater (Technical Direction)**

*Part I: Areas of Inquiry (24 credits)*
A. Social Science and History (3)
B. Arts and Humanities (3)
07:965:281 Theater History
C. Liberal Arts Electives (18)
07:965:282 Theater History II
07:965:370 Global Theater
Liberal arts electives (12)

*Part II: Cognitive Skills and Processes (9 credits)*

A.Writing and Communication (3): 01:355:101 College Writing
B. Literature or second Writing Intensive (3)
C. Quantitative/Technical Skills (3)
07:966:251 Fundamentals of Drafting

*Total Credits: 33*

**Visual Arts**

*Part I: Areas of Inquiry (21 credits)*

A. Social Science and History (6)
B. Arts and Humanities (12)
01:082:105 Art History 105
01:082:106 Art History 106
01:XXX:XXX Art History or Cinema Studies elective
01:XXX:XXX Art History or Cinema Studies elective
C. Liberal Arts Electives (3)

*Part II: Cognitive Skills and Processes (12 credits)*

A. Writing and Communication (3): 01:355:101 College Writing
B. Second Writing Intensive Course (6)
07:081:200 Seminar in Contemporary Art A
07:081:201 Seminar in Contemporary Art B
C. Quantitative/Technical Skills (3)

*Total Credits: 33*

Requirements (MGSA)

# Interdisciplinary Requirement

# Interdisciplinary Requirement

Incoming first-year students are required to complete 07:557:151, Mason Gross Interplay. Interplay is a 1-credit interdisciplinary course (graded P/NC) designed to introduce students to the artistic disciplines represented at Mason Gross, foster relationships between and within departments, and help students develop the skills needed to collaborate.

**Learning Goals:**

- Students will be able to relate to their own field and to other departments within Mason Gross. They will have access to a network of potential peer collaborators.
- Students will be able to conceptualize a variety of possible multimedia collaborations. They will gain the skills necessary to collaborate effectively with others.
- Students will be able to reflect critically upon artwork in disciplines other than their own.

# Graduation (MGSA)

## GRADUATION

Degrees are conferred at the Mason Gross School of the Arts Convocation and the annual university commencement ceremony every May. Degrees are issued to students via postal mail by the university upon recommendation of the faculty and Office for Advising and Student Success once all degree requirements are completed and final grades are posted on the transcript.

The bachelor's degree is conferred with the distinction *summa cum laude* for graduates with a Rutgers cumulative grade-point average of 3.850 or higher; *magna cum laude* for those with an average of 3.700 or higher; and *cum laude* for those with an average of 3.500 or higher. Averages are not rounded to the next higher number in the calculation of honors.

Students graduating in August may request to participate in the commencement ceremonies the preceding spring if they have 6 or less credits to complete their degree and present the dean's office with an academic plan for completion by the August graduation deadline.

Students graduating in January are invited and encouraged to participate in the commencement ceremonies at the completion of the subsequent spring semester.

Degrees are conferred in absentia when the candidate has advised the registrar in advance of their inability to attend commencement. Diplomas are withheld from all students with outstanding financial or library account balances.

Students who complete courses at other institutions or return to Rutgers to complete degree deficiencies must notify the Mason Gross Dean's Office of their completion by submitting official transcripts and completing a diploma application.

*Post-Obitum Award of Degree*. In the unfortunate event of the death of a student who has enrolled in the Mason Gross School of the Arts as a senior in good standing, requests will be considered for the awarding of the degree that was being earned. The request may be submitted in writing to the Assistant Dean for Advising & Student Success.

# Programs of Study (MGSA)

## PROGRAMS OF STUDY

Mason Gross School of the Arts offers professional programs in dance, design, filmmaking, theater, and visual arts, leading to the bachelor of fine arts degree, and a professional program in music, leading to a bachelor of music degree. The curriculum codes for these programs are as follows:

206 Dance

208 Design

211 Filmmaking

702 Music

966 Theater

081 Visual Arts

The specific program requirements are outlined in this chapter.

- Dance 206
- Design 208
- Filmmaking 211
- Music 702
- Theater 966
- Visual Arts 081

# Dance 206 (MGSA)

## DANCE 206

See Dance in the Programs of Study and Courses for Liberal Arts and Sciences Students section for bachelor of arts (B.A.) program information.

The objective of the bachelor of fine arts (B.F.A.) program in dance is to provide professional-level training in multiple movement practices for students seeking careers in dance. The program supports student artists' creative and scholarly research on multiple levels, encouraging them to develop critical thinking skills as a base for career pathways in the arts, business, education, sciences, and technology. Students will attain a clear and fundamental knowledge of how their embodied experiences, including improvising, performing, choreographing, writing, and teaching is investigated, integrated, and ultimately synthesized through artistic and scholarly methodologies.

Dance 206 (MGSA)

## Major Requirements

## Major Requirements

Students must complete a minimum of 120 credits to earn the B.F.A. Degree in Dance. This includes 99 Dance credits (including 8 credits of dance electives), 33 credits of liberal arts, and a one-credit interdisciplinary seminar that is mandatory for first-year students and optional for incoming transfer students. Students must earn a C grade or better in the core curriculum (see table below) or repeat the course. Students must be registered for a minimum of 12 credits each semester to achieve full-time status.

## Semester: Year 1 - Fall

| Course Number | Course Name | Credits |
|---|---|---|
| 07:206:130 | African Diasporic Movement Practices 1 | 1.5 |
| 07:206:131 | Classical/Traditional Movement Practices 1 | 1.5 |
| 07:206:132 | Contemporary Fusion Movement Practices 1 | 1.5 |
| 07:206:133 | Somatic Movement Practices 1 | 1.5 |
| 07:203:115 | Introduction to Dance Studies | 3 |
| 07:206:142 | Improvisation 1 | 2 |
| 07:206:101 | *Concussion Awareness | 0 |
| 07:206:100 | **Dance Assembly | N.5 |

## Semester: Year 1 - Spring

| Course Number | Course Name | Credits |
|---|---|---|
| 07:206:146 | African Diasporic Movement Practices 2 | 1.5 |
| 07:206:147 | Classical/Traditional Movement Practices 2 | 1.5 |
| 07:206:148 | Contemporary Fusion Movement Practices 2 | 1.5 |
| 07:206:149 | Somatic Movement Practices 2 | 1.5 |
| 07:203:145 | Performance Skills 1 | 2 |
| 07:206:126 | Rhythm for Dancers | 2 |
| 07:206:101 | *Concussion Awareness | 0 |
| 07:206:100 | **Dance Assembly | N.5 |

## Semester: Year 2 - Fall

| Course Number | Course Name | Credits |
|---|---|---|
| 07:206:260 | African Diasporic Movement Practices 3 | 1.5 |
| 07:206:261 | Classical/Traditional Movement Practices 3 | 1.5 |
| 07:206:262 | Contemporary Fusion Movement Practices 3 | 1.5 |
| 07:206:263 | Somatic Movement Practices 3 | 1.5 |
| 07:206:243 | Improvisation 2 | 2 |
| 07:206:402 | Laban/Bartenieff for Dance and Dance Education | 3 |
| 07:206:101 | *Concussion Awareness | 0 |
| 07:206:100 | **Dance Assembly | N.5 |

## Semester: Year 2 - Spring

| Course Number | Course Name | Credits |
|---|---|---|
| 07:206:264 | African Diasporic Movement Practices 4 | 1.5 |
| 07:206:265 | Classical/Traditional Movement Practices 4 | 1.5 |
| 07:206:266 | Contemporary Fusion Movement Practices 4 | 1.5 |
| 07:206:267 | Somatic Movement Practices 4 | 1.5 |
| 07:206:235 | Choreography 1 | 2 |
| 07:206:245 | Performance Skills 2 | 2 |
| 07:206:325 | ****Kinesiology for Dancers | 3 |
| 07:206:100 | **Dance Assembly | N.5 |

## Semester: Year 3 - Fall

| Course Number | Course Name | Credits |
|---|---|---|
| 07:206:346 | African Diasporic Movement Practices 5 | 1.5 |
| 07:206:347 | Classical/Traditional Movement Practices 5 | 1.5 |
| 07:206:348 | Contemporary Fusion Movement Practices 5 | 1.5 |
| 07:206:334 | Choreography 2 | 2 |
| 07:206:319 | Sound & Movement | 3 |
| 07:206:237 | ***Dance Production | 3 |
| 07:206:101 | Concussion Awareness | 0 |
| 07:206:100 | **Dance Assembly | N.5 |

## Semester: Year 3 - Spring

| Course Number | Course Name | Credits |
|---|---|---|
| 07:206:356-8 | Intensive study in 2 Movement Practices | 3 |
| 07:206:345 | Advanced Improvisation | 2 |
| 07:206:441 | Dance History: World Survey | 3 |
| 07:206:431 | OR<br>Dance History ONLINE: World Survey (for Ed.M. tracking students OR by permission of the department) | 3 |
| 07:206:237 | ***Dance Production | 3 |
| 07:206:352 | Teaching as an Artist | 3 |
| 07:206:100 | **Dance Assembly | N.5 |

## Semester: Year 4 - Fall

| Course Number | Course Name | Credits |
|---|---|---|
| 07:206:416-8 | Advanced study in one or two Movement Practices | 8 |
| 07:206:450 | Dance Capstone 1 | 2 |
| 07:206:442 | Dance History: 1900-Present | 3 |
| 07:206:432 | OR<br>Dance History ONLINE: 20th Century (for Ed.M. tracking students OR by permission of the department) | 3 |
| 07:206:101 | *Concussion Awareness | 0 |
| 07:206:100 | **Dance Assembly | N.5 |

## Semester: Year 4 - Spring

| Course Number | Course Name | Credits |
|---|---|---|
| 07:206:426 | African Diasporic Movement Practices 8 | 1.5 |
| 07:206:427 | Classical/Traditional  Movement Practices 8 | 1.5 |
| 07:206:428 | Contemporary Fusion Movement Practices 8 | 1.5 |
| 07:206:451 | Dance Capstone 2 | 2 |
| 07:206:161 | ****Production Study | 2 |
| 07:206:100 | **Dance Assembly | N.5 |

- *Students are required to take 07:206:101 Concussion Wise EVERY Fall semester. This course is a pass/fail course and does not count towards total credits for graduation.
- **Students are required to pass 07:206:100 Dance Assembly EVERY SEMESTER. This is a pass/no credit course and does not count towards total credits for graduation.
- ***Dance Production--students may take this course in either the fall or spring semester during their junior year.
- ****These courses also fulfill liberal arts requirements.

## Electives

8 credits of dance electives are required from the options below:

| | |
|---|---|
| 07:203:132 History of Broadway Dance Online | 07:203:170 Yoga for Wellness |
| 07:203:133 Dance in Istanbul Online: Whirling, Belly Dancing an Revolving around East & West | 07:206:154 Pointe Class |
| 07:203:134 Dance in Israel Online: Body, Ideology, and Culture | *07:206:155 Ballet Jumps & Turns |
| 07:203:135 Dance Forms in Africa Online | 07:203:190 Performance Studies |
| 07:203:136 Dance in India Online | 07:206:175 World Dance |
| 07:203:160 Pilates Mat | 07:206:274 Jazz Dance |
| 07:206:311 Ballet 6 | 07:206:370 History & Theory of Integrated Dance |
| 07:206:325 Neuroscience in Partnership with Dance | 07:206:326 Adaptive Movement Through Dance |
| 07:206:344 Video for Dance | 07:206:447/448 Independent Dance Study |
| 07:206:360 University DanceWorks (audition required) | 07:206:495 Special Topics in Dance |
| 07:206:363 Dance Repertory (audition required) | |

* Ballet Jumps, Turns, & Partnering for incoming students requires two semesters (1 year) of ballet technique OR permission of instructor. Continuing BFA students require the completion of one semester of Ballet 6 OR permission of instructor.

# Design 208 (MGSA)

## DESIGN 208

Incoming students at Mason Gross School of the Arts can pursue a bachelor of fine arts (B.F.A.) degree in design. Students opting for the B.F.A. in design will develop innovative and meaningful ways of communicating ideas in a wide range of concrete and dynamic media. They will acquire skills in form-making, systems thinking, publication design, coding, typography, interaction design, and data visualization while shaping content and form in real-world situations. The program encourages a critical engagement with contemporary culture while equipping students for a lifetime of practice as a designer in digital and/or print design. The curriculum prepares graduates to contribute to shaping the future direction of design. For design students, a capstone course will require students to shape a body of self-initiated work in their final year that becomes public, whether in the form of a website, book, an app, or another appropriate format.

Students wishing to pursue the B.F.A. in design apply to the B.F.A. in visual arts and declare the design major during their sophomore year, after completing a common cross-disciplinary foundation year. Transfer students declare at their transfer review.

Design 208 (MGSA)

# Major Requirements

# Major Requirements

Design majors in the bachelor of fine arts (B.F.A.) program are required to complete a total of 87 credits as follows:

**Foundation Courses (16 credits)**

07:081:121-122 Drawing Fundamentals and 4-D Fundamentals (4,4)

07:081:227-228 Visual Thinking A and B (4,4)

**Studio Concentration (32 credits)**

A studio concentration course sequence of I-A and B, II-A and B, III-A and B, two seminars and either Design Practicum or a supervised internship.

Concentration Sequence: six 4-credit courses

07:081:328, 383 Design Seminar A and B (3,3)

07:081:385 Design Practicum or supervised internship (4)

**Thesis Exhibition A and B (3,3 = 6 credits)**

**Studio Electives (31 credits)**

In addition, students must complete a minimum of 33 credits of **liberal arts requirements** (see the Degree Requirements chapter) for a total of 121 credits required for graduation, including the Interdisciplinary Seminar Interplay 07:557:151, 1 credit (which is optional for transfer students). These liberal arts requirements do differ from the visual arts major and include:

01:082:105-106 Introduction to Art History (3,3)

One art history elective (3)

**Contextual Studies requirement,** choose from four choices (3 credits)

# Filmmaking 211 (MGSA)

## FILMMAKING 211

The Mason Gross School of the Arts offers a bachelor of fine arts (B.F.A.) degree in filmmaking.

The Rutgers Filmmaking Center offers a filmmaking degree to students in an innovative program with individualized training in fiction, experimental, and documentary film production taught by a faculty of professional filmmakers with a track record of producing award-winning films.

The Rutgers Filmmaking Center offers comprehensive technical and artistic training in a supportive environment, all within a firm grounding in the humanities. Students collaborate, take risks, and build upon a solid foundation to create original films. This program exposes students to a broad range of cinematic traditions and a wide array of concepts and approaches, so they can become informed filmmakers who can integrate theory with practice.

Students receive hands-on training in directing, cinematography, screenwriting, producing, field production, animation, editing, and postproduction technique while delving into filmmaking history, theory, and criticism. Blended with a wide array of liberal arts electives, students learn to be technically astute filmmakers who understand the fundamental skills of film language, know how to work collaboratively, and have the ability to create a film from conception, through development, shooting, and editing to a finished product.

We help students develop critical thinking skills, so they can analyze their work and the work of others and be able to interpret films through a variety of aesthetic, historical, and theoretical frameworks. Because the filmmaking center is located within a major research university, the filmmaking B.F.A. provides students access to vast intellectual resources and opportunities for cross-disciplinary learning.

Filmmaking 211 (MGSA)

# Major Requirements

# Major Requirements

Filmmaking majors in the bachelor of fine arts (B.F.A.) program are required to complete a total of 121 credits as follows:

| **Year 1** | |
|---|---|
| 07:211:191 | Introduction to Film Production I (4) |
| 07:211:192 | Introduction to Film Production II (4) |
| 07:211:205 | Screenwriting (3) |
| 07:211:120 | Cinematography (3) |
| 01:354:201 | Cinema Studies: Introduction to Film 1 (Arts/Hum) (3) |
| 01:354:202 | Cinema Studies: Introduction to Film 2 (Arts/Hum) (3) |
| 07:081:122 | 4-D Fundamentals (4) |
| See List | Liberal Arts (6) |
| | |
| **Year 2** | |
| 07:211:291 | Intermediate Film Production I (4) |
| 07:211:292 | Intermediate Film Production II (4) |
| 07:211:111 | Sound (3) |
| 01:082:106 | Art History (3) |
| 07:211:XXX | Film Elective (3) |
| 07:211:XXX | Film Elective (3) |
| See list | Liberal Arts (3) |
| | Free Elective (3) |
| | Free Elective (3) |
| | |
| **Year 3** | |
| 07:211:391 | Advanced Directing I (4) |
| 07:211:392 | Advanced Directing II (4) |
| 07:211:231 | Image Post Production (3) |
| 07:211:XXX | Film Elective (3) |
| 01:354:XXX | Cinema Studies Elective (3) |
| See list | Liberal Arts (3) |
| See List | Liberal Arts (3) |

| | |
|---|---|
| | Free Elective (3) |
| | Free Elective (3) |
| | |
| **Year 4** | |
| 07:211:491 | Senior Thesis Part I (4) |
| 07:211:492 | Senior Thesis Part II (4) |
| 07:211:XXX | Film Elective (3) |
| 01:354:XXX | Cinema Studies Elective (3) |
| See list | Liberal Arts (3) |
| | Free Elective (3) |
| | Free Elective (3) |
| | Free Elective (3) |

# Music 702 (MGSA)

## MUSIC 702

See Music in the Programs of Study and Courses for Liberal Arts and Sciences Students section for bachelor of arts (B.A.) program information.

The bachelor of music (B.M.) program offers four areas of concentration: performance, jazz studies, composition, and music education. Students are admitted specifically to one of these four areas. Any change in concentration must be made with the approval of the department. All students in the bachelor of music program must take a piano proficiency examination by the end of the second year of study and pass it in order to graduate. Students in the music education concentration are required to pass the piano proficiency examination by the end of the second year of study as part of the application process for acceptance into the Music Education Professional Sequence.

The course (07:701:100) Music Assembly must be successfully completed in each semester of full-time enrollment with the exception of the semester in which music education majors are enrolled in Clinical Practice II (full-time student teaching). Students who earn an unsatisfactory grade in Music Assembly in any semester will not be allowed to schedule a senior recital or register for Clinical Practice II. All bachelor of music students are also required to perform in Music Assembly in each semester of study.

Students in the music education concentration must complete all degree requirements before the Clinical Practice II semester. In addition, students may not be registered for any other courses during the semester in which they participate in Clinical Practice II unless preapproved by the Music Education Area Head Chair.

# Major Requirements

# Major Requirements

*Instrumental Performance Concentration*

Students in the instrumental performance concentration must take the following courses in music theory (25 credits):

- 07:700:121-122 Theory I,II (3,3)
- 07:700:123-124 Aural Skills I,II (2,2) **or** 07:700:153-154 Advanced Aural Skills I,II (2,2)
- 07:700:127 Introduction to Music Technology (1)
- 07:700:221 Theory III (3)
- 07:700:XXX Theory Elective (3)
- 07:700:223-224 Aural Skills III,IV (2,2) **or** 07:700:253-254 Advanced Aural Skills III,IV (2,2)
- 07:700:329 Conducting I (2)

Performance students must also take the following courses in music history (12 credits):

- 07:700:301-302 European Music Before 1800, European and American Music After 1800 (3,3)
- 07:700:203 Musics and Cultures (3)
- 07:700:419 or 420 Special Studies in Music History (3)

In addition to the requirements above, students in the instrumental performance concentration must pass the piano proficiency exam and also complete the following course of study (50 credits):

- 07:701:407,408 Contemporary Performance Seminar (1,1)
- chamber music courses (4)*
- large ensemble courses (8)*
- pedagogy courses (2)
- applied major lessons (24)

*Music electives (8)* To fulfill the 8 credits of music electives, courses may be selected from any 300- or 400-level music courses not being counted toward the music major requirements, or 200-level music courses pending approval of the undergraduate adviser. Students may use Classroom Piano to satisfy 4 of the 8 music elective credits.

*Free electives (3)* To fulfill the 3 credits of free electives, courses may be selected from any music course or any nonmusic courses.

Students in the instrumental performance concentration must complete a minimum of 33 credits in liberal arts courses (see Degree Requirements), for a total of 120 credits required for graduation. All performance students present a recital in the senior year in partial fulfillment of their requirements for graduation. Acceptability of this recital is determined by a faculty jury in attendance.

*Bachelor of music students must enroll in a large ensemble in every semester of enrollment with the exception of music education majors in the semester in which they are enrolled in Clinical Practice II and composition majors after they have completed the required 6 semesters of large ensemble. The music department will assign all students to the ensemble of its choice.

*Vocal Performance Concentration*

Students in the vocal performance concentration must take the following courses in music theory (25 credits):

- 07:700:121-122 Theory I,II (3,3)
- 07:700:123-124 Aural Skills I,II (2,2) **or** 07:700:153-154 Advanced Aural Skills I,II (2,2)
- 07:700:127 Introduction to Music Technology (1)
- 07:700:221-222 Theory III (3)
- 07:700:XXX Theory Elective (3)
- 07:700:223-224 Aural Skills III,IV (2,2) **or** 07:700:253-254 Advanced Aural Skills III,IV (2,2)
- 07:700:329 Conducting I (2)

Performance students must also take the following courses in music history (12 credits):

- 07:700:301-302 European Music Before 1800, European and American Music After 1800 (3,3)
- 07:700:203 Musics and Cultures (3)
- 07:700:419 or 420 Special Studies in Music History (3)

In addition to the requirements above, students in the vocal performance concentration must pass the piano proficiency exam and also complete the following course of study (52 credits):

- 07:701:407,408 Contemporary Performance Seminar (1,1)
- 07:701:358 Stage Movement for Singers (2)
- 07:701:357 Acting for Singers (2)
- 07:701:201,202 Diction for Singers (1,1)+
- chamber music courses (4)*
- large ensemble courses (8)*
- pedagogy courses (4)
- vocal coaching (4)+
- applied major lessons (20)+

*Music electives (3)* To fulfill the 3 credits of music electives, courses may be selected from any 300- or 400-level music courses not being counted toward the music major requirements or 200-level music course pending approval by the undergraduate adviser. Students may use Classroom Piano to satisfy the music elective credits.

*Free electives (3)* To fulfill the 3 credits of free electives, courses may be selected from any music course or nonmusic courses not counted toward the major requirements.

Students in the vocal performance concentration must complete a minimum of 33 credits in liberal arts courses (see Degree Requirements) for a total of 122 credits required for graduation. All performance students present a recital in their senior year in partial fulfillment of the requirements for graduation. Acceptability of this recital is determined by a faculty jury in attendance.

+Diction for Singers satisfies 2 credits of the chamber music requirement.

*Bachelor of music students must enroll in a large ensemble in every semester of enrollment with the exception of music education majors in the semester in which they are enrolled in Clinical Practice II and composition majors after they have completed the required 6 semesters of large ensemble. The music department will assign all students to the ensemble of its choice.

*Music Education Concentration*

Students in the music education concentration take the following courses in music theory (26 credits):

- 07:700:121-122 Theory I,II (3,3)
- 07:700:123-124 Aural Skills I,II (2,2) **or** 07:700:153-154 Advanced Aural Skills I,II (2,2)
- 07:700:128 Music Education Technology (1)
- 07:700:221 or 07:700:247 Theory III or Jazz Theory I (3)

- 07:700:222 or 07:700:248 Theory IV or Jazz Theory II (3)
- 07:700:223-224 Aural Skills III,IV(2,2) **or** 07:700:253-254 Advanced Aural Skills III,IV (2,2)
- 07:700:329-330 Conducting I,II (2,2)
- 07:700:341 Orchestration I (2)

Music education students must also take the following courses in music history (12 credits):

- 07:700:301-302 European Music Before 1800, European and American Music After 1800 (3,3)
- 07:700:203 Musics and Cultures (3)
- 07:700:419 or 420 Special Studies in Music History or Music in Historical & Cultural Context Elective courses (3)+

In addition to the requirements above, students must pass the piano proficiency exam and also complete the following course of study (58 credits):

- large and small ensemble courses (8)*
- music education courses (35 instrumental) (33 vocal/general)
- performance study courses (15)

There are two streams that music education majors may follow: vocal/general concentration, which requires 123 credits for graduation, and instrumental concentration, which requires a total of 125 credits for graduation. All music education students must present a 30-minute recital in the senior year in partial fulfillment of the requirements for graduation. The total number of requirements for each music education concentration includes 30 credits in liberal arts courses. The music education degree program is specifically designed so that students acquire course credits necessary to both graduate with a degree from Rutgers AND meet the teacher certification requirements for the state of New Jersey. Prior to acceptance into the Music Education Professional Sequence, students must either demonstrate adequate SAT/ACT scores or pass the Praxis Core Academic Skills for Educators Combined Exam (code:5751). In order to be certified as a licensed New Jersey educator, students must also complete and pass a series of exams as required by the state of New Jersey.

# Students who take Jazz Theory I must continue on to Jazz Theory II. Students who take Theory III must continue on to Theory IV

+These 3 credits are included in the 30 liberal arts credits. See elective course options in the Requirement Checklist

*Bachelor of music students must enroll in a large ensemble in every semester of enrollment with the exception of music education majors in the semester in which they are enrolled in Clinical Practice II and composition majors after they have completed the required 6 semesters of large ensemble. The music department will assign all students to the ensemble of its choice.

*Jazz Studies Concentration*

Students concentrating in jazz studies must pass the piano proficiency exam and the following course of study (89 credits):

- 07:700:102 Introduction to Music History (3)
- 07:700:121-122 Theory I,II (3,3)
- 07:700:123-124 Aural Skills I,II (2,2) **or** 07:700:153-154 Advanced Aural Skills I,II (2,2)
- 07:700:125 Survey of Jazz Styles (2)
- 07:700:127 Introduction to Music Technology (1)
- 07:700:223-224 Aural Skills III,IV (2,2) **or** 07:700:253-254 Advanced Aural Skills III,IV (2,2)
- 07:700:247-248 Jazz Theory I,II (3,3)
- 07:700:251-252 Keyboard Harmony for Jazz Majors (2,2)
- 07:700:293 Introduction to Jazz Improvisation Online (2)
- 07:700:203 Musics and Cultures (3)
- 07:700:305-306 Evolution of Jazz (3,3)
- 07:700:329 Conducting I (2)
- 07:700:347-348 Jazz Composition and Arranging (3,3)
- 07:700:371-372 Jazz Improvisation I (3,3)
- 07:700:471-472 Jazz Improvisation II (3,3)
- ensemble courses (12)*
- applied major lessons (16)

Students in the jazz studies concentration must complete a minimum of 33 credits in liberal arts courses (see the Degree Requirements chapter), for a total of 122 credits required for graduation. All jazz students present a recital in their senior year in partial fulfillment of the requirements for graduation. Acceptability of this recital is determined by a faculty jury in attendance.

*Bachelor of music students must enroll in a large ensemble in every semester of enrollment with the exception of music education majors in the semester in which they are enrolled in Clinical Practice II and composition majors after they have completed the required 6 semesters of large ensemble. The music department will assign all students to the ensemble of its choice.

***Composition Concentration***

Students in the composition concentration must take the following courses in music theory (36 credits):

- 07:700:121-122 Theory I,II (3,3)
- 07:700:221-222 Theory III,IV (3,3)
- 07:700:XXX Music Theory Elective (3)
- 07:700:123-124 Aural Skills I,II (2,2) **or** 07:700:153-154 Advanced Aural Skills I,II (2,2)
- 07:700:223-224 Aural Skills III,IV (2,2) **or** 07:700:253-254 Advanced Aural Skills III,IV (2,2)
- 07:700:329-330 Conducting I, II (2,2)
- 07:700:341-342 Orchestration I, II (2,2)

Composition students must also take the following courses in music history (12 credits):

- 07:700:301-302 European Music Before 1800, European and American Music After 1800 (3,3)
- 07:700:203 Musics and Cultures (3)
- 07:700:419 or 420 Special Studies in Music History (3)

Technology (7 credits)

- 07:700:127 Introduction to Music Technology (1)
- 07:700:284 Digital Audio Composition (3)
- 07:700:468 Scoring for Film and Visual Media (3)
- 07:700:469 Interactive Computer Music (3)

In addition to the requirements above, students must pass the piano proficiency exam and also complete the following requirements:

- 07:700: 375 Composition Practicum I-VIII (8)
- composition lessons (16)
- large ensemble courses (6)*
- chamber music (2)
- Music electives (2)
- 07:701:307 Rutgers New Music Workshop (2)
- secondary lessons (4)

Students in the composition concentration must complete a minimum of 30 credits in liberal arts courses (see Degree Requirements) for a total of 123 credits required for graduation. All composition majors must complete an annual portfolio review with the composition faculty and present a recital in partial fulfillment of the requirements for graduation.

*Bachelor of music students must enroll in a large ensemble in every semester of enrollment with the exception of music education majors in the semester in which they are enrolled in Clinical Practice II and composition majors after they have completed the required 6 semesters of large ensemble. The music department will assign all students to the ensemble of its choice.

# Theater 966 (MGSA)

## THEATER 966

See Theater in the Programs of Study and Courses for Liberal Arts and Sciences Students section for bachelor of arts (B.A.) program information and courses.

The bachelor of fine arts (B.F.A.) degree in theater is designed for students seeking intensive conservatory theater training in a liberal arts setting and requires a four-year residency for entering first-year students and transfer students. The program offers eight areas of concentration: acting, costume design, costume technology, dramaturgy, lighting design, scenic design, stage management and technical production. Students are auditioned and/or interviewed as part of the admission process and continue in their program each year by maintaining good artistic and academic standing in the program.

Theater 966 (MGSA)

# General Information

# General Information

**Student Responsibility to Keep Informed**

The Department of Theater makes special demands on students enrolled in the B.F.A. training programs because of the professional nature of the programs and the demands of the profession. Concentration-specific rules and policies are in the Theater Department Student Handbook and Appendices including the Student Handbook Appendix for Acting Students, the Design and Student Handbook Appendix for Production and Design students (Costume, Set, & Lighting Designers, Costume Technicians, Technical Directors, & Stage Management), and the Dramaturgy and Playwrighting Appendix. Students are responsible for understanding and following all rules and policies set forth in these documents, as well as those in the undergraduate university catalog.

**Program and Class Fees**

Students in acting and design are assessed professional program fees that support professional training and career transition. Some courses charge specific fees for tickets, models, or supplies. Should a student leave or be dismissed from the program, all fees are nonrefundable.

**Repeated Courses**

Theater arts B.F.A. students may repeat a liberal arts course taken at Rutgers in accordance with the regulation stated in the Academic Policies and Procedures chapter of the Mason Gross School of the Arts section of this catalog.

**Bachelor of Arts**

The theater arts department also offers a bachelor of arts (B.A.) major and minor in theater arts to liberal arts students enrolled in the School of Arts and Sciences. See Theater in the Programs of Study and Courses for Liberal Arts and Sciences Students section of this catalog for B.A. program information. All students interested in the B.A. Theater major or minor must complete an application available on the website.

Theater 966 (MGSA)

# Study Abroad at Rutgers' Conservatory in London

# Study Abroad at Rutgers' Conservatory in London

Rutgers Conservatory in London gives serious theater artists intensive conservatory training in London under the most accomplished theater artists in the United Kingdom. Through access to Shakespeare's Globe space, master teachers, scholars, and practitioners, this program fulfills the two-fold mission of both Rutgers, The State University of New Jersey, and Shakespeare's Globe by combining the best of conservatory training in a professional theater of international stature. Rutgers sends B.F.A. acting students abroad for conservatory study at Shakespeare's Globe. B.F.A. designers and costume technology students also are in residence at The Lyric Hammersmith in London for a semester in their third year. For more information on the curriculum please see the Concentration Requirements page in this catalog.

Theater 966 (MGSA)

# Major Requirements

# Major Requirements

**B.F.A. Theater Major**

Students must complete a minimum of 120 credits for graduation, which includes a minimum of 33 credits of liberal arts requirements (see the Degree Requirements chapter). However, students must complete all courses required by their program, which may require up to 140 credits for graduation depending on the area of study.

All students begin intensive foundation training in the first year augmented by College Writing and other liberal arts courses.

In addition to the general theater requirements, students must enroll in and complete one of eight concentrations described more fully in the next section of this catalog.

Theater 966 (MGSA)

# Concentration Requirements

# Concentration Requirements

In addition to the general theater requirements, students must enroll in and complete one of the following four concentrations:

## 1. ACTING

The acting program offers a rigorous and collaborative 4-year course of study for students who aspire to a career in the ever-evolving entertainment industry. Students are trained in various acting techniques, including Meisner, on-camera, devising, classics, and global theater with a commitment to new and emerging methodologies and practices.

Students will study at the Rutgers Conservatory at Shakespeare's Globe in London. The training concludes with a focus on the industry and launching of the artist's professional careers. Students are eligible for productions in the program in the second through final years of study.

The drama program is committed to equitable, representative, and evolving practices to support each student on their journey by continuing to learn, scrutinize, and adjust our program to facilitate training that is current, imaginative, and inspired by the needs of the students, the demands of the industry, and work that is yet to be created.

## 2. DESIGN: Costume, Lighting, and Scenic

Theater design students are part of a dynamic 4-year professional training program that includes a semester residency in London. Our program provides students with essential artistic and technical skills as well as a strong foundation in theater history and theory. The faculty are distinguished working professionals who provide students with one-on-one mentoring and prepare them to be effective artists and collaborators in the entertainment industry.

Areas of study include costume, lighting, and scenic design.

## 3. DRAMATURGY

The dramaturgy curriculum provides students with a strong multi/transdisciplinary background in performance practices, performance literature and theory, community/audience engagement, and the Humanities. The core

course of study focuses on building the skills for production dramaturgy and is augmented by direct electives in history, foreign languages, and other non-drama courses to build a firm foundation in both theater and the liberal arts. Students in the dramaturgy concentration cultivate their intellectual prowess, analytical skills, and artistic passions through integral multidisciplinary involvement in the Mason Gross productions and classes in the conception and execution of productions, bringing their knowledge of performance history and dramatic structure, their skills in script analysis and contextual research, and their capacity to engage in collaborative conversation into the rehearsal room. These skills also serve our audience as dramaturgy students practice the art of audience/community outreach and engagement.

The dramaturgy concentration specializes in production development, production support, critical writing, audience outreach, season planning, and artistic leadership. The transdisciplinary curriculum makes it an excellent program of study for students interested in performing arts history and theory, playwrighting and devising, cultural studies, and community outreach.

### 4. PRODUCTION: Costume Technology, Stage Management, & Technical Direction

Production students are part of a 4-year program designed to train students to be professionals in the fields of **costume technology**, **stage management**, or **technical direction**. The program combines integrated knowledge and respect for all aspects of theater at a variety of production levels to create artistically astute, well-versed, thoughtful production professionals. Core training and curriculum come together in production practice, which informs the process of each play. Working from a core artistic sensibility, production students support the work of the contributing artists as together they bring the performance to realization.

# Visual Arts 081 (MGSA)

## VISUAL ARTS 081

The Department of Art & Design offers bachelor of fine arts (B.F.A.) and bachelor of arts (B.A.) undergraduate degrees, as well as a minor in art.

See Art in the Programs of Study and Courses for Liberal Arts and Sciences Students section for the bachelor of arts (B.A.) program information and the art minor.

The bachelor of fine arts (B.F.A.) visual arts program is for students who want to become professional artists and who wish to pursue their specific professional goals within the stimulating intellectual climate of Rutgers University. The education offered by Mason Gross School of the Arts differs from an art school program that focuses exclusively on studio skills. At Mason Gross School of the Arts, studios within and across disciplinary artistic mediums and seminar discussions together confront students with a wide range of techniques, materials, visual languages, and cultural issues. Creation and critical analysis go hand in hand. The program understands that to be a surviving professional artist in the 21st century one should be educated to make informed choices, not only about aesthetic strategies, but also about who to work for and how art can function to serve not only oneself, but also the broader community and society at large.

Work toward the B.F.A. degree starts with foundation courses that introduce the techniques and materials as well as the artistic and cultural questions of contemporary artistic practice. Intermediate and advanced courses provide concentrated training in six major areas: drawing, media, painting, photography, print, and sculpture. Students declare a concentration in one of these areas in their sophomore year, although they can take studio electives in other areas which foster an enriching interdisciplinary arts education. Transfer students declare at their Transfer review in their first term.

The B.F.A. in visual arts is committed to the development of both personal expression and cultural analysis through which a student prepares to face the aesthetic, social, and personal choices involved in being a professional artist.

Visual Arts 081 (MGSA)

# Major Requirements

# Major Requirements

Bachelor of fine arts (B.F.A.) visual arts majors are required to complete a total of 87 credits as follows:

**Foundation Courses (16 credits)**

07:081:121-122 Drawing Fundamentals A and B (4,4)

07:081:227-228 Visual Thinking A and B (4,4)

**Studio Concentration (27 credits)**

A studio concentration course sequence of I-A and B, II-A and B, III-A and B, and a seminar in the concentration is required in one of the following options: design, drawing, media, painting, photography, print, or sculpture.

Concentration sequence: six 4-credit courses
Concentration seminar: 3 credits

**Thesis and Exhibition A and B (3,3 credits)**

**Studio Electives (32 credits)**

**Art History Electives or a seminar in another concentration or cinema studies for media concentration students (3 credits)**

**Visual Arts Practice (3 credits Pass/Fail)***

In addition, students must complete a minimum of 33 credits of liberal arts requirements (see the Degree Requirements chapter) for a total of 121 credits required for graduation, including the Interdisciplinary Seminar Interplay 07:557:151, 1 credit (which is optional for transfer students). These requirements do differ from the design major and include:

01:082:105-106 Introduction to Art History (3,3 credits)

Two art history electives or cinema studies courses (3,3)

07:081:200-201 Seminar in Contemporary Art A and B (3,3 credits)

Visual Arts 081 (MGSA)

# Art Minor

# Art Minor

This track is for non-majors students who wish to explore their artistic interests alongside academic pursuits and professional goals within the creative environment of Mason Gross. It is comprised of diverse foundations courses essential to artistic practice, and not medium specific.

All Rutgers-New Brunswick undergraduate students are eligible to apply for approval to declare a minor in art. Space in this program is limited and not guaranteed. Admission is based on the number of applications received, approval from the student's unit of matriculation and availability in the required courses. Students may only apply to the art minor during the application period in the academic year prior to the fall term in which they will have the minor added to their transcript.

Note: New minor declarations begin in FALL term only.

Once declared, students must received a final grade of C or better for all required courses in the minor. Studio courses are sequential, and students are advised to complete the application to declare the minor no later than the second semester of their sophomore year which will allow for adequate time to complete the Art minor by their expected date of graduation.

Note: Typically, "A" studio classes are offered in the fall (07:081:121, 07:081:227 and 07:081:321) and "B" studio classes are offered in the spring (07:081:228).

Consult the website for more detail and application/program requirements.

Visual Arts 081 (MGSA)

# Academic Advising

# Academic Advising

The Office for Advising and Student Success provides all Mason Gross students with close and continuing academic advice. Nevertheless, students must assume full responsibility for conforming to the academic and Department of Art & Design regulations of the university and Mason Gross School of the Arts for meeting all degree requirements and for having the proper prerequisites for any course in which they register. Faculty and staff advisers are readily available for assistance.

# Explanation of Three-Part Course Numbers (MGSA)

## Explanation of Three-Part Course Numbers

The number preceding each course title is divided into three parts. The first two digits are the administrative code (standing for a faculty or a school), the next three digits are the subject code, and the final three digits are the course code.

*Administrative Codes*

The undergraduate code for the Mason Gross School of the Arts is 07. For a complete list of administrative codes used in this catalog, see the beginning of the Programs of Study and Courses for Liberal Arts and Sciences Students section.

*Subject Codes*

A subject code indicates the subject matter of the course. Courses with the following subject codes are listed in this chapter. (This does not constitute a list of majors.)

081 Art, Studio

203 Dance

211 Filmmaking

557 Interdisciplinary

700 Music

701 Music, Applied

966 Theater Arts

*Course Codes*

The course code comprises the sixth, seventh, and eighth digits in all course numbers. Course codes from 100 to 299 indicate introductory and intermediate undergraduate courses. Codes from 300 to 499 indicate advanced undergraduate courses. (Courses coded from 500 to 799 are graduate courses.)

Two course codes separated by a comma indicate that each semester may be taken independently of the other (example: 07:700:203,204). Two course codes separated by a hyphen indicate that satisfactory completion of the first semester is a prerequisite to the second semester (example: 07:206:138-139); the first semester may be taken for credit without taking the second, except where a statement is added to indicate that both semester courses must be completed in order to receive credit.

Credits awarded for the successful completion of each course are indicated in parentheses following the course title. The notation BA indicates that the number of credits is determined by arrangement with the department offering the course.

The notation P0 indicates that the course is graded pass/fail and that the number of credits is zero.

# Art 081 (MGSA)

## ART 081

The following courses serve as classes for the bachelor of arts (B.A.) and the bachelor of fine arts (B.F.A.) curricula.

**07:081:105** *Visual Arts Practice (VAP) (BA)*
Involves supervised practical experience within the Department of Art & Design's studios, computer, media or photography labs, and galleries, or in artistic organizations or contexts across the University and in the larger community. Substantive projects outside of the department may qualify. 1 credit = 42 service hours; 2 credits = 84 service hours.
***Three credits are required of all B.F.A. visual arts majors; 2 credits are required of all B.A. art majors. Design majors do not complete VAP. Students must register for the course to earn academic credit.***

**07:081:121** *Drawing Fundamentals (4)*
This introductory course is designed to familiarize the student with the basic principles of drawing. Students are taught to see the three-dimensional world around them and to capture what they are perceiving in two-dimensions. Projects are designed to increase the student's technical and perceptual ability within a variety of drawing-based approaches. The first half of the semester focuses on the use of line to address composition, creating space, perspective, accuracy in "seeing," and mastery of materials such as pencil and charcoal. The second half of the semester focuses on the use of value, gesture, and mark-making to address similar formal and structural components with pen and ink. Critiques and discussions address both the formal and conceptual aspects of drawing such as ideation, subject, meaning, context, intentionality, and alternate readings of the work, among others. Art historical and contemporary art examples will be introduced throughout the course, and it is expected that students make at least one trip to New York City during the semester to explore contemporary galleries and attend three visiting artist lectures.
***Offered fall and spring. Art minor requirement.***

**07:081:122** *4D Fundamentals: Time and Space (4)*
Working with the computer and with everyday technologies including smart phones, the internet, cameras, and audio recording devices, students learn fundamentals of time- and screen-based contemporary art practices. The class introduces students to a range of experimental techniques and approaches, working with photomontage, image sequencing, video recording and editing, and sound. The class includes screenings, demos, workshops, labs, readings, group discussions, and critiques. Students will develop their own creative and independent voices while working on a series of focused assignments. The course will culminate in a public screening of student artwork produced during the course.
***Offered fall and spring. Art minor requirement.***

**07:081:200-201** *Seminar in Contemporary Art A and B (3,3)*
An introduction to works of contemporary art from the mid 20th century to the present. Explores different approaches to the production and reception of contemporary art across painting, drawing, sculpture, performance, photography, video, and more. Considers how art disciplines cross-pollinate and some practices abandon the notion

of a distinct medium altogether. Readings as well as podcasts, films, and museum visits will support the course lectures and discussions, which engage contemporary art critically and creatively.
*Prerequisites: 01:082:105 and 01:082:106. 07:081:200 is a prerequisite for 07:081:201.*

**07:081:221** *Drawing I-A (4)*
This course will explore the historical roots and contemporary application of the radical and conceptual process known as collage. Ideas of fracture, montage, image/object, process, and environment will all be explored as students develop their own vocabulary and studio practice. Historical models, relevant texts, and contemporary artists will be examined. Research, special projects, and group and individual critiques are an integral part of the course.
*Prerequisite: 07:081:121. May take Drawing I-A and Drawing II-A (07:081:321) together.*

**07:081:222** *Drawing I-B (4)*
This course introduces the use of color into the drawing practice. While drawing is most often taught as a series of value and/or mark-making relationships, this course will introduce tools and materials that facilitate an approach to using color that goes beyond the simple differentiation of form. Using a variety of methods and materials to introduce color into the drawing process, students will experiment with oil pastel, watercolor, colored pencil and found color material (collage) to explore how color affects the meaning and reading of a work of art. Assignments, readings, presentations, and screenings will all examine color from various viewpoints including (but not limited to) historical, conceptual, psychological, cultural, and ethnographic ideas related to color and its use in the drawing practice.
*Prerequisite: 07:081:121 or permission of instructor. May take Drawing I-B with Drawing II-B (07:081:322) together.*

**07:081:227** *Visual Thinking A: Black and White (4)*
This course provides an introduction to the basic principles of "visual thinking", or the basic formal and conceptual aspects of visual art and design which addresses issues related to visual culture, history, image/object, representation, and artistic intentionality. Projects are designed to increase the student's technical and conceptual ability within a variety of visual arts mediums and approaches. Critiques and discussions play a crucial role in the course in analyzing work, and art historical and contemporary art examples are introduced throughout. Students are expected to make at least one trip to NYC during the semester to tour contemporary galleries.
*Offered fall only. Visual Thinking A OR B is Art minor requirement.*

**07:081:228** *Visual Thinking B: Color (4)*
Explores basic principles of color that address issues related to its physical properties, scientific principles, practical application, cultural implications, and concepts of color "theory."
*Offered spring and summer only. Visual Thinking A OR B is Art minor requirement.*

**07:081:231** *Design I-A: Type and Typography (4)*
Introduction to typography, the practice of making verbal language visual. Builds visual awareness of letterforms and their composition in space through studio projects that engage with type as a means for clear communication and visual expression. In addition to studio work, this course demands absorbing technical and historical knowledge in order to develop a visual sensitivity for typographic form.

The practice of typography gives verbal language a visual form, material, and method of distribution. This course introduces the fundamental concept and terminology of type, such as typefaces, type sizes, leading, kerning, grids, guides, composition, space, color, and motion. This studio course builds technical and practical skills towards a

fluency in setting and manipulating type within a contemporary digital environment. Students will understand and us fonts and typesetting software to create and analyze typographic prototypes for both print and screen.
*Offered fall only.*

**07:081:232** *Design I-B: Form and Meaning (4)*
Introduction to a visual communication design process. Work with both hand methods and digital technologies to develop original design solutions. Assignments integrate conceptual thinking with formal experimentation. Students explore problems dealing with visual metaphor, symbols, and the combination of type and image for making meaning.
*Prerequisite: 07:081:231. Offered spring only.*

**07:081:243** *Media I-A: Introduction to Media Art: Screen/Image/Sound (4)*
This introductory course focuses on the production and concepts of screen-based media artwork. Students learn about the interdisciplinary field of media art, which can include video art, installation, and video sculpture; artists' cinema; experimental film and video; participatory art; live media performance; and art for the internet. Students learn to navigate a landscape of continuously changing technologies and devices. The course includes lectures, workshops, technical demos, readings, critiques of student work, and screenings of artists' works. Students create a series of group and individual media art projects. No technical experience required.

**07:081:244** *Media I-B: Experimental Practices and Techniques (4)*
A course on experimental approaches to screen-based media art including experimental documentary and narrative, collage and montage, sampling, remixing, and abstraction. The course includes a series of technical workshops that may include 2-D animation, compositing, and other visual and digital tools and effects. Screening and discussions about media art in relation to art history and contemporary art. Includes lectures, workshops, technical demos, readings, critiques of student work, and screenings of artists' works. Students create a series of short video and sound artworks.
*Prerequisite: 07:081:243.*

**07:081:251** *Painting I-A (4)*
Introduces a range of technical and experimental approaches to painting with oil and/or acrylic in ways that relate to the history of Western Modernist painting. The course offers varied and dynamic approaches to the problems of structure, shape, materiality, and color, both in representation and abstraction. The development of formal coherence and imagery are guided and practiced through individual and group critiques, slide presentations of a rich cross-section of painters and painting practices, selected readings, and museum visits. This class also introduces students to the vocabulary and critical skills to be able to articulate what they are seeing and making.

**07:081:252** *Painting I-B (4)*
This course builds on the foundational skills, techniques, and modes of perception in Painting I-A through the development of Cubism and the post-Cubist figure in connection with developments in representation, followed by explorations into models of abstraction. Throughout, emphasis will be placed on the materiality of painting and how that central condition of the medium affects perception and meaning. The course consists of in-class exercises, out of class projects, individual mentoring and group critiques and discussion, slide presentations, and visits to museums in New York City. This class continues to introduce students to the vocabulary and critical skills to be able to articulate what they are seeing and making.
*Prerequisite: 07:081:251; offered in the spring only.*

**07:081:261** ***Photography I-A: Introduction to Digital Photography (4)***
A rigorous introduction to digital photography, featuring the digital camera, digital image file development including camera RAW, and the presentation of photographs on screen and in print. This studio-based course explores photography by considering technical, creative, historical, cultural, and critical issues of the multifaceted medium of photography.

**07:081:262** ***Photography I-B: Darkroom Photography (4)***
Explores the foundations of film photography with an emphasis on technique and aesthetic concerns, coupled with an introduction to the history of photography. Emphasizes mastery of the 35mm and large format film camera techniques, lighting, black-and-white film development, gelatin silver printing, visual literacy, editing, and presentation methods.

**07:081:271** ***Print I-A: Silkscreen (4)***
In-depth exploration of silkscreen including hand-drawn, computer-generated positives, and production. The course encourages the combination of other print media and will include a short segment on print as a 3-D structure. Artistic development concerning composition, content, and conceptual ideas will be addressed through individual and group critiques.

***Offered both fall and spring.***

**07:081:272** ***Print I-B: Relief (4)***
In-depth exploration of woodcut, linocut, reduction print; work will be in both black and white and printing of multicolored blocks including reduction block printing. The course encourages the combination of other print media. Artistic development concerning composition, content, and conceptual ideas will be addressed through individual and group critiques.

**07:081:281** ***Sculpture I-A (4)***
Sculpture 1-A is the one of two introductory courses on the fundamentals of sculpture, utilizing traditional and nontraditional techniques. Students will develop an understanding of three-dimensional form through material processes and presentation and become technically and conceptually informed makers. By the end of the semester, students will become confident in the sculpture studio and making the three-dimensional forms they envision with fabrication processes including metal and mold-making in combination with various materials and tools. Projects are designed for students to develop their sculptural practice through making, group discussions, critiques and, most importantly, spending time in a safe and creative studio environment. The studio-based curriculum includes lectures, screenings and assigned readings to support historical and contemporary language around making sculpture. There is no prerequisite for this course.
***Sculpture I-A is offered in the fall.***

**07:081:282** ***Scultpure I-B (4)***
Sculpture I-B is a continued introduction to the fundamentals of sculpture, utilizing traditional and nontraditional techniques. Assignments are designed to develop students¿ sculpture practice through making, group discussions, sketchbooks, models, and, most importantly, spending time in the safe and creative studio environment. Slide presentations and readings will be used to improve general understanding of historical and contemporary language around sculpture and installation. This class is an extension of Sculpture 1-A in that it will focus on material process and expand on an engagement and understanding of how technical craft, formal design, and conceptual underpinning are all integral to the creation of sculptures and installations.
***Offered in the spring only.***

**07:081:303** *Seminar in Media (3)*
A survey of contemporary media art including video art and installation, expanded and artists' cinema, experimental film and video, sound art, and art for the internet. Students are introduced to a range of media art practices that may include experimental narratives and documentaries, radical and activist media, multimedia installations, found footage collage and remix work, online art interventions, and live media performance. The course explores histories, theories, and critical writing on avant-garde media from the 20th century to the present.
*Offered in Spring only. Open to all Visual Arts and Design majors.*

**07:081:306** *Public Art: Place and Process (4)*
This course will center on contemporary practices of public art, introducing brief history, methods of fabrication, field visits to site and with stakeholders, administration, proposal development, readings, writings, presentations, discussions and critiques. Students will explore the process of creating a public work of art while developing a deeper understanding of their own artwork, methods, context and intention, ultimately producing a work in the public realm.
*Prerequisites and Corequisites: 07:081:281 and 07:081:282.*

**07:081:310** *Seminar in Photography (3)*
This course examines historical and contemporary discourse in photography. The course will include detailed discussions of major theoretical approaches to photography. Students encounter aspects of the history of photography and its interaction with other cultural forms through the development of historical, cultural, and political factors and their relationships to the present through key readings, lectures, screenings, and guest speakers.
*No prerequisites. Offered fall only.*

**07:081:313** *Ceramics/Sculpture (3)*
This course provides an introduction to ceramic sculpture with an emphasis on hand-building methods. Students will learn methods of building ceramic sculptures by techniques of pinch building, slab, coil, press hump mold construction, wheel, and slip casting. The history and theories of ceramics and related sculptural practices will be introduced alongside various methods of construction, surface treatment, glaze chemistry, and firing methodology. Students will also engage in presentations, critiques, discussions, field trips, and visiting lectures.
*No prerequisites. Studio elective course.*

**07:081:321** *Drawing II-A (4)*
This course examines the relationship of drawing to time and media-based practices, specifically through the history and techniques of animation. Exploring traditional and experimental animation, we will examine how drawing can mark space and movement to create an illusion of time. Starting from precinematic animation techniques through the realm of the digital, we will examine the impact of technology both technically and conceptually. We will develop a critical understanding of animation and "the animated" as it relates to personal iconography/biography and social/political circumstances through the lens of the current zeitgeist.
*Prerequisite: 07:081:121. Corequisite: 07:081:221*

**07:081:322** *Drawing II-B (4)*
This course examines how to visually tell a story through the medium of drawing. Using techniques associated with graphic novels, comix, storyboarding, and other sequential art, students will learn how to develop their own visual and literary narratives that carry personal, political, social, and/or global themes.
*Prerequisite: 07:081:121 and 07:081:221. Corequisite: 07:081:222.*

**07:081:324** *Figure Drawing (3)*
Working from a live, nude model, students explore how to accurately draw the figure. Observational accuracy, quality of line and tone, technique, and expression are all stressed as students become familiar with all aspects of drawing from the figure in pencil, ink, and charcoal.
***Prerequisite: 07:081:121. Art minor requirement. Studio elective course. Offered spring only.***

**07:081:327** *Seminar in Print (3)*
This seminar considers the history of print, paper, and collaboration from Guttenberg to the internet. The course focuses on the dissemination of printmaking and on the multiple in installation, paper, photography, sculpture, and book forms. Readings, lectures, slides, and film presentations familiarize students with current ideas, history, criticism, practices, and artists who deal with the multiple. The history of the relationship between the collaborative studio and the artist is explored through the Rutgers Print Collaborative, a working model for the collaborative shop housed adjacent to the print studios.
***Offered every other year.***

**07:081:328** *Design Seminar A: Histories (3)*
Exploration of historical and contemporary critical debates in graphic design. Through readings, lectures, research, and presentations, students investigate the ways historical, cultural, political, and economic factors have shaped design. Students situate their practice within the design discourse of today through an examination of the development of the discipline.
***Prerequisites and Corequisites: 07:081:121. Open to both 081 (visual arts) and 208 (design) majors.***

**07:081:329** *Seminar in Painting (3)*
This course consists of readings, presentations, and studio assignments pertaining to current painting practice and the precedents that created it. Through discussions in museums and galleries in the presence of painting, students practice looking and situating what we see with the help of the texts, and learn to engage painting discourse from within.
***Offered fall only.***

**07:081:330** *Seminar in Sculpture: Interdisciplinary Practices (3)*
This seminar is for students interested in contemporary sculpture particularly as it relates to interdisciplinary practices. Sculpture has become a broad range of practices with its door open to many possibilities. Examining contemporary sculpture within the context of its history and traditions and as an expanded discipline, we will explore different historic and topical areas from the mid-20th century to the contemporary moment. As a means of developing their studio practice, students will explore aesthetic, historical, cultural, and theoretical issues in relation to expanded sculpture. The course will map these analyses onto their own research interests through written assignments, readings, presentations, and lectures, as well as studio visits of practicing artists and theorists, connecting histories of sculpture to current studio practices.
***Typically offered spring only.***

**07:081:331** *Design II-A: Systems (4)*
Explores complex multi-part design systems such as visual identities and books. Develops skills in research, visual experimentation, using digital and analog tools for print and screen. Consists of studio work, critiques, technical demonstrations, lectures, readings and class discussion.
***Prerequisites: 07:081:231-232. Offered fall only.***

**07:081:332** *Design II-B: Experimental Computation (4)*
Explores complex multi-part design systems such as visual identities and books. Develops skills in research, visual experimentation, and using digital and analog tools for print and screen. Consists of studio work, critiques, technical demonstrations, lectures, readings, and class discussions.
*Prerequisites: 07:081:331. Offered spring only.*

**07:081:343** *Media II-A: Media Art Installation and Expanded Cinema (4)*
This course focuses on making and displaying screen- and time-based media in galleries and other architectural environments. Students learn about sequencing in space as well as principles and practices of sound and exhibition design. The course explores how different spaces affect moving images, sound, and projections, and how moving images, sound, and projections can construct and alter space. Students learn about historical precedents and current practices, from pre-cinematic magic lantern shows to expanded cinema, and from video sculpture and site-specific installation art to multichannel video installations, urban screens, and artists' cinema. The course includes technical workshops on syncing multiple channels of video and surround sound. Students create their own media installations and environments.
*Prerequisites: 07:081:243-244 or permission of instructor. Offered fall only.*

**07:081:344** *Media II-B: Media and Performance (4)*
A course on various intersections between media and performance art. Topics may include performance for the camera, online performances and interventions, participatory art works, autobiography and video diaries,the filmed body as medium, and live video and cinema performance and events. Students create their own recorded or live media art projects.
*Prerequisite: 07:081:343. Offered spring only.*

**07:081:351** *Painting II-A (4)*
This course nurtures individual growth as a painter in technical mastery and conceptual understanding. Emphasis is placed on working in increasingly self-directed series. Selected readings and visits to exhibitions are required, as are group discussions and critiques.
*Prerequisites: 07:081:251-252 or permission of the department. Painting II-A offered fall.*

**07:081:352** *Painting II-B (4)*
This course nurtures individual growth as a painter in technical mastery and conceptual understanding, while drawing on and deepening the fundamentals of painting. Moving beyond historical and perceptual models discovered in I-A and I-B, Painting II-B explores different modes of play, experimentation, subject matter, painting histories, and processes. This course contains a combination of structured and self-initiated projects as students learn to listen to, activate and direct their creatives voices through painting. The semester will partake of working in series, thinking about painting in relation to its history and other art, while increasingly working independently towards an ambitious and complex final project. The course will also consist of selected readings, presentations, demos, visits to exhibitions, as well as group discussions and critiques.
*Prerequisites: 07:081:251-252; Painting II-B offered spring.*

**07:081:356** *Seminar in Drawing (3)*
Designed for students in the drawing concentration, this seminar examines contemporary drawing within the context of its history and traditions and as a discipline where boundaries are fluid enough to explore drawing through the use of diverse media with nonspecific temporal and spatial boundaries. Drawing is considered in its relationship to a broad range of other disciplines including painting, sculpture, performance, installation,

choreography, design, music, and architecture, among others. As a way of supporting the development of their studio practice, students will explore aesthetic, historical, cultural, and theoretical issues in relation to drawing as a medium, method, and practice through written assignments, readings, presentations, lectures, studio visits to practicing artists, and visits to galleries and museums.
*Offered every year.*

**07:081:361** *Photography II-A: Digital Image and Print (4)*
Features the refinement of digital photography with an emphasis on making exhibition-quality prints and building print portfolios. Through creative assignments, this studio-based course explores photography with particular focus on expressive, historical, and theoretical aspects of the ubiquitous medium.
*Prerequisites: 07:081:261, or all students with Photoshop experience and permission of the instructor.*

**07:081:362** *Photography II-B: Books (4)*
A course focused on refining your photographic images or images of your artwork for a book or catalog made in InDesign and printed on-demand; a slide presentation of the work; and a website or blog. Your project will be self-directed.
*Prerequisite: 07:081:361. Offered spring only.*

**07:081:371** *Print II-A: Intaglio (4)*
In-depth focus on intaglio, including engraving, drypoint, etching, aquatint, and spit bite. The course encourages the combination of other print media and will include a segment on photo polymer plates. Artistic development concerning composition, content, and conceptual ideas will be addressed through individual and group critiques.

**07:081:372** *Print II-B: Lithography (4)*
In-depth focus on lithography, including stones, aluminum plates, photo-litho plates, and color lithography. The course encourages the combination of other print media. Artistic development concerning composition, content, and conceptual ideas will be addressed through individual and group critiques.

**07:081:381** *Sculpture II-A (4)*
In this course, students will continue to explore concept and context through the materials and methods of traditional and non-traditional sculpture. Building on Sculpture I-A/B, this course will introduce digital fabrication skills and further build the connections between ideas and making. Emphasis will be on working directly in the studio to develop personal expression and skill. Slide presentations, readings and informal discussions will be used throughout the semester to unpack the fundamental conceptual and practical underpinnings of sculpture.
*Prerequisites: 07:081:281-282. Sculpture II-A offered fall.*

**07:081:382** *Sculpture II-B (4)*
In this course students will continue to explore concept and context through the material and methods of traditional and non-traditional sculpture. Emphasis will be on working directly in the studio to develop a personal expression and skill. This course will be an exploration of prescribing meaning to objecthood and becoming more aware of how it is we arrive at our intentions through making. We will be looking at references, in and outside of art, and discussing traditional and non-traditional sculptural methods to help us better understand what sculpture is and can be. Many of the projects throughout the semester will act as games to help us extract meaning from movies, readings, media and the everyday to apply to our personal practices in the studio. This course intends to develop a deeper look into the things around us to develop a better understanding of how we, as individual artists, make sense of the world through our studio practice.
*Prerequisites and Corequisites: 07:081:281, 282, 381. Sculpture II-B offered spring only.*

**07:081:383** *Design Seminar B: Contemporary Practice (3)*
Proposes diverse models for contemporary design practice through a series of lectures by guest designers and by related readings. Class discussions, assigned texts, and writing responses address the pragmatics of design, the designer's role as a social agent, and design and politics. Helps students to situate their own research and develop a critical design language to analyze their own and others' work. The course is intended to help students develop a personal philosophy of design and a sense of how they might practice as designers.
*Open only to 208 (design) majors.*

**07:081:385** *Design Practicum (3)*
This course provides practical design experience where students undertake appropriate real-world assignments in a noncommercial environment. This is an advanced production studio for students interested in collaborating with academics from other fields, university administrators, NGO representatives, and other designers. Students will engage in research, concept development, design, production, and presentation. Students are expected to work in close contact with peers and outside collaborators to produce visual projects that meet mutually agreed upon parameters. This class should be taken in the junior or senior year when students have sufficient technical and conceptual experience to benefit from the class.

**07:081:391,392** *Independent Study (2) (B.F.A.,B.A.)*

**07:081:393,394** *Internships (4) (B.F.A.,B.A.)*

**07:081:413-414** *Advanced Ceramics Sculpture (4,4)*
Students will continue to practice approaches to building basic three-dimensional forms with clay. The course will focus on experimental ways of working with clay to play and explore various approaches, materials, and methods of making. We will briefly cover the history of ceramics and begin to learn about contemporary artists working in the medium. My objective as an instructor is that by the end of the course each student will be confident in building with clay, will have explored the many ways of using the material and will have grown in their ability to articulate their ideas and discuss their work. I am committed to supporting your work with clay into your larger creative practice. We will go over different techniques, discuss readings, meet with visiting artists, look at ceramic work together and critique your work. In addition to all of that you will have studio time during each class.
*Prerequisites: 07:081:313/314.*

**07:081:421,422** *Drawing III-A, III-B (4,4)*
Through practice, experimentation, research, and use of a variety of media and methodologies, students will explore more complex approaches to their drawing practice. These may include: the use of image and text; time, sequence, and narrative in drawing; and drawing as a performance practice, among others. Self-directed work in the studio and research and reading of critical texts are required.
*Prerequisites: 01:081:221 and 222 (Drawing I-A and I-B) or corequisite 07:081:321 and 322 (Drawing II-A and II-B) or corequisite 07:081:451-454 (Painting III-A and III-B or Advanced Painting A or B) or by permission of the instructor. Drawing III-A offered fall; Drawing III-B offered spring only.*

**07:081:431** *Design III-A: Design for the Digital Realm (4)*
This course trains students to research, analyze, prototype, and develop design concepts for dynamic digital media such as online, tablets, and mobile apps, for three distinct social and cultural contexts. The focus is on practice and experimentation to master UI/UX design. This course consists of three projects addressing experience design and its presentation. Today interaction online focuses on information through living, social platforms. We will go beyond an average user's perspective to critically examine the web through historical, political, and social lenses.

This course encourages students to holistically approach the web and its constituent code as a living kit of parts waiting to be harnessed in novel and innovative ways. As digital technology industries rapidly alter ways of doing and thinking, design can amplify, shift, comment on, and/or criticize these changes. The role of designers today is not only to style content but to shape it, extracting information from abstract datasets, writing scenarios, and creating systems, all with a critical eye.
***Prerequisites and Corequisites: 07:081:231, 232, 331, 332. Offered fall only.***

**07:081:432** ***Design III-B: Portfolio (4)***
Development of a diverse, refined body of work and format for its presentation. Lectures and readings survey current issues in design practice. Critiques and discussions underpin the process of defining and articulating the student's interests and approach to design.
***Prerequisite: 07:081:431. Offered spring only.***

**07:081:441** ***Media III-A (4)***
Students work under the direction of faculty and in discussion with the class on producing self-directed, independently conceived media artworks that reflect their own interests and ideas. Students will proceed through all stages to fully realize their work--from research, proposal, production, postproduction to installation, screening, or other form of display. Ongoing group discussions, critiques, readings, and screenings related to students' creative projects.
***Prerequisites: 07:081:343-344 or permission of instructor. Media III-A offered fall.***

**07:081:442** ***Media III-B (4)***
This is a class for intermediate-level and advanced students working in media. Students work under the direction of faculty and in dialogue with classmates on self-directed, independently conceived time-based media artworks that reflect your own interests and ideas. The class will give you support and structure as you continue to develop your independent creative voice and vision as an artist. You will be challenged to take risks by working in ways you don't usually work, trying new things, and pushing yourself beyond your habitual ways of making. You will work collaboratively with your peers on skill, concept, and idea sharing in order to develop and nurture peer-to-peer networks, peer-to-peer learning, collaboration, and mutual support. Students will also learn about and develop professional practice skills as you prepare for life and work after art school, including job search preparation, writing cover letters, resumes, artist statements, applying for art residencies, and more. The class will include individual and group discussions, peer-to-peer workshops, individual and group projects, critiques, readings, writing, and screenings, shaped around students' creative work and interests.
***Prerequisites: 07:081:341-344 or permission of instructor. Media III-B offered spring only.***

**07:081:446** ***Advanced Media A (4)***
Students work under the direction of faculty and in discussion with the class on producing self-directed, independently conceived media artworks that reflect their own interests and ideas. Ongoing group discussions, critiques, readings, and screenings in media art.
***Prerequisites: 07:081:441-442 or permission of instructor. Offered fall only.***

**07:081:447** ***Advanced Media B (4)***
This is a class for intermediate-level and advanced students working in media. Students work under the direction of faculty and in dialogue with classmates on self-directed, independently conceived time-based media artworks that reflect your own interests and ideas. The class will give you support and structure as you continue to develop your independent creative voice and vision as an artist. You will be challenged to take risks by working in ways

you don¿t usually work, trying new things, and pushing yourself beyond your habitual ways of making. You will work collaboratively with your peers on skill, concept, and idea sharing in order to develop and nurture peer-to-peer networks, peer-to-peer learning, collaboration, and mutual support. Students will also learn about and develop professional practice skills as you prepare for life and work after art school, including job search preparation, writing cover letters, resumes, artist statements, applying for art residencies, and more. The class will include individual and group discussions, peer-to-peer workshops, individual and group projects, critiques, readings, writing, and screenings, shaped around students¿ creative work and interests.
***Prerequisites: 07:081:446. Offered spring only.***

**07:081:451-452** ***Painting III-A and III-B (4,4)***
In this course, students will work in individual studios on self-directed projects, developing subject matter, content, and methodology through directed research. Selected readings and visits to exhibitions and lectures are required, as is participation in group discussions, presentations, critiques, and reviews.
***Prerequisites: 07:081:351-352 or by permission of the area. Primarily for students who have concentrated in this area. Painting III-A offered fall; Painting III-B offered spring only. (This course is cross-listed with Advanced Painting A).***

**07:081:453-454** ***Advanced Painting A and B (4,4)***
Students in this course are engaged in mentored individual work toward their thesis and explore how to sharpen and sustain the questions that will carry their work beyond it. These are identified and tested through individual studio visits with the instructor, group critiques; discussions of lectures, texts, and exhibitions; instructor and student presentations; peer curation, and review assignments.
***Pre or Corequisites: 07:081:451-452. Advanced Painting A offered fall; Advanced Painting B offered spring only.***

**07:081:455-456** ***Advanced Drawing A and B (4,4)***
Students in this course work on self-directed exploratory-based drawing projects under the mentoring of the instructor and within the engaged, critical dialogue of their peers.
***Pre- or corequisites: 07:081:321 or 322 (Drawing III-A or III-B); or 07:081:451-452 (Painting III-A or III-B). Advanced Drawing A offered fall; Advanced Drawing B offered spring only.***

**07:081:461-462** ***Photography III-A and III-B: Exhibition and Portfolio (4,4)***
In this course, students concentrate on individual artistic development by which they can develop an awareness and understanding of experimental and creative approaches to conceptual projects within the framework of contemporary photographic art practice. Advanced theoretical studies and individual practical investigations are used to support an emerging independent work process culminating in a final body of work.
***Prerequisites: 07:081:361-362. Photography III-A offered fall; Photography III-B offered spring only.***

**07:081:463-464** ***Advanced Photography A and B (4,4)***
Projects in this special topics class concentrate on the approach to specialized development in photography areas such as artists books, multimedia approaches, performance, installation, and photography-based public art. Individual and group work includes research and short- and long-term project development.
***Prerequisites: 07:081:461-462. Advanced Photography A offered fall; Advanced Photography B offered spring only.***

**07:081:471** ***Print III-A: Letterpress (4)***
In-depth focus on letterpress including hand typesetting and polymer plates on the Vandercook press. The course will cover broadsides, artists' books, and chap books. Artistic development concerning composition, content, and conceptual ideas will be addressed through individual and group critiques.

**07:081:472** ***Print III-B: Papermaking (4)***
In-depth focus on papermaking including Western style formation, working with Japanese fibers, three-dimensional pulp casting, coloring of pulps, stencils, watermarking, sizing, pressing, and drying. Artistic development concerning composition, content, and conceptual ideas will be addressed through individual and group critiques.

**07:081:473** ***Advanced Print A: Graphic Impulse (4)***
This course makes the argument that the most suitable container for interdisciplinary language and process is printmaking. We will take under consideration the premise that printmaking constitutes a broad range of approaches that have the capacity to yield new form and new language when combined with other traditional techniques. We¿ll study and examine both historical and contemporary examples of artists output that have encouraged a necessary expansion of the medium of print beyond works on paper. Course lectures and demos will focus on five central themes: Print as Moving Image, Print as 3-Dimensional Form, Print as Substrate, Print as Picture, and Print as Architecture and Design. Assignments will describe conceptual and material conditions that participants must adhere to but will also allow ample rooms for experimentation and encourage a poly-medial process of arriving at the completed work.
***Prerequisites: A minimum of one upper level print course.***

**07:081:474** ***Advanced Print B: Artists' Books (4)***
In-depth focus on handmade artists' books including Japanese stab binding, accordion structures, single and multiple signatures, Coptic, and alternative books. Artistic development concerning composition, content, and conceptual ideas will be addressed through individual and group critiques.
***No prerequisites.***

**07:081:481-482** ***Sculpture III-A and III-B (4,4)***
In this advanced studio course, students will explore, define, and develop their creative work and research in expanded sculptural practices through studio assignments and prompts, writing, instructor and student presentations, professional material development, readings, and independent projects. Students will continue the development of their studio practice in an increasingly independent framework while being asked to define their decisions in group and individual discussions while most likely developing and presenting their work in a Thesis exhibition. Students gain understanding of how their work is situated historically and discursively in the field through lectures, readings, and group and individual critiques.
***Prerequisites: 07:081:381-382. Sculpture III-A offered fall; Sculpture III-B offered spring only.***

**07:081:483-484** ***Advanced Sculpture A and B (4,4)***
Students in this course will work on independently conceived sculpture projects which are developed in consultation with the instructor. Independent research and creative work are supported by group critiques, individual meetings with the instructors, lectures, readings, and class discussions.
***Pre- or corequisites: 07:081:481-482. Advanced Sculpture A offered fall; Advanced Sculpture B offered spring only.***

**07:081:491,492** ***Independent Study (2) (B.F.A.,B.A.)***

**07:081:493,494** ***Internships (4) (B.F.A.,B.A.)***

**07:081:497-498** ***Thesis and Exhibition A and B (3,3)***
The culmination of undergraduate Art & Design creative research and practice, this year-long course provides methodologies, structure, and community to pursue advanced independent studio work and critique, leading to a

group exhibition in the second semester. This year-long course is required for the B.F.A. in Visual Art and B.F.A. in Design degrees.
*Open only to B.F.A. seniors.*

# Dance 203 (MGSA)

## DANCE 203

**07:203:101** *Dance Appreciation (3)*
Dance Appreciation is an introduction to dance as an art form, wherein students study the historical, cultural, social, and performative contexts of diverse dance forms. Students engage with aesthetic, theoretical, and scholarly discourses aimed at illuminating how dance functions as a form of communication and personal, aesthetic expression. In addition, students explore the ways in which dance both reflects and comments upon contemporary society. Students develop fundamental dance literacy through critical analysis of dance in live and recorded formats; identify aesthetic concepts and ideas through written and visual media; demonstrate comprehension in their utilization of dance vocabulary and terminology; discuss influential choreographers and genres of dance; and articulate critical conclusions about the reciprocal relationship between dance, the arts, and societal concerns.
*Please note: Students may not receive credit for both 07:203:101 and 07:203:131.*

**07:203:110** *Street and Club Dances (2)*
The study of fusion dance evolving from traditional and contemporary African and African diasporic dance forms, including contemporary social dances. Students will be introduced to these dance forms through studio practice, video, masterclasses, and performance.
*Open to BA majors, minors, and non-dance majors.*

**07:203:115** *Introduction to Dance Studies (3)*
Introduction to the domain of dance practice and theoretical frameworks, within a humanities context that acknowledges the intersection of multiple intelligences. Students observe and describe dance as a performing art and as cultural intervention. Guest artists provide performance demonstrations on a variety of topics including race/ethnicity, gender/sexuality, disability studies, screendance technology, and sound/lighting/costume design, among others. Descriptive and analytic writing required.
*Open only to dance majors.*

**07:203:123** *Modern Dance 1 (2)*
Introduction to the fundamentals of movement skills and body awareness in modern dance technique, improvisation, and composition.

**07:203:124** *Modern Dance 2 (2)*
Continued development of movement skills, improvisation, and composition in modern dance.
*Prerequisite: 07:203:123 or permission of instructor.*

**07:203:131** *Dance Appreciation (3)*
Dance Appreciation Online is an introduction to dance as an art form, wherein students study the historical, cultural, social, and performative contexts of diverse dance forms. Students engage with aesthetic, theoretical, and scholarly discourses aimed at illuminating how dance functions as a form of communication and personal, aesthetic expression. In addition, students explore the ways in which dance both reflects and comments upon

contemporary society. Students develop fundamental dance literacy through critical analysis of dance in live and recorded formats; identify aesthetic concepts and ideas through written and visual media; demonstrate comprehension in their utilization of dance vocabulary and terminology; discuss influential choreographers and genres of dance; and articulate critical conclusions about the reciprocal relationship between dance, the arts, and societal concerns.
***Please note: Students may not receive credit for both 07:203:101 and 07:203:131.***

**07:203:132** ***History of Broadway Dance Online (3)***
Explores the evolution of dance in musical theater and on Broadway. Course topics will include a historical survey of dance on Broadway; an examination of the reciprocal relationship of Broadway dance to economic and cultural change; and a close look at the power structure and organization of Broadway musicals. The evolution of Broadway dance steps and styles and the contribution of notable dancers will be examined.

**07:203:134** ***Dance in Israel: Body, Ideology, and Culture (3)***
Survey of Israel's concert dance history, from roots in imported styles in the pre- and immediate post-state decades to the blossoming of a homegrown Israeli contemporary dance within the last few decades. Topics include aesthetic influences, significant artists, and recent innovations, with discussions about technical, stylistic, and thematic concerns. Throughout the course, dance is situated within a larger historical, sociopolitical context, and connections to politics, nationalism, religion, ethnicity, and culture are considered.

**07:203:135** ***Dance Forms in Africa (3)***
Explores dance forms from different cultures in different blocks on the African continent. Through readings, viewings, and engagement with movement, students use skills of observation, movement learning, and contextual and comparative analysis, focusing on the social, cultural, religious, and political significance of African dance forms. Types and functions of traditional African dances, contexts of performance, and their unique characteristics will also be explored.

**07:203:136** ***Dance in India (3)***
Covers a wide range of forms practiced in India in the 20th and 21st century, including folk dances, classical dance styles, contemporary choreography, and film dances, among others. Also looks beyond India, into the diaspora and global contexts in which Indian dance forms are practiced. Methods include analysis of readings, video documentaries, dance films, and interviews, as well as concept mapping. Practical engagement with movement material and aesthetic principles included.

**07:203:149** ***Ballet 1 (2)***
Introduction to ballet as an art form with an emphasis on traditional steps.

**07:203:150** ***Ballet 2 (2)***
Practice in the development of ballet technical skill, body alignment, and concepts of ballet aesthetics.
***Prerequisite: 07:203:149 or permission of instructor.***

**07:203:155** ***Introduction to Jazz Dance (2)***
Familiarizes nondance majors to technical and performance aspects of jazz dance. The course introduces students to a variety of jazz styles to provide a broad foundation from which to select future training opportunities.
***Open to BA majors, minors, and non-dance majors.***

**07:203:160** *Pilates Mat (1)*
Covers the 34 Pilates mat exercises as developed by Joseph and Clara Pilates. Variations and modifications for each of these exercises will also be taught in an effort to not only further explore the possibilities that the method offers, but to prevent injury and suit the needs of each student. Use of foam roller and magic circle props will be integrated into this practice.
*Open to dance majors, minors, and non-majors.*

**07:203:170** *Yoga for Wellness (2)*
In this course, students will learn the historical beginnings of yoga, gaining a broad understanding of the cultural significance of this practice. Basic Sanskrit, Hindu mythology, and the culture of India will also be discussed.
*Open to dance majors, minors, and non-majors.*

**07:203:329** *Dance Composition (2)*
Development of fundamental skills in choreography.
*Pre- or corequisite: 07:203:142. Open only to B.A. dance majors and dance minors.*

**07:203:350** *Performing Climate Change (3)*
This course provides a conceptual framework and creative practicum for students who wish to engage with climate change through the performing arts. The course is open to students of all disciplines. The prerequisites are an interest in climate change and a willingness to active the creative imagination.

**07:203:363** *B.A. and Minor Modern Dance Repertory (2)*
Study and performance of original or repertory works, both historical and contemporary, by guest or resident choreographers.
*Open only to B.A. dance majors and dance minors.*

# Dance 206 (MGSA)

## Dance 206

Course listings for Dance 206 can be found at the following link: Courses.

Dance 206 (MGSA)

## Courses (206)

## Courses (206)

**07:206:100** *Dance Assembly (N.5)*
Grade based on attendance. Required of all B.F.A dance majors for eight semesters of enrollment as a declared major.

**07:206:126** *Rhythm for Dancers (2)*
Analysis of rhythmic structure relative to movement. Sight-reading note values, movement dictation, and composition.
*Prerequisites: 07:203:123 and 124. Open to dance majors only.*

**07:206:130** ***African Diasporic Movement Practices 1 (1.5)***
African Diasporic Movement Practices brings forward for dancers the origins of Black African Diasporic derived dance forms and fusions and their value in dance training. Forms and fusions of forms will be identified and contextualized culturally and historically in order to provide students with skills essential to embody and physically master the movement practice. The dance form's social and cultural roots will be studied as essential to movement practice. Studio work, readings, and self-reflections will help students to understand the physical, intentional, and expressive values by which a dancer is understood to be proficient in the form.
***Open only to B.F.A. dance majors.***

**07:206:131** ***Classical/Traditional Movement Practices 1 (1.5)***
Dance forms centered in codified movement vocabularies emerging from global, temporal, and cultural contexts. Example forms include: Classical Ballet, Kathak, Chinese classical dance, and forms based on or derived from Cunningham, Fosse, Cole, Graham, Horton, Limon, Luigi, and Taylor Techniques.
***Open only to B.F.A. dance majors.***

**07:206:132** ***Contemporary Fusion Movement Practices 1 (1.5)***
Studio course in which students engage both physically and theoretically with contemporary movement practices that draw from at least two forms of dance. The course situates the individual forms and fused practice within historical, social, and cultural lenses to provide an understanding of lineage, to accurately represent the values of the practice, and to help students recognize their individual relationship to the practice.
***Only open to B.F.A. dance majors.***

**07:206:133** ***Somatic Movement Practices 1 (1.5)***
Movement practices that emphasize wellness, functional efficiency, and injury prevention through embodied experience and integration of body/mind/spirit. Example practices include: Alexander Technique, Bartenieff Fundamentals, Feldenkrais Method, Franklin Method, Functional Movement Training, Klein Technique, Pilates, and Yoga.
***Open only to B.F.A. majors.***

**07:206:142** ***Dance Improvisation 1 (2)***
Introductory experience in dance improvisation including the use of kinetics, movement design, and spatial sensing as potential sources of movement and partner interaction.
***Open only to dance majors and minors.***

**07:206:145** ***Performance Skills 1 (2)***
Development of performance skills for first-year B.F.A. dance majors. Students are engaged in an extensive rehearsal process with a guest or faculty choreographer in order to introduce them to generative improvisational and compositional strategies for the creation of original works of choreography.
***Open only to B.F.A. majors.***

**07:206:146** ***African Diasporic Movement Practices 2 (1.5)***
African Diasporic Movement Practices brings forward for dancers the origins of Black African Diasporic derived dance forms and fusions and their value in dance training. Forms and fusions of forms will be identified and contextualized culturally and historically in order to provide students with skills essential to embody and physically master the movement practice. The dance form's social and cultural roots will be studied as essential to the

movement practice. Studio work, readings and self-reflections will help students to understand the physical, intentional and expressive values by which a dancer is understood to be proficient in the form.
*Open only to B.F.A. dance majors.*

**07:206:147** *Classical/Traditional Movement Practices 2 (1.5)*
Through engaging in a new Classical/Traditional form, Movement Practices 2 inwardly builds, outwardly expands, and develops variation in learning from Somatic Movement Practices 1. Students continue to find connections among the five course goals and learning outcomes listed below. Students will add to their movement vocabulary and also continue to unearth personal voice through a non-hierarchical nexus of learning.
*Open only to B.F.A. dance majors.*

**07:206:148** *Contemporary Fusion Movement Practices 2 (1.5)*
Through engaging in a new Contemporary Fusion form, Movement Practices 2 inwardly builds, outwardly expands, and develops variation in learning from Contemporary Fusion Movement Practices 1. Students continue to find connections among the five course goals and learning outcomes listed below. Students will add to their movement vocabulary and continue to unearth personal voice through a non-hierarchical nexus of learning. Students will investigate another Contemporary Fusion form that draws from at least two forms of dance. This is a studio course in which students engage both physically and theoretically with such contemporary movement practices.
*Open only to B.F.A. dance majors.*

**07:206:149** *Somatic Movement Practices 2 (1.5)*
Somatic Movement Practices 2 focuses on theoretical and embodied understanding of selected somatic practice(s) with a special focus on application to dance training and performance. Students will examine somatic theories and principles and how they manifest in somatic practices that emphasize internal physical perception and experience.
*Open only to B.F.A. dance majors.*

**07:206:154** *Pointe Class (1)*
Class includes participation in a ballet barre and center work. The focus will be on the practice and principles of the classical ballet vocabulary with an emphasis on strengthening foundational skills in pointe technique. Advice will be given on how students can best prepare and maintain their pointe shoes.
*Open to dance majors only. B.A. dance majors and dance minors with permission of instructor only.*

**07:206:155** *Ballet Jumps and Turns (1)*
Class includes participation in a ballet barre and center work. The focus will be on the practice and principles of classical ballet jumps and turns.
*Open to B.F.A. dance majors only. B.A. dance majors and dance minors with permission of department only.*

**07:206:161** *Production Study (1-2)*
Crew assignments and production support for department dance performances.
*Dance majors and dance minors to complete 1 credit; B.F.A. dance majors to complete 2 credits.*

**07:206:235** *Choreography 1 (2)*
Introduction to the choreographic process. Solo forms and group choreography.
*07:206:243 or permission of the instructor. Open only to B.F.A. dance majors.*

**07:206:237** *Dance Production (3)*
Theoretical and practical applications of computer, lighting, audio, and technical theater skills necessary to produce, promote, and direct dance productions. Students develop computer skills in graphic design and sound design/ editing as well as computer lighting consoles and theatrical lighting equipment in two professional theaters. Students study lighting design and stage management for dance in theory and practical application around a department production.

**07:206:243** *Dance Improvisation 2 (2)*
Exploration of dance improvisation as the source of movement for choreography.
*07:206:142 or permission of the instructor. Open only to B.F.A. dance majors.*

**07:206:245** *Performance Skills 2 (2)*
Continued development of performance skills for second-year B.F.A. dance majors. Students are challenged to further refine their technical skills and advance their performance abilities through a collaborative, creative process with a guest or faculty choreographer.
*07:206:145 or permission of the instructor. Open only to B.F.A. majors.*

**07:206:260** *African Diasporic Movement Practices 3 (1.5)*
African Diasporic Movement Practices 3 inwardly builds, outwardly expands, and develops variation in learning from Movement Practices 2. Students will elevate connections among the five course goals and learning outcomes and incorporate an additional goal towards communication of their individual identities, perspectives and artistry. Students apply skills, approaches to movement, and contexts learned in Movement Practices 1 and 2 to train in a new African Diasporic-derived form as an informed dancer in the movement practice. Students will add to their movement vocabulary and artistic strategies as they navigate the use of their year one Movement Practices training to illuminate embodied communication and strengthen performance in the form. Leadership skills will also be developed.
*Open only to B.F.A. dance majors.*

**07:206:261** *Classical/Traditional Movement Practices 3 (1.5)*
Students apply skills, approaches to movement, and contexts learned in Movement Practices 1 and 2 to train in a new Classical/Traditional form as an informed dancer in the movement practice. Students will add to their movement vocabulary and artistic strategies as they navigate the use of their year one Movement Practices training to illuminate embodied communication and strengthen performance in the form. Leadership skills will also be developed. Students will deeply investigate this codified, Classical/Traditional form and its value in their dance training. Forms and fusions of forms will be identified and contextualized culturally and historically in order to provide students with skills essential to embody and physically master the movement practice. The form's traditions, modes of study, movement vocabularies, and prescriptive grammars will also be studied and expressed
*Open only to B.F.A. dance majors*

**07:206:262** *Contemporary Fusion Movement Practices 3 (1.5)*
Through engaging in a new Contemporary Fusion form, Movement Practices 3 advances the artistic and kinesthetic investment of inwardly building, outwardly expanding, and developing variation in learning from Contemporary Fusion Movement Practices 1 and 2. Students will investigate a Contemporary Fusion form that draws from at least two forms of dance. This is a studio course in which students engage both physically and theoretically with contemporary movement practices. The course situates the individual forms and fused practice within historical, social, and cultural lenses to provide an understanding of lineage, to accurately represent the values of the practice,

and to help students recognize their individual relationship to the practice. The course emphasizes the progression from internal investigation to external expression.
*Open only to B.F.A. dance majors.*

**07:206:263** *Somatic Movement Practices 3 (1.5)*
Somatic Movement Practices 3 continues to focus on theoretical and embodied understanding of selected somatic practice(s) with a special focus on application to dance training and performance. Students will examine somatic theories and principles and how they manifest in somatic practices that emphasize internal physical perception and experience. Distinctive forms enable students to better understand how they can promote wellness and self-knowledge, and prevent injury through continued and varied experiences with and reflective thinking about somatic practices.
*Open only to B.F.A. dance majors.*

**07:206:264** *African Diasporic Movement Practices 4 (1.5)*
Through engagement in a new form, African Diasporic Movement Practices 4 continues to advance the artistic and kinesthetic investment in inwardly building, outwardly expanding, and developing variations in learning from African Diasporic Movement Practices 1, 2 and 3. Students elevate increasingly sophisticated connections among the six course goals and learning outcomes listed below and apply skills, approaches to movement, and contexts learned in Movement Practices 1 and 2 to train in a new African Diasporic-derived form as an informed dancer in the movement practice.
*Open only to B.F.A. dance majors.*

**07:206:265** *Classical/Traditional Movement Practices 4 (1.5)*
Continued study and training in dance forms centered in codified movement vocabularies, emerging from global temporal and cultural contexts. Example forms include: Classical Ballet, Bharatanatyam, Chinese classical dance, and forms based on or derived from Cunningham, Fosse, Cole, Graham, Hawkins, Horton, Limon, Luigi, and Taylor Techniques.
*Open only to B.F.A. dance majors.*

**07:206:266** *Contemporary Fusion Movement Practices 4 (1.5)*
Through engagement in a new Contemporary Fusion form, Movement Practices 4 continues to advance the artistic and kinesthetic investment of inwardly building,¿outwardly expanding, and developing variation in learning from Contemporary Fusion Movement Practices 1, 2 and 3. Students investigate this additional Contemporary Fusion form that draws from at least two forms of dance. This is a studio course in which students engage both physically and theoretically with contemporary movement practices. The course situates the individual forms and fused practice within historical, social, and cultural lenses to provide an understanding of lineage, to accurately represent the values of the practice, and to help students recognize their individual relationship to the practice. The course emphasizes the progression from internal investigation to external expression.
*Open only to B.F.A. dance majors.*

**07:206:267** *Somatic Movement Practices 4 (1.5)*
Somatic Movement Practices 4 continues to focus on theoretical and embodied understanding of selected somatic practice(s) with a special focus on application to dance training and performance. Students will examine somatic theories and principles and how they manifest in somatic practices that emphasize internal physical perception and experience. Distinctive forms enable students to better understand how they can promote wellness and self-

knowledge, and prevent injury through continued and varied experiences with and reflective thinking about somatic practices.
*Open to only B.F.A. dance majors.*

**07:206:274** *Jazz Dance (2)*
Various styles and techniques in the idiom of jazz dance.
*May be repeated for credit. Open only to dance majors and minors.*

**07:206:277** *Latino and Hispanic Dance Forms (2)*
Studio course includes technique and performance of selected dance forms within their historical and cultural contexts. Dance forms may include indigenous, diasporic, and hybrid dances from the Caribbean, Mexico, and South America; classical Spanish and Flamenco dance; and Filipino dances derived from Spanish influence.
*May be repeated for credit if a new culture.*

**07:206:312** *Advanced Ballet (2)*
Studio-based course with barre and center format. We will call upon our curiosities and sense of play to examine and embody classical ballet vocabulary through the applications of somatic practices, repertory, and improvisation techniques. Class material will increase with complexity of vocabulary, tempos, and spatial pathways over the course of the semester. Journaling and class discussions will include, but are not limited to: the role of ballet a Eurocentric form in the 21st century, the potential for ballet class to be an individual and/or collective practice, and applications of tools/approaches learned in this class to other dance forms.
*Classical/Traditional Movement Practices 2 or Ballet 2*

**07:206:319** *Sound and Movement (3)*
Analysis of the relationships of music and dance in content, form, and structure.
*B.A. dance majors complete 07:203:126 prior to enrollment.*

**07:206:325** *Kinesiology for Dancers (3)*
Functional human anatomy and the study of the scientific basis of human movement as they relate to dance training. Course includes somatic studies of diverse movement disciplines.
*Open only to dance majors.*

**07:206:326** *Adaptive Movement Through Dance (3)*
A hybrid integrated dance studies/studio course that introduces how to teach modified movement techniques for special populations. The course integrates lecture/studio course training to teach students how to use various types of adaptive movement methods, including ballet, modern, jazz, tap, ballroom, musical theater choreography, and the Brain Dance to create a series of rhythmic patterns. These patterns offer flow and consistency to enhance the weight shifting and transitional steps to promote a progression of skills. Total body integration methods such as Bartenieff Fundamentals, Alexander Technique, Feldenkrais Method, Yoga, and other forms of kinesthetic learning will be introduced. Populations with a variety of both congenital and acquired disabilities will be discussed to summarize their specific needs for having access to an appropriate adaptive movement class.
*07:206:325*

**07:206:334** *Choreography 2 (2)*
Continued development of solo and group choreographic processes with emphasis on movement invention and experimental forms.
*07:206:235. Open only to B.F.A. dance majors.*

**07:206:341** *Advanced Jazz (2)*
Advanced Jazz expands on artistic and kinesthetic investment in jazz dance and jazz dance-infused practices. Students elevate increasingly sophisticated connections among the six course goals and learning outcomes listed below and apply skills, approaches to movement, and contexts learned in Movement Practices 1 and 2 or Jazz 1 and 2, to train in a new jazz dance form. Continuing the expansion of their movement vocabulary, students will further illuminate their personal voice through visible expression. Jazz dance forms and fusions of forms are identified and contextualized culturally and historically, and in connection to other forms, in order to provide students with skills essential to embody and physically master the advanced practice.
*African Diasporic Movement Practices 2 or Jazz 2*

**07:206:343** *Advanced Modern (2)*
Practice in advanced skills in modern dance. The purpose of this course is to prepare the mind and body of the dancer for a wide range of movement possibilities: forms, qualities, dynamics and intention. The course is designed to enhance the student's self-awareness, so as to recognize the ways in which lineage, individual habits and tendencies, and individual preferences/biases are present in the body. Mindful approach to enhancing the self-awareness from which movement is executed is essential with an emphasis in breath, body alignment and mental focus. The course works towards building proficient dance technique that integrates physical mastery, somatic awareness, conceptual understanding, emotional investment and musicality.
*Contemporary Fusion Movement Practices 2 or Modern 2*

**07:206:344** *Video for Dance (2)*
Communication through dance as a video art. Emphasis on video shooting and editing techniques, environmental controls, choreographed and improvisational dance movement structures used in the creation of short dance films. Smaller projects lead to a final dance on film project for each student.
*Open only to dance majors.*

**07:206:346** *African Diasporic Movement Practices 5 (2.5)*
Intensive study and training in dance forms derived from or informed by Africa and/or the Black African Diaspora. Development of improvisational and choreographic skills in the form with direct connections to repertory performance opportunities. Example forms include: West African, Afro-Fusion, Hip-Hop, Jazz, Street Dance, Dunham-based Technique.
*Open only to B.F.A. dance majors.*

**07:206:347** *Classical/Traditional Movement Practices 5 (2.5)*
Intensive study and training in dance forms centered in codified movement vocabularies, emerging from global temporal and cultural contexts. Example forms include: Classical Ballet, Bharatanatyam, Chinese classical dance, and forms based on or derived from Cunningham, Fosse, Cole, Graham, Hawkins, Horton, Limon, Luigi, and Taylor Techniques.
*Only open to B.F.A. dance majors.*

**07:206:348** *Contemporary Fusion Movement Practices 5 (2.5)*
Intensive study and training in contemporary movement practices that draw from at least two forms of dance. Individual forms and fused practice are situated in historical, social, and cultural contexts. Example forms include: Release Techniques, Yorchha, Bollywood, Contemporary Ballet.
*Open to B.F.A. dance majors.*

**07:206:349** *Somatic Movement Practices 5 (2.5)*
Intensive study in a Somatic Movement Practice that emphasizes wellness, functional efficiency and injury prevention through embodied experience and integration of body/mind/spirit. Development of creative and practical skills for use of the form with direct connections to diverse applications.
***Open only to B.F.A. dance majors.***

**07:206:352** *Teaching as an Artist (3)*
A pedagogical introduction into the nuances and skill set necessary to effectively teach dance to different ages and levels, in differing environments (i.e. K-12, studio, professional company, etc.). Through an active performer lens, students will deconstruct and examine the specialized attributes and knowledge essential for teaching and integrate them to become well-rounded and successful teaching artists.
***Open only to B.F.A. dance majors.***

**07:206:356** *African Diasporic Movement Practices 6 (2.5)*
Intensive study and training in dance forms derived from or informed by Africa and/or the Black African Diaspora. Development of improvisational and choreographic skills in the form with direct connections to repertory performance opportunities. Example forms include: West African, Afro-Fusion, Hip-Hop, Jazz, Street Dance, Dunham-based Technique.
***Open only to B.F.A. dance majors.***

**07:206:357** *Classical/Traditional Movement Practices 6 (2.5)*
Intensive study and training in dance forms centered in codified movement vocabularies, emerging from global temporal and cultural contexts. Development of improvisational and choreographic skills in the form with direct connections to repertory performance opportunities. Example forms include: Classical Ballet, Bharatanatyam, Chinese classical dance, and forms based on or derived from Cunningham, Fosse, Cole, Graham, Hawkins, Horton, Limon, Luigi, and Taylor Techniques.
***Open only to B.F.A. dance majors.***

**07:206:358** *Contemporary Fusion Movement Practices 6 (2.5)*
Intensive study and training in contemporary movement practices that draw from at least two forms of dance. Development of improvisational and choreographic skills in the form with direct connections to repertory performance opportunities. Individual forms and fused practice are situated in historical, social, and cultural contexts. Example forms include: Release Techniques, Yorchha, Bollywood, Contemporary Ballet.
***Open only to B.F.A. dance majors.***

**07:206:360** *University DanceWorks (2)*
Performance experience in the student touring dance company.
***B.F.A. dance majors in third and fourth year only. May be repeated for credit. Audition required.***

**07:206:363** *Dance Repertory (2)*
Study and performance of historical and contemporary repertory by guest or resident choreographers.
***B.F.A. dance majors by audition only. May be repeated for credit.***

**07:206:402** *Introduction to Laban Movement Analysis (3)*
A systematic study of Laban's theoretical model describing concepts and principles of human movement. Includes an overview of Bartenieff Fundamentals (BF), an integrative tool for reeducating the body.
***Open only to dance majors.***

**07:206:410** ***Neuroscience in Partnership with Dance (3)***
Neuroscience in Partnership with Dance will explore how many regions of the brain are affected by dance. The four main regions of the brain will be presented and deconstructed to understand how they function and control the nervous system within the body. Students will explore, in lecture and studio laboratory settings, how rhythmic and patterned sequences of dance movement can create new connections within the brain. Students will research the growing field of dance neuroscience and new applications. Students in the Exercise Science concentration at the Kinesiology and Health Department may enroll in this course by completing equivalent pre-requisites, by petition.

**07:206:431** ***Dance History--World Survey Online (3)***
Study of dance in diverse cultures and times through film, video, reading, lectures, discussion, and directed research. Activity fee for films and field trips.
***Please note: Students may not receive credit for both 07:206:431 and 441.***

**07:206:432** ***Dance HIstory--1900 to Present Online (3)***
Dance artists and dance masterpieces in the Western theater tradition from 1900 to the present. Study of the influences on contemporary concert dance of diverse cultural, artistic, and social movements through film, video, reading, lectures, discussion, and directed research. Activity fee for films and field trips.
***Please note: Students may not receive credit for both 07:206:432 and 442.***

**07:206:441** ***Dance History--World Survey (3)***
Study of dance in diverse cultures and times through film, video, reading, lectures, discussion, and directed research. Activity fee for films and field trips.
***Please note: Students may not receive credit for both 07:206:431 and 441.***

**07:206:442** ***Dance History--1900 to Present (3)***
Dance artists and dance masterpieces in the Western theater tradition from 1900 to the present. Study of the influences on contemporary concert dance of diverse cultural, artistic, and social movements through film, video, reading, lectures, discussion, and directed research. Activity fee for films and field trips.
***Please note: Students may not receive credit for both 07:206:432 and 442.***

**07:206:447-448** ***Independent Study in Dance (BA)***
Reading and/or studio research determined by the student and adviser with the consent of the department committee for independent study.
***Open only to junior and senior B.F.A. dance majors with permission of the department. Students may only take up to two independent studies in dance per year.***

**07:206:450** ***Dance Capstone 1 (2)***
Dance Capstone 1 is the first semester of a two-semester sequence for seniors in which students develop and implement a Capstone project across an academic year. Through this faculty-mentored process, students will build on previous content knowledge and experiences to select and research a specific area of interest from the following areas: Choreography, Performance, Somatic Studies, Dance Education, or Learner-Designed Research.
***Enrollment in this class must be approved by the Academic Advisor and Student Success Counselor.***

**07:206:451** ***Dance Capstone 2 (2)***
Dance Capstone 2 is the second semester of a two-semester sequence for seniors in which students continue to develop and implement a Capstone project in their final semester. Through this faculty and peer-mentored process, students will research and present a specific area of interest from the following concentrations: Choreography,

Performance, Somatic Studies, Dance Science, or Learner-Designed Research. Enrollment in this class must be approved by the Undergraduate Coordinator.
*Enrollment in this class must be approved by the Academic Advisor and Student Success Counselor.*

**07:206:495** *Special Topics/Dance (BA)*
Intensive study of a single topic from a variety of perspectives including technical, creative, production, educational, and theoretical inquiry.
*Department approval required before registration.*

# Filmmaking 211 (MGSA)

## FILMMAKING 211

**07:211:110** *Introduction to Filmmaking (3)*

Have you ever thought deeply about what it takes to make a movie? Have you ever wanted to learn the tools and techniques of the film maker, transforming your research, creative practice, idea, or experience into a film? Whether you are a scientist or painter, a journalist or poet, this rigorous introduction to filmmaking will teach you the foundational methods you need to stage, shoot, and edit sounds and images into works of film art. Through readings, film screenings, technical workshops, classroom discussions and critiques, and production assignments, we will learn to use film to study, story, and experiment. Our focus will span narrative, documentary, and avant-garde practices and will use this unique interdisciplinary course as an opportunity to examine how film intersects with art, science, scholarship, and entertainment.

**07:211:111** *Sound (3)*
Introduces students to the fundamentals of producing audio for the moving image. Explores emerging techniques and strategies of sonic practice while also emphasizing underlying principles that have defined the film industry for the past century. Students will learn the essentials of recording audio in the field, editing, mixing and sound design, with particular emphasis on acquiring critical listening skills. Students produce a series of short projects culminating with an ambitious final project.

**07:211:120** *Cinematography (3)*
In this class, students will work with digital cameras to learn composition, lighting, lenses, and filters. They will study the language of film with a focus on visual storytelling. Students will become proficient in technical aspects of shooting digital cinema, both for documentary and narrative scenarios.

**07:211:191** *Introduction to Film Production I (4)*
Through a series of short film and sound exercises this introductory course puts basic film theory, language, and dramatic structure for the screen into action. During the course, students will study formal devices such as camera framing, lighting, sound, dialogue, and editing choices.

**07:211:192** *Introduction to Film Production II (4)*
In this course, students will continue learning the basics of film language through a series of short film exercises. Each exercise will explore a specific approach or formal device. Using specific feedback exercises, students will learn to engage critically in each other's work.

**07:211:205** ***Screenwriting (Short Film) (3)***
This introductory course allows students to learn the fundamentals of screenwriting while developing a short 12-16 page screenplay. Students will learn about dramatic structure, development of character, writing dialogue, developing a theme, and concept as it applies to writing a short screenplay. The students will create "video drafts" from their screenplay to provide them with the opportunity to visually explore creative ways to drive the narrative beyond the word on the page. This interaction between writing and production allows the screenwriter to explore visual language and visual storytelling.

**07:211:211** ***Advanced Sound (3)***
This advanced audio course explores creative production and postproduction techniques for sound design. In this course, students will learn to design sound for an array of applications, from composition to sound for moving-image to sound installation. We also learn DIY and experimental strategies for sound production in the field. Students will work with ProTools digital audio workstations and field recorders to produce a range of projects oriented around a set of unique design challenges.

**07:211:212** ***Digital Field Production (3)***
This intent of this course is to give students a comprehensive understanding of group-oriented Digital Field Production which can be applied to both fiction and documentary production strategies. Students will receive training on various camera systems and audio equipment. This is a hands-on field-production course that covers single- and multi-camera shoots in multiple settings and locations. Students will work in small groups in a wide variety of real-world production situations. Students will learn production skill sets and the importance of collaborative processes in both the pre-production and production stages of filmmaking.

**07:211:217** ***Horror Film Production (3)***
This production course is a deep consideration of horror as both subject and cinematic/artistic form. Horror has been dismissed for its "crude" aesthetics; criticized for the pleasures it takes in violence, misogyny, racism, escapism, etc.; and lauded as a potential vehicle for subversion and critique. Class viewings will include a wide array of narrative fiction ("canonical", Hollywood, B-movies, cult films, arthouse, foreign, etc.), experimental films, and documentary, as well as works of video art, performance, photography, and radio. Class readings draw from film studies, cultural studies, psychoanalysis, and fiction. Utilizing an interdisciplinary approach to filmmaking, students will produce one nonfilmic work (audio, performance, or creative writing), a non-narrative "horror" short film, and one final film.

**07:211:220** ***Advanced Cinematography (3)***
This is an intensive hands-on production course, intended to serve as a venue through which students will expand upon the skills they have acquired through Cinematography (211:120). In this course, students will learn more sophisticated lighting techniques, advanced composition, color, and different lens options. Students will study films for specific techniques, then attempt to shoot using those in class, then follow up with a group homework shoot that will be presented in the class.

**07:211:230** ***Animation 2-D (3)***
Introduces the basic terminology, concepts, and principles of 2-D animation intended to illustrate or reinforce narrative concepts. It covers three distinct techniques within 2-D animation: animating for the web, stop motion animation, and 2-D, vector-based animation. While focusing on technical aspects of 2-D animation, this course takes into consideration the historical perspective, current technologies, and applications of animation within documentary and fiction film.

**07:211:231** ***Image Postproduction (3)***
This course is designed to provide a workshop opportunity for students to develop their post-production skills. We will explore a set of tools, concepts, and methods covering both primary and intermediate aspects of digital video post-production. Over the course of the semester, we will delve into editing, compositing, sync sound, color correction/grading, and exporting techniques. The class time will be comprised of lectures, readings, exercises, and screenings to help students build a technical and aesthetic foundation in digital post-production.

**07:211:291** ***Intermediate Film Production I (4)***
This course provides students with the opportunity to continue to gain theoretical and practical experience in the craft of conceptualizing and directing a film. Students will put film theory, language, grammar, and dramatic structure for the screen into action. This course builds on the fundamentals of film language and basic visual grammar, concentrating on collaboration, staging, shooting, and editing. Through lectures, readings, and screenings, students will engage in discussions regarding various formal approaches to cinema. By the end of the semester, students will have produced and directed four assignments guided by formal restrictions.

**07:211:292** ***Intermediate Film Production II (4)***
This course provides students with the opportunity to expand upon theoretical and practical experience in the craft of conceptualizing and directing films. Students produce, direct, and edit three exercises and a final project of their choosing. Thematic restrictions will guide each exercise. Students learn to work in groups and share the responsibilities in the filmmaking process. Through lectures, readings, and screenings, students will engage in discussions regarding various formal approaches to cinema.

**07:211:293** ***Directing the Actor (3)***
This is a workshop course designed to develop techniques for directing engaging and believable on-screen performances. Exercises and assignments will emphasize the relationship between the director and actor. Through script analysis, rehearsals, and scene performances, students will learn the fundamentals of the acting process and gain the necessary skills to communicate their objectives and intentions with actors effectively.

**07:211:294** ***Introduction to Producing (3)***
This course will introduce students to the multiple responsibilities of a film producer and will explore how producers ensure all legal, financial, and safety requirements while also helping fulfill the film's creative and commercial potential. This course will also cover: pre-production, production, and how to prepare: budgets, shooting schedules, hiring crew, and tracking costs, and negotiating contracts.

**07:211:295** ***Special Topics in Digital Filmmaking (BA)***
Explores in depth a unique topic in filmmaking. Topic determined by the program.

**07:211:300** ***Short Film Repurposed (3)***
Intensive postproduction course where students will explore the possibilities of moving images from multiple artistic and conceptual perspectives. The course will engage with the tradition of science documentary filmmaking, as well as with found footage/appropriated filmmaking. In the first part of the course, students will complete a short documentary film focusing on the needs of scientists and/or science communication. For the second part, using the raw footage of their science films, students will make another film that is conceptually and artistically different. Students will be exposed to found/appropriated footage filmmaking and be expected to produce innovative and critical works from the images and obstructions presented in this course.

**07:211:301** *Sensory Ethnography (3)*
This course introduces students to Sensory Ethnography as both a research method and aesthetic approach to filmmaking. Through in-class screenings, production workshops, and seminar, students are exposed to the key terms and debates fundamental to ethnographic filmmaking, the films, and filmmakers crucial to its evolving practice, and the tools and techniques used to produce sensory films. The course will continually interrogate the relationships between film form, content, and the ethnographic method. Students will produce two short production assignments, a detailed written treatment, and a sensory ethnography film.

**07:211:305** *Screenwriting: Feature Film I (3)*

This course allows students to advance their screenwriting abilities while developing a feature-length screenplay. During this course, students will continue their learning of the fundamentals of screenwriting and apply those principles to the development of a step-outline and the first act of a feature-length screenplay (approximately 25-30 pages). The class will be a mixture of lecture, screenplay analysis, discussion of viewed films, and workshopping of the students' Step-Outline and Screenplays with peer review.

**07:211:306** *Short-Form Series Filmmaking (3)*
Gives students hands-on experience as a producer, writer, director, and editor of their own short-form serialized narratives. Students will learn how to conceptualize and structure a Short-form Series. They will write two screenplays or documentary treatments: the pilot and episode #1. The students will gain theoretical and practical experience in producing, directing, and editing as they work to complete these episodes through pre-production, production, and post-production.

**07:211:307** *AI and New Technologies in Filmmaking (3)*
This online synchronous course focuses on giving students real-world learning experiences with cutting-edge technologies in machine learning, generative AI, and other spaces, in combination with storytelling fundamentals, to help students navigate the next great tech revolution in cinema.

**07:211:308** *Community Engaged Filmmaking (3)*
What does a filmmaking practice rooted in ethical and caring community engagement look like? What tools and techniques are needed to create compelling films with community partners? What is the metric of a successful community film collaboration? In this rigorous introduction to community engaged filmmaking, students will learn to identify and collaborate with community partners to create captivating and impactful films. Through readings, film screenings, classroom discussions, production workshops, and community endeavors, students will explore crucial stylistic and social characteristics of community film and will learn strategies for sharing authorship and engaging community members. Students will be exposed to a wide range of ethical considerations and fiction and non-fiction approaches.

**07:211:320** *Essay Filmmaking (3)*
Film critic Alexandre Astruc created the term camera-stylo to suggest a new means of writing through cinema, in which the camera would serve as a pen, creating arguments, mediation and inquiries. Film essays are usually a hybrid of different forms, often playing with documentary and fictional narrative conventions, and tend to be driven by theme rather than plot. Through lectures, in-class discussions, and feedback sessions, students will develop a deep understanding of the essay film, its history, and the possibilities for its future practice. The goal is for students to study, negotiate, and engage the essay film¿s many potentialities as a means towards honing their own artistic practices. Students will produce two short essay film exercises and one 8-12 minute final film that addresses or responds to the materials covered in the class.

**07:211:325** ***Blurred Boundaries: An Introduction to Fact/Fiction Filmmaking (3)***
This course will examine filmmaking techniques that blur boundaries between fact and fiction. Students will explore the evolution of fact/fiction blurring through film movements such as direct cinema, cinema verité, realism and surrealism, ethno-fiction, slow cinema, auto-documentary, and found footage, among others. Students will create three assignments and a final film that utilizes similar techniques. This course will provide students with a foundational understanding of film form and grammar while challenging the assumption that film techniques can be reduced to film truths. Students will learn approaches to filmmaking that seek to craft uncertain and enigmatic film experiences.

**07:211:330** ***Animation 3-D (3)***
This course introduces the basic terminology, concepts, and principles of 3-D animation. It is designed to remove the complexities of modern digital 3-D development tools by examining each segment individually and reinforcing it with in-class workshops and weekly assignments. This course takes into consideration the historical evolution of 3-D animation, the current technologies, and applications of animation within documentary and fiction film.

**07:211:337** ***Experimental Film (3)***
Production course based on an overview of key works and ideas that have informed "avant-garde" and "experimental" film, from their beginnings in the early years of cinema through the present day. While the emphasis is placed on non- narrative works, which generally stress nonlinear and/or abstract expression via form, color, and movement, the course also considers narrative and documentary films that utilize the experimental form to challenge, question, and problematize traditional kinds of cinematic storytelling. Through in-class workshops and assignments, students will learn the fundamentals of experimental film production, including shooting on/working with 16mm, hand-processing, darkroom techniques, etc. Students will produce three short-film exercises and a final film.

**07:211:375** ***Documentary Lab Production (3)***
In this course students will be working exclusively on projects developed at the Documentary Film Lab. As they craft advanced non-fiction film projects, students will learn - depending on the production schedule of projects at the Lab: pre-production, research methods, pre-conceptualization, methodologies of production, film portraiture, interviewing methods, non-fiction story structure, editing and post-production. Students will develop and refine their documentary filmmaking skills with support and direction from a faculty instructor.

**07:211:391** ***Advanced Directing I (4)***
This advanced course is designed to enable students to produce from conception to completion a short fiction film. In class, students will workshop every project through all the stages of production. Crew members for shoots can be drawn from within the course; each student is required to crew a minimum of 3 projects in addition to their directing project. An understanding of historical and aesthetic issues that have shaped the development of narrative film will comprise a significant part of the course. The class will consist of continuous feedback sessions throughout the development of each student's script, rough cut, and final cut.

**07:211:392** ***Advanced Directing II (4)***
In this advanced course, students enrolled in the course will complete a documentary film. In class, students will workshop every project through all the stages of production and discuss the general stylistic approach of each film. An understanding of historical and aesthetic issues that have shaped the development of documentary film will

comprise a significant part of the course. Students will participate in various dynamic feedback exercises, which will encourage intellectual and artistic investment in each other's projects. A collaborative spirit of participation and discussion is essential as students engage with each student's work and collectively develop critical viewing skills.

**07:211:491,492** ***Senior Thesis I,II (4,4)***
This two-semester culminating filmmaking workshop provides the framework and opportunity for senior B.F.A. film students to write, produce, direct, and edit a short thesis film. In this class, students will workshop every aspect of this project with student feedback. In the final semester, students will present their latest cut to faculty members for a thesis review panel. By the end of the semester, students will have produced, directed, and edited a short film that can be submitted to film festivals.

**07:211:495** ***Independent Study (1-4)***
In this independent study, students working on an individual project will have the chance to develop and refine their filmmaking skills with one-on-one support and direction from professional faculty. Students are offered supervision and instruction in all areas of filmmaking from technical to narrative structure as they craft their advanced film projects.

**07:211:498** ***D. Filmmaking Internship (3)***
Immerse yourself in the world of media through our internship course. This program offers students the opportunity to work alongside professionals at media companies, gaining valuable insights into the industry's operations. Enhance your understanding of production, marketing, and distribution in a collaborative, real-world environment. Develop the skills and connections in the media and entertainment sectors, allowing you to build a strong professional network and gain practical knowledge.

# Interdisciplinary 557 (MGSA)

## INTERDISCIPLINARY 557

**07:557:121** ***Introduction to Environmental Arts (3)***
Introduction to Environmental Arts Online is a three-credit, interdisciplinary course that examines the unique role Environmental Arts plays in tackling the conversations and complexities of our current planetary moment. Accompanied by a selection of content by thought leaders spanning the arts, humanities, and sciences, coursework encourages students to think critically about themes such as empathy, curiosity, sustainability, site-specificity, community, transformation, environmental justice, collaboration, and art-as-research. Multi-disciplinary studio assignments with fieldwork components and critiques offer practical application of course concepts and invite students to experiment with ways environmental arts can facilitate feelings, ideas, wisdom, and conversation.

**07:557:131** ***Introduction to Arts in Health (3)***
Introduction to Arts in Health is a three-credit, interdisciplinary course that explores the emerging, experimental field of Arts in Health. While there are many directions and priorities across the field, the National Organization for Arts in Health (known colloquially as NOAH) shares a definition that emphasizes the expansive field's focused "dedication to using the power of the arts to enhance health and well-being in diverse institutional and community contexts." Throughout the semester, students will study the historical and contemporary roles that art and creative work have played in fostering a culture of health and well-being, explore how arts and cultural policy can be

reconceived as health policy, and create art and cultural work that may contribute to good health. At the same time, we'll practice holding questions, dilemmas, tensions and disturbances present across our cultural industries that exacerbate harms to public health.

**07:557:141** ***Introduction to Arts Leadership (3)***
This course uses research, journalism, and case studies from multiple creative forms to discover and develop the universal technical skills, values, and structures that guide strong arts leaders. Whether it's artist entrepreneurs or cultural anchor institutions, the capacity, strength, and sustainability of the arts are based on leadership practices that adhere to inspired mission, creative practice, and innovative business principles. The best arts leaders identify and implement effective operating models inspired by creative values that effectively nurture arts practice, engage audiences, and maintain enthusiastic stakeholders, regardless of scope or scale.

**07:557:151** ***Mason Gross Interplay (1)***
Mason Gross Interplay is designed to introduce first-year students to the artistic disciplines represented in MGSA, to foster relationships between and within departments, and to help students develop the skills needed to collaborate.
***Graded pass/no credit. Required for all BFA/BM incoming first-year students. Optional for BFA/BM incoming transfer students.***

**07:557:201** ***Practical Finance for Entrepreneurial Creatives Online (3)***
The course teaches personal and entrepreneurial financial management concepts. It is designed for nonbusiness majors who have already commenced or are contemplating single- multi-person ventures.

# Music 700 (MGSA)

## MUSIC 700

**07:700:100** ***Fundamentals of Aural Skills (3)***
Intended for first-year Mason Gross music majors who did not place into Music Theory I and/or Aural Skills I. The course covers fundamentals of written music theory and ear-training skills including note reading, key signatures, major and minor scales, intervals, solfege, and melodic and rhythmic dictation.

**07:700:101** ***Introduction to Music (3)***
For students with little or no background in music. Basic concepts for intelligent listening to all kinds of music. Emphasis on aspects of sonority, rhythm, melody, harmony, and structure.

**07:700:102** ***Introduction to Music History (3)***
Introductory historical survey of styles, genres, forms, and composers in music from antiquity to the present.
***Prerequisite: 07:700:101 or 103 or equivalent.***

**07:700:103** ***Introduction to Music Theory (3)***
Rudiments of music: intervals, scales, key signatures, modes, chords, rhythm, and meter. Development of aural skills.
***No previous musical experience required. Intended for nonmajors.***

**07:100:104** ***Introduction to Music Analysis (3)***
Exploration of basic analytical techniques that reveal principles of musical structure; examples drawn from the medieval period through the 20th century; introduction to various types of music notation and score reading; further development of aural skills.
***Prerequisite: 07:700:103 or equivalent. Intended for nonmajors.***

**07:700:105** ***Making Music with Computers: Introduction to Digital Audio (3)***
An introduction to computer music technology with a focus on creative composition projects integrating studies in electronic music theory and history, digital signal processing (DSP), performance practice, and aesthetics.

**07:700:110** ***Introduction to Music Education (1)***
This introductory survey course is designed for undergraduate music education majors, or those considering adding music education, to explore various topics related to teaching, learning, and social issues in music education. Students will also challenge their positions and experiences, as well as the dominant narratives affecting their assumptions and beliefs about music teaching and learning. Those who are not currently music education majors but wish to add or change their major may interview with music education faculty at the end of the semester.

**07:700:121** ***Theory I (3)***
Model counterpoint and introduction to tonal harmony. For students intending to major in music.
***Prerequisite: Demonstrated understanding by entrance examination of rhythmic/pitch notation, intervals, scales, and key signatures. Corequisites: 07:700:123, 127.***

**07:700:122** ***Theory II (3)***
Tonal harmony through modulation.
***Prerequisite: 07:700:121***

**07:700:123-124** ***Aural Skills I,II (2,2)***
Intensive work in sight-singing; dictation of melody, rhythm, and harmony; score reading; and keyboard harmony.

**07:700:125** ***Survey of Jazz Styles (2)***
Historical and analytical survey of major jazz recordings from the 1920s to the present.
***Corequisites: 07:700:121, 123. For students intending to major in music.***

**07:700:127** ***Introduction to Music Technology (1)***
Fundamental skills in music technology: computer-based notation, MIDI sequencing, and digital-audio techniques.
***Corequisites: 07:700:121, 123. For students intending to major in music.***

**07:700:128** ***Music Education Technology (1)***
Fundamental skills in music education technology: computer-based notation, MIDI sequencing, and digital-audio techniques.
***Corequisites: 07:700:121, 123. For students intending to major in music education.***

**07:700:131** ***Introduction to Music Online (3)***
See 07:700:101.

**07:700:133** ***Introduction to Music Theory Online (3)***
See 07:700:103.

**07:700:134** ***Introduction to Music Theory Short Course Online (2)***
An intensive introductory study of music theory including the fundamental principles and concepts of music: pitch, rhythm and meter, notation, keyboard layout, scales, and keys.

**07:700:135** ***Making Music with Computers: Introduction to Digital Audio Online (3)***
An introduction to computer music technology with a focus on creative composition projects integrating studies in electronic music theory and history, digital signal processing (DSP), performance practice, and aesthetics.

**07:700:153-154** ***Advanced Aural Skills I,II (2,20)***
Advanced track of intensive work in sight-seeing; diction of melody, rhythm, and harmony; score reading; and keyboard harmony.
***Corequisites: 07:700:121-122. For students intending to major in music.***

**07:700:203** ***Musics and Cultures (3)***
An introduction to musics in diverse cultural contexts through readings, listenings, and analysis. Students will learn about traditional, popular, and protest music, examining them in consideration with issues of cultural transformation, socio-political environments, hybridity, gender, race, circulation, and technological mediation. Students will also examine music cultures in and around New Jersey. Through deep listening and reading, students will learn of diverse musical cultures, as well as develop musical vocabulary to critically engage with both familiar and unfamiliar sounds.

**07:700:210** ***Foundations of Music Education (3)***
Introduction to the historical and philosophical background for school music in the United States. Discussion of current practices and teaching roles at all grade levels and subjects. Includes field experience.
***For Mason Gross School of the Arts music education students only.***

**07:700:211,212** ***Studies in Music History (3,3)***
Musical styles and genres in different historical periods. May be repeated for credit with differing course content.
***Prerequisite: 07:700:101 or 103 or equivalent.***

**07:700:221** ***Theory III (3)***
Chromatic harmony of the 18th century.
***Prerequisites: 07:700:121,122; or equivalent.***

**07:700:222** ***Theory IV (3)***
Analysis of 20th-century music.
***Prerequisite: 07:700:221.***

**07:700:223-224** ***Aural Skills III,IV (2,2)***
Continued work in sight-singing; dictation of melody, rhythm, and harmony; score reading; and keyboard harmony.
***Corequisites: 07:700:221-222 or permission of instructor.***

**07:700:230** ***Music in Film Online (3)***
This course examines music created for film from both the historical and analytic perspectives. Topics covered include music of composers from the 1930s to the present.

**07:700:231,232** ***Special Topics Music History Online (3,3)***
See 07:700:211,212.

**07:700:233** *American Popular Song Online (3)*
Study of the evolution of music that is uniquely American from colonial days to the 1970s.

**07:700:234** *From Jazz to Hip-Hop: African-American Music in the 21st Century Online (3)*
The exploration of the relationship between jazz and other African-American musical traditions from the early 1900s to the present.

**07:700:235** *Rock and Roll: Origins to Present Online (3)*
The exploration of the history of rock-and-roll music from a wide array of perspectives, emphasizing the formation and development of the genre as the result of exchange and interaction across cultural, racial, and economic boundaries, as well as its role in social change.

**07:700:237,238** *Studies in Major Composers I,II (3,3)*
Studies of selected compositions by a major composer. Specific composer varies from semester to semester. May be repeated for credit with differing course content.
***Prerequisite: 07:700:101 or 103 or equivalent.***

**07:700:239** *Rock and Roll: Origins to Present Online Short Course (3)*
The exploration of the history of rock-and-roll music from a wide array of perspectives, emphasizing the formation and development of the genre as the result of exchange and interaction across cultural, racial, and economic boundaries, as well as its role in social change.

**07:700:241** *Studies of World Music Online (3)*
An introduction to the study of the intersection of music and culture as exhibited in diverse regions across the globe.

**07:700:242** *Country Music: A Cultural and Musical Survey Online (3)*
A study of country music's historical development including a thorough investigation of the cultural, social, and musical implications of country music's 21st-century resurgence.

**07:700:243** *Introduction to the History of Opera Online (3)*
An introduction to the operatic genre from the 17th century to the present day, this course explores how opera serves as a lens through which a variety of cultural, performative, and historical issues may be examined.

**07:700:247-248** *Jazz Theory I,II (3,3)*
Rudiments of jazz improvisation and composition: Lydian chromatic scales, jazz modes, seventh chords, rhythm, intervallic retention, and meter; sight-reading and dictation in jazz idioms.
***Prerequisites: 07:700:122 and 124.***

**07:700:253-254** *Advanced Aural Skills III,IV (2,2)*
Continued work in the advanced track of sight-singing; diction of melody, rhythm, and harmony; score reading; and keyboard harmony.
***Corequisites: 07:700:221-222.***

**07:700:261** *Vocal Technique for School Choirs (1)*
Fundamentals of singing; methods for class vocal instruction for elementary and high schools.
***Pre- or corequisite: 07:700:121 or examination. For Mason Gross School of the Arts music education students only.***

**07:700:263** ***School Music: String Instrument Techniques (1)***
Fundamentals of playing and teaching the string instruments; survey of materials for use in the schools.
***Pre- or corequisite: 07:700:121. For Mason Gross School of the Arts music education students only.***

**07:700:265** ***School Music: Woodwind Instrument Techniques (1)***
Fundamentals of playing and teaching the woodwind instruments of the orchestra and band.
***Pre- or corequisite: 07:700:121. For Mason Gross School of the Arts music education students only.***

**07:700:267** ***School Music: Brass Instrument Techniques (1)***
Fundamentals of playing and teaching the brass instruments of the orchestra and band.
***Pre- or corequisite: 07:700:121. For Mason Gross School of the Arts music education students only.***

**07:700:269** ***School Music: Percussion Instrument Techniques (1)***
Fundamentals of playing and teaching the percussion instruments of the orchestra and band.
***Pre- or corequisite: 07:700:121. For Mason Gross School of the Arts music education students only.***

**07:700:284** ***Digital Audio Composition (3)***
An introduction to the digital audio workstation as well as basic concepts of computer music, sound, and electroacoustic composition. Students will develop compositional skills through their own creative projects as well as the study of a wide range of electronic/computer music.
***Prerequisite: 07:700:105 or 127 or 135.***

**07:700:287** ***Choral Music Education Labaratory (1)***
Practical conduction and performance of repertoire for K-12 ensembles.

**07:700:290** ***Rock and Roll as Culture Phenomenon: History and Development of Rock and Related Genres (3)***
Survey of the influence of rock and roll with a focus on the artists and music that reflected and influenced American society.

**07:700:291** ***Jazz Appreciation (3)***
Survey of the relationships between jazz and other African-American musical traditions from the early 1900s to the present.

**07:700:292** ***Introduction to Musics of the World (3)***
An introduction to the study of the intersection of music and culture as exhibited in diverse regions across the globe.

**07:700:293** ***Introduction to Jazz Improvisation Online (2)***
Provides core theoretical and practical competency in jazz improvisation to meet basic expectations within the Mason Gross jazz curriculum. Principle topics include vertical and horizontal harmonic structures, aural recognition of intervals and chords, inversions, neighbor tones and embellishments, basic scales and modes, and their application in an improvised line.
***Intended for first-year jazz studies majors.***

**07:700:295,296** ***Special Topics in Music (3,3)***
Studies in musical genres such as symphony, concerto, or choral music; repertoires (music and theater or music since 1945); or cultures (American music, African-American music, music and society, or women and music). May be repeated for credit with differing course content.
***Prerequisite: 07:700:101 or 103.***

**07:700:301** *European Music Before 1800 (3)*
Study of styles and forms of Western music from antiquity to 1800.
***Prerequisite: 07:700:122. Intended primarily for music majors.***

**07:700:302** *European and American Music After 1800 (3)*
Study of styles and forms of Western music from 1800 to the present.
***Prerequisite: 07:700:122. Intended primarily for music majors.***

**07:700:305-306** *Evolution of Jazz (3,3)*
History of jazz. First semester: African and African-American origins to the 1930s; basics of improvisation; development of aural ability to distinguish forms and styles. Second semester: jazz of the 1940s to the present.
***Prerequisites: 07:700:122 and 124, or permission of instructor. Intended for Mason Gross School of the Arts jazz studies majors.***

**07:700:310** *Business of Music (2)*
Study of issues concerning entry into the music profession such as music publishing, professional management, ethics, and music publishing and recording.

**07:700:311** *Art of Production I: Recording (3)*
Study of the practical applications of recording technology: acoustics, microphones, audio consoles, and recording techniques. Through reading, listening, and hands-on projects, students will develop the necessary skills to record individual instruments and ensembles using both mono and stereo microphone techniques, as well as develop critical listening skills and the ability to aurally evaluate a variety of recording techniques from practitioners in the field.
***Prerequisite: 07:700:105 or 127 or 135.***

**07:700:312** *Art of Production II: Mixing (3)*
Study of the practical applications of digital audio editing and mixing, including principles of digital audio, advanced signal processing, advanced audio console/digital audio workstation skills, editing, mixing, and mastering. Through reading, listening, and hands-on projects, students will develop the necessary skills to edit, mix, process, and master stereo and multitrack recordings, as well as develop critical listening skills and the ability to aurally evaluate a variety of mixing and processing techniques in professionally produced recordings.
***Prerequisite: 07:700:311.***

**07:700:322** *Music Analysis (3)*
Analysis of music from different historical periods and culture.
***Prerequisite: 07:700:321.***

**07:700:323** *Aural Skills V (2)*
Work in sight-singing; dictation of melody, rhythm, and harmony; score reading; and keyboard harmony.
***Prerequisite: 07:700:222. Intended primarily for B.Mus. music education students.***

**07:700:329-330** *Conducting I,II (2,2)*
Fundamentals of conduction and organization of school choruses, bands, and orchestras.
***Prerequisite: 07:700:222.***

**07:700:341** *Orchestration I (2)*
Study and demonstration of instruments of the orchestra; writing idiomatically for individual instruments; scoring for small ensembles.
*Prerequisite: 07:700:222. Intended primarily for B.Mus. music education students.*

**07:700:342** *Orchestration II (2)*
Study of selected scores; writing for various ensembles and for symphony orchestra.
*Prerequisite: 07:700:341.*

**07:700:347-348** *Jazz Composition and Arranging (2,2)*
Fundamentals of jazz composition and arranging, beginning with arrangements for two or three winds and rhythm sections; and culminating in compositions and arrangements for large ensembles in early, modern, and popular jazz idioms.
*Prerequisites: 07:700:247-248 and 251-252.*

**07:700:353** *Advanced Aural Skills V (2)*
Advanced work in sight-singing; dictation of melody, rhythm, and harmony; score reading, and keyboard harmony.
*Prerequisite: 07:700:224 or 254.*

**07:700:371-372** *Jazz Improvisation I (3,3)*
Jazz techniques involving chord nomenclature, melodic development, turnbacks, cycles, the blues, scale coloring, rhythmic patterns, and harmonic concepts.
*Prerequisites: 07:700:247-248 and 251-252.*

**07:700:375** *Composition Practicum (1)*
A project-based course for undergraduate composition majors in collaboration with students from the dance, digital film, theater, and other departments.

**07:700:381** *Materials and Methods for General Music Education (3)*
A hands-on activity approach to classroom music programs. Conventional as well as Orff and Kodaly procedures. Fieldwork.
*Prerequisite: 07:700:210.*

**07:700:382** *Materials and Methods for Choral Music Education (3)*
Topics include the boy's changing voice, high school choral classes, instrumental music programs, and implications of the revised copyright law.
*Prerequisite: 07:700:210.*

**07:700:384** *Materials and Methods for Instrumental Education (3)*
Pedagogical techniques for instrumental music in K-12 curricula.
*Prerequisite: 07:700:210. Intended for music education majors.*

**07:700:386** *Instrumental Music Education Labaratory (1)*
Practical conducting and performance of repertoire for K-12 ensembles. Sections in choral and instrumental emphases offered in alternate years.
*Prerequisite: 07:700:210.*

**07:700:387** ***Choral Music Education Labaratory II (1)***
Practical conducting and performance of repertoire for K-12 ensembles. Sections in choral and instrumental emphases offered in alternate years.
***Prerequisite: 07:700:210.***

**07:700:389** ***Inclusive Learning in Music Online (3)***
Skills and techniques for teaching music to diverse student populations. Emphasis is on neurological, physical, and behavioral diversity, but other aspects of student diversity are also addressed. Strategies for teaching music in both inclusive and self-contained music classrooms.
***Prerequisite: 05:300:383. Corequisite: 07:700:381, 382, 383, 384 or 483.***

**07:700:390** ***Music Internship***
Music Internship is open to Bachelor of Music students who are in good academic standing and have completed 2 years of Applied Major Lesson. Internships may take place in organizations or companies whose work involves any of the following aspects of music: theory, musicology, publication, production, or performance. Scheduled internship hours may not interfere with other courses scheduled in the internship semester. Internship content and hours must be approved of and sponsored by the undergraduate coordinator, and the course may only be taken once.

**07:700:419,420** ***Special Studies in Music History (3,3)***
Intensive study of a single topic from a variety of perspectives; reading, discussion, and oral and written reports.
***Prerequisites: 07:700:301-302. Intended for music majors.***

**07:700:460** ***Special Topics: Instrumental Music Education (1)***
Selected topics related to instrumental music education. A variety of subjects will be taught on a rotating basis. May be repeated for credit with differing content.

**07:700:461** ***Special Topics: Advanced Vocal Techniques for School Choirs (1)***
Advanced techniques of vocal instruction for secondary and elementary school choirs. Intended for music education choral students only.
***Prerequisites: 07:700:210 and 261. Intended for music education majors.***

**07:700:463** ***Special Topics: Vocal Music Education (1)***
Selected topics related to K-12 vocal music education. A variety of subjects will be taught on a rotating basis. May be repeated for credit with differing content.
***Prerequisite: 07:700:210. Intended for music education majors.***

**07:700:464** ***Special Topics: Choral Literature for School Choirs (1)***
A study of choral literature appropriate for elementary, middle, and high school choirs. Focus on concert programming and repertoire selection for developmental, intermediate, and advanced school choirs.
***Prerequisites: 07:700:210 and 07:701:300. Intended for music education majors.***

**07:700:467** ***Special Topics: Jazz for Music Educators (1)***
Techniques, repertoire, and resources for teaching instrumental jazz in secondary schools.
***Prerequisite: 07:700:210. Intended for music education majors.***

**07:700:468** *Scoring for Film and Visual Media (3)*
Introduction to the production and compositional techniques required for film and other visual media. Students will also gain a basic understanding of film scoring history through readings and in-class screenings.
*Prerequisite: 07:700:284.*

**07:700:469** *Interactive Computer Music (3)*
Students will develop systems for interactive computer music composition and performance as well as gain practical, hands-on experience with real-time digital signal processing, sound synthesis, and basic programming culminating with a final performance/presentation of a concert-length piece or installation.
*Prerequisite: 07:700:105 or 127 or 135 or permission of instructor.*

**07:700:470** *Electroacoustic Music Instrumental Design (3)*
Students will develop skills in acoustic/electroacoustic musical instrument design, acoustics, and physical properties of materials, as well as design and construct electroacoustic musical instruments, developing skills in basic electronics, circuit design, sensors, electro-mechanical transduction, human-computer interaction, and interface design culminating with a performance featuring these invented instruments.
*Prerequisite: 07:700:105 or 127 or 135 or permission of instructor.*

**07:700:471-472** *Jazz Improvisation II (3,3)*
Jazz techniques exploring forms in jazz from 1925 to the present; the study of cadences; the Lydian chromatic concept as applied to defining specific devices and as manifested in various compositions.
*Prerequisites: 07:700:371-372.*

**07:700:477** *Special Topics: Directing the School Musical (1)*
Techniques, literature, and resources for staging productions of musical theater, jazz, and show choir in the secondary school.
*Prerequisite: 07:700:210. Intended for music education majors.*

**07:700:478** *Special Topics: Marching Band (1)*
Techniques of designing marching band routines.
*Prerequisite: 07:700:210. Intended for music education majors.*

**07:700:479** *Special Topics: Wind Ensemble Literature (1)*
*Prerequisite: 07:700:210. Intended for music education majors.*

**07:700:480** *Clinical Practice II: Seminar (1)*
Examination of problems relevant to contemporary elementary and secondary music education. Concerns relevant to student teaching emphasized. Opportunity to address problems encountered while student teaching.
*Corequisite: 07:700:487. Open only to students in a teacher education program who have been admitted formally to student teaching.*

**07:700:483** *Clinical Practice I: Seminar (1)*
Examination of problems relevant to contemporary elementary and secondary music education, to process what is learned during the part-time student teaching placement, preparation for full-time student teaching and the required certification portfolio (edTPA).
*Corequisite: 07:700:484.*

**07:700:484** ***Clinical Practice I (4)***
Part-time student teaching in approved schools under the supervision of members of the faculty.
***Corequisite: 07:700:483.***

**07:700:487**
Full-time student teaching in approved schools under the supervision of members of the faculty.
***Corequisite: 07:700:480. Open only to students in a teacher education program who have been admitted formally to student teaching.***

**07:700:493,494** ***Independent Study (BA,BA)***
Supervised research in music composition, education, history, or theory.
***Prerequisite: Permission of instructor.***

**07:700:495** ***Senior Honors Tutorial (3)***
***Prerequisite: Permission of department.***

# Applied Music 701 (MGSA)

## APPLIED MUSIC 701

Applied Music 701 (MGSA)

## Applied Music Elective Courses

## Applied Music Elective Courses

**07:701:251** ***Bassoon Reed Making (1)***
Elective weekly class providing instruction in bassoon reed making techniques and tools.

**07:701:252** ***Oboe Reed Making (1)***
Elective weekly class providing instruction in oboe reed making techniques and tools.

Applied Music 701 (MGSA)

## Ensembles

## Ensembles

Participation in all ensembles requires an audition or permission of the instructor.

**07:701:301** ***Helix! (1)***
A small ensemble that performs music of the 20th and 21st centuries, including newly written works by composers in the Rutgers graduate composition program.

**07:701:303** ***Rutgers Baroque Players (1)***
An ensemble dedicated to the performance of Baroque music.

**07:701:304** ***Rutgers Interactive Music Ensemble (1)***
An ensemble incorporating technology including laptops, controllers, sensors, and robots with acoustic instruments.

**07:701:307** ***Rutgers New Music Workshop (1)***
An ensemble intended for undergraduate composition majors to learn and work on various skills related to their original compositions and undergraduate performers who wish to play contemporary music.

**07:701:308** ***Rutgers University String Ensemble (1)***
An ensemble which studies and performs chamber orchestra repertoire without a conductor.

**07:701:311,312** ***Rutgers University Kirkpatrick Choir (1,1)***
A select mixed choir that surveys and performs a broad spectrum of music, sacred and secular, from all periods. Occasional performance of large works with orchestra.

**07:701:313,314** ***Rutgers University Collegium Musicum (1,1)***
A small ensemble dedicated to the performance of Renaissance music.

**07:701:319,320** ***Rutgers Chamber Jazz Ensemble (1,1)***
Study and performance of jazz for small mixed instrumental ensembles.

**07:701:321,322** ***Rutgers Jazz Ensemble I (1,1)***
Exploration and performance of traditional and contemporary jazz for a large ensemble.

**07:701:323,324** ***Rutgers Symphony Orchestra (1,1)***
Study and performance of major orchestral repertoire.
***Registration for this ensemble is for string students only.***

**07:701:325,326** ***Rutgers Percussion Ensemble (1,1)***
Study and performance of music for percussion ensemble.

**07:701:327,328** ***Rutgers Brass Ensemble (1,1)***
Study and performance of the literature for brass ensemble. Emphasis is placed on mastering the principles of brass playing within an ensemble.

**07:701:330** ***Rutgers Concert Band (1)***
Study and performance of music for concert band. Emphasis on improving performance skills.

**07:701:331,332** ***Rutgers Jazz Ensemble II (1,1)***
Exploration and performance of traditional and contemporary jazz for a large ensemble.

**07:701:333,334** ***Rutgers University Voorhees Choir (1,1)***
A soprano/alto choir that performs music of all periods and styles; regularly tours.

**07:701:337** ***Rutgers Marching Band (1)***
Study of precision marching techniques and other skills relating to the football band. Performance at university football games and other events.

**07:701:338** ***Rutgers Pep Band (1)***
Wind/percussion band that plays at sport team events.

**07:701:339,340** ***Rutgers University Choir (1,1)***
A mixed choir that performs music of all periods and styles. Occasional performance of large works with orchestra.

**07:701:343,344** ***Rutgers Symphony Band/Rutgers Symphonic Winds (1,1)***
Study and presentation in concert of major works for wind band. Emphasis on performance techniques.

**07:701:345,346** ***Rutgers Symphony Orchestra/Rutgers Wind Ensemble (1,1)***
Study and presentation in concert of major works for wind ensemble. Emphasis on performance techniques.
***Registration for this ensemble is for brass/woodwinds/percussion students only.***

**07:701:347,348** ***Rutgers Sinfonia (1,1)***
Study and performance of orchestral repertoire.

**07:701:349,350** ***Rutgers University Glee Club (1,1)***
Study and performance of music for tenor/bass voices.

**07:701:353,354** ***Opera Workshop (1,1)***
Study and performance of operatic literature.

**07:701:355,356** ***Chamber Music (1,1)***
Study and performance of music for small mixed instrumental ensembles.

**07:701:401** ***Introduction to Instrumental Studio Teaching (1)***
Instruction and practice in teaching one's own instrument in individual lessons, with guidance from instructors about methods and repertoire for developing specific components of playing at various levels (beginner, intermediate, advanced). Guidance in the establishment and maintenance of the business of a private studio, including bookkeeping, communication, resources, professional organizations, etc.

**07:701:419,420** ***Chamber Jazz Ensemble (1,1)***
Study and performance of jazz for small mixed instrumental ensembles.

**07:701:455,456** ***Chamber Music (1,1)***
Study and performance of music for small mixed instrumental ensembles.

Applied Music 701 (MGSA)

# Performance Study

# Performance Study

Permission for Instrumental/Voice Lessons and Applied Major Lessons are by audition only. Bachelor of music (B.M.) students, depending on the area of concentration and their class year, receive 1, 2, or 3 credits per semester. Bachelor of arts (B.A.) students receive 1 or 2 credits per semester.

**First Year**

07:701:100 Music Assembly (N1) Required of all bachelor of music students during each semester of full-time enrollment. Grade based on attendance.

07:701:103 Instrumental/Voice Lesson (1)

07:701:159 Classroom Piano I (1)
*Beginners only. Priority given to music majors.*

07:701:160 Classroom Piano II (1)
*Priority given to music majors.*

07:701:175,176 Applied Major Lesson: first-year-level

07:701:204 Secondary Lesson, Alternate (1)
*Intended for composition majors.*

**Second Year**

07:701:100 Music Assembly (N1) Required of all bachelor of music students during each semester of full-time enrollment. Grade based on attendance.

07:701:201-202 Diction for Singers (1,1)
The study of pronunciation of Italian, French, German, and English as applied to singing, utilizing the International Phonetic Alphabet. *07:700:201 is a prerequisite of 07:701:202.*

07:701:203 Music Education Secondary Lesson (1)
*Intended for music education majors.*

07:701:204 Secondary Lesson, Alternate (1)
*Intended for composition or music education majors.*

07:701:259 Classroom Piano III (1)
*Priority given to music education majors.*

07:701:260 Classroom Piano IV (1)
*Priority given to music education majors.*

07:701:275,276 Applied Major Lesson: second-year-level

**Third Year**

07:701:100 Music Assembly (N1) Required of all bachelor of music students during each semester of full-time enrollment. Grade based on attendance.

07:701:302 Vocal Coaching (1) Required for third-year undergraduate vocal performance majors, this course supplements Applied Major Lessons and includes the exploration and coaching of vocal repertory involving interpretation of music and text, historical context, and diction.

07:701:351-352 Art of Accompanying (1,1) Study of ensemble techniques for pianists. Performance with singers and instrumentalists.

07:701:357 Acting for Singers (2) Improvisation and exercises to free the body and imagination, to develop acting skills. Basic stage technique, terminology, tools for determining circumstance, action, and intention using monologues, arias, and scene work.

07:701:358 Stage Movement for Singers (1) Focus on the study of rhythm, coordination, movement vocabulary, dance positions, partner work and stage representation while incorporating Opera dance forms such as the Minuet, Waltz, Gavotte, Pas de Basque, Polonaise, etc. Readings from texts will reinforce studio class work, as well as historical background of movement.

07:701:375,376 Applied Major Lesson: third-year-level

**Fourth Year**

07:701:100 Music Assembly (N1) Required of all bachelor of music students during each semester of full-time enrollment. Grade based on attendance.

07:701:400 Senior Recital (0)

07:701:401 Introduction to Instrument Studio Teaching (1)
Supervised by the appropriate faculty, senior performance majors study pedagogical methods and materials and teach private lessons to nonmajors or music education students learning a secondary instrument. *Open only to senior bachelor of music performance majors, except by special permission. This is a two-semester requirement. Instrumental majors other than percussion and piano take one semester of Introduction to Instrumental Studio Teaching (07:701:401) and one semester of the Instrumental Techniques course in their area.*

07:701:402 Vocal Coaching (1) Required for fourth-year undergraduate vocal performance majors, this course supplements Applied Major Lessons and includes the exploration and coaching of vocal repertory involving interpretation of music and text, historical context, and diction.

07:701:407-408 Contemporary Performance Seminar (1,1)
Study and performance of contemporary music.

07:701:413,414 Percussion Pedagogy (1,1)
Supervised by the appropriate faculty, senior performance majors study pedagogical methods and materials and teach private lessons to nonmajors or music education students learning a secondary instrument. *Open only to senior bachelor of music performance majors, except by special permission. 07:701:413 is a prerequisite to 07:701:414.*

07:701:415,416 Voice Pedagogy (2, 2)
In the first semester, senior performance majors study pedagogical methods and materials; in the second semester, students review methods and materials and, supervised by the appropriate faculty, teach private lessons to nonmajors or music education students learning a secondary instrument. *Open only to senior bachelor of music performance majors, except by special permission. 07:701:415 is a prerequisite to 07:701:416.*

07:701:451-452 Studio Accompaniment (1,1)
Piano accompaniment in a vocal or nonpiano instrumental studio studying the repertoire of the student with whom the accompanist is paired. *Prerequisites: Four semesters of large ensemble and 07:701:351, 352.*

07:701:459,460 Keyboard Pedagogy (1,1)
Supervised by the appropriate faculty, senior performance majors study pedagogical methods and materials and teach private lessons to nonmajors or music education students learning a secondary instrument. *Open only to senior bachelor of music performance majors, except by special permission. 07:701:459 is a prerequisite to 07:701:460.*

07:701:475,476 Applied Major Lesson: fourth-year-level

07:701:499 Individual Study (BA)

# Theater Arts 966 (MGSA)

## THEATER ARTS 966

**07:966:103** *Theater Colloquium (0)*
Theater Homeroom is a multidisciplinary weekly event that includes: sharing of ideas, information, and inspirations; professional and academic panels and workshops; guest artists; discussions and performances.
***Attendance is mandatory and the course is taken for pass/fail credit. Open to 966 majors only. Course repeated.***

**07:966:105** *Drawing Practice: Theater Design (2)*
This course is an exploration into drawing techniques for both lighting and scenic design. Scenic, Lighting, and Production students will learn to "see" better, by the use of simple exercises that employ the conditions of visual reality transferred to the flat surface by flat planes and straight lines. Model Fee associated with course.
***Prerequisite: Open only to 966 design majors or by permission of instructor. Course repeated for credit.***

**07:966:106** *Drawing Practice: Theater Design (2)*
The goals of this course are to provide students with specific drawing and media experiences that build the skills necessary to render costume illustrations and concept presentations that meet industry standards. They will obtain the artistic techniques essential to designing costumes for theatre, television, and film. They will gain experience communicating their ideas both visually and verbally.
***Open to 966 majors only.***

**07:966:123** *Theater Practice (2)*
Sections include assignments in one of the production shops: set, lighting, and costume or a run crew assignment on one show. Attending one MGSA strike is mandatory in the semester. A minimum of 90 hours is required to pass the course, but some production running assignments may require up to 150 hours.
***Two semesters are required for all 966 production majors and B.A. theater majors.***

**07:966:124** *Theater Practice for Designers and Actors (1)*
This course allows the students to experience different areas of the Production experience including the production shops, backstage crew, or understudying on one show. This is a lab course that must be taken twice consecutively covering one full academic year. For B.F.A. Design & Production majors, over the course of the year, they will be assigned 1 run crew assignment and spend 7 weeks in each of the 3 production shops: Scene Shop, Costume Shop, & Light Shop. For the B.F.A. Actors, over the course of the year, they will be assigned to work crew on one show and understudy on one show.
***Two semesters are required for all 966 designers and one majors.***

**07:966:132** *Auditioning (1)*
Discussions, demonstrations, practices and exercises will develop an awareness and ownership of the habits consistent with strong audition technique.
*Open to 966 majors only.*

**07:966:135** *On Camera Acting I (2)*
This course introduces the skills necessary to work as an actor in the film and television industry. Students will gain a greater understanding of the tools and techniques used to tell visual stories, the actors' role in the filmmaking process and a greater appreciation for the cinematic arts overall.
*Open to 966 majors only.*

**07:966:201** *Production Planning (3)*
We will explore the role of the Technical Director, this will include this history of the job, communication with the creative team, other departments and the scene shop staff; time management; and leadership and other skills necessary for the successful execution of a scenic design. The class will work in a progression from the designer's concept to closing.
*Open to 966 majors only.*

**07:966:202** *Stage Management Forum (1)*
This class is set up as a series of full Stage Management Area seminars designed to give students an opportunity to unpack their thoughts about stage management as well as discuss topical stage management-related readings and theater industry news. Most discussion topics are not determined in advance of the semester's onset, in an effort to hold space for topics to arise.
*Open to 966 majors only.*

**07:966:209** *Introduction to Stage Lighting Technology (2)*
This class teaches basic skills in Stage Electrics to prepare the student to work in Theatre production safely and effectively. Through hands-on exercises and quizzes, students will learn standard professional practice in Stage Lighting and gain an understanding of this area theatrical production. Students will be prepared to move on to more advanced levels of training in Stage Lighting if interested.
*Open to 966 majors only.*

**07:966:215** *Introduction to Design (3)*
Introductory course in basic theatrical design and production, as well as an exploration of both the elements and the principles of design and promotion of conceptual and divergent thinking. Lectures cover a wide range of topics relating to the technical and aesthetic aspects of designing scenery, costumes, and lighting for the stage; lab periods will be utilized to learn technical skills and to put the information covered in the lectures into practice.
*Open only to 966 design and production majors or by permission of instructor.*

**07:966:216** *Introduction to Design (3)*
The second semester of Introduction to Design focuses on research and the realized set, costume, and lighting design process for one complete design project.
*Prerequisites: 07:966:215. Only open to 966 production majors or by permission of instructor.*

**07:966:219** ***Introduction to Scenic Construction (2)***
Students will be taught techniques and terminology that will prepare them for working in a scene shop; constructions of scenic elements will be covered. Working with power tools and learning the basics of theatrical scenery construction while working safely and in a timely fashion.
***Only open to B.F.A. students or by permission of instructor.***

**07:966:220** ***Advanced Scenic Construction (2)***
This course serves as a continuation and enhancement of the basic concepts covered in Introduction to Scenic Construction. The fall semester will delve deeper into rigging techniques and systems, intermediate millwork and joinery, and welding.
***Prerequisites: 07:966:219. Only open to 966 students or by permission of instructor.***

**07:966:222** ***Auditioning II (2)***
Discussions, demonstrations, practices and exercises will develop an awareness and ownership of the habits consistent with strong audition technique.
***Prerequisites: 07:966:132. Open to 966 majors only.***

**07:966:225-226** ***Voice & Speech I (2,2)***
Introducing the practices of developing one's vocal mechanism and speech skills to apply to acting and performance.
***Open to 966 acting students only.***

**07:966:230-231** ***Movement I (2,2)***
Basic development of the body for the stage.
***07:966:230 is a prerequisite for 07:966:231. Open only to 966 acting students.***

**07:966:232-233** ***History of Costume and Décor I-II (2,2)***
This introductory research course explores the major cultural ideas, events, and styles from antiquity through the 21st century--how ideas travel through history being adopted, adapted, then accessed and acknowledged by theatrical artists is the foundation of our work in this course. We engage in multidimensional exploration of both material and nonmaterial culture, as well as an appreciation of aesthetics from both around the globe and throughout history will be introduced. Lectures and lab work will utilize a range of research methods. Student researchers will begin to develop not only a foundational knowledge of global architecture, dress, and objects, they will learn to thoughtfully, question and synthesize the ideas and concepts used to create identity, narrative, and culture while applying these findings within their own theatrical disciplines.
***Open to 966 design and production students or by permission of instructor.***

**07:966:235** ***On Camera Acting II (2)***
This course teaches skills necessary to work as an actor in the film and television industry.
***Open to 966 majors only.***

**07:966:242** ***Introduction to Stage Lighting (2)***
A seminar/lab course discussing and applying stage lighting practices. The course is focused on the technologies used in entertainment lighting design. Topics include: theatrical lighting fixtures, optics, photometrics, color theory, programming computer light boards, practical lighting skills, script analysis, research, and theoretical design.
***Open only to 966 theater majors or by permission of instructor.***

**07:966:244** *Elements of Design I (3)*
In this class students look at text analysis from the point of view of production preparation and process (from page to stage), giving strategies for how to read a play effectively, finding foundations for choices, understanding character and atmosphere in the context of the whole play, as well as methods for addressing the needs of different genres, playwrights and theatrical texts.
*Open only to 966 design and production majors.*

**07:966:245-246** *History of Architecture and Decorative Arts (2,2)*
This is an introductory course on basic period styles. Weekly lectures introduce vocabulary and main points of identification, along with field trips to the Cloisters, Metropolitan Museum of Art, Frick Collection, and other museums where students do sketch assignments covering appropriate historical periods. Students are responsible for all public transportation and entrance fees.
*Open only to 966 design majors or by permission of instructor. Prerequisites: 07:966:215-216.*

**07:966:249** *Iintroduction to Stage Management (3)*
This course is designed to introduce students to core stage management concepts.
*Open to 966 and BA Theater majors as availability allows. Priority given to Stage Management majors.*

**07:966:250** *Fundamentals of Stage Management (3)*
This course is designed to ensure that first year student stage managers understand the essentials of script analysis and common stage management tasks from the perspective of all members of a stage management team, with an emphasis on the connection between these tasks and the stage manager's role as communicator, leader, and facilitator.
*Prerequisites: 07:966:249. Open to 966 majors only.*

**07:966:251** *Fundamentals of Drafting (3)*
Fundamental skills in technical drawing and stagecraft techniques.
*Open only to 966 design and production majors or by permission of instructor.*

**07:966:257** *Accents I (1)*
This course introduces the student actor to all relevant topics regarding accents for performance, including tangible and abstract components of accents, the relationship between accent and identity, as well as the historical context surrounding performance, language standardization and accent. Throughout the semester, the student actor will apply these aspects of accent work to a monologue in an accent other than their own.
*Open to 966 majors.*

**07:966:260** *Stage Management Beyond Theater (1.5)*
This course is designed to expand the conversation about stage management beyond the major focus of theater practice.
*7 week minicourse. Open to 966 majors only.*

**07:966:261** *Intimacy Coaching in Theater (1.5)*
This course is designed to provide the stage manager with an understanding of the techniques and safety measures employed when staging intimacy. Through both discussion and practical learning, we will establish how to create and maintain the safe and equitable room needed for this work. We will explore the spectrum of staging emotional and physical intimacy, choreography building, theatrical effects, interdepartmental collaboration, and safety issues.
*7 week minicourse. Open to 966 majors only.*

**07:966:268** *Opera and Production (3)*
This class is an introduction to opera for students coming from a theatre background. The course will cover opera as a unique performing art form (its history, structure, composers, and varied styles) as well as its culture, process, and theatrical/technical aspects. Extensive listening and viewing of audio and video recordings will be used to provide examples of the form. Attendance at a final dress rehearsal at the Metropolitan Opera House in NYC will be arranged as part of the course.
*Open to 966 majors only or by permission of instructor.*

**07:966:271-272** *Acting I (3,3)*
The first year is the student's introduction to an immersive conservatory environment. Students will have the opportunity to explore their inner emotional life and develop a personal point of view, as well as a solid technique through which to express that point of view. This structure allows the student to become intimately acquainted with their own instrument and how they process and experience things in the imaginary world. All of the first year work is about the actor as a unique individual, working as themselves under imaginary circumstances.
*Open only to 966 acting students.*

**07:966:274** *Costume Construction (2)*
This is an introductory course where you will learn fundamental sewing skills that are used in constructing costumes for theater. The course begins with learning both hand sewing and machine sewing techniques. Once you have completed a sample binder displaying these skills you will construct a ballet bodice utilizing the techniques covered earlier and further expand on your costume construction skills to include cutting, uses of flatlining, boning and more advanced sewing techniques.
*Open to 966 design and production majors or by permission of instructor.*

**07:966:277** *Production Properties (2)*
This course is an introduction to the world of stage properties. The class will cover responsibilities, paperwork, research, programs, and additional duties typically performed by a prop master, as well as focusing on creating props by using different materials commonly found in prop shops.
*Course fee to cover materials. Open only to 966 design and production majors or by permission of instructor.*

**07:966:280** *Introduction to Production Management*
A production manager is the person who oversees the creation of the production from beginning to end; this includes people, resources, facilities, money, calendar, the list goes on. Simply put by Jay Sheehan, "The goal of a production manager is to make sure the project happens on time, on budget, safely and with everyone speaking to each other in the end."
*Open to 966 majors only.*

**07:966:305** *Advanced Stage Lighting Technology (2)*
Technical and mechanical aspects of stage lighting including electrical theory, practical wiring, equipment maintenance, and safety practice. Applications to stage, film, and touring situations.
*Open to 966 majors. Prerequisites: 07:966:209 or 07:966:242 and permission of instructor.*

**07:966:306** *Aesthetics of Space (3)*
The Aesthetics of Space is an interdisciplinary and immersive exploration of the sensory and philosophical aspects theatrical spaces in various historical and cultural contexts. This course delves into the intricate relationship between human perception, spatial design, and the creation of meaningful environments. This course is designed to

deepen your understanding of how the physical environment and spatial context contribute to the storytelling and artistic expression.
*Open to 966 majors and BA Theater 965 majors/minors only.*

**07:966:308** *Introduction to Projection Design (3)*
Introduction to Projection Design is a broad overview of the discipline of projection design in live performance. Topics covered will include modes of projection design and conceptualization process, content creation, and playback systems. Students will breakdown scripts, create storyboards, and build sample pieces of content during the semester, culminating in a final project.
*Open to 966 majors only.*

**07:966:309-310** *Costume Design I (3, 3)*
Costume Design I is the first step in developing an understanding and appreciation for the art of costume design. Through a series of weekly projects, exercises, and discussions, students begin to understand and employ the concepts and vocabulary of the basic design elements and principles and how it applies to character driven theatrical design. Studying groundbreaking theatrical costume designers, both historical and contemporary, students will begin to understand their place in the costume continuum while embarking on a journey toward developing their own unique and individual style of creating costume sketches and renderings. Student work will be presented each week for constructive feedback from the professor and fellow classmates.
*Open only to 966 design and production majors or by permission of instructor.*

**07:966:311** *Draping I (3)*
In this course, students will obtain a basic knowledge of pattern drafting based on draping to an individual, starting with the dress form and fitting it to a specific body. The text we will be using focuses on feminine-presenting bodies. We will use draping techniques to learn pattern manipulation for garments post-1920s.
*Prerequisite: 07:966:390. Open only to 966 design and production majors or by permission of instructor.*

**07:966:312** *Draping II (3)*
The objective of this course is to focus on the fit of clothing and costumes to individuals. You will learn how to identify fit issues in a fitting setting and how to correct the pattern. Bias construction, flat-patterning, working with stretch, and giving direction will be explored.
*Prerequisites: 07:966:311. Open only to 966 design and production majors or by permission of instructor.*

**07:966:313-314** *Set Design I (3,3)*
This course is an introduction to the set designer's role in the creation of a theatrical design. Through analysis and interpretation of dramatic prompts and text, we will fully explore the scenic design process. This will include the technical skills necessary to conceptualizing and realizing the design including: model-making, drawing, drafting, and the presentation of design ideas in addition to script analysis, research and dramaturgy. Students will also examine the work of scenic designers that have made a significant impact on the field of theatrical design.
*Open only to 966 design majors or by permission of instructor.*

**07:966:315** *Principles of Stage Management (3)*
The course is designed to build on the foundation of stage management essentials through a process of elaboration and expansion, continuing to explore the evergreen question: how do stage management building blocks function in practice in the field at each stage of production?
*Open only to 966 stage management students or by permission of instructor. Prerequisites: 07:966:249-250.*

**07:966:316** *Scene Painting (2)*
Scene Painting uses specific projects to introduce you to the traditional skills of Theatrical Scene Painting. The exercises progress in complexity, using perspective drawing of architecture and landscape, grid and scale layout, color mixing and matching of hue and value; various "broken color" texture techniques such as spraying, spattering, and glazing, as well as basic wood grain and marble techniques. The principles of Trompe l'oeil painting are introduced: using bamboos and straight edges for 'lining' to create the illusion of dimensional molding, the concept of a 45° light source, and directional shadows. As time permits, simple aging techniques may also be explored.
*Open to 966 majors only.*

**07:966:317** *On Camera III (2)*
This course teaches skills necessary to work as an actor in the film or television industry.
*Prerequisites: 07:966:235. Open to 966 majors only.*

**07:966:323** *Theater Practice (BA)*
This is a B.F.A. lab course that expands the students' experience in their concentration as a vital part of the construction crew in either the Scene, Costume, or Electrics Shops.
*Prerequisite: 07:966:124. Not open to first-year students. The course is repeated.*

**07:966:325-326** *Acting II: Technique (3,3)*
Scene study and the basis of characterization. To discover and explore: the various styles and approaches as it applies to performance. Reinforcing the training from the first year in the program. Consistent habits for breaking down and studying a script. To become conversant about the profession.
*Prerequisites: 07:966:271-272. Open only to B.F.A. II actors.*

**07:966:327-328** *Voice & Speech II (2,2)*
The goal of this semester is for the actor to explore their own instrument. All levels of voice production are covered through daily warmups and rehearsals for a new play. The student will learn to lead the warmup for the company. We will work with monologues and scenes where the actor will explore their body, sound, and effect in the space. We will also explore physical risk in order to expand vocal and physical range and its relationship to emotional vulnerability. The vocal and physical vigor of the course will stretch limitations and deepen our connection with our body, voice, and presence in the space. The semester draws from other techniques such as Fitzmaurice, Lecog, Lessac, Clown, Linklater, Bartenieff, and Skinner.
*Prerequisites: 07:966:225-226. 07:966:327 is a prerequisite for 07:966:328. Open only to B.F.A. II actors.*

**07:966:331-332** *Devising (2,2)*
Discussions, demonstrations, practices and exercises will develop an awareness and ownership of the habits consistent with developing and creating new works.
*Open to 966 majors only. Prerequisites: 07:966:325-326.*

**07:966:333-334** *Movement II (2,2)*
Emphasis on stage challenges such as period movement; use of objects; awareness of space, energy, and time. Use of the body to develop characterization.
*Prerequisites: 07:966:230-231, 07:966:333 is a prerequisite for 07:966:334. Open only to B.F.A. II actors.*

**07:966:335-336** *Costume Design II (3,3)*
This is an upper level course for graduating costume designers and technicians. In this course, we continue the application of methods, materials, and techniques used in the creative storytelling process. Character analysis,

costume research and rendering, and fabric swatching will be the focus, providing students with a working understanding of the theatrical design process as well as the essential skills needed to design costumes for live performance.
*Open only to 966 design majors or by permission of instructor. Prerequisites: 07:966:309-310.*

**07:966:339-340** *Technical Direction I & II (3,3)*
Principles and practice of Technical Direction and the role of the Technical Director within the context of a collaborative process.
*Prerequisites: 07:966:220, 07:966:339 is a prerequisite for 07:966:340. Open only to 966 production and design majors.*

**07:966:343-344** *Fundamentals of Lighting Design (3,3)*
Basic theory and practice of lighting design including script analysis, physics of light and color, and light plots.
*Prerequisites: 07:966:242. Open only to 966 design and production majors or the permission of instructor.*

**07:966:347** *Design Collaboration (3)*
This is an advanced course in theatrical design in which design students of all concentrations (scenic, costume and lighting) will be asked to complete projects in collaboration with each other and a visiting director. Students will work in teams to create a fully developed and holistic design for a specific production and space.
*Open to 966 majors only. Prerequisites: 07:966:310 or 07:966:314 or 07:966:344.*

**07:966:350** *Fabric Dyeing (2)*
Covers the basics of fabric dyeing including color matching; ombre; shibori; resist-dyeing; fabric painting; and distressing using union dyes, fiber specific dyes, and fabric paint. Safety issues and concerns will also be addressed.
*Open only to 966 design majors or by permission of instructor.*

**07:966:351** *Costume Crafts (2)*
This course will introduce the student to each of the areas of costume crafts, which include but are not limited to a variety of materials. Millinery basic techniques may also be explored.
*Open only to 966 design majors or by permission of instructor.*

**07:966:358** *Portfolio Preparation (1)*
This course prepares the B.F.A. design student to present themselves and their design work in the professional portfolio formats required by the industry. Team-taught by members of the design faculty, the student is guided in resume preparation, cover letter writing, business cards, and digital portfolio creation. In this course, students will either start a new portfolio or update a current portfolio. This will include completing an online website portfolio and a digital portfolio.
*Open only to 966 design majors.*

**07:966:359-360** *Directed Study (BA,BA)*
This course allows students to work and study on a project independently which provides the opportunity to develop and refine their theater skills with one-on-one support and direction from professional faculty.
*Open only to 966 majors with permission of concentration adviser.*

**07:966:361** *Sound Technology for the Theater (2)*
Basic theory and practice for use of sound in the theater. Fees: cost of media.
*Prerequisites: 07:966:215-216 or permission of instructor. Open to 966 majors only.*

**07:966:371** *Script Analysis for Actors (2)*
The ability to read and analyze a script is essential to the theatre-maker. In this class, we explore and apply the fundamental dramaturgical tools needed to move from the page to the stage. The goal of the course includes--distinguishing the architecture of diverse dramatic works; identifying the types and uses of stage directions; recognizing and activating punctuation, silences and pauses; learning to tell the difference between atmosphere and mood; understanding how to discern and express character through textual clues; and determining the most effective research methods required by a variety of texts.
*Open only to 966 students or by permission of instructor.*

**07:966:372** *Advanced Text: Dramatic Structure (2)*
Course builds on concepts and skills learned in Script Analysis for Actors and applies them to close reads of two dramatic works and an intensive reading of two others, enabling the actor to get the most out of the first readings of a play. How do different works demand different or similar approaches? What is the nature and function of research in the artistic process?
*Open only to 966 students or by permission of instructor.*

**07:966:390** *Advanced Costume Construction (3,3)*
This hands-on course is a continuation of Costume Construction and teaches the basic skills and terminology that are used in costumes. Throughout the semester students will learn advanced hand- and machine-sewing techniques used to stitch historical and modern costumes.
*Prerequisite: 07:966:274. Open only to 966 design majors or permission of instructor.*

**07:966:403-404** *Voice & Speech III (2,2)*
Continuing intermediate level practice of voice and speech, as well as the beginning of advanced work. Depending on need, various texts may be used during class, including monologues, scenes, poetry, and text from current production assignments. Introduction to extreme voicing, technical skills in voice modulation, working in variable venues, and adjustment of personal process to meet changeable production demands. The course will explore how artistic choices, including genre, medium, style, and other aesthetic considerations, influence use of voice and speech skills. Students will demonstrate high levels of consistency in their application of voice and speech skills from prerequisite courses, including: strong vocal and physical range, emotional vulnerability, and deep connection with vocal and physical presence. Development of stamina and sustainable practice/process will continue through vigorous in-class work. This is the fifth semester in a multi-year curriculum of voice and speech.
*Open to 966 majors only. Prerequisite: 07:966:327-328. 07:966:403 is a prerequisite for 07:966:404.*

**07:966:405-406** *Acting III (3,3)*
Advanced scene study. In this course, Acting Majors will study and perform scenes from Contemporary and Modern plays, with a focus on American Playwrights.
*Prerequisites: 07:966:325-326, 07:966:405 is a prerequisite for 07:966:406. Open to 966 majors only.*

**07:966:407** *Scene Painting II (2)*
Advanced techniques in scene painting.
*Prerequisite: 07:966:316. Open only to B.F.A. students or by permission of instructor.*

**07:966:408** *Projection Design II (3)*

**07:966:410** ***Stage Combat (1)***
Course geared for directors and stage managers on the physical aspects of stage violence from unarmed fighting to the use of weapons. Emphasis on safety.
***7 week minicourse. Open to 966 majors only.***

**07:966:411** ***Production Techniques (3)***
This is a required lab course that expands the student's experience in their concentration as a vital part of the construction crew in either the Scenic, Costume, or Electrics Shops.
***Open only to 966 design and production majors. Prerequisite: 07:966:323. Course repeated.***

**07:966:417-418** ***British Art and Culture (3,3)***
British history, art, and architecture studied on site as part of Rutgers' Conservatory at in London to provide historical, social, and religious contexts for Shakespeare's plays.
***Open only to 966 students studying in London.***

**07:966:419-420** ***Topics in Technical Direction (BA,BA)***
This course serves to further expand the knowledge of concepts needed to work as a Technical Director. The course will include laboratory and independent research. There will be a number of projects that each student will need to independently take to completion, using the tools and skills that have been learned as a Technical Direction Student
***Open only to 966 students or by permission of instructor. Prerequisites: 07:966:219-220.***

**07:966:422** ***Production and Design Projects (BA)***
Realizing production design in the areas of costumes, sets, sound, and lights, as assigned by the faculty.
***Course may be repeated for credit. Open only to 966 design and production majors.***

**07:966:423** ***Stage Management (3)***
The course is designed to build on the foundation of stage management essentials established in 'Principles of Stage Management' (07:966:315) through a process of elaboration and expansion, continuing to explore the evergreen question: how do stage management building blocks function in practice in the field at each stage of production?
***Prerequisite: 07:966:315. Open only to 966 stage management majors.***

**07:966:424** ***Stage Management Projects (BA)***
Production work assigned by semester in a stage management role. Production work may be on a Theater Department production or outside the Theater Department (e.g. with Dance or Music, as common but not exclusive examples). Production work assigned by the Head of Stage Management is the only production work that will count toward course credit.
***Open only to 966 stage management majors. Prerequisite: 07:966:315.***

**07:966:425** ***Acting IV (4)***
Advanced acting technique and preparation for the profession.
***Prerequisites: 07:966:325-326. Open only to 966 acting students.***

**07:966:427-428** ***Shakespeare's Plays in Context (3,3)***
Intensive study at Rutgers' Conservatory of Shakespeare's Globe in London of 20 classical Shakespearean plays over the course of a year.
***Open to 966 students studying in London.***

**07:966:430** *Performance (BA)*
Student-generated performance projects consisting of a variety of public and workshop performances.
*Open to 966 acting majors only.*

**07:966:431-432** *Movement III (2)*
Emphasis on time periods, including but not limited to Elizabethan, Baroque, and Victorian. Use of the body to develop characterization.
*Prerequisites: 07:966:333-334, 07:966:431 is a prerequisite for 07:966:432. Open to 966 majors only.*

**07:966:443-444** *Advanced Stage Management (3,3)*
This class explores the stage manager's process with a focus on the science, art, and skills of stage management. Activities in and outside of the classroom will be utilized in fine-tuning a stage manager's ability to intuit the varying needs of a project, organize themselves accordingly, create effective and efficient schedules, run tech, and support the artistic process.
*Open only to 966 stage managers. Prerequisite: 07:966:423.*

**07:966:447** *Draping III (3)*
In this course, students learn how to replicate period gowns prior to the 1920s by draping and flat-patterning techniques. This will include the construction of one complete finished set of period undergarments and period gowns in muslin.
*Open to 966 majors only. Prerequisites: 07:966:312.*

**07:966:448** *Millinery (2)*
To learn the basics of millinery using beginning techniques of patterning and constructing hats with a variety of materials including: fabric, wire, buckram, felt, and straw.
*Open to 966 majors only.*

**07:966:451** *Tailoring (3)*
Students will obtain a basic knowledge of tailoring techniques by constructing men's suits. This will include patterning, fitting to an individual, and constructing a suit jacket.
*Open to 966 majors only. Prerequisites: 07:966:312.*

**07:966:455** *Costume History Seminar (3)*
In-depth study of western period clothing with emphasis on primary research sources. This course explores how costume designers interpret historical research. We will synthesize world events, cultural history, and relationships between dress, identity, economics, social history, and technology. We will use the visual, applied, and performing arts in order to gain insight into the design process and how historical garments have been represented in different periods in history.
*Open only to 966 design students or by permission of instructor. Prerequisites: 07:966:232-233.*

**07:966:456** *Costume History Seminar (3)*
This is an upper level seminar course for B.F.A. costume designers and technicians. A detailed study of western dress specifically focuses on the study garments, styles, trends and influences of the 18th- 21st century. The study of the garments, their history and fashion theory will guide us. In this current age of information, knowledge is abundant, and yet the acquisition and interpretation of historical sources through research continues to elude the developing and ever discerning eye of early career costumers. Ideas, styles have always been adopted, and adapted,

yet the acknowledgment has not. Utilizing a broad range of research methods, student researchers will develop and present their findings, on the many ways clothing aids in presentation of identity and narratives.
*Open only to 966 design students or by permission of instructor. Prerequisites: 07:966:455.*

**07:966:460** *Scene Design II (3)*
This is an advanced course in Set Design, in which students will be asked to complete a semester-long project designing a large scale (multi-scene) opera. The course will culminate in the presentation of a finished 1/4" scale model along with a drafted master floor plan, scene-by-scene floor plans, and CL section drawings.
*Prerequisites: 07:966:313-314. Open only to 966 design majors.*

**07:966:464-465** *Lighting Design I (3,3)*
Students undertake lighting design projects and prepare instrumentation and light plots for critique.
*Prerequisites: 07:966:343-344, 07:966:464 is a prerequisite for 07:966:465. Open only to 966 design majors.*

**07:966:467** *Advanced Stage Management Project (BA)*
Production work assigned by semester in a stage management role. Production work may be on a theater department production or outside the theater department (with the dance or music departments, as common but not exclusive examples). Production work assigned by the Head of Stage Management is the only production work that will count toward course credit.
*Open only to 966 majors.*

**07:966:468-469** *Computer Drafting I (2,2)*
Object-based computer drafting using industry standard computer programming including but not limited to Vectorworks and AutoCAD.
*Open only to 966 design and production majors.*

**07:966:470** *Computer Illustration I (2)*
Digital Rendering and Costume Design introduces students to the Adobe Photoshop computer program, as a tool for illustration and graphic design. This course will provide instruction on the basic operations of the program, as well as specific graphic design techniques used to create costume design illustrations.
*Open only to 966 design and production majors.*

**07:966:471** *Computer Illustration II (2)*
Computer illustration programs including PhotoShop for scenic and lighting rendering.
*Open only to 966 design and production majors.*

**07:966:473-474** *Production Practicum (BA,BA)*
Senior project or internship arranged with specialty adviser and production student adviser.
*Open only to 966 production students.*

**07:966:476** *Video/Auditioning (1)*
On-camera acting and auditioning techniques.
*Open to 966 acting majors only.*

**07:966:480** *Auditioning/Career Transition (1)*
Preparation for graduating actors in the business of business.
*Open only to 966 acting students.*

**07:966:483** ***Advanced Topics in Stage Management (3)***
By taking this course, students will study advanced topics in stage management and learn about the real world (i.e., non-academic) context in which our work takes place: including union membership and inter-union relationships, and the nuances of freelancing and interviewing. The student stage manager will complete this course ready for graduation and entry into the work force.
***Prerequisites: 07:966:444. Open to 966 majors only.***

**07:966:488-489** ***Computer Drafting II (2,2)***
Advanced computer drafting using industry standard computer programming including but not limited to Vectorworks.
***Prerequisites: 07:966:468 or 07:966:469. Open to 966 majors only.***

**07:966:490-491** ***Acting in London (12,12)***
Classical acting and voice training, British culture, and literature in residence at Rutgers' Conservatory at Shakespeare's Globe in London program.
***Open only to 966 acting students studying in London.***

**07:966:492** ***Theater Design in London (12)***
Classical design training for the theater, British culture, and literature in residence at Rutgers' Conservatory in London program.
***Open only to 966 design students studying in London.***

**07:966:496** ***Professional Development Seminar (1)***
Students are provided with a comprehensive integration of career development approaches, entrepreneurial strategies, and explorations of regional, national, and global markets, movements, and players.
***Open only to 966 majors.***

# Administration (MGSA)

## ADMINISTRATION

Jason Geary, Dean

Ellen Bredehoft, Associate Dean for Academic Affairs

Annabelle Luu, Associate Dean for Finance and Administration

Marshall Jones, Associate Dean for Equity

# Faculty (MGSA)

## FACULTY

Faculty (MGSA)

# Department of Art & Design

# Department of Art & Design

**Chair:** Jacqueline Thaw

**Associate Chair:** Hanneline Røgeberg

**Professors:**

Gerry Beegan, M.A., Middlesex (UK)

Natalie Bookchin, B.A., SUNY (Purchase); M.F.A., School of the Art Institute of Chicago

Barbara Madsen, B.F.A., Brigham Young; M.F.A., Drake

Hanneline Røgeberg, B.F.A., San Francisco Art Institute; M.F.A., Yale

Stephen Westfall, B.A., M.F.A., California (Santa Barbara)

John Yau, B.A., Bard College; M.F.A., Brooklyn College

**Associate Professors:**

Atif Akin, B.S., M.Sc., Middle East Technical (Ankara, Turkey)

Marc Handelman, B.F.A., Rhode Island School of Design; M.F.A., Columbia

Steffani Jemison, B.A., Columbia; M.F.A., School of the Art Institute of Chicago

Julie Langsam, B.F.A., SUNY (Purchase); M.F.A., Queens College

Miranda Lichtenstein, B.A., Sarah Lawrence; M.F.A., California Institute of the Arts

Jeanine Oleson, B.F.A., School of the Art Institute of Chicago; M.F.A., Rutgers

Jacqueline Thaw, B.A., Brown; M.F.A., Yale

**Assistant Professors:**

Heather Hart, B.F.A., Cornish College of the Arts; M.F.A., Mason Gross School of the Arts, Rutgers

Sue Huang, B.S., Georgetown University; M.F.A., University of California, Los Angeles (UCLA)

Cheon Pyo Lee, B.F.A., The School of the Art Institute of Chicago; M.F.A., Yale, School of Art

Mark McKnight, B.F.A., San Francisco Art Institute; M.F.A., University of California, Riverside

Didier William, B.F.A., Maryland Institute College of Art; M.F.A., Yale

**Tepper Endowed Chair:**

Chat Travieso, B.F.A., Maryland Institute College of Art; M.A., Yale

Faculty (MGSA)

# Department of Dance

# Department of Dance

The Department of Dance is a member of the National Associate of Schools of Dance.

**Chair:** Gerald Casel

**Associate Chair:** Barbara Angeline

**Professors:**

Gerald Casel, B.F.A., The Juilliard School; M.F.A., Wisconsin (Milwaukee)

Jeffrey Friedman, B.A.Arch., Oregon; C.L.M.A., Utah; Ph.D., California (Riverside)

**Associate Professors:**

John Evans, B.A., Western Washington; M.A., Ohio State

Chien-Ying Wang, B.F.A, Northern Illinois; M.F.A., Ohio State

**Assistant Professors:**

Ani Javian, B.A., Connecticut College; M.F.A., Ohio State

Alessandra Williams, B.A., Macalester College; M.A., Ph.D., California (Los Angeles)

**Associate Professors of Professional Practice:**

Frederick Curry, B.A., Alabama; M.A., New York; C.M.A., Laban/Bartenieff Institute of Movement Studies (New York)

**Assistant Professors of Professional Practice:**

Cristina Marte, B.F.A., Montclair State; M.A., New York

**Assistant Teaching Professors:**

Barbara Angeline, B.A., California (Irvine); M.A., New York

Pam Tanowitz, B.F.A., Sarah Lawrence College; M.F.A., Ohio State

Faculty (MGSA)

# Department of Music

# Department of Music

The Department of Music is a member of the National Association of Schools of Music.

**Director:** Amanda Eubanks Winkler

**Associate Director:** Maureen Hurd

**Graduate Adviser:** Robert Grohman

**Undergraduate Advisor:** Ellen Leibowitz

**Distinguished Professor:**

George B. Stauffer, Musicology; B.A., Dartmouth; M.A., Bryn Mawr; M.Ph., Ph.D., Columbia

Nancy Yunhwa Rao, Music Theory; B.A., National Taiwan Normal; M.M., Ph.D., Michigan

**Professors:**

Robert Aldridge, Composition; B.A., Wisconsin (Madison); M.M., M.M.A., New England Conservatory; Ph.D., Yale

Ralph Bowen, Jazz Saxophone; B.M., M.M., Rutgers; A.D., Indiana

Amanda Eubanks Winkler, Musicology; B.M., Illinois State; M.A., Ph.D, University of Michigan

Conrad Herwig, Jazz Trombone; B.A., Goddard; M.A., Queens

Kynan Johns, Conducting; B.M., Elder Conservatorium (Adelaide, Australia); M.M., Sydney Conservatorium, Rubin Academy

Douglas Johnson, Musicology; B.A., Goddard; M.A., Ph.D., California (Berkeley)

Min Kwon, Piano; B.M., Curtis Institute of Music; M.M., D.M.A., The Juilliard School

**Associate Professors**

Stephanie Cronenberg, Music Education; B.M.E., Wingate; M.A., Maryland (College Park); Ed.M., Harvard; Ph.D., Illinois (Urbana-Champaign)

Christopher Doll, Music Theory and Composition; B.A., Case Western Reserve; M.M., Cincinnati Conservatory; Ph.D., Columbia

Barbara González-Palmer, Piano; B.M., Oberlin Conservatory of Music; M.M., The Juilliard School

Ching-Chun Lai, Director of Orchestral Activities and Engagement; M.M., New England Conservatory; D.M.A., Wisconsin-Madison

Maureen L. Hurd, Clarinet; B.M., Iowa State; M.M., M.M.A., D.M.A., Yale

Todd Nichols, Director of University Bands and Athletic Bands, Music Education and Wind Bands; B.A., College of New Jersey; M.M., Messiah; D.M.A., Rutgers

Judith Nicosia, Voice; B.M., Ithaca; M.M., Indiana

Jonathan Spitz, Cello; B.M., Curtis Institute of Music

Joseph Tompkins, Percussion; B.M., Eastman School of Music; M.M., Manhattan School of Music

Brandon Williams, Director of Choral Activities; B.A., Western Illinois; M.M.Ed., Illinois (Urbana-Champaign); D.M.A., Michigan State

Kraig Alan Williams, Wind Ensemble and Aural Skills; B.M., California State (San Bernardino); M.M., California State (Northridge); D.M.A., Texas (Austin)

**Assistant Professors:**

Julia Baumanis, Wind Bands; B.M., M.M., Ph.D., Florida State

Nicholas Chong, Musicology; B.A., Yale; M.M., Cincinnati; M.A., M.Ph., Ph.D., Columbia

Kenneth DeCarlo, Trumpet; B.M., Manhattan School of Music

Robert Grohman, Piano; B.M., B.A., Northwestern; M.M., Mannes School of Music; D.M.A., Rutgers

Scott Ordway, Music Theory; B.A., Puget Sound; M.M., Oregon; Ph.D., Pennsylvania

Marjoris Regus, Music Education; B.M., M.M., The University of Utah

Marc Stasio, Jazz Piano, Composition and Arranging, Jazz Studies; B.M., Berklee College of Music; M.M., Rutgers

Kristen Wallentinsen, Music Theory; B.M., Arizona; M.M., Massachusetts (Amherst); Ph.D., Western Ontario

Shelley Zhang, Ethnomusicology; B.Mus., M.A., University of Toronto; Ph.D., Pennsylvania

**Instructors:**

Karina Bruk, Piano; B.M., M.M., Manhattan School of Music; D.M.A., Rutgers

Mikhaela Mahony, Director of Opera, B.A., Barnard, M.F.A., Columbia

**Part-Time Faculty:**

Andrew Adelson, Oboe; B.M., M.M., Juilliard School

Anthony Alms, Graduate Studies; B.A., University of Wisconsin-Eau Claire; M.M., Boston; Ph.D., City University of New York

Robert Ameen, Jazz Drums; B.A., Yale

Alan Baer, Tuba; B.M., Cleveland Institute of Music

Noreen Baer, Trombone; B.M., M.M., California State (Long Beach); D.M.A., Southern California

Robert Bernotas, Jazz Appreciation; B.A., Rutgers; M.A., Ph.D., Johns Hopkins

Anthony Branker, Jazz Studies; B.A., Princeton; M.M., Miami; Ed.M., Ed.D., Columbia

Abe Burton, Jazz Saxophone; B.M., The Hartt School

David Chapman, Musicology, B.M., Rhode Island; M.M., Yale; Ph.D., Rutgers

Yun Kyung Choo, Classroom Piano; B.M., M.M., The Juilliard School; G.P.D., Peabody; D.M.A., Rutgers

Andrea Christie, Performance Studies; B.M., British Columbia; M.M., D.M.A., SUNY Stony Brook

Sooyun Chung, Vocal Studies; B.M., Oberlin; M.M., University of Cincinnati College Conservatory of Music

Tim Cobb, String Bass; B.M., Curtis Institute of Music

Paul Cohen, Saxophone; B.M., Baldwin-Wallace; M.M., D.M.A., Manhattan School of Music

Paul Conrad, Classroom Piano; B.M., M.M., Rutgers

Kenneth Davis, Jazz Bass and Jazz History; B.A., Northeastern Illinois; M.A., Rutgers

Mark Dover, Clarinet; B.M., Michigan; M.M., Manhattan School of Music

Melissa Dunphy, Composition; BM.M., West Chester; Ph.D., Pennsylvania

Orin Evans, Jazz Piano; B.M., Rutgers

Bart Feller, Flute; B.M., Curtis Institute

Kathleen Foster, Viola; B.M., University of Utah; M.M., Mannes

Solomon Guhl-Miller, Musicology, B.M., M.M., Peabody, Ph.D., Rutgers

Amanda Harberg, Composition; B.M., M.M., The Juilliard School; Ph.D., Rutgers

Kaoru Hinata, B.M., Northwestern; M.M., A.D., Yale

Nathan Hughes, Oboe; B.M., Cleveland Institute of Music; M.M., The Juilliard School of Music; Metropolitan Opera Orchestra

Sungwon Hwang, Aural Skills; B.M., M.M., Eastman School of Music; D.M.A., Rutgers

Mark Hyczko, Aural Skills; B.A., B.M., Rutgers; M.M., Mannes College of Music

Taina Kataja-Urrey, Voice; B.M., Sibelius Academy (Finland); Diploma, Hochschule für Musik und Darstellende Kunst (Austria)

Ahran Kim, Classroom Piano; B.M., New England Conservatory; M.M., Manhattan School of Music

Dawn Kotoski-Shicoff, Voice; B.M., M.M., Manhattan School of Music

Louis Levitt, String Bass; B.M., A.D., Cincinnati Conservatory of Music

Victor Lewis, Jazz Drums, Nebraska

Alex Lough, Music Technology, M.M., Florida

David Martin, Music Education; B.A., Rutgers; M.M., Northwestern; Doctoral Studies, Eastman; D.M.A., Rutgers

Jessica Morel, Aural Skills; B.M., Indiana; M.M., University of Nevada Las Vegas; D.M.A., North Texas

Angelique Mouyis, General Music Studies; B.M., M.M., University of the Witwaterstrand, Johannesburg; M.F.A., New York University; Ph.D., Rutgers

Leah Gale Nelson, Violin, B.M., Roosevelt University, Chicago Musical College; M.M., Mannes

Alex Norris, Jazz Trumpet; B.M., Peabody; M.M., Manhattan School of Music; D.M.A., Miami

Roger Nye, Bassoon; B.M., Eastman School of Music; M.M., Southern California, School of Music

Louie Ocampo, Vocal Studies; M.F.A., Ohio State

MyungJin Oh, Musicology, B.M., Academic Musical College of the Moscow State Conservatory; M.M., Manhattan School of Music; D.M.A., Rutgers

Hirono Oka, Violin; San Francisco Conservatory; Curtis

Daniel Panner, Viola; B.A., Yale; A.D., Curtis Institute; M.M., The Juilliard School; D.M.A., CUNY

David Peel, Horn; B.M., M.M., Miami

John Perry, Piano; B.M., M.M., Eastman School of Music

Todd Phillips, Violin; B.M., The Juilliard School

Susan Quittmeyer, Voice; B.M., Illinois Wesleyan; M.M., Manhattan School of Music

Anthony Rideout, Music Education, M.A., Montclair; D.M.A., Rutgers

Sasha Romero, Trombone; B.M., Baylor; M.M., Rice

Gregg Rossetti, Percussion; B.A., Muhlenberg; M.A., Montclair State; Ph.D., Rutgers

Carol Sharar, Strings; B.M., Montclair State; M.M., William Paterson

John Sheppard, Trumpet; B.M., Manhattan School of Music

Leelanee Sterrett, Horn; B.M., Wisconsin (Madison); M.M., Yale

Dave Stryker, Jazz Guitar

Ian Sullivan, Percussion; B.M., Michigan; M.M., The Juilliard School

Brennan Sweet, Violin; B.M., A.D., Indiana

André Tarantiles, Harp; B.M., M.M., Indiana

Mark Timmerman, Bassoon; B.M., Curtis Institute

Michael Truesdell, Percussion; B.M., Lawrence; M.M., D.M.A., The Juilliard School

Timothy Urban, Aural Skills; B.S., M.S., M.M., SUNY (Binghamton); M.F.A., Sarah Lawrence; M.A., Ph.D., Rutgers

Vladmir Valjarevic, Piano; B.M., M.M., Mannes School of Music; P.S.D., Geneva Conservatory (Switzerland); D.M.A., Rutgers

Jessica Valiente, Jazz Studies; B.A., Barnard College, Columbia; M.A., D.M.A., The Aaron Copland School of Music, Queens College, The City University of New York

Aaron VanderWeele, Euphonium; LTCL, Trinity College London

Jennifer Wharton, Bass Trombone; B.M., New England Conservatory

David Wolfson, Theory; B.M., Cleveland Institute of Music; M.A., Hunter; Ph.D., Rutgers

Michael Zavorskas, Music Technology; B.A., Stevens Institute of Technology; M.M., Rowan

Zhuo Zhao, Theory; B.A., M.A., Inner Mongolia; M.M., New England Conservatory

Carmit Zori, Violin; B.M., Curtis Institute

Faculty (MGSA)

# Department of Theater

# Department of Theater

**Chair:** David Gordon

**Associate Chair:** Christopher Cartmill

**Director of Design and Production:** Jenn Stauffer

**Head of Acting:** Cameron Knight

**Head of Costume Design:** Valerie Marcus Ramshur

**Head of Costume Technology:** TBD

**Head of Dramaturgy:** Christopher Cartmill

**Head of Lighting Design:** Don Holder

**Head of Scenic Design:** Lee Savage

**Head of Stage Management:** Anne McPherson

**Head of Technical Production:** Jenn Stauffer

**Head of M.F.A. Playwriting:** Kathleen Tolan

**Professors:**

David Esbjornson, B.A., Gustavus Adolphus; M.F.A., New York

Don Holder, B.S., Maine; M.F.A., Yale; Honorary Doctor of Arts, Muhlenberg

Marshall Jones III, B.A., Rutgers; M.A., New York

**Associate Professors:**

Ellen Bredehoft, B.F.A., Idaho; M.F.A., Boston

Christopher Cartmill; B.A., Washington and Lee; M.F.A., Virginia

David P. Gordon, B.F.A., New York

Cameron Knight, B.F.A., Rutgers; M.F.A., Maryland

Valerie Marcus Ramshur, B.A., Bennington; M.F.A., New York

Jenn Stauffer, B.A., Macalester

Kathleen Tolan, B.A., SUNY (Empire State); M.F.A., Brooklyn

**Assistant Professors of Professional Practice:**

Deb Jackel, B.F.A., Rutgers

Danielle Liccardo-Massood, London Academy of Music and Dramatic Art

Anne McPherson, B.A., Reed ; M.F.A., Yale

Lee Savage, B.F.A., Rhode Island School of Design; M.F.A., Yale

Ann-Louise Wolf, B.F.A., UNCSA; M.F.A., with Distinction, Royal Central School of Speech and Drama

**Lecturers:**

Karen Alvarado, B.A., Texas A&M Corpus Christi; M.F.A., Rutgers

Jen Ash, B.A. & B.S., University of Texas at Austin

Valeria A. Avina, B.A., Graceland; M.F.A, Iowa

Kyle Bahl, B.F.A., University of Nevada; William Esper Studio

Shane Ballard, Fashion Institute of Technology

Jeff Bender, B.F.A, Michigan

William Carden, St. Lawrence, Brandeis

Elizabeth Hope Clancy, B.A., William and Mary; M.F.A., Yale

Chris Cragin-Day, B.A., Oklahoma Baptist; M.F.A., Baylor

David Dannenfelser, B.A., William Paterson; M.A., New York; M.F.A., Sarah Lawrence

Colleen Dolan, B.F.A., Rutgers

Kate Douglas, B.F.A., New York

Jerilyn Jurinek, B.A., School of the Art Institute of Chicago; M.F.A., Columbia

Jessica Kahkoska, B.A., Northwestern

John Keller, B.A., Holy Cross; M.F.A., Rutgers

Joleen Addleman Loyd, B.F.A., University of North Carolina School of the Arts

Kasson Marroquin, B.F.A., University of North Texas; M.F.A., University of California San Diego

Pat McCorkle, B.A., Rutgers; M.A., New York

David Murin, B.F.A., New York

John Narun, B.F.A., Northwestern

Greg Perri, B.A., Binghamton; M.F.A., Rutgers

Sari Ruskin, B.A., M.A., City College of New York; Ph.D., Long Island

Alexandra Speith, B.F.A., Carnegie Mellon

Cat Tate Starmer, M.F.A., Yale

Denise Wagner, B.F.A., Suny (Purchase); M.F.A., North Carolina (Chapel Hill)

Christine Whalen, B.A., Rutgers

Shannon White, B.F.A., Rutgers

Antu Yacob, B.A., Minnesota-Duluth; M.F.A., Rutgers

**Professors Emeriti:**

Lee Blessing, B.A., Reed; M.F.A., Iowa

Eileen Blumenthal, B.A., M.A., Brown; Ph.D., Yale

F. Mitchell Dana, B.F.A., Utah State; M.F.A., Yale School of Drama

William Esper, B.A., Case Western Reserve; Neighborhood Playhouse School of the Theater; teaching training with Sanford Meisner

Vickie Esposito, B.A., Rutgers; M.F.A., Minnesota

John Jensen, B.S., Oregon; Pratt Institute and Lester Polakof School of Stage Design

Virginia Johnson, B.S., Moorhead State; M.A., Bowling Green

Kevin Kittle, B.A., Caldwell; M.F.A., Rutgers

Eric Krebs, B.A., M.A., Rutgers

Barbara Marchant, B.A., Fort Wright; teaching training with William Esper

Joseph F. Miklojcik Jr., B.S., Northwestern; M.A., Connecticut

R. Michael Miller, B.F.A., M.F.A., Washington

Amy Saltz, B.A., Wisconsin

Faculty (MGSA)

# Rutgers' Conservatory in London

# Rutgers' Conservatory in London

## Rutgers' Acting Conservatory at Shakespeare's Globe in London

**Director:** Cameron Knight

**Director in Residence:** Philip Cumbus

**Instructors:**

Sam Adams, Dramatherapist

David Antrobus, Theater Criticism

Joseph Atkins, Singing, Composer and Musical Directing

Jimmy Garnon, Global Performance Practice

Anna Healey, Movement

Cory Hippolyte, Text and Monologues

Federay Holmes, Acting

Abi Kessel, Intimacy Director

Gemma Maddock, Voice

Kate Maravan, Meisner Technique

Huw Prall, Wester European Historical Dance

Senior Globe Research Lecturer, Texts and Contexts

## Rutgers' Design Conservatory in London

**Program Director:** Michael Pavelka

**Art and Design Co-Directors:** James Perkins & Victoria Smart

**Instructors:**

Sam Adams, Dramatherapist

David Antrobus, Theater Criticism

David Farley, Technical Design Support

Sally Ferguson, Project Lighting Design

Prema Mehta, Project Lighting Designer

Richard Sharples, Visual Art

Karen Shannon, Millinery

Jenny Tiramani, Director of The School of Historical Dress

Will Tosh, Texts and Contexts

Faculty (MGSA)

# Filmmaking Faculty

# Filmmaking Faculty

**Chair:** Patrick Stettner,  M.F.A., Columbia

**Professors:**

Caroline Key, M.F.A., California Institute of the Arts

Danielle Lessovitz, M.F.A., New York (Tisch School of the Arts)

Shawn Snyder, M.F.A., NYU (Tisch School of the Arts)

**Documentary Film Lab Director:**

Thomas Lennon, B.A., Yale

# History and Aims of the School (PHARM)

## HISTORY AND AIMS OF THE SCHOOL

The Ernest Mario School of Pharmacy was founded in 1892 as the New Jersey College of Pharmacy by a group of citizens dedicated to the interest of pharmacy. It was incorporated into Rutgers University in 1927. The college was housed at various locations in downtown Newark, and, after 1925, in its own building in north Newark. During these years, most students lived at home and commuted to classes. In 1971, the college was relocated to the Busch Campus in Piscataway, adjacent to the Robert Wood Johnson Medical School and also near the Library of Science and Medicine and other buildings related to the basic sciences at Rutgers University. In December 2001, the school was renamed from the College of Pharmacy to the Ernest Mario School of Pharmacy in recognition of the many significant contributions and achievements of alumnus Ernest Mario and to reflect the fact that the school only offers a doctoral professional degree. Ernest Mario is a 1961 graduate of the school and is recognized as one of the most distinguished executives in the pharmaceutical industry.

Today, the school accommodates both resident students (housed at one of the residential campuses in the New Brunswick area) and commuters. Under either arrangement, pharmacy students have access to all cultural and other extracurricular activities within the university.

The six-year, professional degree curriculum for the doctor of pharmacy (Pharm.D.) is structured to educate and prepare men and women for practicing the profession of pharmacy in the community, medical institutions, organized health care facilities, or the pharmaceutical industry by developing high levels of theoretical comprehension and professional skill required for competence in each of these areas. In addition, the Pharm.D. program is designed to create independent thinkers and problem solvers who know how to communicate and counsel health care professionals and patients and who are knowledgeable in all aspects of drug therapy.

The curriculum offers a combination of courses in the biological, physical, and social sciences and the humanities, and an expansive variety of new clinical field experiences, which is the hallmark of the program. Finally, because the pharmacist functions in the context of contemporary society, the curriculum is shaped to develop in the student a sensitivity to the socioeconomic, ethical, and legal aspects of professional life, and an appreciation of the artistic and cultural currents of modern civilization.

These objectives are realized through a balanced program of study in chemical biology, clinical pharmacy, pharmacy practice and administration, pharmaceutical chemistry, pharmaceutics, pharmacology, the natural and social sciences and the humanities, and a structured clinical experience program.

# The Pharmacy Profession (PHARM)

## THE PHARMACY PROFESSION

Pharmacy is a health care profession concerned with the management of drug therapy in patients, the compounding and dispensing of medications, and the generation and transmission of knowledge about the proper selection and use of drugs and their effects on humans and animals.

Pharmacists in their role as managers of drug therapy work with physicians, patients, and health care providers to ensure effective treatments, particularly for such chronic diseases as asthma, hypertension, and diabetes, by collaborating on medication choices, educating and assisting patients with drug usage, tracking patient progress, and monitoring drug-therapy outcomes.

While everyone is familiar with the community pharmacist, the general public is less aware that career openings also exist in industrial and hospital pharmacies, government agencies, and education, as well as in nursing homes, health maintenance organizations, clinics, home health care agencies, governmental agencies, and nuclear pharmacies.

The community pharmacist serves patients directly as a vital part of total health care. Patients may obtain prescription service, medicines, surgical supplies, immunizations, and information and advice in pharmacies located in almost every town and city.

The modern hospital employs pharmacists who are responsible for establishing an efficient system for managing and providing drug therapy to patients throughout the institution. Hospital pharmacists are increasingly a critical member of the health care team and are involved in the clinical management of drug therapy, consultation, providing drug information to physicians and nurses, designing and preparing special dosage regimens for patients, and counseling patients directly about the proper utilization of their medication.

Many pharmacists are employed by the pharmaceutical industry, serving as scientists and supervisors in research, sales, marketing, and drug information. Others teach and conduct research in colleges of pharmacy, and increasing numbers work for state and federal law enforcement agencies, the military, the U.S. Public Health Service, and the Veterans Administration.

# Advantages at Rutgers (PHARM)

## ADVANTAGES AT RUTGERS

For students who wish to prepare for one of the many exciting pharmaceutical careers, Rutgers University offers many advantages. The Ernest Mario School of Pharmacy is located on a modern, attractive suburban campus, surrounded by the university's golf course, the Robert Wood Johnson Medical School, the School of Public Health and the university's major science departments. Student housing, a campus student center, and the Library of Science and Medicine are within walking distance of the school. While the campus is a traditional college campus and away from the hustle and bustle of any downtown business district, the nearby central New Jersey metropolitan region offers a wide array of practice-oriented educational opportunities in community pharmacies, hospitals, and the pharmaceutical industry. The school's professional experiential programs take full advantage of these opportunities, including industrial pharmacy sites that provide a unique experience with the nation's leading drug manufacturers.

All activities, both academic and extracurricular, of the larger university are available to pharmacy students, including extensive academic offerings in the basic sciences, humanities, and social sciences.

Dual-degree programs provide specialized opportunities for some of our highest achieving students. Our Pharm.D./Ph.D. program gives select students an excellent opportunity to start graduate work in research programs that combine pharmacy with basic, translational, or clinical research in pharmaceutics, pharmacology, and related

fields. Our Pharm.D./M.B.A. provides students with an opportunity to jump-start their careers in pharmacy and business--in hospitals, industry, and other health care venues. Our Pharm.D./M.P.H. enables our students to build on their pharmacy training with a sound understanding of public health fields, such as organization of health services, pharmacoepidemiology, health care policy, biostatistics, and environmental health.

As a state university, Rutgers offers tuition rates that are particularly affordable to New Jersey residents, while maintaining reasonable tuition rates for out-of-state students. Scholarships and other forms of financial aid also are available. For further information, see the Tuition and Fees and Financial Aid websites.

The pharmacy faculty also offers graduate programs for students wishing to earn a master of science or doctor of philosophy degree in chemical biology, pharmaceutical and medicinal chemistry, pharmaceutics and industrial pharmacy, pharmacology, or toxicology. These programs are described on the School of Graduate Studies website.

# Facilities (PHARM)

## FACILITIES

Facilities (PHARM)

## William Levine Hall

## William Levine Hall

The principal pharmacy building, William Levine Hall, provides more than 110,000 square feet of space on six different levels for undergraduate instruction and graduate study and research. Undergraduate laboratories and classrooms are provided for instruction in chemical biology, pharmaceutical chemistry, pharmacy practice and administration, pharmaceutics, and pharmacology. Specialized facilities accommodate work in animal experimentation, radioisotopes, electronic instrumentation, and pharmaceutical manufacturing. The 2016 addition to the building provides state-of-the-art hospital simulation suites and a mock intravenous admixture lab. Additionally, a new community pharmacy laboratory, several large and small classrooms, and student study space have been added. The Ernest Mario School of Pharmacy faculty is located in this building as well as in several other buildings throughout the campus, including the newly expanded Susan Lehman Cullman Laboratory for Cancer Research, which is attached to William Levine Hall.

Facilities (PHARM)

## Libraries

## Libraries

Pharmacy students make use of extensive pharmacy, science, and health-related collections in the Library of Science and Medicine adjacent to the school. Other sources are available in the Alexander Library on the College Avenue campus and the other libraries, general and specialized, of the university library system. All university library materials are accessible to pharmacy students directly or through interlibrary loan and online reference service.

# New Jersey Legal Requirements for the Pharmacy Profession (PHARM)

## NEW JERSEY LEGAL REQUIREMENTS FOR THE PHARMACY PROFESSION

The requirements for licensure as a registered pharmacist in the state of New Jersey are set by the state Board of Pharmacy. Since the specific requirements change from time to time, it is advisable to contact the state board for the most current information when specific questions about the requirements for licensure arise. Correspondence to the board may be addressed to the Executive Director, Board of Pharmacy, 124 Halsey Street, P.O. Box 45013, Newark, NJ 07101 (973-504-6450 or here).

To qualify for licensure in the state of New Jersey, the applicant must be a graduate of an accredited college of pharmacy, must have completed a sufficient amount of time in an approved experience program, and must have passed both the state Board of Pharmacy Licensure Examination and the Multistate Jurisprudence Pharmacy Examination. The experience program may consist of internship, externship, or a combination of both. Externship refers to a college-credited and supervised experience program that has been approved by the Board of Pharmacy as meeting the experience requirement. Internship refers to postgraduate experience in an approved pharmacy with a board-approved preceptor. A total of 1,440 hours of internship/externship is necessary for a candidate to qualify to take the licensure examination. The examination itself is a comprehensive computer-adaptive examination that integrates the pharmaceutical sciences with pharmacy practice.

The curriculum at the Ernest Mario School of Pharmacy currently provides an externship and related experience components that meet the experience requirements for licensure in New Jersey. Students contemplating registration as a pharmacist in states other than New Jersey should become familiar with the licensure and reciprocation requirements in those states. Information about registration in other states may be obtained from the appropriate state board of pharmacy or through the National Association of Boards of Pharmacy, 1600 Feehanville Dr., Mount Prospect, IL 60056 (847-391-4406 or here).

# Office of Continuing Education (PHARM)

## OFFICE OF CONTINUING EDUCATION

The mission of the Office of Continuing Education, under the guidance of the dean's office, is to serve the educational needs of practitioners through the provision of educational programs. These programs are designed to let the participant achieve, retain, and strengthen professional knowledge and competencies. The website is here.

# Accreditation (PHARM)

## ACCREDITATION

Accreditation (PHARM)

# Accreditation Council for Pharmacy Education

# Accreditation Council for Pharmacy Education

The Pharm.D. degree program of the Ernest Mario School of Pharmacy is accredited by the Accreditation Council for Pharmacy Education, 190 S. LaSalle Street, Suite 2850, Chicago, IL 60603-3410 (312-664-3575; Fax: 312-664-3575). The Accreditation Council for Pharmacy Education is made up of 10 members representing the American Association of Colleges of Pharmacy, the American Pharmaceutical Association, the National Association of Boards of Pharmacy, and the American Council on Education. It is recognized as the national accrediting agency for colleges of pharmacy in this country. The council also accredits the Ernest Mario School of Pharmacy as an approved continuing education provider.

Accreditation (PHARM)

# American Association of Colleges of Pharmacy

# American Association of Colleges of Pharmacy

The Ernest Mario School of Pharmacy is a member of the American Association of Colleges of Pharmacy, which was organized in 1899 for the promotion of the interests of pharmaceutical education. Since its founding, the association has steadily increased in size and enlarged its services. Today, it is recognized as a vital factor in the welfare of the profession of pharmacy. It has set and maintained high standards of pharmaceutical education. Members of the faculty participate in its activities, and the school maintains its prescribed standards.

# Technical Standards for the Pharm.D. Program (PHARM)

## TECHNICAL STANDARDS FOR THE PHARM.D. PROGRAM

The Technical Standards were updated in August 2019. They were approved by the University General Counsel in August 2019 and the EMSOP Faculty on August 29, 2019. The standards can be found here.

# Requirements (PHARM)

## REQUIREMENTS

The degree of doctor of pharmacy is awarded to a pharmacy student by the university upon the recommendation of the faculty of the Ernest Mario School of Pharmacy. Recommendation is contingent upon the student's fulfillment of the following requirements:

1. completion of the six-year curriculum for the doctoral degree

2. cumulative grade-point average must be greater than 2.5, and the cumulative professional grade-point average must be greater than 2.5

3. professional grade-point average in the terminal year must be greater than 2.5

4. completion of four years of full-time study for the doctoral degree at an accredited college of pharmacy, the last year of which must have been spent at the Ernest Mario School of Pharmacy

5. candidate must be adjudged by the faculty to be of good ethical character and properly equipped for the profession of pharmacy

6. candidate must submit the graduating student survey prepared in conjunction with the American Association of Colleges of Pharmacy (AACP) and the Accreditation Council for Pharmacy Education (ACPE)

Requirements (PHARM)

## Proficiency in English

## Proficiency in English

Students are expected to demonstrate the ability to speak and write effectively in the English language. Those failing to write literate English on any written assignment may warrant a failing grade for that reason alone. Instructors report to the English department any failure to meet this standard. Students who continue to write unsatisfactorily even though they have passed 01:355:101 Expository Writing I may be required to repeat the course in addition to their regular program.

# Graduation (PHARM)

## GRADUATION

Degrees are conferred by the university at the recommendation of the school faculty only at the annual commencement at the end of the spring semester. Students completing degree requirements in August, October or January may make a written request to the Office of the Registrar for a certificate attesting to their completion of degree requirements after September 1, October 1, or January 1, provided they have completed a diploma application by the appropriate deadline. All students are required to file a diploma information form with the registrar (available here), normally at the beginning of the fourth professional year.

Graduation (PHARM)

## Graduation with Honors

## Graduation with Honors

Students whose Rutgers cumulative grade-point averages are between 3.160 and 3.359 graduate with the distinction *cum laude*. Those whose averages are between 3.360 and 3.659 graduate *magna cum laude*. Students whose averages are between 3.660 and 4.000 graduate *summa cum laude*. Averages are not rounded to the next higher number in the calculation of honors. Only courses completed at Rutgers are counted in these averages.

# Six-Year Pharmacy Curriculum (PHARM)

## SIX-YEAR PHARMACY CURRICULUM

**First Preprofessional Year**

*First Semester*

01:119:115 General Biology I (4)

01:160:161 and 101 General Chemistry I (4)

01:160:171 Introduction to Experimentation (1)

01:355:101 Expository Writing I (3)

01:640:135 Calculus I (4)

*Second Semester*

01:119:116 General Biology II (4)

01:119:117 General Biology Lab (2)

01:160:162 General Chemistry II (4)

01:_:_ Second College-level Writing course (3)*

30:725:104 Pharmacy Convocations (1)**

humanities/social sciences electives (3)

**Second Preprofessional Year**

*First Semester*

01:160:307 Organic Chemistry I (4)

01:220:102 Introduction to Microeconomics (3)

01:750:161 Elements of Physics (4)

humanities/social sciences elective (3)

psychology/sociology elective (3)

*Second Semester*

30:718:200 Integrated Organ Physiology (3)

01:160:308 Organic Chemistry II (4)

01:160:311 Organic Chemistry Laboratory (2)

01:960:401 Basic Statistics for Research (3)

2 humanities/social sciences electives (6)

**First Professional Year**

*First Semester*

30:158:309 Biochemical Foundations of Pharmaceutical Biotechnology (3)

30:718:304 Pathophysiology (3)

30:721:301 Introduction to Pharmaceutics and Laboratory (4)

30:715:207 Pharmaceutical Chemistry (2)

30:725:320 Foundations of Pharmacy Care (4)

30:_:_ Professional elective I (2)***

30:725:304 LEAP-AHEAD Documentation Portfolio I (0.5)

*Second Semester*

30:158:310 Biochemical Foundations of Pharmaceutical Biotechnology II (3)

30:721:430 Introduction to Biopharmaceutics and Pharmacokinetics (4)

30:718:320 Pharmacology and Pharmacogenetics (3)

30:721:320 Drug Delivery and Laboratory (4)

30:725:321 Integrated Pharmacy Assessment Skills Series (iPASS) I (1)

30:725:305 LEAP-AHEAD Documentation Portfolio II (0.5)

30:_:_ Professional elective I (2)

*Summer Semester*

30:725:330 Introductory Practice Community Experience (2)

**Second Professional Year**

*First Semester*

30:158:420 Pharmaceutical Microbiology (3)

30:715:409 Medicinal Chemistry I (3)

30:720:440 Pulmonary and Hematology Pharmacotherapy (3)

30:720:442 Cardiology Pharmacotherapy (4)

30:725:470 Medical Literature Evaluation and Application (3)

30:725:432 iPASS II (2)

30:_:_ Professional elective II (2)

30:725:404 LEAP-AHEAD Documentation Portfolio III (0.5)

*Second Semester*

30:715:410 Medicinal Chemistry II (3)

30:720:445 Renal Pharmacotherapy (2)

30:720:446 Infectious Disease Pharmacotherapy (4)

30:725:489 Sterile Compounding (2)

30:725:308 Pharmacy Practice Management (3)

30:_:_ Professional elective III (2)

30:725:433 iPASS III (2)

30:725:405 LEAP Seminar IV (0)

*Summer Semester*

30:725:480 Introductory Pharmacy Practice Experience Hospital/Institutional (2)

**Third Professional Year**

*First Semester*

31:720:540 Endocrine and Reproductive Pharmacotherapy (2)

31:720:541 Gastrointestinal, Hepatic, and Nutrition Pharmacotherapy (2)

31:720:542 Oncology Pharmacotherapy (3)

31:725:550 Self Care and Home Care (3)

31:725:540 Principles of Pharmaceutical Economics (3)

30:_:_ Professional elective IV (2)

31:725:534 iPASS IV (2)

31725:504 LEAP-AHEAD Documentation Portfolio V (0.5)

*Second Semester*

31:725:545 Pharmacy Law and Bioethics (4)

31:720:545 Psychiatric and Behavioral Disorders Pharmacotherapy (2)

31:720:546 Neurology Pharmacotherapy (3)

31:720:547 Immunology, Ocular, and Dermatology Pharmacotherapy (1)

30:725:415 Poison Management and Drug Abuse (3)

30:_:_ Professional elective V (2)

31:725:535 iPASS V (2)

31725:505 LEAP-AHEAD Documentation Portfolio VI (0.5)

*Note: All curriculum requirements of the first five years must be successfully completed before students may register for any sixth-year rotation (Advanced Pharmacy Experience). Students must complete at least eight experiential rotations during the last year of the program (summer, fall, spring).*

**Fourth Professional Year**

*Summer Session*

31:725:791 Advanced Practice Experience I (5)

31:725:792 Advanced Practice Experience II (5)

31:725:793 Advanced Practice Experience III (5)

*First Semester*

31:725:794 Advanced Practice Experience IV (5)

31:725:795 Advanced Practice Experience V (5)

31:725:796 Advanced Practice Experience VI (5)

*Second Semester*

31:725:797 Advanced Practice Experience VII (5)

31:725:798 Advanced Practice Experience VIII (5)

31:725:799 Advanced Practice Experience IX (5)

31:725:615 Student Portfolio (2)

31:725:617 Pharmacy Reflection Seminar (2)

*01:355:201, 01:355:202, 01:355:203, 01:355:301, 01:355:302, 01:355:312, 01:355:315, 01:355:342, 01:355:375, or 01:355:303. Communication courses will NOT be accepted.
**30:725:104 is required of first-year students only. Transfer students entering the first professional (third) year of the program do not take this course.
***Students must complete five professional electives during the first through third professional years; one of which must be a clinical elective in the third professional year.

# Prepharmacy Curriculum (PHARM)

## PREPHARMACY CURRICULUM

This program outlines the courses required by students who currently are not enrolled at the Ernest Mario School of Pharmacy but who are interested in the profession of pharmacy and wish to apply to the school as transfer students. Upon satisfactory completion of both years of the program, students are eligible to apply for transfer to the Ernest Mario School of Pharmacy. However, students should understand that transferring is a competitive process and many students admitted will have more than two years of college completed. Admission is not guaranteed. All requirements of the preprofessional program must be completed prior to starting the first professional year. Parenthetical numbers below refer to the number of credits.

**First Year**

*First Semester*

General Biology I with laboratory (4,2)

General Chemistry I with laboratory (4,1)

English Composition I (3)*

Calculus I (4)

*Second Semester*

General Biology II with laboratory (4,2)

General Chemistry II (4)

English Composition II (3)*

humanities/social sciences electives (3)

**Second Year**

*First Semester*

Human Anatomy and Physiology I (3)**

Organic Chemistry I with laboratory (4,1)

Microeconomics (3)

Physics I with laboratory (3,1)***

humanities/social sciences electives (6)

*Second Semester*

Human Anatomy and Physiology II (3)**

Organic Chemistry II with laboratory (4,1)

Physics II (3)***

Basic Statistics for Research (3)****

humanities/social sciences electives (6)

*These are college-level English and writing courses that include training in the successful writing of a research paper.
**Rutgers students may substitute Systems Physiology (01:146:356), which generally has spaces available in the Summer Session offering.
***Elements of Physics (01:750:161) may be substituted for Rutgers students if spaces are available.
****A two-semester sequence of general statistics may be substituted.

# Dual-Degree Options (PHARM)

## DUAL-DEGREE OPTIONS

**Pharm.D./M.B.A.**

The Pharm.D./master of business administration (M.B.A.) is designed for students who wish to add business expertise to their professional pharmacy education. Pharm.D. students may earn advanced standing in the Rutgers Business School: Graduate Programs-Newark and New Brunswick (RBS) master of business administration (M.B.A.) program for some of their required and elective Pharm.D. courses. Pharm.D. students, who meet academic eligibility requirements, may apply to the Rutgers Business School: Graduate Programs-Newark and New Brunswick in their fourth professional year. If accepted, students matriculate into RBS immediately after completion of the Pharm.D., or they may defer enrollment for one year. With advanced standing, full-time students will complete the M.B.A. in approximately 15 months; part-time students need approximately three years to complete the program.

**Pharm.D./M.P.H.**

The Pharm.D./master of public health (M.P.H.) program is designed to provide students with in-depth complementary training as pharmacists and public health experts. The Pharm.D./M.P.H. is offered jointly with the School of Public Health. Graduates will build on their pharmacy training with a sound understanding of public health fields, such as organization of health services, pharmacoepidemiology, health care policy, biostatistics, and environmental health. Students meeting the eligibility requirements may apply for admission during the second professional year or later after completing two public health core courses. Students enroll in the School of Public Health after they complete the Pharm.D. program. With advanced standing, full-time students may finish the M.P.H. in one year; part-time students need approximately three years to compete the program.

**Pharm.D./Ph.D.**

The Pharm.D./doctor of philosophy (Ph.D.) degree option is designed to meet the needs and interests of exceptionally bright and highly motivated students wishing to pursue the doctor of philosophy (Ph.D.) degree. Students are eligible to apply for entry into the graduate program in pharmaceutical science, the joint graduate program in toxicology, or the program in medicinal chemistry by the end of the second professional year of the Pharm.D. program. Applicants must meet the entry criteria, including academic performance standards and Graduate Record Exam (GRE) scores as set by the graduate program and an interview with a member of the dual-degree faculty committee. Admitted students will continue in the Pharm.D. program and complete graduate courses and/or research during the summer and also in place of professional electives. Students will complete the Pharm.D. and graduate at the end of the fourth professional year. They will remain in graduate school for approximately three years while engaging predominantly in research with a mentor and advisory committee. Over this time the student will complete required coursework and conduct research in accordance with the curriculum of the graduate program and will fulfill the requirements of both degrees in six plus three years. The program is highly individualized to the student's research interests.

**Pharm.D./M.D.**

The Pharm.D./doctor of medicine (M.D.) dual-degree option, developed jointly by Rutgers' Ernest Mario School of Pharmacy and Robert Wood Johnson Medical School (RWJMS), is the first dual degree of its kind in the United States. Only currently enrolled Pharm.D. students at the Ernest Mario School of Pharmacy are eligible to apply for admission. This highly selective program is designed to create an elite cadre of interdisciplinary practitioners, highly skilled in the disciplines of both pharmacy and medicine, and poised to provide leadership in collaborative clinical practice, academic research, public policy, and the pharmaceutical industry.

Applicants must be in the second or third year of the professional program at the School of Pharmacy and have an excellent academic record, typically with a GPA of 3.5 or better.Clinical and/or research experience, service, and leadership are also essential. Prospective students should pursue opportunities to engage in clinical settings, participate in interprofessional programs, and work with student organizations to provide community service in health-related fields. Applicants are first screened by a School of Pharmacy committee; successful applicants are then referred to the Robert Wood Medical School for additional screening and for a final decision on admission.

Dual-degree students are encouraged to participate in interprofessional programs with students in other fields of health care. In their final year at the School of Pharmacy, they are assigned to specialized clinical clerkships emphasizing collaborative practice with medical students and physicians. Once students begin the RWJMS curriculum, specialized enrichment options will provide opportunities to take advantage of their extensive

knowledge of pharmacology, pharmacotherapy, and pharmacy practice. A capstone experience brings together their interests and experiences in pharmacy and medicine. The dual-degree program requires two years of preprofessional study, four years in the Pharm.D. program, and four years in medical school.

# Honors and Awards (PHARM)

## HONORS AND AWARDS

Honors and Awards (PHARM)

## Honors Program

## Honors Program

The Pharm.D. Honors Research Program is designed to provide exceptional students in the Ernest Mario School of Pharmacy with in-depth research training and experience in a specialized area of interest. The program is flexible to maximize opportunities and meet student needs; students may enter at any time from the spring semester of the second preprofessional year through the fall semester of the second professional year, though they are encouraged to enter the program as early as feasible. The admission requirements include a cumulative grade-point average of 3.3 or better, a letter of recommendation from an Ernest Mario School of Pharmacy faculty member who agrees to serve as the student's Honors Research mentor, and an application form with essay and résumé. Students interested in the program should contact faculty members to inquire about availability to perform honors research. Students who successfully complete the Honors Research Program will be identified at graduation with special commendation, which will also be noted on their transcripts. The full program description is available on the program's website.

Honors and Awards (PHARM)

## Rho Chi Society

## Rho Chi Society

Students in the Ernest Mario School of Pharmacy are eligible for election to Rho Chi Honor Society, the national pharmacy honor society. After completion of no less than one-half of the required professional didactic coursework, students ranked in the top 20th percentile of their class and who have attained a minimum professional grade-point average of 3.0 on a 4.0 scale are eligible for election. Election is based on high standards of scholarship with the view that scholarly attainment indicates the capacity of the individual for outstanding achievement in pharmacy.

Honors and Awards (PHARM)

## Sigma Xi

## Sigma Xi

Students who have shown excellence in scholarship and promise of engaging in scientific research at a recognized institution during the ensuing year are eligible for election as associate members of Sigma Xi, the national scientific honor society. The website can be found here.



## Other Honors and Awards

## Other Honors and Awards

Students in the Ernest Mario School of Pharmacy may compete for departmental, fraternal, industrial, or association monetary awards. Election to Phi Lambda Sigma, the national pharmacy leadership society, is a highly coveted honor for pharmacy students active in student life.

# Scholarships (PHARM)

## SCHOLARSHIPS

The following scholarships, in varying amounts, are awarded annually to pharmacy students on the basis of financial need and academic merit. Inquiries regarding these scholarships should be addressed to the Ernest Mario School of Pharmacy dean's office at 848-445-6250.

***Acme Markets Scholarship.*** Provides annual tuition assistance to New Jersey students in their last three years who are employed in a community pharmacy setting. Awards based on financial need and academic merit.

***New Jersey Pharmacists Association Scholarship.*** For students in the professional years; based on academic achievement, financial need, and extracurricular activities.

***Barone Endowed Pharm.D./M.D. Scholarship.*** For full-time students enrolled in the Pharm.D./M.D. dual-degree program.

***Harold Blumenkrantz Scholarship.*** For full-time students from Monmouth County who are in their professional years. Awards based on academic merit and financial need. Preference given to students who demonstrate an interest in pursuing community pharmacy as a career.

***Dr. Sanford M. Bolton and Phyllis Bolton Endowed Scholarship.*** Awarded to full-time graduate students based on academic merit and financial need.

***Lucille and Michael Bongiovanni Endowed Scholarship.*** Based on academic merit and financial need for students in their professional years of the curriculum.

***NJ Women's League/Bowers Memorial Scholarship.*** For a third-year student enrolled at the Ernest Mario School of Pharmacy. Scholarship administered jointly with the Women's League of Rutgers University.

***John and Josephine Calasibetta Endowed Scholarship.*** For students in their professional years; based on academic merit and financial need.

***Class of 1934 Pharmacy Scholarship.*** For students in their professional years; based on academic merit and need.

***Ronald I. Cohen Endowed Scholarship.*** For students in their professional years. Preference given to students who have an interest in pursuing community pharmacy as a career.

***John L. Colaizzi Scholarship.*** For students in their final two years; based on academic merit and/or financial need.

***David L. Cowen History of Pharmacy Scholarship.***

***Samuel Cutler Endowed Scholarship.*** For full-time undergraduate and graduate students based on merit and financial need.

***James R. Croucher/Eli Lilly Endowed Scholarship.*** For New Jersey residents exhibiting leadership and community involvement; based on financial need.

***CVS/Caremark Charitable Trust.*** For students in their professional years; based on academic achievement, financial need, extracurricular activities, and interest in community pharmacy practice.

***Martin G. and Marlene Daffner Endowed Scholarship.*** For students in their professional years; based on academic merit and financial needs.

***Davidson, Davidson & Kappell, LLC Annual Scholarship.*** Based on academic merit and/or financial need.

***John J. DeBus Memorial Scholarship.*** Based on academic merit and financial need.

***Delta Sigma Theta Fraternity Scholarship.*** Based on academic merit and financial need for students in their professional years.

***Anthony J. DeRosa Scholarship.*** Based on academic merit and financial need.

***Louis T. and Monica M. DiFazio Scholarship.*** Based on academic merit and financial need for students in their professional years. Preference given to students who have an interest in pursuing a career in the pharmaceutical industry related to research or the field of pharmaceutics.

***Bruce and David Epstein Endowed Pharm.D. Scholarship.*** For full-time students in the professional years based on academic merit and financial need.

***Oswald Fechner Endowed Scholarship.*** Based on academic merit and financial need.

***Louis E. Feinerman Scholarship.*** Based on academic merit and financial need.

***Alvin Felmeister Scholarship.*** Based on academic merit and financial need.

***Foxcroft Pharmacy Endowed Scholarship.*** For a student in the professional years; based on academic merit, financial need, extracurricular activities, and interest in community pharmacy practice.

***Lawrence S. Fromkin Scholarship.*** For full-time students in their professional years or part-time, post-B.S. students, pursuing their Pharm.D. Emphasis given to those applicants who are active in pharmacy-related activities/ associations at the Ernest Mario School of Pharmacy and/or other professional organizations that are not affiliated with the school.

***Leonard Gold, M.D., and Mrs. Eleanor Gold Endowed Scholarship.*** Awarded to full-time students based on academic merit and financial need.

***Steven and Linda Gooen Professional Development Travel Scholarship.*** Awards to support travel for conference participation.

***Hudson County Pharmaceutical Society Endowed Scholarship.*** Based on academic merit and financial need.

***Gertrude D. Kuebler Scholarship.*** Based on academic merit and financial need.

***Deborah Lewin Kull Annual Scholarship.*** Based on academic merit and/or financial need.

***Stephen and Ruth Lane Endowed Scholarship.*** For full-time students in Ocean County in their professional years. Awards based on academic merit, financial need, and interest in pursuing community pharmacy practice.

***Daniel and Nancy Levine Endowed Scholarship.*** Awarded to qualified full-time students based on academic merit.

***William and Helen Levine Endowed Scholarship.*** For students in their professional years.

***Walter J. Lewitt Scholarship.*** Based on financial need and academic merit. For students in their professional years.

***Seymour A. Lubman Memorial Scholarship.*** Based on academic merit and/or financial need.

***Ernest Mario Endowed Scholarship.*** For students in their professional years; based on academic merit and financial need.

***Emil P. Martini Sr. Memorial Scholarship.*** For a student demonstrating outstanding scholastic achievement, character, and financial need.

***Jack Mazer Memorial (Class of 1930) Scholarship.*** For students in their professional years; based on academic merit and financial need.

***Margaret Ryan Murray Scholarship.*** For New Jersey residents in the final two years; based on academic merit and financial need.

***National Association of Chain Drug Stores Foundation.*** Based on academic merit and/or financial need.

***Thomas T. Nevin Memorial Scholarship.*** For students in their professional years; based on academic achievement, financial need, extracurricular activities, and interest in community pharmacy practice.

***Novartis Endowed Scholarship.*** Based on academic merit and financial need.

***Harold and Betty Perl Endowed Scholarship.*** For students in their professional years; based on academic merit and financial need.

***Pharmacy Alumni Association Scholarships.*** For pharmacy students in their professional years; based on academic achievement, financial need, or extracurricular activities.

***Pharmacy Reunion Campaign Scholarship.*** Awarded annually based on academic merit and financial need.

***Reema and Navneet Puri Endowed Graduate Scholarship.*** Awarded to qualified Pharm.D. student intending to continue into the Ernest Mario School of Pharmacy graduate programs.

***Sumant and Leena Ramachandra Endowed Scholarship.*** Preference given to underrepresented minority groups.

***Amalia R. and R. Raymond Ricciardi Endowed Scholarship.*** For a full-time student; based on academic merit.

***Jacob Robbins Memorial Scholarship.*** Based on academic merit and financial need.

***John V. Saenger Endowed Scholarship.*** Based on academic merit and financial need.

***Schering-Plough Scholarship.*** For students in their professional years; based on academic merit and financial need.

***Eric D. Seifert Memorial Scholarship.*** For students in their professional years; based on academic merit and financial need.

***Edward Solow Endowed Scholarship.*** Awarded to qualified full-time students.

***Paul Stonehill Memorial Endowed Scholarship.*** Based on academic merit, financial need, and interest in pursuing community pharmacy practice.

***Supervalue Pharmacies.*** For New Jersey residents in their last three years of pharmacy school who are currently employed in a community pharmacy practice. Awards based on financial need and academic merit.

***Glenn A. and Leslie E. Van Buskirk Annual Scholarship.*** Based on academic merit and/or financial need.

***Walgreens Diversity Scholarship.*** For students in their professional years; based on academic merit, financial need, and involvement with student organizations promoting diversity on campus.

***Walgreens Pharmacy Management Scholarship.*** Based on academic merit and/or financial need.

***Wal-Mart Scholarship Fund.*** For students in their professional years; based on academic achievement, financial need, extracurricular activities, and interest in community pharmacy practice.

# Educational Opportunity Fund (PHARM)

## EDUCATIONAL OPPORTUNITY FUND

Students eligible for an Educational Opportunity Fund (EOF) grant not only receive financial support, but also are assigned an adviser who will help with any problems that may arise as well as provide assistance in organizing their academic programs. In addition to advising, EOF offers tutorial assistance for basic to more advanced academic courses. The EOF program also offers a wide range of workshops to help students sharpen their skills and progress successfully through the curriculum.

Each year, EOF offers a precollege summer-on-campus program to help the student make a smooth transition from high school to college.

For more information about EOF, please contact the Ernest Mario School of Pharmacy, Office for Student Development (848-445-6263).

# Explanation of Three-Part Course Numbers (PHARM)

## EXPLANATION OF THREE-PART COURSE NUMBERS

The number preceding each course title is divided into three parts. The first two digits are the administrative code (standing for a faculty or a school), the next three digits are the subject code, and the final three digits are the course code.

*Administrative Codes*

The Ernest Mario School of Pharmacy administrative code is 30 through the first four years of the Pharm.D. program. A code of 31 is used in the last two years of the doctoral program. For a complete list of administrative codes used in this catalog, see the beginning of the Programs of Study and Courses for Liberal Arts and Sciences Students section.

*Subject Codes*

A subject code comprises the third through fifth digits in all course numbers and indicates the subject matter of the course. Courses with the following subject codes are listed in this chapter. (This list does not constitute a list of majors.)

158 Chemical Biology

715 Medicinal Chemistry

718 Pharmacology and Toxicology

720 Pharmacy

721 Pharmaceutics

725 Pharmacy Practice and Administration

*Course Codes*

The course code comprises the sixth, seventh, and eighth digits in all course numbers. Course codes from 100 to 299 indicate introductory and intermediate undergraduate courses. Codes from 300 to 499 indicate advanced undergraduate courses. Courses coded from 500 to 899 are graduate courses.

Two course codes separated by a comma indicate that each semester may be taken independently of the other (example: 30:720:391,392). Two course codes separated by a hyphen indicate that satisfactory completion of the first semester is a prerequisite to the second semester (example: 30:725:202-203); the first semester may be taken for credit without taking the second, except where a statement is added to indicate that both semester courses must be completed in order to receive credit.

Credits awarded for the successful completion of each course are indicated in parentheses following the course title. The notation BA indicates that the number of credits is determined by arrangement with the department offering the course.

Unless otherwise indicated, a course normally meets weekly for a number of lecture hours equal to the number of credits to be earned. Special hours or modes of class, other than lecture, are usually indicated in italics below the course title.

# Chemical Biology 158 (PHARM)

## CHEMICAL BIOLOGY 158

**30:158:309-310** ***Biochemical Foundations of Pharmaceutical Biotechnology I and II***
Covers basic principles in cell and molecular biology and biochemistry. Addresses the application of biochemistry to biotechnology. Focuses on the concepts in biochemistry and molecular biology in drug discovery and the practice of pharmacy.
***Lec. 3 hrs. Prerequisites: 01:119:115,116,117 (formerly 01:119:101-102); 01:160:307-308.***

**30:158:402** ***Diet, Nutrition, and Disease Prevention in Pharmacy Practice (2)***
Selected topics on diet and nutrition as they relate to health and disease. The biochemical mechanisms and critical analyses of the existing information will be emphasized. Students are encouraged to make class presentations or write semester papers.
***Lec. 2 hrs.***

**30:158:420** ***Pharmaceutical Microbiology (3)***
Study of the basic principles of human disease causing bacteria, viruses, fungi, protozoa, and helminth parasites. This courses focuses on organisms capable of causing disease as well as the study of the immune system and mechanisms used to defend against pathological microorganisms. Also included are the mechanisms of pharmacological agents such as antibiotics that are used to treat infectious microorganisms.
***Prerequisites: 01:119:115,116,117 (formerly 01:119:101-102); 01:160:307-308; 01:694:301.***

**30:158:495,496,497,498** ***Research in Chemical Biology (BA)***
Undergraduate research in chemical biology.
***Prerequisite: Permission of instructor. No more than two semesters of research courses may be used to satisfy degree requirements.***

# Medicinal Chemistry 715 (PHARM)

## MEDICINAL CHEMISTRY 715

**30:715:307** ***Pharmaceutical Chemistry (2)***
Introduces structure, properties, and analysis of pharmaceutical agents and metabolites as well as the fundamental techniques used for near patient testing in clinical laboratories.

**30:715:360** ***Pharmaceutical Biochemistry (2)***
Introduction to drug interaction in basic biochemical processes. Includes enzyme inhibitors, antimetabolites, and detoxification enzymes.
***Prerequisite: 11:115:301.***

**30:715:409-410** ***Medicinal Chemistry I, II (3,3)***
Study of organic medicinal and pharmaceutical compounds, with special emphasis on the correlation of structural and physiochemical properties with biological activity.
*30:718:320*

**30:715:450** ***Drugs: Structure and Function (3)***
Provides a survey of the major pharmaceutical agents in clinical use. Emphasis is placed on the influence of chemical structure in the elicitation of pharmacological effects.
***Prerequisite: Undergraduate organic chemistry.***

**30:715:451** ***Research Techniques in Medicinal Chemistry (3)***
Basic course for students preparing to do research in medicinal chemistry. Topics covered include information management, computer methods, basic laboratory techniques, bioassay techniques, metabolism, prodrugs, and quantitative structure-activity relationships.
***Prerequisite: Undergraduate organic chemistry.***

**30:715:452** ***Principles of Drug Design (3)***
Topics covered include identifying new drug leads, drug absorption and distribution, pharmacomodulation, enzymes and receptors as targets, peptidomimetics, computer-aided drug design, and combinatorial chemistry.
***Prerequisite: Undergraduate organic chemistry.***

**30:715:453** ***Herbal Medicines and Nutraceuticals (2)***
Introduction to basic aspects of natural products chemistry as well as mechanisms associated with absorption, distribution, metabolism, and excretion of endogenous compounds and xenobiotics. Topics covered include disease states wherein herbal medicines and nutraceuticals have been suggested as having beneficial effects.

**30:715:454** ***Heterocycles in Medicinal Chemistry***
This course provides a discussion of the properties, reactions, and synthesis of the major classes of heterocyclic compounds, including sugars, which comprise most drugs in
clinical use.
*01:160:307-308*

**30:715:495,496,497,498** ***Research in Medicinal Chemistry (BA)***
Undergraduate research in medicinal chemistry.
***Prerequisite: Permission of instructor. No more than two semesters of research courses may be used to satisfy degree requirements.***

# Pharmacology and Toxicology 718 (PHARM)

## PHARMACOLOGY AND TOXICOLOGY 718

**30:718:304** ***Pathophysiology (3)***
General principles of disease and their application to the study of clinical disorders that affect the body as a whole, its specific systems, and individual organs.
***Lec. 3 hrs. Practicum provided as needed. Prerequisite: 01:119:116. Corequisite: 01:694:301.***

**30:718:320** ***Pharmacology and Pharmacogenetics (3)***
Chemical structure, physiochemical properties, drug absorption, and metabolism of medicinal agents.
***Prerequisite: 01:694:301.***

**30:718:401** ***Theoretical Aspects of Pharmacology (2)***
Introduction to some of the emerging theoretical concepts and principles in the areas of biochemistry, molecular biology, cell biology, physiology, and human genomics. Theoretical concepts and principles surveyed applied to pharmacologically relevant topics, such as receptor-ligand interactions, signal transduction, genotype-phenotype coupling, and others.
***Prerequisite: First professional year standing or higher.***

**30:718:409** ***Pharmacogenomics (2)***
Survey of the polymorphisms (population and individual differences) in the pharmacokinetics and pharmacodynamics of therapeutic drugs. Genetics and molecular basis of these polymorphisms and examples of associated abnormal responses to therapeutic agents and sensitivity to environmental toxicants.
***Prerequisites: One year of pharmacology or graduate standing and consent of instructor.***

**30:718:495,496,497,498** ***Research in Pharmacology (BA)***
Undergraduate research in pharmacology.
***Prerequisite: Permission of instructor. No more than two research courses may be used to satisfy degree requirements.***

# Pharmacy 720 (PHARM)

## PHARMACY 720

**30:720:301** ***Introduction to Research (2)***
Provides students an understanding of the nature of scientific investigation and how it differs from learning the known facts in a field of study. Students to learn how to gather information, assimilate, and through the use of deductive and inductive reasoning, generate novel theory and hypothesis.
***Prerequisite: Permission of instructor.***

**30:720:401** ***Principles of Research in Pharmacy (2)***
This course is designed to give students an understanding of the principles involved in experimental design as it pertains to bench and clinical research. Includes lectures, independent learning, team learning, class discussions, and written assignments.

**30:720:440** ***Pulmonary and Hematology Pharmacotherapy (3)***
Overview of the pathophysiology, pharmacology, and therapeutics of common disorders of the pulmonary and hematologic systems. Emphasis on application of pharmaceutical-care principles to pulmonary and hematologic disorders.

**30:720:441** ***Hematology Pharmacotherapy (1)***
Overview of the pathophysiology, pharmacology, and therapeutics of common disorders of the hematologic systems. Emphasis on application of pharmaceutical-care principles to hematologic disorders.

**30:720:442** ***Cardiology Pharmacotherapy (4)***
Overview of the pathophysiology, pharmacology, and therapeutics of common disorders of the cardiovascular systems. Emphasis on application of pharmaceutical-care principles to cardiovascular disorders.

**30:720:445** ***Renal Pharmacotherapy (2)***
Provides knowledge of the normal physiologic functions of the kidneys and anatomy of renal circulation, as well as the pathophysiology of renal disorders. Identify the etiology, clinical presentation, and treatment of fluid/electrolyte imbalances and interpret acid-base disorders. Calculate appropriate patient specific fluid requirements, renal function, and dosing regimen. Determine and classify the type of acute kidney injury a patient is experiencing.

**30:720:446** ***Infectious Diseases Pharmacotherapy (4)***
Overview of the pathophysiology, pharmacology, and therapeutics of common infectious diseases. Includes overview of microbiological organism and appropriate drug therapy. Emphasis on application of pharmaceutical-care principles to infectious diseases.

**31:720:540** ***Endocrine and Reproductive Pharmacotherapy (2)***
Overview of the pathophysiology, pharmacology, and therapeutics of common disorders of the endocrine and reproductive systems. Emphasis on application of pharmaceutical-care principles to diabetes, reproductive health, and disorders of hypothalamic-pituitary-adrenal axis and thyroid.

**31:720:541** ***Gastrointestinal, Hepatic, and Nutritional Pharmacotherapy (2)***
Overview of the pathophysiology, pharmacology, and therapeutics of common disorders of the cardiovascular systems. Emphasis on application of pharmaceutical-care principles to gastrointestinal, hepatic, and nutrition disorders.

**31:720:542** ***Oncology Pharmacotherapy (3)***
Overview of the pathophysiology, pharmacology, and therapeutics of common oncologic disorders. Emphasis on application of pharmaceutical-care principles to oncologic disorders.

**31:720:545** ***Psychiatric and Behavioral Disorders Pharmacotherapy (2)***
Overview of the pathophysiology, pharmacology, and therapeutics of common psychiatric and behavioral disorders. Emphasis on application of pharmaceutical-care principles to psychiatric and behavioral disorders.

**31:720:546** ***Neurology Pharmacotherapy (3)***
Overview of the pathophysiology, pharmacology, and therapeutics of common disorders of the neourologic systems. Emphasis on application of pharmaceutical-care principles to neurologic disorders.

**31:720:547** ***Immunology, Ocular, and Dermatology Pharmacotherapy (2)***
Overview of the pathophysiology, pharmacology, and therapeutics of common disorders of the immune, ocular, and dermatologic systems. Emphasis on application of pharmaceutical-care principles to immunological, ocular, and dermatologic disorders.

# Pharmaceutics 721 (PHARM)

## PHARMACEUTICS 721

**30:721:301** ***Introduction to Pharmaceutics and Laboratory (4)***
Selected topics dealing with the physicochemical properties of drugs and pharmaceuticals (physical pharmacy); study of the fundamental principles and processes of pharmacy, metrology, and calculations.
***Prerequisites: 01:160:308, 1:640:135, 01:750:161.***

**30:721:320** ***Drug Delivery and Laboratory (4)***
Pharmaceutical product design and drug delivery. Theory of dosage form formulation, manufacturing, testing, stability, bioavailability, and controlled release.
***Prerequisite: 30:721:301.***

**30:721:430** ***Introduction to Biopharmaceutics and Pharmacokinetics (4)***
Rate processes; time-course extent of absorption, distribution, and elimination of drugs in humans, involving models, bioavailability calculations, and dosage regimen design.
***Prerequisite: 30:721:301.***

**30:721:495,496,497,498** ***Research in Pharmaceutics (BA)***
Undergraduate research in the pharmaceutical sciences.
***Prerequisite: Permission of instructor. No more than two semesters of research courses may be used to satisfy degree requirements. Pharmaceutics faculty.***

# Pharmacy Practice and Administration 725 (PHARM)

## PHARMACY PRACTICE AND ADMINISTRATION 725

**30:725:104** ***Pharmacy Convocations (1)***
Introduces basic concepts of the practice of pharmacy as a component of the health care system. Discusses the role of pharmacists and the goals and trends of pharmaceutical education and the career pathways available to pharmacists.
***Required for all first-year, preprofessional students.***

**30:725:304,305,404,405; 31:725:504,505** *LEAP-AHEAD Documentation/Portfolio 1-6 (0.5 each)*
The LEAP (Leadership, Entrepreneurship and Innovation, Assessment of Self Professionalism) seminar introduces the practice of personal and professional development using a case-based approach. The goal is to develop a student's knowledge and skills as they relate to professionalism, self-awareness, leadership, innovation, and entrepreneurship. Co-curricular activities will allow students to become engaged citizens with the profession of pharmacy and their community through service, leadership, and community engagement activities with reflection assignments woven throughout the experiences.

**30:725:308** *Pharmacy Practice Management (3)*
Relates principles of management to pharmacy practice environments (such as community and home health care pharmacies, chain pharmacies, managed-care pharmacies, and hospitals and other institutional pharmacies).

**30:725:320** *Foundations of Pharmacy Care (4)*
Provides fundamental understanding of functions, responsibilities, and outcomes of pharmacy practice in modern health and disease and a systematic inquiry into the role and nature of pharmacy practice in the health care system. Concept of pharmaceutical care emphasized as the underlying basis of pharmacy practice. Essential skills and pharmaceutical calculation acquired through self-study tutorials. Pharmaceutical nomenclature and medical terminology are emphasized.
*Prerequisite: First professional year standing.*

**30:725:321** *Integrated Pharmacotherapy Assessment Skills Series I (2)*
iPASS I is the first of a five-semester series designed to provide students with an introduction to principles encountered in the ambulatory care and hospital practice settings. The purpose of this course is to prepare students with the fundamental information needed to assure their success on the Introductory Pharmacy Practice Experience (IPPE) rotations. In addition, the student will be introduced to concepts and basic skills of communication, drug information, and professionalism

**30:725:330** *Introductory Pharmacy Practice Community Experience (2)*
Provides students with their first structured exposure to professional pharmacy practice in the community pharmacy setting and the provision of pharmaceutical care in representative ambulatory settings. Students are assigned to a practice setting for a 160-hour experience.

**30:725:341** *Economic Modeling of Pharmaceuticals and Other Health Interventions (3)*
This course will cover the principles and methods of economic modeling of pharmaceuticals and other health-improving interventions such as devices, diagnostics, and new models of delivering care and health promotion programs.

**30:725:350** *Motivating Change as a Health Ambassador for Diabetes Mellitus (2)*
This course is designed to increase student understanding of diabetes mellitus and to provide students the necessary tools to help patients suffering from diabetes take control of their disease. While health related professions often teach their students diabetes in their curriculum, few offer interdisciplinary education approaches. Furthermore, behavior modification and motivational interviewing is often not included in these courses. In order to improve patient outcomes, it is essential to leverage the expertise of multiple professions.

**30:725:422** *Gerontological Pharmacy Practice (2)*
The course is taught through interactive case-based lectures, debates, group projects, presentations, and practical exercises. Students will improve their skills in patient interviewing techniques, geriatric assessment, SOAP note

writing, and Medication Therapy Management (MTM) documentation. The goal is to develop the student's problem-solving skills and empathy in the care and management of geriatric patients who often present with multiple disease states, polypharmacy, and challenging issues.
***Prerequisite: Third professional year standing.***

**30:725:423** ***Medical Writing (2)***
Practical applications of technical writing required of pharmacists in the health care system; tools needed to meet demands and improve written communication skills.
***Prerequisite: Second or third professional year standing.***

**30:725:424** ***History of Pharmacy (2)***
Historical development, trends, and impact of pharmacy as a health care profession and a biomedical science from ancient to modern times.

**30:725:427** ***Community Practice Management (2)***
Overview of opportunities and involvement in community pharmacy practice.
***Prerequisite: First professional year standing.***

**30:725:428** ***Hospital Practice Management (2)***
Introduction to hospital pharmacy practice; presentation and discussion of services, functions, personnel, administration, and relation to other hospital departments. Field trips and projects.
***Prerequisite: First professional year standing.***

**30:725:429** ***Introduction to Pharmaceutical Industry (2)***
Steps and factors involved in discovery and development of new pharmaceuticals. Emphasis on organizational functions and interfaces.
***Prerequisite: First professional year standing.***

**30:725:432** ***Integrated Pharmacotherapy Assessment Skills Series II (2)***
The second course of a five-semester series designed to integrate content from the organ module pharmacotherapy series with application-based learning; enables students to gather patient information; perform physical assessments; integrate medical literature and patient information to design pharmacotherapy care plans; communicate information to patients, caregivers, and other health care professionals; and evaluate literature. Emphasis on pulmonary, hematology, and cardiology pharmacotherapy. The standards of professionalism will be promoted throughout the course.

**30:725:433** ***Integrated Pharmacotherapy Assessment Skills Series III (2)***
The third course of a five-semester series designed to integrate content from the organ module pharmacotherapy series with application-based learning; enables students to gather patient information; perform physical assessments; integrate medical literature and patient information to design pharmacotherapy care plans; communicate information to patients, caregivers, and other health care professionals; and evaluate literature. Emphasis on renal and infectious disease pharmacotherapy. The standards of professionalism will be promoted throughout the course.

**30:725:470** ***Medical Literature Evaluation and Application (3)***
Provides fundamental background for answering drug information requests and critically evaluating primary literature.
***Prerequisites: Statistics and second professional year standing.***

**30:725:480** ***Introductory Pharmacy Practice Experience Hospital/Institutional (2)***
Provides students with their first structured exposure to professional practice and the provision of pharmaceutical care in representative acute-care settings. Students are assigned to a practice setting for a 160-hour experience.
***Prerequisite: Completion of second professional year didactic coursework.***

**31:725:481** ***Pediatric Pharmacy Practice (2)***
Introduction to the concepts of pharmacy practice as it relates to the expanding segment of pediatrics.
***Prerequisite: Third professional year standing.***

**30:725:482** ***Leadership for Pharmacy Professionals (2)***
This course is designed to introduce students to broad concepts of leadership and professionalism in pharmacy practice. The format includes interactive lectures, as well as a number of group projects, presentations, and practical exercises. Topics include leadership theory, emotional intelligence, the Myers-Briggs test, presentation skills, professional writing, etiquette, ethics, conflict resolution, and networking.
***Prerequisites: First professional year standing and permission of instructor.***

**30:725:483** ***Adventures in Pharmacy Practice (2)***
Complement to the required Pharmacy Practice Management. Topics include contemporary subjects that have a direct impact on pharmacy practice. Subjects include automation, politics, ethics, customer satisfaction, "pharmacy practice in the news," and the future of pharmacy practice.
***Prerequisite: First professional year standing or higher.***

**30:725:484** ***Women's Health Issues (2)***
Investigate, explore, and discuss issues important to women's health. An in-depth presentation of the female reproductive system, along with related diseases and disorders, is covered in addition to broad coverage of other disorders prevalent in women.
***Prerequisite: Third professional year standing.***

**30:725:485** ***Herbal and Alternative Medicine (2)***
Reviews the herbal/alternative medicine used to alleviate the common disease states. Topics include overview of the history of alternative medicine, in-depth analysis of the most popular herbs, and patient counseling for herbal use.
***Prerequisite: Third professional year standing.***

**30:725:488** ***Introduction to Pharmacoepidemiology (2)***
This course will cover basic concepts of pharmacoepidemiology including pharmacovigilance and its role in drug regulation, study methods, basic statistical tools, and data resources.

**30:725:489** ***Sterile Compounding (2)***
Provides students with an introduction to sterile compounding, including proper techniques, pharmaceutical calculations, current sterile compounding guidelines, chemotherapy, and other hazardous drugs, and total parenteral nutrition.

**30:725:495,496,497,498** ***Research in Pharmacy Practice and Administration (BA)***
Undergraduate research in pharmacy practice and/or administration.
***Prerequisite: Permission of instructor. No more than two semesters of research courses may be used to satisfy degree requirements.***

**31:725:515** ***Poison Management and Drug Abuse (3)***
Provides an understanding of the effects in clinical management of drug overdose, toxic exposure, and substance abuse. Didactic lectures and student-based case discussions.
***Prerequisite: Third professional year standing.***

**31:725:526** ***Patient Advocacy and Health Care Policy (2)***
Developing strategies that lead to sound health care policy is more important than ever. The student will gain a deeper understanding of contemporary health policy topics such as pharmaceutical pricing, drivers of health care cost, and the role of both state and federal government in shaping the future of health care and patient access. Additionally, the course will help pharmacy students understand role of patient advocacy organizations and professional societies in influencing health policy.

**31:725:530** ***Clinical Research Design (2)***
Delineates the principles of clinical research design, characteristics, and types of clinical trials, selection and usage of statistical methods appropriate to various designs, and methods and issues related to outcomes assessment alongside clinical trials.

**31:725:534** ***Integrated Pharmacotherapy Assessment Skills Series IV (2)***
The fourth course of a five-semester series designed to integrate content from the organ module pharmacotherapy series with application-based learning; enables students to gather patient information; perform physical assessments; integrate medical literature and patient information to design pharmacotherapy care plans; communicate information to patients, caregivers, and other health care professionals; and evaluate literature. Emphasis on endocrine, reproductive, gastrointestinal, hepatic, nutritional, and oncologic pharmacotherapy. The standards of professionalism will be promoted throughout the course.

**31:725:535** ***Integrated Pharmacotherapy Assessment Skills Series V (2)***
The fifth course of a five-semester series designed to integrate content from the organ module pharmacotherapy series with application-based learning; enables students to gather patient information; perform physical assessments; integrate medical literature and patient information to design pharmacotherapy care plans; communicate information to patients, caregivers, and other health care professionals; and evaluate literature. Emphasis on psychiatric, behavioral disorders, neurology, immunology, ocular, and dermatology pharmacotherapy. The standards of professionalism will be promoted throughout the course.

**31:725:540** ***Principles of Pharmaceutical Economics (3)***
Provides an understanding of the economic aspects of pharmacy practice and the pharmaceutical industry within the context of the health care system. Explores the principles and applications of pharmacoeconomics and pharmacy practice and provides the techniques to measure outcomes and disease-state management.
***Prerequisite: 01:220:102.***

**31:725:545** *Pharmacy Law and Bioethics (4)*
Provides understanding of the theoretical and applied aspects of pharmaceutical jurisprudence and ethics, as required for professional practice and licensure as a pharmacist.
***Prerequisites: 30:725:308 and 320 and third professional year standing.***

**31:725:550** *Self-Care and Home Care (3)*
Provides opportunity to learn the concepts and acquire knowledge required for the pharmacist's involvement in self-care and home care.
***Prerequisites: 31:725:570 and 585.***

**31:725:576** *Emergency Medicine Pharmacotherapy (2)*
Familiarize pharmacy students with key disease states encountered by the emergency medicine pharmacist. Didactic lectures are presented by experienced emergency medicine pharmacists with an emphasis on evidence-based medicine and practical bedside applications. Students are expected to facilitate peer-to-peer and collaborative learning respectively through topic discussion, case development, and simulation lab participation.

**31:725:577** *Concepts in Palliative and End-of-Life Care (3)*
Introduces the emerging field of palliative care and pharmacy practice issues related to the care of patients with noncurable, advanced illness or those at the end-of-life. Topics covered include communication skills, clinical decision making, control of symptoms, management of complications, psychosocial and spiritual care, and care of the dying patient. The goal is to develop the student's critical thinking skills in the provision of palliative pharmacy care as well as compassion for patients and caregivers living with a serious or terminal illness.
***Prerequisite: Third professional year standing.***

**31:725:578** *Strategies in HIV Therapeutics (2)*
Provides an in-depth overview of HIV/AIDS management. Covers various topics, including the intricacies of providing patient-specific antiretroviral therapy, management of antiretroviral and AIDS-related complications, global HIV/AIDS policy and advocacy, and sociological/psychological implications of HIV. Students will give presentations based on patient cases and current topics in HIV.
***Prerequisite: Third professional year standing.***

**31:725:579** *Advanced Pharmacotherapy Applications (2)*
This course is intended to enhance and develop problem-solving skills relative to the management of complex patient cases similar to those encountered in the inpatient setting. For third professional year students in the doctor of pharmacy program.
***Prerequisite: Third professional year standing.***

**31:725:581** *Concepts in Psychiatric Pharmacotherapy (2)*
The course will explore more in-depth the disease states from therapeutics, as well as discuss other topics such as autism, eating disorders, personality disorders, and factitious disorders. The course will be interactive, as students will have the opportunity to conduct a simulated patient interview, write SOAP notes, and present topics.
***Corequisite: 31:725:595.***

**31:725:582** *Critical Care Pharmacotherapy (2)*
Students will develop critical thinking, problem-solving, and decision-making skills that will help them effectively evaluate the types of medication-related issues for patients seen in the intensive care unit.
***Prerequisite: Third professional year standing.***

**31:725:583** ***Pharmaceutical Marketing (2)***
Educates on the skills that pharmaceutical marketers will need to master to be successful. Provides an in-depth understanding of the development of pharmaceutical advertising, promotional pieces, and messages. Also provides information on potential marketing career options in the pharmaceutical industry.
***Prerequisite: Second professional year standing or higher.***

**31:725:584** ***Managed Care Pharmacy Practice (2)***
Focuses on issues surrounding practice of pharmacy in a managed care environment, including cost, payment, and recognition of stakeholders. Discusses the impact of managed care on other pharmaceutical environments.
***Prerequisite: 30:725:308.***

**31:725:615** ***Student Portfolio (2)***
Documentation of students' experiences, activities, and personal reflections regarding their Introductory Practice Experience through Advanced Practice Experience rotations.
***Prerequisites: Fourth professional year standing.***

**31:725:617** ***Pharmacy Reflection Seminar (2)***
Pharmacotherapeutic topics, drug/disease state knowledge, and ethics/professionalism will be reviewed in a highly interactive manner requiring student participation in discussions, cases, and breakout sessions. At the conclusion of the course, clinical skills will be evaluated including blood pressure assessment, glucometer utilization, and other assessments.

**31:725:791 through 799** ***Advanced Practice Experience Rotations (5)***
Pharmaceutical-care experience rotations conducted in the final professional year of the program. Sequence consists of seven, five-week rotations to include community-based pharmaceutical care experience, hospital-based pharmaceutical care experience, and general medicine practice experience. One elective practice experience can be selected from available sites and preceptors.
***Prerequisites: Fourth professional year standing.***

# Administration (PHARM)

## ADMINISTRATION

Joseph A. Barone, Dean

John L. Colaizzi, Dean Emeritus

Nancy Cintron, Senior Associate Dean for Diversity, Equity, Inclusion (DEI) and Student Affairs

Carol Goldin, Senior Associate Dean for Planning and Assessment

Donald K. Woodward, Senior Associate Dean for Academic Services

Donna Feudo, Associate Dean for Experiential Education

Renping Zhou, Associate Dean for Research

Minakshi Lahiri, Assistant Dean for Academic Assessments

# Faculty (PHARM)

## FACULTY



## Department of Chemical Biology

## Department of Chemical Biology

**Chair:** Suzie Chen

**Professors:**

Suzie Chen, B.S., Trinity College; M.S., Ph.D., Albert Einstein College of Medicine

Philip Furmanki, B.A., Ph.D., Temple

Nanjoo Suh, B.S., Ewha Women's (Korea); M.S., Seoul National; Ph.D., Illinois (Chicago)

Chung S. Yang (Emeritus), B.S., National Taiwan; M.S., Ph.D., Cornell

Renping Zhou, B.S., Nanjing Teacher's College (China); Ph.D., California (Berkeley)

Wei-Xing Zong, B.S., M.S., Nankai (China); Ph.D., University of Medicine and Dentistry of New Jersey

**Associate Professors:**

Luca Cartegni, M.S., Ph.D., Pavia (Italy)

Fang Liu, B.S., Beijing; Ph.D., Harvard

Audrey Minden, B.A., Colorado; Ph.D., Illinois (Chicago)

**Assistant Professors:**

Christina Glytsou, B.S., M.S., National and Kapodistrian; Ph.D., University of Padua

**Research Professors:**

Xi Zheng, B.S., Sun Yatsen Medical Sciences (China); Ph.D., Huddinge University Hospital, Karolinska Institute (Sweden)

Lanjing Zhang, M.D., Tongji Medical (Wuhan, China)

**Assistant Research Professor:**

Hong Wang, M.S., Institute of Biophysics, Chinese Academy of Sciences; Ph.D., Cincinnati-College of Medicine

**Adjunct Professors:**

Richard Chang, B.S., National Taiwan; M.S., Utah State

Xiaoxin Chen, M.D., Beijing Medical; Ph.D., Rutgers

Anthony Y. Lu, Ph.D., North Carolina

Hubert Maehr, Ph.D., Rutgers; Ph.D., Universitat fur Bodenkultur (Austria)

Shengmin Sang, Ph.D., Shanghai Institute of Materia Medica (China)

Shuiping Tu, Ph.D., Shanghai Jiao Tong University School of Medicine

Ronald White, Ph.D., Wisconsin

Guang-Yu Yang, M.D., M.S., Ph.D., China Medical

Helmut Zarbl, D.C.S., Marianopolis (Canada); B.Sc., Ph.D., McGill (Canada)

Kun Zhang, B.S., M.S., Guangdong University of Technology (China); Ph.D., Lanzhou (China)

X. F. Steven Zheng, Ph.D., Harvard

**Adjunct Associate Professors:**

Ji-An Pan, B.S., Ph.D., Wuhan (China)

**Adjunct Assistant Professors:**

Anne Marie Api, B.S., Manhattan; M.S., St. John's; Ph.D., Aston (England)

Byeong Seon Jeong, B.S., M.S., Western Illinois; Ph.D., Connecticut

Pavel Kramata, M.S., Institute of Chemical Technology (Czech Republic); Ph.D., IOCB, Academy of Sciences (Czech Republic)

Joseph Wahler, B.S., Pennsylvania State; Ph.D. Rutgers

Brian Wall, Ph.D., Rutgers

Faculty (PHARM)

# Department of Medicinal Chemistry

# Department of Medicinal Chemistry

**Chair:** Longqin Hu

**Professors:**

Longqin Hu, B.S., M.S., Second Military Medical (China); Ph.D., Kansas

Edmond J. LaVoie (Emeritus), B.S., Fordham; Ph.D., SUNY (Buffalo)

**Associate Professor:**

Jun Wang, B.S., Wuhan, M.S., National Universit of Singapore, Ph.D., University of Pennsylvania

**Assistant Professor:**

Matthew Moschitto, B.S., Bates; M.S., Ph.D., Cornell

**Adjunct Professors:**

Ray Bakhtiar, B.S., Arkansas; M.S., Arkansas (Fayetteville); Ph.D., North Dakota State

Samuel Chackalamannil, B.S., Karala (India); M.S., Temple; Ph.D., Yale

Vladyslav Kholodovych, M.S., Kiev State (Ukraine); Ph.D., Ukrainian National Academy of Sciences (Kiev)

Jian Shen, M.E., Shanghai Jiaotong; Ph.D., Houston

Qun Sun, B.S., Science and Technology of China; Ph.D., Rutgers

**Part-Time Lecturers:**

Samuel Chackalamannil, B.S., Kerala (India); M.S., Temple; Ph.D., Yale

Joel Freundlich, B.S., M.E., Cornell; Ph.D., Massachusetts Institute of Technology

Allen Jones, B.S., Elizabethtown; Ph.D., SUNY (Buffalo)

Michael Totleben, B.S., Gannon; Ph.D., Pittsburgh

Faculty (PHARM)

# Department of Pharmaceutics

# Department of Pharmaceutics

**Chair:** Tamara Minko

**Professors:**

**Arash Hatefi, Pharm.D., Shahid Beheshi (Iran); Ph.D., Alberta**

Ah-Ng Tony Kong, B.S., Alberta; Ph.D., SUNY (Buffalo)

Bozena Michniak, B.S., Ph.D., Leicester Polytechnic (UK)

Tamara Minko, M.S., Mordovsky State (Russia); Ph.D., Institute of Physiology/Ukrainian Academy of Sciences

Patrick J. Sinko, B.S., Rutgers; Ph.D., Michigan

Guofeng You, B.S., Beijing Medical; Ph.D., Clark

**Associate Professors:**

**Luigi Brunetti, B.S., St. Peter's, Pharm.D., Philadelphia College of Pharmacy, M.P. H., UMDNJ, Ph.D., Rutgers**

Leonid Kagan, M.S., Ph.D., Hebrew (Israel)

**Assistant Research Professor:**

Olga Gabuzenko, M.S., Ph.D., State University Kharkov (Ukraine)

Dayuan Gao, Ph.D., Shenyang Pharmaceutical

Faculty (PHARM)

# Department of Pharmacology and Toxicology

# Department of Pharmacology and Toxicology

**Chair:** Debra L. Laskin

**Professors:**

Lauren Aleksunes, B.S., Pharm.D., Ph.D., Connecticut

Andrew Gow, B.S., Edinburgh (UK); M.Ed., Ph.D., Temple

Grace Guo, M.B.B.S., West China; M.S., Arkansas; Ph.D., Kansas-Medical Center

Debra L. Laskin, B.A., New York; M.A., CUNY (Hunter College); Ph.D., Medical College of Virginia

Chistopher J. Molloy, B.S., Ph.D., Rutgers

Kenneth Reuhl, (Emeritus), B.A., Ph.D., Wisconsin

**Associate Professor:**

Marion K. Gordon, B.A., Rutgers; Ph.D., Rutgers/University of Medicine and Dentistry of New Jersey

Phoebe G. Stapleton, B.S., SUNY (Cortland); M.S.Ed., Southern Illinois (Edwardsville); Ph.D., West Virginia

**Associate Research Professors:**

Carol R. Gardner, B.A., SUNY (Potsdam); M.S., Southern Illinois; Ph.D., Texas Woman's

Laurie B. Joseph, B.S., George Washington; M.S., Ph.D., Ohio State

Rama Malaviya, B.S., M.S., Ph.D., Lucknow (India)

Vasanthi Sunil, M.S., Ph.D., Rutgers/University of Medicine and Dentistry of New Jersey

**Assistant Professors:**

Alison I. Bernstein, B.A., University of Pennsylvania, Ph.D., Washington (St. Louis)

Shuo Xiao, B.Med., M.S. Peking University Health Science Center, Ph.D., Georgia

**Assistant Research Professors:**

Changjiang Guo, M.B., M.D., Henan Medical (China)

Josesph Jude, B.V.Sc., University of Peradeniya, Sri Lanka; Ph.D., Minnesota

Bo Kong, Ph.D., Shanghai Institute for Biological Sciences

Ahmed Lasfar, M.S., Ph.D., Paris

Raymond Charles Rancourst, B.S., Rutgers; Ph.D., Rochester

Peihong Zhou, M.D., Anhui Medical (China)

**Adjunct Professors:**

Robert P. Casillas, B.S., Ph.D., Georgia State

Michael A. Gallo, Ph.D., Albany Medical

Michael Goedken, B.S., Loras; D.V.M., Iowa State; Ph.D., Connecticut

Jules Mitchel, B.S., Queens (New York); M.S., Oregon; M.B.A., Pace; Ph.D., New York

**Adjunct Associate Professors:**

Michael G. Bird, B.Sc., Nottingham (UK); M.Sc., Ph.D., Surrey (UK)

Markus P. Dey, B.S., Rutgers; Ph.D., Rutgers/University of Medicine and Dentistry of New Jersey

Alycia Halladay, B.A., Texas (Austin); M.S., Rutgers; Ph.D., Rutgers/University of Medicine and Dentistry of New Jersey

Diane E. Heck, B.A., Rutgers; Ph.D., Rutgers/University of Medicine and Dentistry of New Jersey

**Adjunct Assistant Professor:**

Joshua P. Gray, B.S., Pennsylvania State; Ph.D., Rutgers/University of Medicine and Dentistry of New Jersey

# Department of Pharmacy Practice and Administration

# Department of Pharmacy Practice and Administration

**Chair:** Marc Sturgill

**Vice Chair for Program Development and Assessment:** Julie Saleh

**Professors:**

Joseph A. Barone, B.S., Pharm.D., St. John's

Tobias Gerhard, B.S., Albert-Ludwig (Germany); Ph.D., Florida

John Louis Colaizzi (Emeritus), B.S., Pittsburgh; M.S., Ph.D., Purdue

Laura Pizzi, B.S., M.P.H., Pharm.D., Rutgers

**Clinical Professors:**

Liza Andrews, B.S., Pharm.D., Rutgers

Mary Bridgeman, Pharm.D., Rutgers

Evelyn Hermes-DeSantis (Emeritus), B.S., Pharm.D., Rutgers

Clifton Lacy, M.D., University of Medicine and Dentistry of New Jersey

Rupal Mansukhani, Pharm.D., Philadelphia College of Pharmacy, University of the Sciences in Philadelphia

Rachel Meyers, B.S., Mary Washington; Pharm.D., Connecticut

Navaneeth Narayanan, Pharm.D., Rutgers

Anita Siu, Pharm.D., Philadelphia College of Pharmacy, University of the Sciences in Philadelphia

Lucio Volino, B.S., College of Saint Rose; Pharm.D., Albany College of Pharmacy

**Research Professor:**

Michael Toscani, B.S., Pharm.D., St. John's

**Associate Professors:**

Luigi Brunetti, B.S., St. Peter's; Pharm.D., Philadelphia College of Pharmacy, University of the Sciences in Philadelphia

Marc G. Sturgill, B.S., Pharm.D., Kentucky

Mary L. Wagner, M.S., Minnesota; Pharm.D., California (San Francisco)

**Clinical Associate Professors:**

Daniel T. Abazia, Pharm.D., Rutgers

Deepali Dixit, Pharm.D., Rhode Island

Megan E. Maroney, Pharm.D., Rutgers

Caitlin McCarthy, Pharm.D., Rutgers

Enid Morales, B.S., Puerto Rico; Pharm.D., Maryland

Yekaterina Opsha, Pharm.D., Long Island

Christine Robinson, B.S., Pharm.D., Rutgers

Julie A. Saleh, B.S., Pharm.D., Minnesota

Pooja Shah, Pharm.D., Rutgers

Michael Wynd, B.S., Temple; Pharm.D., Rutgers

**Assistant Professor:**

Chintan Dave, Pharm.D., St. Louis College of Pharmacy, Ph.D., Florida

**Clinical Assistant Professors:**

M. Thomas Bateman Jr., Pharm.D., Philadelphia College of Pharmacy, University of the Sciences in Philadelphia

Lindsay Brust-Sisti, Pharm.D., Rutgers

Maria Cardinale, Pharm.D., Rutgers

Basem Elashal, Pharm.D., Rutgers

Andrew Giaquinto, Pharm.D., Northeastern

Jimmy Gonzalez, B.A., Williams; Pharm.D., Rutgers

Daniel J. Greer, B.S., Pharm.D., Pittsburgh

Jessica Hu, Pharm.D., Pittsburgh

Humberto Jimenez, Pharm.D., Rutgers

Gregory Kelly, M.Pharm., Florida, Pharm.D., Rhode Island

Caitlin Kulig, B.S. Steven Institute of Technology, Pharm.D., North Carolina

Geeny Lee, Pharm.D., Rutgers

Mei Liu, Pharm.D., Rutgers

Cavan O'Kane, B.S. La Salle, Pharm.D., Temple

May Nguyen, B.S., Pharm.D., Philadelphia College of Pharmacy, University of the Sciences in Philadelphia

Christine Parikh, Pharm.D., Philadelphia College of Pharmacy

Ammie Patel, Pharm.D., Rutgers

Ewelina Pelczar, B.A., Pharm.D., Rutgers

Ashmi Philips, Pharm.D., Philadelphia College of Pharmacy, University of the Sciences in Philadelphia

Kristin Reinaker, Pharm.D., Wilkes

Niti Shah, Pharm.D., Rutgers

Molly Siver, Pharm.D., Albany College of Pharmacy

Danielle Tompkins, Pharm.D., Rutgers

Joseph Walter, Pharm.D., Rhode Island

Jessica Wilczynski, B.S., The College of New Jersey, Pharm.D., Jefferson College of Pharmacy

**Part-Time Lecturers:**

Angelo Cifaldi, B.S., Rutgers; J.D., Seton Hall

Bruce Epstein, B.S., Rutgers; M.B.A., New York

**Adjunct Professors:**

Robert T. Adamson, Pharm.D., Rutgers

Samy A. Ayoub, M.S., Pharm.D., Rutgers

Kurtis J. Barry, B.S., Wyoming

Jean Gagnon, Ph.D., Ohio State

Christine Jaderland, Pharm.D., Florida

Michael E. Kafrissen, M.D., Temple

John Louis Parascandola, Ph.D., Wisconsin

Bruce E. Ruck, Pharm.D., St. John's

Melvin P. Weinstein, M.D., George Washington

**Adjunct Associate Professors:**

Lawrence I. Golbe, M.D., Brown

Mark Grebenau, M.D., Ph.D., New York

George H. Lambert, M.D., Illinois

Henry A. Lubinski, M.S., Rutgers

Judy Lum, B.A., SUNY (Stony Brook); M.P.A., Columbia

Mark Monane, M.D., M.S., New York

Eric Racine, Pharm.D., Wayne State

J. Russell Teagarden, M.A., Loyola (Chicago)

**Adjunct Assistant Professors:**

Walter Bender, B.S., OSNI

Rami Ben-Joseph, B.S., Hebrew (Israel); Ph.D., Florida

Tracy A. Benson, B.S., Pharm.D., Rutgers

Keri Bicking, Pharm.D., Rutgers

Nancy Castanheira, Pharm.D., Rutgers

Joseph DiCesare, M.P.H., Rutgers

Eileen F. Duffy, B.S., Philadelphia College of Pharmacy, University of the Sciences in Philadelphia

George D. Hartpence, B.S., Philadelphia College of Pharmacy, University of the Sciences in Philadelphia

Eric Tomasz Hola, B.S., Ohio State

David H. Kaplan, M.S., Temple

Joseph M. Kenny, B.S., Rutgers

Nancy Lisowski, Pharm.D., Maryland

Laura Litzenberger, Pharm.D., Pacific

Timothy Nguyen, B.S., Pharm.D., Philadelphia College of Pharmacy, University of the Sciences in Philadelphia

John O'Brien, Pharm.D., Nova Southeastern

James L. Perhach, Ph.D., Pittsburgh

Stanley Reuben, M.B.A., Fairleigh Dickinson

Mitch Rusay, B.S., Rutgers

Monica Shah, Pharm.D., Rutgers

Thomas F. Turco, B.S., Pharm.D., Philadelphia College of Pharmacy, University of the Sciences in Philadelphia

Calbert V. Valencia, Pharm.D., Rutgers

Will Zachok, Pharm.D., St. John's

**Adjunct Instructors:**

Floyd Farano, M.S., Fairleigh Dickinson

Marcy Portnoff Gever, B.S., Rutgers

Michael P. Kane, B.S., Rutgers

**Adjunct Clinical Professor:**

Susan E. Boruchoff, M.D., Columbia

**Adjunct Clinical Associate Professor:**

Linda Gooen, B.S., Pharm.D., Rutgers

Mark D. Peters II, B.S. Rutgers, Pharm.D., MUSC

**Adjunct Clinical Assistant Professors:**

Vincent Brett, B.S., Rutgers; M.S., Bridgeport; Pharm.D., Creighton

Mona Mahal, M.D., Christian Medical (India)

Robin Winter-Sperry, B.A., Miami; M.D., Northeastern (Tampico, Mexico)

# History and Aims of the School (RBS-NB)

## HISTORY AND AIMS OF THE SCHOOL

The Rutgers Business School: Undergraduate-New Brunswick (RBS-UNB) offers major programs that lead to the bachelor of science degree in accounting, business analytics and information technology, finance, leadership and management, marketing, and supply chain management. Undergraduate degrees in the broad functional areas of business have been offered New Brunswick since 1934. In 1981, these departments were reorganized into the School of Administrative Sciences under the Faculty of Professional Studies.

In June 1984, the university's Board of Governors approved a reorganization of the School of Administrative Sciences into the School of Business. The new School of Business received final approval from the New Jersey Department of Higher Education in February 1986, and began operation as a distinct unit on September 1, 1986. In April 1991, the School of Business-New Brunswick received its accreditation from the Association to Advance Collegiate Schools of Business International (AACSB International) in business administration.

In 1996, the School of Business, the School of Management in Newark, and the Graduate School of Management, the business units on Rutgers' northern campuses, were merged into a single school that was subsequently named Rutgers Business School-Newark and New Brunswick. The undergraduate business program in New Brunswick remains a separate program--with unique entrance and graduation requirements--within the Rutgers Business School.

The Rutgers Business School: Undergraduate-New Brunswick has the following mission: to provide a high-quality program of study for students wishing to pursue professional careers in industry and public accounting firms, to expand the university's research efforts in the areas of business and managerial issues, to encourage faculty in business studies to serve the business and government communities, and to participate in professional associations.

# The Program (RBS-NB)

## THE PROGRAM

The undergraduate majors offered by the Rutgers Business School: Undergraduate-New Brunswick (RBS-UNB) include accounting, business analytics and information technology, finance, leadership and management, marketing, and supply chain management. Each major leads to the degree of bachelor of science and combines a liberal arts foundation in mathematics, the natural sciences, the social and behavioral sciences, and the humanities, with a professional specialization in one of the broad functional areas of business.

The purpose of the curriculum is to provide a broad education that prepares the student for imaginative and responsible citizenship and leadership roles in business and society. The curriculum is responsive to social, economic, and technological developments and reflects the application of evolving knowledge in economics and the behavioral and quantitative sciences. All RBS-UNB programs of study include an emphasis on written and oral expression.

Through coursework at RBS-UNB, every student is exposed to the international dimensions of business, to the economic and legal environments as they pertain to profit and nonprofit organizations, and the effects of ethical considerations and social and political influences on such organizations. In studies outside the Rutgers Business School: Undergraduate-New Brunswick, each student gains an understanding of the political and legal environments of business and society through coursework in areas such as political science, public administration, and ethics.

# Scholarships (RBS-NB)

## SCHOLARSHIPS

Rutgers Business School: Undergraduate-New Brunswick (RBS-UNB) scholarships are administered by the Special Programs Department and, sometimes, the individual departments. RBS scholarships are competitive awards based upon outstanding GPAs, active organization participation, faculty recommendations, and leadership potential. Scholarship specifications are also a governing factor. Students must apply to be considered for an award. The application process begins in mid-August and thru mid-September. RBS students are notified by email when the scholarship portal opens.

**Alumni Association Scholarship** - Awarded annually to a full-time undergraduate New Jersey resident who demonstrates superior academic achievement.

**Atrion Corporation Endowed Scholarship** - The Atrion Corporation created this endowed scholarship to provide financial assistance to undergraduate, non-traditional students enrolled at Rutgers Business School on the New Brunswick campus.

**The Bank of New York Mellon Scholarship** - This scholarship fund seeks to support Rutgers Business School's recruitment of outstanding students and, in turn, further strengthen the quality of the RBS-UNB student body.

**C. Thomas Mallos Scholarship** - Awarded annually to a full-time undergraduate senior accounting major who demonstrates academic excellence and service. Established by C. Thomas Mallos.

**The Center for Women in Business (CWIB)** - CWIB will award selected students up to $5,000 in scholarship money to fund expenses while pursuing a degree at RBS. This scholarship will be awarded to students who demonstrate a commitment to developing their own leadership potential and/or advancing other women in business. This scholarship is awarded to F/T undergraduate students based on financial need. Recipients should participate in the Rutgers Business School's Women BUILD Program or be a student leader in an RBS club or organization.

**Chopruvka Family and Goldman Sachs Gives Endowed Quant Scholarship** - Recipients are to be selected among full-time undergraduate sophomore students enrolled in RBS. Students must be members of the Road to Wall Street Program at RBS and pursuing at least one quantitative major, including but not limited to Computer Science, Mathematics, and/or BAIT.

**Classroom to Boardroom** - This scholarship is for a first-year F/T undergraduate student applicant based on academic merit. The donor requests that the recipient make an informal pledge to "pay it forward" to future Rutgers students once they graduate.

**Cohn Reznick Scholarship** - Awarded to a junior accounting major who has achieved academic excellence, engages in extracurricular activities and plans to pursue a career in the accounting profession.

**Deloitte Foundation Accounting Scholarship** - Applicants must be pursuing an undergraduate baccalaureate degree in accounting and obtaining their CPA from an accredited program and have a GPA of 3.0 or higher. Selected participants must matriculate to the University's Master of Accounting program for the duration of the 2022-2023 academic year and complete such a program in May 2023. Applicants shall demonstrate knowledge and appreciation for the challenges faced by members of demographic groups underrepresented in the field of public accountancy. Applicants must be US citizens or permanent residents.

**Edgar Dunlap Scholarship** - Awarded to a full-time junior who demonstrates superior academic achievement.

**EY Diversity and Inclusion Accelerator Program** - This fund provides scholarship support for students enrolled in the B-STAR program with awards designed for Road to CPA students or students majoring in accounting.

**Gary Dornbush** - Awards are made to full-time undergraduate students majoring in accounting in excellent academic standing.

**Gary Cohen Endowed Scholarship** - Awarded to a full-time Rutgers Business School student who demonstrates drive and high academic merit.

**Gebruder Weiss Supply Chain Leadership Scholarship** - This scholarship is awarded to full-time undergraduate students. Two students will be selected each year - one from the New Brunswick campus and the other from the Newark campus. Recipients will be offered an internship at the company as well.

**Jayceryll Malabuyoc de Chavez Memorial Scholarship** - Awards are made to full-time New Brunswick undergraduate students enrolled in the Rutgers Business School, based on academic merit, who have demonstrated leadership at the University and/or in the community.

**Kenneth and Jessica Miller Scholarship** - Awards are made to full-time undergraduate RBS students based on academic and financial needs. Awards may be renewed for up to three years.

**Littman Family Scholarship** - Awards are made to provide tuition assistance to undergraduate business students on the New Brunswick campus. Established by Leonard and Herbert Littman.

**Michael and Elizabeth Dimond BAIT Scholarship** - Awards are made to full-time undergraduate students with a minimum 3.2 GPA who have demonstrated leadership potential. Preference to finance majors but not required.

**MSD Scholars Initiative Program at Rutgers Business School -** The MSD Scholars Initiative, a strategic partnership with Rutgers Business School, will create a pathway program for professional opportunities on Wall Street for students focused on diversity, equity, and inclusion issues from prior to their first year through graduation.

**Nan and Paul Okarma** - Road to CPA - New Brunswick is an all-inclusive program created to provide guidance and support to students on their path to CPA licensure and a meaningful accounting career. Recipients must be full-time RBS New Brunswick undergraduate accounting majors with a 3.0 GPA or higher. One female recipient is preferred.

**Omotayo Okusanya B-STAR Program** - Scholarship awards are made to students in the Business Student Transition at Rutgers Program (B-STAR).

**Omotayo Okusanya Beta Alpha Psi** - This scholarship is awarded to a full-time New Brunswick undergraduate accounting major in their junior year (Class of 24) who is a member of Beta Alpha Psi with a minimum GPA of 3.5.

**Omotayo Okusanya Road to Wall Street** - This award calls for a sophomore, junior, or senior with a 3.5 GPA or higher who has completed a summer internship with a Wall Street investment bank or in the area of venture capital, private equity, or asset management at a reputable financial services institution and has earned a grade of A in the Road to Wall Street class.

**Petra Cephas B-STAR** - This scholarship supports a hard-working incoming OR current F/T undergraduate B-Star student that has demonstrated unmet financial need.
RBS Board of Advisors - This scholarship is for F/T undergraduate, graduate, or MBA students based on academic merit and financial need.

**RBS 75th Anniversary Endowed Scholarship** - Awarded annually to undergraduate and/or graduate students based on academic merit. This endowed scholarship fund is established by alumni and friends of Rutgers Business School in recognition of the school's 75th anniversary.

**Richard Luhmann Scholarship** - Awarded annually to a senior accounting major who has demonstrated academic excellence and service. Established by family, friends, and colleagues in memory of Richard Luhmann, Rutgers College Class of 1948.

**Richard Federici Scholarship** - Scholarships are awarded to New Jersey residents with good academic standing.

**Robert and Leighanne Egan Family Endowed Scholarship** - Awards are made to full-time undergraduate RBS students based on academic merit and financial need.

**Dr. Rosa Oppenheim Leadership Award** - This award is made to graduating seniors who support future business leaders who exhibit a commitment to leadership. A short essay on leadership is required.

**Roslyn Kuchin Scholarship** - Awards are made annually to full-time students who are in good standing.

**Salina and Zhexuan Wang** - This scholarship is for F/T undergraduate, graduate, or MBA students based on academic merit and financial need.

**School of Business Scholarship** - Awarded to full-time students with high academic performance. Established in 1993.

**Victor W. Farris Scholarship** - Scholarships are awarded to full-time undergraduate students majoring in the RBS RAISED Entrepreneurship program with a cumulative GPA of 3.5 or higher.

**Vito A. Cardace Scholarship** - Awards are made to full-time students who demonstrate outstanding academic achievement. Created by Vito A. Cardace (RBS'60).

**William T. Quinn Sr. Memorial Endowed Scholarship** - New Brunswick campus. Awards are made to full-time undergraduate juniors who show an interest in an entrepreneurial career, are New Jersey residents, and must have previous work experience.

# Admissions (RBS-NB)

## ADMISSIONS

Admissions (RBS-NB)

## First Year

## First Year

First-year students should apply online through the Office of University Undergraduate Admissions. Information for admitted first-year students can be found here.

Admissions (RBS-NB)

## External Transfer

## External Transfer

Transfer students from outside of Rutgers should apply online through the Office of University Undergraduate Admissions. Information for potential and admitted transfer students can be found here.

Admissions (RBS-NB)

# School-to-School Transfer

# School-to-School Transfer

Students who wish to transfer to Rutgers Business School: Undergraduate-New Brunswick from other Rutgers University schools should use the online application. More information about the requirements can be found here.

Admissions (RBS-NB)

# Reenrollment

# Reenrollment

Students in good academic standing who interrupt their registration at Rutgers Business School: Undergraduate-New Brunswick must apply for reenrollment. Any conditions established at the time of leaving must be met before an application for readmission is made. Students who are eligible to return will be reenrolled at Rutgers Business School: Undergraduate-New Brunswick. Students will be held to all of the Rutgers Business School: Undergraduate-New Brunswick degree requirements. (Re)declaration of major and/or departmental certification is at the discretion of the relevant academic department(s).

*Important Note:* Only previous Rutgers Business School: Undergraduate-New Brunswick students may apply for reenrollment for the spring semester. Students who were previously enrolled in another school of Rutgers University may apply for reenrollment to the Rutgers Business School: Undergraduate-New Brunswick for the fall semester. Students who have been academically dismissed will not be permitted to reenroll under any circumstances.

Students interested in applying for reenrollment to the Rutgers Business School: Undergraduate-New Brunswick should submit their application for reenrollment by January 1 for the spring semester or August 31 for the fall semester. The reenrollment application is available at the following website: Here.

# Credits and Residency (RBS-NB)

## CREDITS AND RESIDENCY

All students must earn at least 120 degree credits, with a minimum cumulative grade-point average of 2.000. Most students should be able to complete their baccalaureate requirements in four years of full-time study. Students must complete the required program of study in their business major, in addition to the liberal arts core curriculum requirements. See Programs of Study section for complete requirements.

Rutgers Business School: Undergraduate-New Brunswick (RBS-UNB) students must complete 45 business credits at Rutgers University-New Brunswick. Students matriculated in RBS-UNB must receive written prior approval to take courses outside of Rutgers-New Brunswick.

# Graduation (RBS-NB)

## GRADUATION

Degrees are conferred by Rutgers University on the recommendation of the faculty of the Rutgers Business School-Newark and New Brunswick in May, January, and August. Students file for their diploma through the online diploma application. Diplomas will be withheld from all students whose financial accounts are delinquent. The bachelor's degree is conferred with the distinction *summa cum laude* for graduates with a Rutgers cumulative grade-point average of 3.850 or higher, *magna cum laude* for those with an average of 3.700 or higher, and *cum laude* for those with an average of 3.500 or higher. Averages are not rounded to the next higher number in the calculation of honors. Academic departments may recommend students for departmental honors based on a combination of cumulative grade-point average and academic excellence within the major. More information about RBS graduation can be found here.

# Programs of Study: Majors and Minors (RBS-NB)

## PROGRAMS OF STUDY: MAJORS AND MINORS

The business studies program is only part of the student's academic program. Students will complement their professional education with coursework in the humanities, mathematics, natural sciences, and social and behavioral sciences. In order to design an integrated academic program, full-time students should plan their program over four years. During the first three semesters, the student should formulate a schedule that is comprised of the six prerequisite courses and liberal arts core curriculum requirements. During the remaining five semesters, the schedule focuses on completing the remaining credits required of the business major. Students should also plan to take additional general elective credits to ensure that their total degree credits equals 120, the number of credits needed for the bachelor of science degree. Business majors should consult with a Rutgers Business School: Undergraduate-New Brunswick advisor when they are planning their academic program.

The following are prerequisite courses that students must complete during their first three (four at most) semesters and before they are eligible to take additional business courses:

**Prerequisite Courses (19 credits)**
01:198:170 Computer Applications for Business (3)
01:220:102 Introduction to Microeconomics (3)
01:220:103 Introduction to Macroeconomics (3)
01:640:135 Calculus I (4)
01:960:285 Introductory Statistics for Business (3)
33:010:272 Introduction to Financial Accounting (3)

**Liberal Arts Core Curriculum Requirements (minimum 27 credits)**
In addition to the six eligibility courses and courses that are required for the major, all Rutgers Business School: Undergraduate-New Brunswick students must complete the following liberal arts core curriculum requirements:
1) Contemporary Challenges (two courses)
2) Areas of Inquiry (six courses)

3) Cognitive Skills and Processes (five courses).
All courses must be at least 3 credits and must be taken for degree credit. Pass/no credit courses may not be used to fulfill these requirements. Students should see Degree Navigator for specific courses and conditions.

**Major Requirements (56-62 credits)**
The major requirements for Rutgers Business School: Undergraduate-New Brunswick programs of study can be divided into two parts: business core course requirements that all students must complete regardless of their choice of major program (accounting, business analytics and information technology, finance, leadership and management, marketing, or supply chain management), and a combination of required and elective courses that students take according to their choice of major. Students must complete the requirements of the major that are in effect at the time of their admission into the major. All core courses and required courses specific to the major must be completed with a grade of C or better.

- 010 Accounting
- 136 Business Analytics and Information Technology (BAIT)
- 390 Finance
- 605 Leadership and Management
- 630 Marketing
- 799 Supply Chain Management
- 135 Business Administration Minor
- 382 Entrepreneurship Minor

# 010 Accounting (RBS-NB)

## 010 Accounting

Major requirements for students who enter Rutgers Business School: Undergraduate-New Brunswick (RBS) ***in the fall 2018 semester to the fall 2022 semester:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) (junior or senior year)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Accounting Courses**

33:010:325 Intermediate Accounting I (3) (prerequisite: 33:010:272)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:010:326 Intermediate Accounting II (3) (prerequisite: 33:010:325)
33:010:451 Cost Accounting (3) (prerequisite: 33:010:275)
33:010:415 Concepts of Auditing (3) (prerequisite: 33:010:325)
33:010:421 Income Tax Accounting (3) (prerequisite: 33:010:325)
33:010:401 Advanced Accounting (3) (prerequisite: 33:010:326)
33:010:416 Audit Analytics (3) (prerequisite: 33:010:415)

In order to declare Accounting as a major, you must earn a grade of B or better in Intro to Financial Accounting, 33:010:272.

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2022 semester to the fall 2023 semester:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) (junior or senior year)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Accounting Courses**

33:010:325. Intermediate Accounting I (3) (prerequisite: 33:010:272)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:010:326 Intermediate Accounting II (3) (prerequisite: 33:010:325)
33:010:451 Cost Accounting (3) (prerequisite: 33:010:275)
33:010:415 Concepts of Auditing (3) (prerequisite: 33:010:325)
33:010:421 Income Tax Accounting (3) (prerequisite: 33:010:325)
33:010:401 Advanced Accounting (3) (prerequisite: 33:010:326)
33:010:416 Audit Analytics (3) (prerequisite: 33:010:415)
33:010:422 Topics in Income Taxation (3) (prerequisite: 33:010:326 and 33:010:421)

In order to declare Accounting as a major, you must earn a grade of B or better in Intro to Financial Accounting, 33:010:272.

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:***

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Accounting Courses**

33:010:325. Intermediate Accounting I (3) (prerequisite: 33:010:272)
33:010:458 Accounting Information Systems (3) (prerequisite: 33:010:272)
33:010:326 Intermediate Accounting II (3) (prerequisite: 33:010:325)
33:010:451 Cost Accounting (3) (prerequisite: 33:010:275)
33:010:415 Concepts of Auditing (3) (prerequisite: 33:010:325)
33:010:421 Income Tax Accounting (3) (prerequisite: 33:010:325)
33:010:401 Advanced Accounting (3) (prerequisite: 33:010:326)
33:010:416 Audit Analytics (3) (prerequisite: 33:010:415)
33:010:422 Topics in Income Taxation (3) (prerequisite: 33:010:421)

In order to declare Accounting as a major, you must earn a grade of B or better in Intro to Financial Accounting, 33:010:272.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.

Students with more than one Business School major may only double count one RBS course between those majors.

# 136 Business Analytics and Information Technology (BAIT) (RBS-NB)

## 136 Business Analytics and Information Technology (BAIT)

Major requirements for students who entered RBS ***prior to the fall 2023 semester***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (junior or senior year 33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)

33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required BAIT Courses**

33:136:388 Foundations of Business Programming (3)
33:136:485 Time Series Modeling for Business (3) (prerequisite: 33:136:385)
33:136:470 Business Data Management (3) (prerequisites: 33:136:370 or 33:010:458; and 33:136:388)
33:136:400 Business Decision Analytics under Uncertainty (3) (prerequisite: 33:136:386)

**Three BAIT electives (9),** 3 credits of which must be from the Department of Management Science and Information Systems (136).

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:*** **Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301,

and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required BAIT Courses**

33:136:388 Foundations of Business Programming (3)
33:136:485 Time Series Modeling for Business (3) (prerequisite: 33:136:385)
33:136:470 Business Data Management (3) (prerequisites: 33:136:370 or 33:010:458; and 33:136:388)
33:136:400 Business Decision Analytics under Uncertainty (3) (prerequisite: 33:136:386)

**Three BAIT electives (9),** 3 credits of which must be from the Department of Management Science and Information Systems (136).

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

# 390 Finance (RBS-NB)

## 390 Finance

Major requirements for students who entered RBS ***prior to the fall 2023 semester***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (junior or senior year, 33:140:320 required if double majoring in Accounting)
33:390:310 Financial Management for Finance Majors (3)**
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Finance Courses**

33:390:380 Investment Analysis (3) (prerequisite: 33:390:310)
33:390:420 Derivatives (3) (prerequisite: 33:390:380)
33:390:400 Corporate Finance (3) (prerequisite: 33:390:310)

**Four Finance Electives (12)**

If you major in Finance as your first, second, or third major, you are required to take 33:390:310 Financial Management for Finance Majors. You will not earn credit for taking 33:390:300 Financial Management.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Finance Courses**

33:390:380 Investment Analysis (3) (prerequisite: 33:390:310)
33:390:420 Derivatives (3) (prerequisite: 33:390:380)
33:390:400 Corporate Finance (3) (prerequisite: 33:390:310)

**Four Finance Electives (12)**

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

# 605 Leadership and Management (RBS-NB)

## 605 Leadership and Management

Major requirements for students who entered RBS ***from fall 2017 to fall 2022:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (junior or senior year33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Management Courses**

33:620:369 International Business (3) (prerequisite: 33:620:301)
33:620:410 Executive Leadership (3) (prerequisite: 33:620:302)

**Electives: At least 6 credits (two courses) of the following:**

33:620:362 Effective Leadership Communications (3) (prerequisite: 33:620:302)
33:620:330 Women Leading in Business (3) (prerequisites: 33:620:301 or 33:620:302) 33:620:320 Cross Cultural Management (3) (prerequisite: 33:620:301)

33:620:350 Negotiations (3) (prerequisite: 33:620:301)
33:620:370 Managing Diversity in Organizations (3) (prerequisite: 33:620:301)
33:620:430 Team Building and Group Processes (3) (prerequisite: 33:620:301)

**Other elective courses (up to 6 credits)**

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.
If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.
Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Management Courses**

33:620:369 International Business (3) (prerequisite: 33:620:301)
33:620:410 Executive Leadership (3) (prerequisite: 33:620:302)

**Electives: At least 6 credits (two courses) of the following:**

33:620:362 Effective Leadership Communications (3) (prerequisite: 33:620:302)
33:620:330 Women Leading in Business (3) (prerequisites: 33:620:301 or 33:620:302) 33:620:320 Cross Cultural Management (3) (prerequisite: 33:620:301)
33:620:350 Negotiations (3) (prerequisite: 33:620:301)
33:620:370 Managing Diversity in Organizations (3) (prerequisite: 33:620:301)
33:620:430 Team Building and Group Processes (3) (prerequisite: 33:620:301)

**Other elective courses (up to 6 credits)**

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.
If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.
Students with more than one Business School major may only double count one RBS course between those majors.

# 630 Marketing (RBS-NB)

## 630 Marketing

Major requirements for students who entered RBS ***prior to the fall 2023 semester***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (junior or senior year33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)

**Required Marketing Courses**

33:630:385 Marketing Research (3) (prerequisites: 33:136:385 and 33:630:301)
33:630:374 Consumer Behavior (3) (prerequisite: 33:630:301)
33:630:452 Marketing Strategy and Decision-Making (3) (prerequisite: 33:630:385 and seniors only)

**Four Marketing Electives (12)**

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required Marketing Courses**

33:630:385 Marketing Research (3) (prerequisites: 33:136:385 and 33:630:301)
33:630:374 Consumer Behavior (3) (prerequisite: 33:630:301)
33:630:452 Marketing Strategy and Decision-Making (3) (prerequisite: 33:630:385 and seniors only)

**Four Marketing Electives (12)**

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

# 799 Supply Chain Management (RBS-NB)

## 799 Supply Chain Management

Major requirements for students who entered RBS ***from fall 2016 to fall 2022:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:300 Business Forum (2)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (junior or senior year33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management OR 33:390:310 Financial Management for Finance Majors (3) (33:390:310 required if double majoring in Finance)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required SCM Courses**

33:799:305 Global Procurement and Sourcing Strategies (3) (prerequisite: 33:799:301)
33:799:330 Business Logistics and Transportation (3) (prerequisite: 33:799:301)
33:799:310 Demand Planning and Fulfillment (3) (prerequisite: 33:799:301)
33:799:380 Introduction to Project Management (3) (prerequisite: 33:799:301)
33:799:493 Internship in Supply Chain Management (3) (prerequisite: 33:799:301) OR 33:799:421 Co-op in Supply Chain Management (3) (prerequisite: 33:799:301) OR 33:799:420 SCM Industry Client Projects (3)** (prerequisites: 33:799:380 and seniors only)

**Three Supply Chain Electives (9)****

There are two introductory Finance courses that can fulfill a business core requirement. If you intend to double major in Finance or declare a Finance concentration you will need to take Financial Management for Finance Majors (33:390:310). You can take Financial Management (33:390:300) if you have no intention of majoring in Finance or declaring a Finance Concentration. Credit will not be given for both courses if you take both due to switching to a Finance major/declaring a Finance concentration at a later date.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

**Students may only take one experiential learning course towards their SCM required courses from among these three categories: Industry Client Projects, Internship in Supply Chain Management, and Co-op in Supply Chain Management. Co-op in Supply Chain Management and Internship in Supply Chain Management for SCM required credits are by application only through the Supply Chain department. If you choose to take Co-op in Supply Chain as your one SCM required course you will also be registered for both 799:421 (SCM Co-op) and 799:422 (SCM Elective Co-op) with 799:422 counting toward SCM elective credit. This is the only exception for experiential learning toward SCM elective credit. Any other experiential learning experience after your one allowed for SCM required credit must apply through to the Office of Career Management and you will be registered for general elective credit only.

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Major requirements for students who entered RBS ***in the fall 2024 semester or later:***

**Business Core**

33:010:275 Introduction to Managerial Accounting (3) (prerequisite: 33:010:272)
33:011:301 Foundations for Your Career Journey (1)
33:011:302 Building Your Brand (1) (prerequisite: 33:011:301)
33:011:303 Conquering Your Transition (1) prerequisite: 33:011:302)
33:136:370 Management Information Systems OR 33:010:458 Accounting Information Systems (3) (33:010:458 required if double majoring in Accounting, Prerequisite for 33:010:458: 33:010:272)
33:136:385 Statistical Methods in Business (3)
33:136:386 Operations Management (3)
33:140:320 Business Law I (3) OR 33:522:334 Business Ethics (3) (33:140:320 required if double majoring in Accounting)
33:390:300 Financial Management (3)
33:620:301 Introduction to Management (3)
33:620:302 Management Skills (3)
33:620:492 Business Policy and Strategy (3) (prerequisites: 33:390:300 or 33:390:310, 33:620:301, 33:630:301, and senior year)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)

**Required SCM Courses**

33:799:305 Global Procurement and Sourcing Strategies (3) (prerequisite: 33:799:301)
33:799:330 Business Logistics and Transportation (3) (prerequisite: 33:799:301)
33:799:310 Demand Planning and Fulfillment (3) (prerequisite: 33:799:301)
33:799:380 Introduction to Project Management (3) (prerequisite: 33:799:301)
33:799:493 Internship in Supply Chain Management (3)** (prerequisite: 33:799:301) OR 33:799:421 Co-op in Supply Chain Management (3)** (prerequisite: 33:799:301) OR 33:799:420 SCM Industry Client Projects (3)** (prerequisites: 33:799:380 and seniors only)

**Three Supply Chain Electives (9)****

** Students may only take **one** experiential learning course towards their SCM required courses from among these three categories: Industry Client Projects, Internship in Supply Chain Management, and Co-op in Supply Chain Management. Co-op in Supply Chain Management and Internship in Supply Chain Management for SCM required credits are by application only through the Supply Chain department. If you choose to take Co-op in Supply Chain as your **one** SCM required course you will also be registered for both 799:421 (SCM Co-op) and 011:482 (Special Topics in Admin Studies) with 011:482 counting for general elective credit only. SCM students are limited to one experiential learning experience. After your **one** course allowed for SCM required credit, you must apply through to the Office of Career Management and you will be registered for general elective credit only.

A grade of B or better is required to take any additional Finance department courses beyond 33:390:300 Financial Management.

If you major in Accounting as your first, second, or third major, you are required to take 33:010:458 Accounting Information System and 33:140:320 Business Law I. You will not earn credit for taking 33:136:370 Management Information System. You can earn credit towards graduation if you take 33:522:334 Business Ethics but it will not fulfill a major requirement.

Students with more than one Business School major may only double count one RBS course between those majors.

# 135 Business Administration Minor (RBS-NB)

## 135 Business Administration Minor

***This minor is only for non-RBS students:*** Rutgers students from other schools, departments, and majors can expand their education and enhance their careers by earning a minor in business administration at Rutgers Business School: Undergraduate-New Brunswick. The minor benefits any major by giving students skills and knowledge to compete globally while broadening their appreciation for how the world works.

**Path to Minor**

Rutgers Business School's undergraduate program in New Brunswick offers a minor in business administration to provide students with a strong foundation in the broad functional areas of business. The 18-credit minor consists of six 3-credit introductory courses covering each of Rutgers Business School's disciplinary areas. This combination provides a substantial and comprehensive overview of the major aspects of business administration.

**The business administration minor requires the successful completion with a grade of C or better of the following courses:**

33:010:272 Financial Accounting (3)
33:390:203 Introduction to Finance(3) (prerequisite: Financial Accounting [33:010:272]) 33:620:301 Introduction to Management (3)
33:630:301 Introduction to Marketing (3)
33:799:301 Introduction to Supply Chain Management (3)
*And a choice of one of the following:*
33:136:287 Introduction to Business Analytics (3) OR
33:136:385 Statistical Methods (3) (prerequisite: Calculus) OR
33:136:386 Operations Management (3) (prerequisite: Calculus)

Please note that if you intend to transfer into Rutgers Business School, none of the 200-level courses required for the minor will transfer in except for Financial Accounting 33:010:272. With the exception of Introduction to Finance and Introduction to Business Analytics, all of the above courses are taken alongside RBS majors.

Be informed that students may not double minor in business administration and entrepreneurship. Eligibility to be admitted into the minor requires the student to meet all of the following criteria:

- Good academic standing with a GPA of 2.0 or better.
- Successful completion with a grade of C or better of Precalculus College Mathematics (01:640:115) (or placement out of Precalculus).
- Successful completion with a grade of C or better of Statistics I (01:960:211). [Introductory Statistics for Business (01:960:285), Basic Statistics for Research (01:960:401), Basic Statistics for Exercise Science (01:377:275), Basic Statistics for Sport Studies (01:377:276), Basic Statistical Methods (10:762:205), Quantitative Methods for Psychology (01:830:200), or Analysis of Social Science Data (01:920:312) may be substituted for Statistics 1.]

# 382 Entrepreneurship Minor (RBS-NB)

## 382 Entrepreneurship Minor

***This minor is only for non-RBS students:*** Non-RBS students pursuing the entrepreneurship minor will take all six courses (18 credits).

The suggested course track for this minor will be to first take the preliminary core requirements designed to provide students with general business skills (9 credits), then take the entrepreneurship core courses (6 credits), and finally select an elective (3 credits). The entrepreneurship minor course sequence is structured such that students acquire basic business knowledge and skills before taking more advanced courses. Within the minor, students receive a combination of theoretical and practical exposure to entrepreneurship. Case study is the principal teaching method, supplemented by lectures, project work, and guest speakers. Be informed that students may not double minor in business administration and entrepreneurship.

**Preliminary Core Requirements (9 credits)**

33:382:103 Accounting for Entrepreneurs and Small Businesses (3)
33:382:203 Finance for Entrepreneurs and Small Businesses (3)
33:382:202 Marketing for Entrepreneurs and Small Businesses (3)

**Entrepreneurship Core Requirements (6 credits)**

33:382:302 Introduction to Entrepreneurship (3)
33:382:303 Managing Growing Ventures (3)

**Electives (3 credits)**

# RBS Concentrations (RBS-NB)

## RBS CONCENTRATIONS

Students who are enrolled in a Rutgers Business School Undergraduate Program in New Brunswick major can complete a concentration in Business Analytics, Entrepreneurship, Finance, Global Business, Leadership Skills, Management Information Systems, Real Estate, or Professional Selling

You may declare a concentration if you have successfully completed all 6 pre-business eligibility requirements courses and have declared your major by the end of the spring semester of your sophomore year. You may only declare one concentration. Freshmen and rising sophomores are not eligible to declare a concentration.

If you have a Business Analytics and Information Technology major you may not declare a Business Analytics or Management Information Systems concentration. If you have a Finance major you may not declare a Finance concentration. If you have a Leadership and Management major you may not declare an Entrepreneurship, Global Business, or Leadership Skills concentration. If you have a Marketing major you are permitted to do the Professional Selling Concentration.

In order to declare a Finance concentration students must earn a grade of B or better in 33:390:300 Financial Management.

- 136 Business Analytics Concentration
- 382 Entrepreneurship Concentration
- 390 Finance Concentration
- 620 Global Business Concentration
- 623 Management Information Systems Concentration
- 625 Leadership Skills Concentration
- 631 Sales Concentration
- 634 Professional Selling
- 851 Real Estate Concentration

# 136 Business Analytics Concentration (RBS-NB)

## 136 Business Analytics Concentration

The intention of this concentration is to allow students not majoring in business analytics and information technology (BAIT) to add a field of secondary expertise to their transcripts, complementing their major area of study, without having to take the full complement of seven extra courses required to double-major in BAIT. Such students are advised to select one of the two concentrations (business analytics [BA] or management information systems [MIS]); selecting both concentrations requires six additional courses, in which case it is recommended that the student take one further course and thus qualify for a major or double major in BAIT.

**Concentration Requirements (9 credits total)**

Business Decision Analytics under Uncertainty 33:136:400 (3) (prerequisite: 33:136:386)
Time Series Modeling for Business 33:136:485 (3) (prerequisite: 33:136:385)

**Elective Courses (3 credits)**
Students can choose one of the following courses as an elective:

Data Mining for Business Intelligence 33:136:494 (3)
Investment Modeling with 'R' 33:136:450 (3) (prerequisite: 33:136:370)
Large-Scale Business Data Analysis 33:136:487 (3) (prerequisite: 33:136:370)
Optimization Modeling 33:136:486 (3) (prerequisite: 33:136:386)
Risk Modeling 33:136:405 (3) (prerequisite: 33:136:386)

You cannot 'double count' or overlap any courses between RBS-NB majors and RBS-NB concentrations. All concentration courses must be fulfilled by courses not required by an RBS-NB major. Degree Navigator will not remove the double counted courses and it is the student's responsibility to monitor this manually.

# 382 Entrepreneurship Concentration (RBS-NB)

## 382 Entrepreneurship Concentration

Many companies are explicitly setting expectations for, and placing value on, employees with entrepreneurial skills. Within the concentration, students receive a combination of theoretical and practical exposure to entrepreneurship. Case study is the principal teaching method, supplemented by lectures, project work, and guest speakers.

RBS students pursuing the entrepreneurship concentration will take two entrepreneurship core requirements (6 credits) and one entrepreneurship elective (3 credits).

**Concentration Requirements (9 credits total)**

**Required Courses (6 credits)**
Students are required to take the following two courses:

Introduction to Entrepreneurship 33:382:302 (3)
Managing Growing Ventures 33:382:303 (3) (prerequisite: 33:382:302)

**Elective Courses (3 credits)**
Students can choose one of the following courses as an elective:

Creativity, Innovation, and Entrepreneurship 33:382:340 (3)
Entrepreneurship Practicum 33:382:496 (3)
Managing Technological Innovation 33:382:355 (3)
Multicultural Market 33:382:352 (3)
Music Industry 33:382:486 (3)
New Product Planning 33:630:369 (3)
Social Entrepreneurship 33:382:310 (3)
Technology Ventures 33:382:360 (3) (prerequisite: 33:382:302)
Urban Entrepreneurship and Economic Development 33:382:342 (3)

You cannot 'double count' or overlap any courses between RBS-NB majors and RBS-NB concentrations. All concentration courses must be fulfilled by courses not required by an RBS-NB major. Degree Navigator will not remove the double counted courses and it is the student's responsibility to monitor this manually.

# 390 Finance Concentration (RBS-NB)

## 390 Finance Concentration

Finance focuses on all aspects of money management such as investment, collection, disbursement, borrowing, and fundraising. These individuals prepare financial reports needed to conduct operations and to satisfy tax and regulatory requirements.

To declare a finance concentration, students must complete 33:390:310 Financial Management for Finance majors with a grade of C or better. If students have already completed 33:390:300 Financial Management, they can take a qualifying examination through the finance department.

**Concentration Requirements (9 credits total)**

Investment Analysis 33:390:380 (3)
Corporate Finance 33:390:400 (3)
Derivatives 33:390:420 (3) (prerequisite: 33:390:380)

You cannot 'double count' or overlap any courses between RBS-NB majors and RBS-NB concentrations. All concentration courses must be fulfilled by courses not required by an RBS-NB major. Degree Navigator will not remove the double counted courses and it is the student's responsibility to monitor this manually.

# 620 Global Business Concentration (RBS-NB)

## 620 Global Business Concentration

In the interconnected global economy, a clear understanding of the complex global business environment is important to compete domestically as well as in international markets. The global business concentration is designed to equip students with the knowledge, skills, and global perspectives required to thrive in the global workplace.

RBS students pursuing the global business concentration take two global business core courses (6 credits) and one elective (3 credits).

**Concentration Requirements (9 credits total)**

**Required Courses (6 credits)**
Students are required to take the following two courses:

Global Management and Strategy 33:620:402 (3)
International Business 33:620:369 (3)

**Elective Courses (3 credits)**
Students can choose one of the following courses as an elective:

Cross-Cultural Management 33:620:320 (3)
Doing Business in Emerging Markets 33:620:479 (3)
Executive Leadership 33:620:410 (3)
Global Capital Markets 33:390:320 (3)
International Financial Management (3)
International Marketing 33:630:371 (3)
Managing Diversity in Organizations 33:620:370 (3)
Negotiations 33:620:350 (3)
Procurement and Global Sourcing Strategies 33:799:305 (3)

You cannot 'double count' or overlap any courses between RBS-NB majors and RBS-NB concentrations. All concentration courses must be fulfilled by courses not required by an RBS-NB major. Degree Navigator will not remove the double counted courses and it is the student's responsibility to monitor this manually.

# 623 Management Information Systems Concentration (RBS-NB)

## 623 Management Information Systems Concentration

The intention of this concentration is to allow students not majoring in business analytics and information technology (BAIT) to add a field of secondary expertise to their transcripts, complementing their major area of study, without having to take the full complement of seven extra courses required to double-major in BAIT. Such

students are advised to select one of the two concentrations (business analytics [BA] or management information systems [MIS]); selecting both concentrations requires six additional courses, in which case it is recommended that the student take one further course and thus qualify for a major or double-major in BAIT.

**Concentration Requirements (9 credits total)**

**Required Courses (6 credits)**
Students are required to take the following two courses:

Business Data Management 33:136:470 (3) (prerequisite: 33:136:370)
Foundations of Business Programming 33:136:388 (3)

**Elective Courses (3 credits)**
Students can choose one of the following courses as an elective:

Data Mining for Business Intelligence 33:136:494 (3)
Enterprise Architecture 33:136:465 (3) (prerequisite: 33:136:370)
Information System Security 33:136:471 (3) (prerequisite: 33:136:370)
Investment Modeling with 'R' 33:136:450 (3) (prerequisite: 33:136:370)

You cannot 'double count' or overlap any courses between RBS-NB majors and RBS-NB concentrations. All concentration courses must be fulfilled by courses not required by an RBS-NB major. Degree Navigator will not remove the double counted courses and it is the student's responsibility to monitor this manually.

# 625 Leadership Skills Concentration (RBS-NB)

## 625 Leadership Skills Concentration

The leadership skills concentration within the Department of Management and Global Business aims to help students to master some of the critical "soft skills" necessary to progress through a successful career. With its focus on courses such as Executive Leadership, Effective Leadership Communications, and Negotiations, students should emerge with a greater understanding of themselves and have built a toolkit for effectively interacting with others. The department will also offer course options for this concentration that focus on teamwork, diversity, and issues involved with cross-cultural management.

RBS students pursuing the leadership skills concentration will take one requirement (3 credits), one elective that must be chosen from a list of two (3 credits or 6 credits if both are taken), and if needed, one extra elective from a list of courses offered by the department (0-3 credits).

**Concentration Requirements (9 credits total)**

**Required Courses (3 credits)**
Students are required to take the following course:

Executive Leadership 33:620:410 (3)

**Elective Courses (6 credits)**
Select at least one of the following two (may select both):

Effective Leadership Communications 33:620:362 (3)
Negotiations 33:620:350 (3)

*If needed, select one of the following:*

Cross-Cultural Management 33:620:320 (3)
Managing Diversity in Organizations 33:620:370 (3)
Team Building and Group Processes 33:620:430 (3)
Women Leading in Business 33:620:330 (3)

You cannot 'double count' or overlap any courses between RBS-NB majors and RBS-NB concentrations. All concentration courses must be fulfilled by courses not required by an RBS-NB major. Degree Navigator will not remove the double counted courses and it is the student's responsibility to monitor this manually.

# 631 Sales Concentration (RBS-NB)

## 631 Sales Concentration

*Discontinued after spring 2023*

The sales concentration provides an opportunity for RBS students (all majors except marketing) to obtain the essential knowledge and skills required to begin professional careers in sales. Sales representatives provide value for their business customers by satisfying needs and solving customer problems. In order to accomplish this, sales representatives develop strong relationships with their customers that are built on trust, cooperation, commitment, and information. These representatives may sell consumer goods and services, industrial products, business goods and services, and health care products and services.

**Concentration Requirements (9 credits total)**

**Required Courses (6 credits)**
Students are required to take the following two courses:

Sales Management 33:630:401 (3)
Business to Business Marketing 33:630:370 (3)

**Elective Courses (3 credits)**
Students can choose one of the following courses as an elective:

Consumer Behavior 33:630:374 (3)
Retail Marketing 33:630:368 (3)
Negotiations 33:620:350 (3)
International Marketing 33:630:371 (3)
New Product Planning 33:630:369 (3)

You cannot 'double count' or overlap any courses between RBS-NB majors and RBS-NB concentrations. All concentration courses must be fulfilled by courses not required by an RBS-NB major. Degree Navigator will not remove the double counted courses and it is the student's responsibility to monitor this manually.

# 634 Professional Selling (RBS-NB)

## 634 PROFESSIONAL SELLING

Students who complete this concentration will demonstrate the following:

1. Understanding of the professional sales role and how it fits into the overall marketing strategy.
2. Knowledge of the steps in building a cohesive sales strategy.
3. A deeper understanding of how to build relationships with the customer.
4. Strategy for creating and delivering compelling sales presentations.
5. Best practices as it relates to solving problems and overcoming objections.
6. Techniques for improving time management skills.
7. Understanding Sales EQ and how to strengthen it.

**Concentration Requirements (9 credits total)**

**Required Courses (6 credits)**
Students are required to take the following two courses:

Sales Management 33:630:401 (3)
Introduction to Professional Selling 33:630:485 (3)

**Elective Courses (3 credits)**

Students can choose one of the following courses as an elective:
Business to Business Marketing 33:630:370 (3)
Retail Marketing 33:630:368 (3)
Negotiations 33:620:350 (3)
New Product Planning 33:630:369(3)

You cannot 'double count' or overlap any courses between RBS-NB majors and RBS-NB concentrations. All concentration courses must be fulfilled by courses not required by an RBS-NB major. Degree Navigator will not remove the double counted courses and it is the student's responsibility to monitor this manually.

# 851 Real Estate Concentration (RBS-NB)

## 851 Real Estate Concentration

Current undergraduate business school students pursuing a concentration in real estate will take four courses (12 credits). Students in this program will be taught by top-notch real estate experts and be exposed to relevant coursework and industry-leading guest speakers. But more importantly, by enrolling in either of these programs,

students will have unparalleled access to the more than 70 industry leaders who advise the Rutgers Center for Real Estate. Further, the center will provide scholarships, mentoring, internships, and career opportunities for students enrolled in the program.

**Concentration Requirements**

The concentration consists of four courses (12 credits) in addition to satisfaction of the core undergraduate business requirements. There are two paths to completion of the concentration--one path for finance majors andanother for students in RBS majors in areas other than finance.

**Requirements for Nonfinance Majors**

Satisfactory completion of Financial Management for nonfinance majors (33:390:300) is a prerequisite for Essentials of Real Estate Finance (33:851:380).

**Required courses (12 credits)**

Real Estate Law 33:851:350 (3)
Essentials of Real Estate Finance 33:851:380 (3)
Commercial Debt Markets 33:851:470 (3)
Development 33:851:432 (3)

**Requirements for Finance Majors**

Real Estate Finance and Mortgage-Backed Securities (33:390:435) satisfies the concentration's real estate finance requirement. Students taking 33:390:435 are waived from the requirement to take Essentials of Real Estate Finance (33:851:380).

Satisfactory completion of Financial Management for Finance Majors (33:390:310) is a prerequisite for Real Estate Finance and Mortgage-Backed Securities (33:390:435).

**Required courses (12 credits)**

Real Estate Law 33:851:350 (3)
Real Estate Finance and Mortgage-Backed Securities* 33:390:435 (3)
Commercial Debt Markets 33:851:470 (3)
Development 33:851:432 (3)

*Course credit counts simultaneously as both a requirement for the concentration and as an elective for finance majors.

You cannot 'double count' or overlap any courses between RBS-NB majors and RBS-NB concentrations. All concentration courses must be fulfilled by courses not required by an RBS-NB major. Degree Navigator will not remove the double counted courses and it is the student's responsibility to monitor this manually.

# Explanation of Three-Part Course Numbers (RBS-NB)

## EXPLANATION OF THREE-PART COURSE NUMBERS

The number preceding each course title is divided into three parts. The first two digits are the administrative code (standing for a faculty or a school), the next three digits are the subject code, and the final three digits are the course code.

*Administrative Codes*

The code for the Rutgers Business School: Undergraduate-New Brunswick is 33. For a complete list of administrative codes used in this catalog, see the beginning of the Programs of Study and Courses for Liberal Arts and Sciences Students section.

*Subject Codes*

A subject code comprises the third through fifth digits in all course numbers and indicates the subject matter of the course. Courses with the following subject codes are listed in this chapter. (This does not constitute a list of majors.)

010 Accounting

011 Administrative Studies

136 Business Analytics and Information Technology

140 Business Law

382 Entrepreneurship

390 Finance

522 Business Ethics

620 Management and Global Business

630 Marketing

799 Supply Chain Management

851 Real Estate

*Course Codes*

The course code comprises the sixth, seventh, and eighth digits in all course numbers. Course codes from 100 to 299 indicate introductory and intermediate undergraduate courses. Codes from 300 to 499 indicate advanced undergraduate courses. (Courses coded from 500 to 799 are graduate courses.)

Two course codes separated by a comma indicate that each semester may be taken independently of the other (example: 33:620:498,499). Two course codes separated by a hyphen indicate that satisfactory completion of the first semester is a prerequisite to the second semester (example: 33:010:325-326); the first semester may be taken for credit without taking the second, except where a statement is added to indicate that both semester courses must be completed in order to receive credit.

Credits awarded for the successful completion of each course are indicated in parentheses following the course title. The notation BA indicates that the number of credits is determined by arrangement with the department offering the course.

# Accounting 010 (RBS-NB)

## ACCOUNTING 010

For required courses for the accounting major, see the Programs of Study chapter. Additional information about the undergraduate program can be found here.

**33:010:272** *Introduction to Financial Accounting (3)*
Introduction to basic accounting concepts, business and reporting, and accounting; emphasis on measuring and recording transactions and interpreting financial statements.
*Not open to first-year students.*

**33:010:275** *Introduction to Managerial Accounting (3)*
Introduction to basic concepts of management accounting with emphasis on decision making and controlling operations through the use of budgets and forecasting models, cost and activity analyses, and various financial and nonfinancial performance measures.
*Prerequisite: 33:010:272 or 29:010:203 or 52:010:101. Not open to first-year students.*

**33:010:310** *Accounting for Engineers (3)*
Introduction to financial accounting and significant cost accounting concepts.
*Prerequisites: Open only to students majoring in engineering. Not open to first-year students.*

**33:010:325** *Intermediate Accounting I (3)*
Development of accounting principles under the corporate form of business organization. Topics include basic financial statements, cash and receivables, inventories, property, plant, equipment, and intangible assets.
*Prerequisites: 33:010:272 or29:010:203 or 52:010:101. Open to accounting and finance majors.*

**33:010:326** *Intermediate Accounting II (3)*
Continuation of 33:010:325 with topical coverage of long-term liabilities, stockholders' equity, investments, revenue recognition, accounting for income taxes, pensions, leases, accounting changes, and statement of changes in financial position.
*Prerequisites: 33:010:325 or 29:010:305. All except first-year students.*

**33:010:401** *Advanced Accounting (3)*
Consolidated financial statements, including the elimination of intercompany transactions. Accounting for foreign currency transactions and translation of foreign currency financial statements. Fund accounting for state and local governments. Reporting by segments of conglomerates.
***Prerequisites: 33:010:326 or 29:010:306.***

**33:010:415** *Concepts of Auditing (3)*
Introduction to the principles and concepts of the audit as an attestation service offered by the accounting profession. Primary emphasis is placed on generally accepted auditing standards, the role of the CPA/auditor in evidence collection, analytical review procedures and reporting, the CPA/auditor's ethical and legal responsibilities, and the role of the Securities and Exchange Commission and other constituencies. Audit testing including statistical sampling, internal control issues, and audit programs are discussed.
***Prerequisites: 33:010:325 or 29:010:305. All except first-year students.***

**33:010:416** *Audit Analytics (3)*
This course is designed to familiarize accounting majors with various analytical skills and provide them with a practical demonstration in an auditing context. It is designed to familiarize students with the concept of audit analytics, the basic audit analytical tools, the trending topics in this field, and the application of different analytical methods in the internal and external audit process. It links audit analytics to corporate continuous monitoring and business process support and provides hands-on experience in using state-of-the-art audit analytical tools.
***Prerequisites: 33:010:415 or 29:010:430. Junior and senior accounting majors only.***

**33:010:421** *Income Tax Accounting (3)*
Analysis of the income tax laws as they apply to the income of individuals with an emphasis on problems arising from these laws.
***Prerequisites: 33:010:325 or 29:010:305.***

**33:010:422** *Topics in Income Taxation (3)*
Designed for those who will specialize in taxation. Examination of taxation problems of corporations and partnerships, corporate distributions, liquidations, reorganizations, and other corporate tax matters.
***Prerequisite: 33:010:421 or 29:010:413.***

**33:010:451** *Cost Accounting (3)*
Basic cost concepts and the operation of the two basic cost systems (job order and process cost), including problems involving multiple product costing and standard cost with emphasis on variance analysis.
***Prerequisites: 33:010:275 or 29:010:204 or 52:010:202. Not open to first-year students. Accounting majors only.***

**33:010:458** *Accounting Information Systems (3)*
Management information systems concepts used to develop an accounting information system for corporations, with emphasis on general concepts, management of accounting data flow, and software controls.
***Prerequisites: (01:198:170 or 14:440:127) & 33:010:272 OR 29:010:203 & (01:197:170 or 01:198:110)***

**33:010:472** *Analysis of Financial Statements (3)*
Factors that affect the critical examination and interpretation of financial statements from the viewpoint of groups, using such data with emphasis on accounting problems, analytical methods, and item content of formal statements.
***Prerequisites: 33:010:325 or 33:390:400 or 29:010:305 or 20:390:330. Open to accounting and finance majors only.***

**33:010:472** *CPA Level Financial Accounting and Reporting (3)*
The objective of the course is to familiarize students with strategies to help successfully complete the Financial Accounting and Reporting section of the Uniform Certified Public Accountant (CPA) exam. This course will cover new financial accounting and reporting material and techniques in relevant areas not addressed in core accounting curriculum classes. In addition, the course will build on students existing knowledge of financial accounting and reporting to provide a comprehensive review of the areas generally tested on the exam integrating the material in a manner which students have not previously seen.
***Prerequisites: 33:010:401***

**33:010:490** *Independent Project in Accounting (3)*
Individual research and/or reading program under guidance of member of the department.
***Prerequisites: Permission of department. Open to accounting majors only.***

**33:010:495,496** *Honors Project in Accounting (3,3)*
Individual research and preparation of a written thesis under direction of an accounting faculty member.
***Prerequisites: Open to accounting seniors in honors program only. Both semesters must be completed to receive credit.***

# Administrative Studies 011 (RBS-NB)

## ADMINISTRATIVE STUDIES 011

**33:011:100** *Introduction to Business (3)*
Introduction to business functions, methods of business operation, types of business ownership, and the role of business organizations in society.
***First-Years and Sophomores.***

**33:011:231** *Women's Business Leadership Intiative Seminar I (1)*
This course, reserved for students newly admitted to the Women BUILD program, provides an understanding of the various dimensions of Gender Identity and explores the unique challenges and opportunities presented to women in business. The course aims to provoke students to question their assumptions and become more self-aware, confident members and future leaders within an organizational context. Students learn to make meaningful connections between seminar content and the development of a personal leadership style.
***Open to Rutgers Business School students - Permission from Undergraduate Office.***

**33:011:270** *BYOC: Continuous Business Monitoring (1)*
This course describes a paradigm shift from the traditional auditing and monitoring approach. Rather than resorting to analyzing a sample of the population, this course presents methodologies and techniques that can be applied to the entire population of records in an audit-by-exception manner. The students learn about various related topics, such as process mining, artificial intelligence, exception identification and prioritization, and automation, among others.

**33:011:271** *BYOC: Emerging Technologies in Business (1)*
This course covers a wide range of emerging technologies in the accounting and auditing areas. Students are introduced to data visualization and interactive dashboards, artificial intelligence, process mining, blockchain, smart contracts, crypto currencies, cybersecurity, and text mining. Moreover, students learn about practical applications and use cases of such technologies in a business environment.

**33:011:272** ***BYOC: Business Process Automation (1)***
This course discusses the increasingly popular Robotic Process Automation (RPA) technology. Students learn about progressiveness advanced and complex scenarios of automation. In addition, they learn about the relationship between automation and the concept of continuous auditing and continuous monitoring, as well as hands-on use cases in accounting.

**33:011:273** ***BYOC: Cloud Computing Blockchain & Crypto (1)***
This course introduces students to blockchain technology and cloud computing and how they are applied in an accounting and auditing context. Students learn about various issues related to cryptocurrencies and their valuation and markets, such as their unique properties and the technologies used to build them. Furthermore, students learn about information risk management and cyber security as well as their impact on business and good practice standards of cybersecurity.

**33:011:274** ***BYOC: AI in Accounting & Audit (1)***
In this course students learn about Artificial Intelligence (AI) and some of its potential applications in accounting and auditing. By studying technology from a business perspective, students get a more holistic view of its uses. In addition to the basics of AI, students study techniques such as classifiers, cluster analysis, exception and anomaly detection, automation, and learn more advanced applications of AI in accounting and auditing.

**33:011:275** ***BYOC: Design it Yourself in Accounting & Audit***
This course allows students to design the course themselves by allowing them to select modules of interest. More specifically, students can choose any five modules from a set of eligible modules across all BYOC courses.

**33:011:300** ***Business Forum (2)***
Brief overview of business disciplines; composed of a series of lectures on current issues and their impact on business operations.
Course will not be offered after the fall 2024 semester.
***Prerequisite: Admission to Rutgers Business School.***

**33:011:301** ***Foundations for Your Career Journey***
Foundations for your Career Journey is the first in the Business Forum 3 course series. This course is designed to introduce the resources and opportunities available at the business school and Rutgers University that support student success, creates foundational materials needed to begin career journeys, and drives development of business professionalism in students.

**33:011:302** ***Building Your Brand***
Building your Brand is the second in the Business Forum 3 course series. This course is designed to build your professional brand by learning to effectively communicate in professional contexts and translating your personal skillset and competencies into internship and career opportunities.
***Prerequisite: 33:011:301***

**33:011:303** ***Conquering Your Transition***
Conquering Your Transition is the third and final in the Business Forum 3 course series. This course is designed to navigate your transition from college to the workplace and translate your accumulated business knowledge and experiences into success in the business world. It involves mastering skills necessary to foster a supportive

professional network, navigate the challenges of personal finance, and navigate difficult yet common workplace challenges.
***Prerequisite: 33:011:302***

**33:011:380** ***Co-op Education (6)***
Provides the opportunity to apply concepts learned in class to the work environment.
***Prerequisite: Special Permission.***

**33:011:390** ***Personal Financial Planning (3)***
The emphasis of this course is on the applications of personal financial planning concepts in an integrated planning environment, exposing students to the financial planning profession and assist students with their own personal financial decisions. Students will learn the following aspects of financial planning: money management skills, tax planning, credit management, risk management and insurance, personal investment management, retirement planning, and estate planning.
***Prerequisite: 33:390:300 or 33:390:310. Open to Rutgers Business School students.***

**33:011:480** ***Special Topics in Business (BA)***
Consideration of interdisciplinary topics of contemporary importance in business.
***Prerequisites: Junior and senior status and permission of instructor. Rutgers Business School majors only.***

**33:011:485** ***Field Internship in Business (3)***

Supervised involvement in a private, public, or nonprofit organization providing the student with an opportunity to apply business knowledge.

***Prerequisite: Special Permission.***

# Business Analytics and Information Technology 136 (RBS-NB)

## BUSINESS ANALYTICS AND INFORMATION TECHNOLOGY 136

For required courses for the business analytics and information technology (136) major, see the Programs of Study chapter. Additional information about the undergraduate program can be found here.

**33:136:287** ***Introduction to Business Analytics (3)***
Introduction to Business Analytics for business administration minors.
***Business Administration minors only.***

**33:136:370** ***Management Information Systems (3)***
Fundamentals of computer technology, including hardware, software, telecommunications, and basics of the internet. The role of computer-based information and executive decision support systems in the modern firm. Design, normalization, creation, and querying of relational databases. Management of information and data. Elementary system development principles.
***Prerequisites: 01:198:170 or 01:198:111 or 01:198:110 or 14:440:127. Open to Rutgers Business School majors.***

**33:136:385** *Statistical Methods in Business (3)*
Review of principles of hypothesis testing, chi-square tests, one-way and two-way ANOVA, simple and multiple regression analysis, correlation analysis, nonparametric methods, indices, time series, forecasting, and applications to business.
***Prerequisites: (01:640:135 & 01:960:285) or (01:640:130 & 01:960:211) or (01:640:135 & 01:960:285). Open to Rutgers Business School majors and minors.***

**33:136:386** *Operations Management (3)*
Key quantitative techniques essential for analyzing and improving business operations. Spreadsheet modeling of business decision problems, both with and without data uncertainty. Linear and integer programming optimization models. Elementary applied probability modeling and Monte Carlo simulation.
***Prerequisites: 01:640:130 or 01:640:135 or 01:640:151 or 21:640:135 or 50:640:121. Open to Rutgers Business School majors and minors.***

**33:136:388** *Foundations of Business Programming (3)*
Principles of programming and software development are covered in depth, with an emphasis on an object-oriented programming (OOP) style, using an OOP language such as C++ or Java. Studies the principles of object-oriented design using the UML modeling language; fundamental data structures and algorithm development for solving business problems.
***Prerequisites: Open to 136 majors and 623 CERT. All except first-year students.***

**33:136:400** *Business Decision Analytics under Uncertainty (3)*
Introduction to methods for planning problems that include both time evolution and uncertainty. Covers the ideas of dynamic programming, classical decision trees, and application of Bayesian methods to derive tree probabilities. Includes fundamental computer programming techniques for numerical calculations, loops, and arrays. Introduction to sampling-based simulation techniques. Writing and implementing Monte Carlo simulations and the study of specialized packages for discrete-event simulation.
***Prerequisites: 33:136:386 or 29:623:311. Open to 136 majors and 136 CERT. All except first-year students.***

**33:136:405** *Risk Modeling (3)*
Introduction of the main concepts and models of decision making under uncertainty when risk aversion plays a major role. Topics serve as a foundation for models involving measures of risk and include expected utility modes with their economic background and business applications; mean-risk models with applications to finance; the concepts of value at risk and average value at risk with applications. Examines fundamental dynamic models, with applications to insurance, finance, and inventory management.
***Prerequisites: 33:136:386 or 29:623:311. Open to 136 majors. Junior or senior status.***

**33:136:440** *Special Topics: Relational Database and Web Applications (3)*
Provides the basics about the integration of relational databases and the World Wide Web. Utilizes a server-side tool to build and query databases using HTML and SQL, including the design of "shopping cart" applications and interactive web games. Emphasis includes how to build, manipulate, and create output from a database to a webpage.
***Prerequisite: 33:136:370 or 33:010:458 or 29:010:485. Open to Rutgers Business School juniors and seniors.***

**33:136:450** *Investment Modeling with "R" (3)*
Extends upon the strategies from Investment Modeling with VBA and expands to implementing probability models in R with respect to investment models. Explores event-driven strategies in the hedge fund world and pricing

inefficiencies in complicated products such as options and ABS securities.
***Prerequisites: 33:136:370 or 33:136:458 or 29:010:485. Open to 136 majors, 136 CERT and 623 CERT. Open to Rutgers Business School juniors and seniors.***

**33:136:455** ***Introduction to ERP (3)***
An introduction to Enterprise Resource Planning (ERP) systems. Addresses how enterprise information systems are integrated and facilitated to improve business operations. Emphasis on hands-on experience of SAP R/3. Includes the study of functional business domains and associated business processes, business problems inherent in unintegrated information systems, ERP systems as a solution to various business problems and challenges, and provides an overview of marketing, operations management, and accounting.
***Prerequisites: 33:136:370 and 33:010:458 or 29:010:485. Open to 136 majors. Junior or senior status.***

**33:136:465** ***Enterprise Architecture (3)***
An introduction to models, techniques, and tools for developing Enterprise Architecture (EA), the study of principles, methods, and models that are used in the design and realization of an enterprise's organization structure, business processes, information systems, and infrastructure. Covers methods and frameworks from The Open Group Architecture Framework (TOGAF), Zachman, and other frameworks. Provides an overview and history of EA, TOGAF core concepts, and follows with a tour of the IT landscape in business organizations. Presents EA through the TOGAF standard and its associated modeling language, ArchiMate.
***Prerequisites: (33:136:370 or 33:010:458 or 29:010:485) & 33:136:388. Open to 136 majors or 623 CERT. Open to Rutgers Business School juniors and seniors.***

**33:136:470** ***Business Data Management (3)***
Introduces principles and techniques for managing corporate data resources. Techniques for managing the design and development of large database systems, including data models, concurrent processing, data distribution, database administration, and data warehousing; demonstrates their use in business applications. Discusses principles of database systems, database design, database schemas, and database manipulation using SQL. Surveys advanced database management topics such as transaction control, distributed databases, data warehouses, database ecommerce applications, and object-oriented databases. In addition to conceptual material, provides significant hands-on experience using current database technologies.
***Prerequisites: (33:136:370 or 33:010:458 or 29:010:485) & 33:136:388. Open to 136 majors or 623 CERT. Junior or senior status.***

**33:136:471** ***Information System Security (3)***
Provides an overview of information security and assurance in ebusiness and other cyber environments. Studies key issues associated with protecting information assets, determining levels of protection and response to security incidents, and designing a consistent, reasonable information security system with appropriate intrusion detection and reporting features. Covers the fundamentals of threats, vulnerabilities, firewalls, secure access, intrusion detection, cryptography, disaster recovery techniques, and secure programming.
***Prerequisites: 33:136:370 or 33:623:370 or 33:010:458 or 29:010:485. Open to 136 majors or 623 CERT. Junior or senior status.***

**33:136:485** ***Time-Series Modeling for Business (3)***
Introduction to time-series models with emphasis on practical applications in business. Examines how dynamic financial and economic data can be modeled and analyzed using proper statistical techniques. Topics include methods for trend and seasonal analysis and adjustment, modeling, and forecasting with autoregressive moving

average (ARMA) processes; and model identification and diagnostics for time series, volatility, and state space models. This course provides hands-on experience by pairing lectures on methodology with lab sessions using high-performance statistical software to perform real-world data analyses.
*Prerequisites: (01:198:111 and 01:960:285) or 33:623:385 OR (01:198:111 and 01:960:285) or 33:136:385. Open to 136 majors or 136 CERT. All except first-year students.*

**33:136:486** *Optimization Modeling (3)*
Introduces optimization modeling beyond the confines of a two-dimensional spreadsheet. Study of appropriate mathematical notation for formulating realistic, complex optimization models; how to translate this notation into a modern modeling language; and how to represent given problem data symbolically and separate it from the fundamental model structure. Use of set-theoretic and network ideas in formulating models and representing data; use of nonlinear models or integer variables. Examines how to formulate models in a linear or convex manner; introduction of Lagrange multipliers and their economic interpretation.
*Prerequisites: 33:136:386 or 29:623:311. Open to 136 majors and 136 CERT. Junior or senior status.*

**33:136:487** *Large-Scale Business Data Analysis (3)*
Introduction to fundamental statistical techniques for analyzing large-scale business data; provides systematic training in statistical models for massive datasets and programming, data management, and exploratory data analysis in real-world settings. Students develop context-sensitive models and perform model checking and diagnosis. Topics include parametric inference, logistic regression, nonlinear regression, causal inference, graphical models, dimension reduction, and model selection. Provides a comprehensive set of data analysis techniques through lessons, demonstrations, and programming labs.
*Prerequisites: 33:136:370 or 33:010:458 or 29:010:485. Open to 136 majors. Junior or senior status.*

**33:136:494** *Data Mining for Business Intelligence (3)*
Explores the fundamental concepts of data mining and provides extensive hands-on experience in applying the concepts to real-world business applications. Topics include classification, clustering, association analysis, and anomaly/novelty detection. The final two weeks of the course involve student project presentations applying data mining techniques to applications such as fraud detection, web usage analysis, customer churn analysis, customer segmentation, blog mining, text mining, and other business data analysis.
*Prerequisites: 33:136:385 & 33:136:388. Open to 136 majors, 136 CERT, and 623 CERT. Junior or senior status.*

**33:136:495, 496** *Honors Project in MSIS (3,3)*
Individual research and preparation of a written thesis under direction of a Management Science & Information Systems department faculty member.
*Open to Business Analytics & Information Systems major students in the honors program only.*

**33:136:498** *Independent Project in MIS (3)*
Individual research and/or reading program under guidance of a member of the Management Science & Information Systems department.
*Permission of department. Open to Business Analytics & Information Systems major students only.*

# Business Law 140 (RBS-NB)

## BUSINESS LAW 140

**33:140:320** *Business Law I (3)*
Discussion of the legal environments of business; contracts--their formation, operation, and discharge; sales--property, both real and personal.
***Prerequisites:01:220:102 & 01:220:103 & 33:010:272 OR 21:220:101 & 21:220:102 & 29:010:203. All except first-year students.***

**33:140:321** *Business Law II (3)*
Negotiable instruments, agency, partnerships, corporations, secured transactions, and bankruptcy.
***Prerequisite: 33:140:320. Open to accounting majors; junior or senior status.***

# Entrepreneurship 382 (RBS-NB)

## ENTREPRENEURSHIP 382

**33:382:103** *Accounting for Entrepreneurs and Small Business (3)*
Introduction to basic concepts of managerial and financial accounting in the context of new ventures and small business. Two main emphases frame this course. First, managerial accounting: decision making and controlling operations through the use of budgets and forecasting models, cost and activity analyses, and various financial and nonfinancial performance measures. Second, financial accounting: emphasis on resource management, measuring and recording transactions, and interpreting financial statements.
***Not open to Rutgers Business School students.***

**33:382:105** *Design Thinking Approach to Innovation and Entrepreneurship (3)*
Creating new businesses, capturing new markets, and enhancing organizational effectiveness occur through improving productivity or innovation, or both. New discoveries, new technologies, competition, and globalization compel both entrepreneurs and existing firms to foster innovation and agility. Design thinking is a human-centered, prototype-driven process for innovation that can be applied to product, service, and business design. This course examines the theory and practice of promoting and managing innovation in start-ups and existing firms. It explores successful use of design thinking frameworks for the design of strategies, funding techniques, business models, risks, and reducing barriers for introducing breakthrough products and services. Topics include business model innovation, design-driven innovation, leadership, strategy, information technology, knowledge management, process improvement, performance measurement, and change management. The course emphasizes hands-on projects and studio-style project works.

**33:382:202** *Marketing for Entrepreneurs and Small Business (3)*
Extensive overview of marketing: the process of creating goods and services in response to consumer wants and needs. Study of the marketing function in business firms and nonprofit organizations. Consumer behavior, marketing research, industrial marketing, pricing, channels of distribution, and promotion.
***Not open to Rutgers Business School students.***

**33:382:203** ***Finance for Entrepreneurs and Small Business (3)***
Introduction to basic financial concepts, business, and reporting in the context of new ventures creation and small business operations.
***Not open to Rutgers Business School students.***

**33:382:302** ***Introduction to Entrepreneurship (3)***
An experiential learning class that provides a framework for understanding the entrepreneurial process. Explores challenges, problems, and issues faced by entrepreneurs who start new businesses. Students identify and evaluate business opportunities, develop business concepts, assess and obtain the required resources, manage the growth of new ventures, and write a business plan. Emphasis on case studies, with supplemental lectures, business cases, and guest speakers.
***Not open to first-year students.***

**33:382:303** ***Managing Growing Ventures (3)***
An experiential learning class: explores the basics of running a small business including a discussion of leadership, strategy, marketing, finance, operations, human resources, supplier management, facilities, banking, and legal and regulatory considerations. Topics are integrated and presented in the context of a small business environment with the objectives for students to learn how to plan and manage various activities essential for running a small business and how to recognize and avoid the common mistakes made by small business managers. Business case examples and text are used to supplement lectures, student projects, and guest speakers.
***Prerequisites: 33:382:302. Open to juniors and seniors.***

**33:382:310** ***Social Entrepreneurship (3)***
An experiential learning class: explores entrepreneurship as a mechanism for social change, economic development, and community wealth creation. Examines organizational approaches (for-profit and nonprofit) that emphasize both social mission and effectiveness. Students learn how to recognize social impact opportunities, how to reconfigure products and services for underserved markets, and how to develop social enterprise models that are sustainable and scalable. Provides concepts to evaluate social enterprises and the capabilities to become social entrepreneurs.
***Prerequisite: Junior or senior status.***

**33:382:340** ***Creativity, Innovation, and Entrepreneurship (3)***
An experiential learning class that focuses on teaching students to leverage intellectual capital by enhancing the innate creativity to improve the ability to generate creative ideas. Develops creativity through practical exercises. Includes a team project developed from an idea for a product or business presented to a panel of faculty and entrepreneurs.
***Not open to first-year students.***

**33:382:342** ***Urban Entrepreneurship and Economic Development (3)***
An experiential learning class that explores the many dimensions of urban entrepreneurship in the context of socioeconomic development. Utilizes action research methods and the development and completion of consulting projects to explore the business and policy issues in urban areas that affect or foster new ventures. Students will be directed to develop urban-framed entrepreneurial initiatives suited to foster social and economic development in New Jersey.
***Prerequisite: Junior or senior status.***

**33:382:352** ***Multicultural Markets (3)***
An experiential learning class that provides students with a learning experience combining business cases, theory, and history. Explores the link between the size and growth of multicultural populations with successful marketplace performance of businesses in urban communities. Focuses on the challenges businesses face in meeting the needs of consumers from diverse backgrounds, such as Asia, the Middle East, and other countries and in inner-city communities.
***Prerequisite: Junior or senior status.***

**33:382:355** ***Managing Technological Innovation: In-House Entrepreneurship (3)***
Focuses on creating streams of new products or services in established firms by leveraging science and technology. Topics include: managing multiple innovation teams, managing research and development and other resources to support streams of new products, developing a long-term strategic commitment to technological innovation, and organizing for innovation.
***Prerequisite: Junior or senior status.***

**33:382:360** ***Technology Ventures (3)***
Explores the fundamental issues that revolve around technology-intensive ventures. Analysis and evaluation of a business plan for technology business ventures including demand forecasting, financial modeling, licensing of technology and intellectual property, and other issues for current business conditions. Through a collection of case studies, lectures, workshops, and projects that cover high-growth ventures in information technology, electronics, life sciences, biotechnology, and other industries, this course provides the necessary tools to identify business opportunities, start a technology enterprise, gather talent and capital resources, and manage rapid growth.
***Prerequisites: 33:382:302. Junior or senior status.***

**33:382:486** ***Music Industry (3)***
A survey of the music business with emphasis on distribution of recorded music, music publishing, performance rights societies, record companies, agents, personal managers, and contracts.
***Prerequisite: Junior or senior status.***

**33:382:496** ***Entrepreneurship Practicum (3)***
Designed to allow students to gain experience working with and solving problems for a real external company. Students are placed in small teams of three-to-five students and assigned to a local company, which applies for and is vetted by the Small Business Development Corporation in conjunction with Rutgers Business School. The students, coached by their instructor, meet with the firm and agree on a problem for them to work on during the semester. Students learn to assume the role of a consulting organization, author and execute a statement of work, and focus on one aspect of the firm's business. Each situation is different and the team is coached closely by Rutgers faculty. Rutgers will assist teams if required by giving them access to external experts or other faculty members if required for specific expertise. This course serves as the culmination of their entrepreneurial courses and allows students to be fully immersed in developing entrepreneurial skills and learning from successful entrepreneurs.
***Prerequisites: 33:382:302. Junior or senior status.***

# Finance 390 (RBS-NB)

## FINANCE 390

For required courses for the finance major, see the Programs of Study chapter. Additional information about the undergraduate program can be found here.

**33:390:203** *Introduction to Finance (3)*
Introduction to concepts of value, valuation of financial instruments, capital budgeting, risk and return, and security analysis.
*33:010:272 or 29:010:203 or 52:010:101. Open to 135 minor.*

**33:390:205** *Special Topic: Overview of Finance for Wall Street (3)*
This is the introductory course for the Road to Wall Street program. The course and the program are designated for high-potential students. The course is offered in the fall, and interested students should apply during the spring semester of their freshman year. Applicants will be selected based on their GPA, application essays, and interviews. The purpose of this New Brunswick-based overview course is to provide students with an elementary understanding of basic topics relevant to finance, financial modeling, financial markets, and financial instruments in order to prepare them for sophomore/junior year interviews. This course does not provide finance elective credit.
*Sophomores only.*

**33:390:300** *Financial Management (3)*
Valuation of assets based on the timing and risk (including portfolio-based risk) of their cash flows. Applications include the valuations of financial assets (bonds and shares of stock) and capital budgeting. The use of arbitrage to value assets such as options.
*33:010:272 & 01:220:103 & 01:960:285 or 33:010:272 & 01:220:103 & 01:960:211. Not open to first-year students.*

**33:390:310** *Financial Management for Finance Majors (3)*
Valuation of assets based on the timing and risk (including portfolio-based risk) of their cash flows. Applications include the valuations of financial assets (bonds and shares of stock), the cost of capital, and capital budgeting. The use of arbitrage to value assets such as options.

This course will not be offered after the spring 2024 semester.
*Prerequisites: 33:010:272 and 01:640:135 and 01:960:285. Junior or senior status.*

**33:390:320** *Global Capital Markets (3)*
A study of the structure of securities, the financial markets in which they are traded, and the trading rules used by these markets. The assets include stocks, bonds, derivatives, and securitized assets issued by domestic and international issuers from the public and private sectors. The markets include both domestic and international exchanges.
*Prerequisites: 33:390:300 or 33:390:310 or 29:390:329. Open to Finance majors only. Junior or senior status.*

**33:390:331** *Special Topics: Ethics in Finance (3)*
Focuses on the ethical issues confronting financial professionals, including considerable coverage of the many corporate and investment firm challenges and violations, the role of the financial regulators, and the very latest developments threatening the financial world (markets, institutions, and participants). Instruction includes an

overview and discussion of what is legal and what is illegal, what is ethical and what is unethical, and why it is so important in the business of finance.
*Prerequisites: 33:390:300 or 33:390:310 or 29:390:329. Open to Finance majors. Junior or senior status.*

**33:390:375** *International Financial Management (3)*
A study of the markets and the regimes for the exchange and interest rates for the world's leading economies and currencies. Examines the related institutions (e.g., central banks), agreements and policies, and the use of markets to share and allocate risk.
*Prerequisites: 33:390:300 or 33:390:310 or 29:390:329. Open to Finance majors. Junior or senior status.*

**33:390:380** *Investment Analysis (3)*
Overview of financial markets and instruments that are used in investments. A brief discussion of the allocation of capital to risky assets. Efficient markets hypothesis, the behavioral finance critique, and technical analysis. The term structure of interest rates and the valuation of fixed income securities, including the use of duration and convexity. Valuation of common stock.
*Prerequisites: 33:390:300 or 33:390:310 or 29:390:329. Open to Finance majors and 390 CERT. All except first-year students.*

**33:390:385** *Investment Banking Analysis (3)*
A valuation-oriented course that provides many of the skills and knowledge required by first-year investment banking analysts. Includes Excel-based valuation models, financial statement and discounted cash flow analyses, and comparable valuation methodologies. Also included are modeling leverage buyouts and mergers and acquisitions.
*Prerequisites: 33:390:400 or 29:390:330. Finance majors only. Junior or senior status.*

**33:390:400** *Corporate Finance (3)*
Capital budgeting, capital structure, dividend policy, mergers and acquisitions, and some aspects of international finance.
*Prerequisites: 33:390:300 or 33:390:310 or 29:390:329. Finance majors and 390 CERT. All except first-year students.*

**33:390:410** *Asset Pricing and Portfolio Analysis (3)*
Focuses on modern theories of portfolio choice and portfolio management. In-depth coverage of mean variance portfolio selection, efficient frontier, Markowitz portfolio selection model, and single- and multifactor index models. Examines capital asset pricing models and the efficient market hypothesis, portfolio performance evaluation, active portfolio management, and international diversification.
*Prerequisites: 33:390:380 or 29:390:315. Finance majors only. Junior or senior status.*

**33:390:415** *Indexing & ETFS (3)*
An advanced, modern finance course with the objective of studying portfolio construction and investment management by way of understanding and using indexes and Exchange Traded Funds (ETFs). The course is designed to be comprehensive in covering the economic space available to investors, the many investment objectives/ strategies represented by indexes and ETFs, and the key determinants for building and trading these portfolios. The contemporary and practical class content is enhanced by exposure to useful industry resources and participants. There is a class project that involves working on teams to practice the application of tools and material learned in class.
*33:390:380 and 33:136:385 or 29:390:315 & 136:385. Open to Finance majors. Junior and senior status.*

**33:390:420** *Derivatives (3)*
Analysis of different kinds of futures and options. Use of commodity, interest rate stock index, and currency futures for hedgers and speculators. Stock options, investment strategies, arbitrage restriction on value and evaluation models, and the use of options and futures contracts in portfolio management.
***Prerequisites: 33:390:380 or 29:390:315. Open to Finance majors and 390 CERT. Junior or senior status.***

**33:390:430** *Treasury Management (3)*
Introduction to liquidity and cash management, including the examination of inventory, cash, accounts receivable, and other treasury-related, short-term, financial management issues.
***Prerequisites: 33:390:300 or 33:390:310 or 29:390:329. Open to Finance majors only. Junior or senior status.***

**33:390:435** *Real Estate Finance and Mortgage-Backed Securities (3)*
Examination of primary markets, secondary markets, and derivative products. Topics include origination process, income-producing mortgage loans, agency purchases, security pricing, and securitization of single-family and commercial loans.
***Prerequisites: 33:390:300 or 33:390:310 or 29:390:329. Open to Finance majors only. Junior or senior status.***

**33:390:440** *Advanced Corporate Finance (3)*
Complex corporate securities, such as callable and convertible debt or adjustable rate preferred stock, option theory, corporate insurance, and hedging.
***Prerequisites: 33:390:400 or 29:390:330. Finance majors only. Junior or senior status.***

**33:390:445** *Special Topics: Digital Assets (3)*
This is an introductory course in financial technology and its application to digital assets. It is designed for a non-technical audience interested in understanding how the existing financial system works and how digital assets have the potential for disruptive change. These changes are already impacting payments systems and exchanges, increasing, speed, access and lowering costs. The impact of digital assets goes beyond finance. They are opening the door to new business models in advertising, intellectual property, supply chain, social media, communications and more.
***Prerequisites: 33:390:300. Open to finance majors. Junior or senior status.***

**33:390:450** *Financial Analysis, Planning, and Forecasting (3)*
Overview of short-term and long-term financial analysis, planning, and forecasting; credit, cash, marketable securities, and inventory management. Applications of regression, linear programming, and computer techniques in alternative financial planning and forecasting analyses.
***Prerequisites: 33:390:300 or 33:390:310 or 29:390:329. Open to Finance majors only. Junior or senior status.***

**33:390:460** *Corporate Risk Management (3)*
Examination of issues faced by the risk manager. Provides a survey of techniques used to measure, estimate, and mitigate a variety of risk exposures, by insurance, hedging, and diversification. Covered risk exposures include interest rate risk, credit risk, market risk, liquidity risk, foreign exchange risk, off balance sheet risk, and operational risk.
***Prerequisites: 33:390:420 or 29:390:386. Finance majors only. Junior or senior status.***

**33:390:465** *Pension Fund Investment and Management (3)*
Application of financial theory and methods to pension fund investment and management.
***Prerequisites: 33:390:300 or 33:390:310. Finance majors only. Junior or senior status.***

**33:390:480** ***Research in Finance (BA)***
Individual research and reading program under the guidance of a member of the department.
***33:390:300 or 33:390:310. Open to Finance majors. Junior and senior status.***

**33:390:481** ***Research in Finance (BA)***
Individual research and reading program under the guidance of a member of the department.
***Prerequisites: Permission of department. Open only to finance juniors or seniors.***

**33:390:490** ***Fixed Income (3)***
The study of bond valuation and various measures of bond risk, securitization, and measures of portfolio risk and how spread risk and convexity affect the value of a bond portfolio when interest rates change.
***Prerequisites: 33:390:380 or 29:390:315. Finance majors only. Junior or senior status.***

**33:390:491** ***Special Topics: Credit Analysis (3)***
This course is designed to expand student knowledge of fixed-income markets with an in-depth discussion of credit investing. The focus of the class will build on entry-level understanding of interest rates, credit investing, and securitization to more precise real-world investing analysis and techniques. Topics will include understanding the fundamental drivers of credit markets, corporate bond risk, and the understanding of the segments of a corporate capital structure.
***Prerequisites: 33:390:380 or 29:390:315. Open to Finance majors. Junior and senior status.***

**33:390:492** ***Special Topics in Finance (3)***
Special topics course in an area of finance.

**33:390:493** ***Special Topics in Finance (3)***
This course and 390:494 make a limited enrollment, yearlong sequence that satisfies the Capstone Project requirements of the Honors College and the SAS Honors Program. Students who are accepted into the seminar are expected to take both semesters of the seminar. Admission is based on an application process and acceptance by the course professors. Three of the 6 credits qualify as a finance elective. The format for both semesters will be conversational, rather than a traditional lecture. Students will be required to present their analyses of topics and answer challenging questions from their classmates. Students taking 390:493 will study the nature of U.S. and global financial cycles and crises. The cycles selected for study will begin hundreds of years ago and end with the Great Recession of 2008-2009. The course will focus on the influence of factors such as excess borrowing, asset bubbles, herd mentality, contagion, and globalization on financial asset returns. Students will also read and discuss some of the classic books about investing. During this first semester, students will write a scholarly research paper on a topic related to the coursework.
***Senior status only. Permission of dean.***

**33:390:494** ***Special Topics in Finance Honors Seminar (3)***
During the second semester, small teams will concentrate on portfolio management of a model portfolio. The portfolio will consist of a multi-asset and be USD based. All portfolios will be managed on the Bloomberg Terminal and students will be required to keep a trade log and trade notes. Students will analyze discrepancies between the returns that were expected at the time that the portfolio was selected and the realized returns. There will be a combined emphasis on both risk management as well as the total returns of the model portfolios. Class time will simulate a mock investment committee where students will discuss news events and their effects on markets, recent trades, and portfolio performance. The second semester will also have a number of specific lectures

that reinforce certain portfolio and risk management techniques. Only three of the credits for 33:390:493 and 33:390:494 qualify as a finance elective credits.
***Prerequisites: 33:390:393. Senior status.***

**33:390:495,496** ***Honors Project in Finance (3,3)***
Individual research and preparation of a written thesis under direction of a finance faculty member.
***Prerequisites: Honors only. Permission of dean.***

# Business Ethics 522 (RBS-NB)

## BUSINESS ETHICS 522

**33:522:334** ***Business Ethics (3)***
Provides a multidisciplinary, interactive study of business ethics and social responsibility in business organizations. Includes coverage of foundational concepts such as virtue theory, rights, justice, utilitarianism, stakeholder management, and social contract theory.
***Prerequisites: 01:220:102 & 01:220:103 & 33:010:272 OR 21:220:101 & 21:220:102 & 29:010:203. Open to Rutgers Business School majors; all except first-year students.***

# Management and Global Business 620 (RBS-NB)

## MANAGEMENT AND GLOBAL BUSINESS 620

For required courses for the management (620) and leadership and management (605) majors, see the Programs of Study chapter. Additional information about the undergraduate program can be found here.

**33:620:301** ***Introduction to Management (3)***
Focuses on major managerial functions including developing and implementing strategies, designing the organization so diverse employees work collaboratively, enabling ongoing product/business innovation, building an ethical workplace, and engaging with the global competitive environment.
***Rutgers Business School students and business administration minors only.***

**33:620:302** ***Management Skills (3)***
Focuses on the manager's role in working with and leading others including understanding how people differ; developing proficiencies for working with others through decision making and communication; enhancing emotional intelligence, motivation, and commitment; and building and leading teams.
***Rutgers Business School students only.***

**33:620:320** ***Cross-Cultural Management (3)***
Addresses the challenges and opportunities that people experience in international, multicultural environments. Develops understanding and behavioral skills relevant to the interaction of different cultures in business and organizational settings. Utilizes a variety of methods such as experiential learning, case studies, and hands-on activities to develop cross-cultural sensitivity and competence.
***Prerequisites: 33:620:301 or 29:620:301. Rutgers Business School majors. All except first-year students.***

**33:620:330** ***Women Leading in Business (3)***
Provides a foundation to develop leadership skills and career goals as leaders in business organizations. Introduces the core concepts of leadership and career development with special emphasis on the ways that gender affects leadership capabilities and effectiveness.
***Prerequisites: 33:620:301 or 29:620:301. Not open to first-year students.***

**33:620:340** ***Networking and Influence in Business (3)***
Examines the theory and practice of professional and social networking and of building relationships in a job and career; explores the role of power, influence, and legitimacy in organizations.
***Prerequisites: 33:620:301 or 29:620:301. Junior or senior status. 620 and 605 majors only.***

**33:620:350** ***Negotiations (3)***
Examines the major concepts, theories, and processes of negotiation, influence, and persuasion; analyzes the dynamics of communication and conflict and its resolution; emphasizes the building and practicing of negotiation skills using role-playing exercises covering a variety of personal (such as job and buyer/seller negotiations) and professional (such as supply chain, acquisitions, coalitions, and disputes) settings.
***Prerequisites: 33:620:301 or 33:620:300 or 29:620:301. Open to majors 605, 799, CERT 620, CERT 625, CERT 631, and CERT 634. All except first-year students.***

**33:620:362** ***Effective Leadership Communication (3)***
This course is designed to provide students with practical and theoretical knowledge of leadership communication in an era of complexity, fast pacing and heightened scrutiny. Students will learn the leading-edge leadership communication competencies, techniques and skills that are needed by 21st Century leaders. In today's dynamic environment, leaders need to be able to communicate effectively in all three main modalities: one to one, one to many and the various forms. This course will explore the connections between communication and leadership to help students develop their own leadership communication abilities and understand the role of leadership communication inside and outside of organizations.
***33:620:302 or 29:620:302. Open to Rutgers Business School and CERT 625.***

**33:620:365** ***Management of Human Resources (3)***
Explores traditional issues (e.g., staffing, training, job evaluation, compensation, and benefits administration) and contemporary concerns (e.g., organizational change, employee ownership, and cross-cultural and international considerations) related to the management of human resources; emphasizes government legislation affecting human resource functions and the linkage between human resource management and firm strategy.
***Prerequisites: 33:620:301 or 29:620:301. Junior or senior status. 620 and 605 majors only. Credit not given for both 33:620:365 and 37:533:301.***

**33:620:369** ***International Business (3)***
The distinctive circumstances of management arising from the conduct of business in more than one country. Topics include international monetary systems, trade framework, European economic community and regional groups, home and host country policies in international investments, and international agencies. Relevant for the conduct of international business and the management of international corporations.
***Prerequisites: 33:620:301 or 33:620:300 or 29:620:301. Open to majors 605, 620, CERT 620, and CERT 631. Junior or senior status.***

**33:620:370** *Managing Diversity in Organizations (3)*
Explores the demographic diversity of the U.S. labor force and the challenge it presents to organization managers; treats diversity from the perspective of cultures and subcultures.
*Prerequisites: 33:620:301 or 29:620:301. Junior or senior status. 620 and 605 majors only.*

**33:620:375** *Organizational Design and Change (3)*
Describes major perspectives on organizational structures, processes, and culture; examines models of organizational change; introduces methodologies that facilitate creativity and change at the individual, group, and organizational levels.
*Prerequisites: 33:620:301 or 29:620:301. Junior or senior status. 620 and 605 majors only.*

**33:620:402** *Global Management & Strategy (3)*
Explores the formulation and implementation of global strategy in multinational corporations. Examines concepts and frameworks related to the globalization of industries, firm motivations for foreign expansion, foreign market selection, entry mode strategies, organizational design choices, and innovation management in multinational firms.
*33:620:301 or 33:620:300 or 29:620:301. Open to Rutgers Business School.*

**33:620:410** *Executive Leadership (3)*
Analyzes leaders, the leadership role, and the leadership process in organizational settings; examines leadership activities and classical and contemporary theories; investigates interactions among leadership styles, employee predispositions, group makeup, and organizational culture.
*Prerequisites: 33:620:302 or 29:620:302. Open to major 606, CERT 620 and CERT 625. Junior or senior status.*

**33:620:425** *Management Consulting (3)*
Provides the best practice skills that internal and external consultants need to introduce change in organizations. Covers problem assessment, data collection and analysis, and implementation.
*Open to Rutgers Business School juniors and seniors.*

**33:620:430** *Team Building and Group Process (3)*
Examines the skills needed to successfully manage teams in organizations. Utilizes exercises, role-plays, case analyses, and discussions to establish skills. Skills examined and practiced include team building, conflict management, decision making, and strategic thinking.
*Prerequisites: 33:620:301 or 29:620:301. Junior or senior status. 620 and 605 majors only.*

**33:620:475** *Special Topics: International Entrepreneurship*
International Entrepreneurship (IE) course explores the creation and management of international/global ventures. This course introduces students to a framework for understanding the entrepreneurial process in global contexts. It aims to (1) encourage students to explore entrepreneurial activities outside of their domestic setting, (2) prepare students to better understand and more accurately identify global opportunities, and (3) equip students with skills needed to manage their ventures in the face of ever-evolving global challenges.
*Prerequisites: 33:620:301 or 29:620:301.*

**33:620:479** *Doing Business In ...*
A global experience course designed for students to learn about the business, economic, and cultural environments of a given foreign country through hands-on learning. Through reading and writing assignments, visiting local and multinational companies, touring cultural sites, and interacting with locals, students expand their global

perspectives, build international networks, and enhance their business, management, and cultural knowledge and skills.
*Open to Rutgers Business School. By special permission.*

**33:620:486** *Organization and Management of the Music Industry (3)*
This course provides an overview of the music business and its connection to all segments of the culture industries. Students will learn to dissect and analyze the commercial characteristics of the industry and will examine activities at multiple levels of analysis: individuals and groups, company, and industry. Some of the questions we will seek to explore are: How can one define the music industry? Who are the major industry actors? What are the major technological and social trends shaping the industry? In addition, we will explore issues related to the companies and organizations in the industry, as well as the individual business person and/or artist. Throughout our discussions, our analyses will be guided by basic concepts of strategic management.
*Open to Management majors and 085 minors.*

**33:620:492** *Business Policy and Strategy (3)*
Explores strategic decision making at the business and corporate levels, which determines the competitive advantage of a firm and its short- and long-term performance. Topics include situation analysis, core competence, competitive strategy, mergers/acquisitions, strategic alliances, and corporate restructuring.
*Prerequisites: 33:390:300/33:390:310, 33:620:301, 33:630:301. Senior status. Rutgers Business School majors only.*

**33:620:495,496** *Honors Project in Management (3,3)*
Individual research and preparation of a written thesis under direction of a management faculty member.
*Prerequisites: Open to management or leadership and management seniors in honors program only. Both semesters must be completed to receive credit.*

**33:620:498,499** *Independent Management Projects (3,3)*
Individual research and reading program under the guidance of a departmental faculty member.
*Prerequisites: 33:620:300 or 33:620:301. Open to major 620. Juniors and seniors.*

# Marketing 630 (RBS-NB)

## MARKETING 630

For required courses for the marketing major, see the Programs of Study chapter. Additional information about the undergraduate program can be found here.

**33:630:301** *Introduction to Marketing (3)*
Extensive overview of marketing: the process of creating goods and services in response to consumer wants and needs. Study of the marketing function in business firms and nonprofit organizations. Consumer behavior, marketing research, industrial marketing, pricing, channels of distribution, and promotion.
*Rutgers Business School majors and minors only.*

**33:630:363** ***Introduction to Advertising (3)***
Advertising viewed as a promotional function in the context of marketing objectives. The history and economic significance of advertising; its social importance and relation to business organization; study of advertising functions.
***Prerequisites: 33:630:301:29:630:301. Open to Marketing majors. All except first-year students.***

**33:630:368** ***Retail Marketing (3)***
Channels of distribution approach to the retailing function. The changing character of retail competition; relations between manufacturers and middlemen; procedures and problems of retail management. Emphasis on the smaller entrepreneur as well as the large retail organization. Case studies, field projects.
***Prerequisites: 33:630:301 29:630:301. Open to major 630, major 799, CERT 631, and CERT 634. All except first-year students.***

**33:630:369** ***New Product Planning (3)***
Study of the functions, concepts, and decisions required in the introduction, maintenance, and deletion of products. Special attention given to the areas of new-product need, new-product development, and product planning and strategy.
***Prerequisites: 33:630:301 29:630:301. Open to major 630, major 799, CERT 382, CERT 631, and CERT 634. All except first-year students.***

**33:630:370** ***Business-to-Business Marketing (3)***
Analysis of industrial marketing planning and activities; the management of distribution channels, costs, and policy development.
***Prerequisites: 33:630:301 29:630:301. Open to major 630, major 799, CERT 631, and CERT 634. All except first-year students.***

**33:630:371** ***International Marketing (3)***
Analysis of economic, social, and political environments influencing international markets; comparative studies of global buying behavior, international marketing strategy, and operations.
***Prerequisites: 33:630:301 or 29:630:301. Junior or senior status. Marketing majors only.***

**33:630:372** ***Services Marketing (3)***
Addresses the challenge of marketing services and managing the service component of product/service combinations. Issues covered include service design, quality definition, satisfaction measurement, performance guarantees, and internal and external marketing planning and execution.
***Prerequisites: 33:630:301 or 29:630:301. Junior or senior status. Marketing majors only.***

**33:630:374** ***Consumer Behavior (3)***
Explores the roots of buyer behavior from a managerial perspective, drawing on the disciplines of psychology, sociology, and anthropology. Development of sound marketing strategy. Topics include perception, learning, communication, cognition, memory, motivation, and attitudes of consumers.
***Prerequisites: 33:630:301 or 29:630:301. Open to major 630 and CERT 631. All except first-year students.***

**33:630:385** ***Marketing Research (3)***
Techniques of marketing research and the role of the marketing research department in a business structure. Emphasizes the use of analytical techniques in the design and conduct of marketing research. Problem formulation;

collecting and organizing respondent data; and evaluation and use of research findings.
***Prerequisites: 33:623:385 or 33:136:385 AND 33:630:301 or 29:630:301. Open to major 630 and major 799. All except first-year students.***

**33:630:401** ***Sales Management (3)***
Problems, policies, and functions of sales management as the vital link between selling and marketing. Role of the sales manager in the development of a successful sales force. Topics include territory and market analyses, compensation, sales planning, and control.
***Prerequisites: 33:630:301 or 29:630:301. Open to major 799, major 630, CERT 631 or CERT 634. All except first-year students.***

**33:630:428** ***Nonprofit Marketing (3)***
The Nonprofit Marketing class is a practical course focusing on marketing strategies for NGOs; it covers the nonprofit market and dynamics from macro to micro, the fundraising process, players and institutions, support processes and other applications. It requires the development of a Nonprofit Marketing Team Project, where student teams as consultants for a real-life social cause.
***Prerequisites: 33:630:301 or 29:630:301 or 29:630:301. Marketing majors only. All except first-year students.***

**33:630:452** ***Marketing Strategy (3)***
Integrating and applying marketing concepts to the actual problems of real business and nonbusiness organizations. Strong emphasis on the case method of study. Written and oral presentations required.
***Prerequisites: 33:630:385 or 29:630:385. Senior marketing majors only.***

**33:630:480** ***Special Topics in Marketing: Social Media and Mobile Marketing (3)***
This course focuses on current social media and mobile marketing trends and strategies. It explores social media and mobile marketing and ecosystems and how organizations incorporate these tools into their business strategies. The course will also provide best practices for students to represent their personal brand on social media.
***Prerequisites: 33:630:301 or 29:630:301. Marketing majors only. All except first-year students.***

**33:630:481** ***Special Topics: Marketing Technology (3)***
Marketers can access hundreds of vendors offering diverse technology applications such as campaign management, marketing resource management, marketing analytics, and content marketing. This course introduces students to the opportunities and challenges of using these marketing technologies. The opportunities range from targeting the right audiences to personalizing messaging to leveraging new digital technologies to effectively managing complex multi-channel marketing campaigns. Students will learn how marketing executives decide which technologies are right for addressing their marketing problems.
***Prerequisites: 33:630:301. Open to all except first-year students.***

**33:630:482** ***Advertising Strategy (3)***
Investigation and solution of actual advertising problems by management; examination of advertising as influenced by the marketing structure and environment.
***Prerequisites: 33:630:301, 363. Junior or senior status. Marketing majors only.***

**33:630:485** ***Special Topics: Introduction to Professional Selling (3)***
The role of selling is a critical function in all industries and is responsible for driving revenue, share and profit for an organization. Salespeople also serve as an important link between an organization and its customers. Everyone

is a salesperson, and Professional Selling requires a specific set of skills for an individual to be successful; whether selling a product, a service, an idea, or themselves. This course will introduce you to the components of the sales process, as well as the "soft" and "hard" skills necessary to thrive in the business world, including:

1. Finding customers and developing relationships
2. Using various strategies and tools to meet client needs
3. Solving customer problems
4. Psychology of selling

***Prerequisites: 33:630:301 or 29:630:301. Open to Rutgers Business School students. All except first-year students.***

**33:630:486,487** ***Independent Study in Marketing (BA)***
Individual research project under the guidance of a departmental faculty member.
***Prerequisites: 33:630:385 and permission of department. Open only to 630 majors.***

**33:630:488** ***A.I. in Marketing (3)***
This course provides a broad introduction to Artificial Intelligence (AI), Machine Learning, and new emerging technologies that influence Marketing. The course will cover basic concepts in each of the topics and applications in the specific marketing scenarios The course will also draw upon case studies and applications, so that students will learn how to apply these concepts to solve real business problems. Students will learn how to choose the right method for the most common business problems and will obtain hands on experience in solving these problems.
***Prerequisites: 33:136:385 and (33:630:301 or 29:630:301).***

**33:630:489** ***Special Topics in Marketing: Marketing Analytics (3)***
This course will help students design, implement, and apply various techniques to support such decisions. Specifically, students will learn to use and analyze data to target key customers, measure cross-channel campaign performance, and understand customer purchase funnels.
***Prerequisites: 33:630:301 or 29:630:301. Open to major 136 and major 630. All except first-year students.***

**33:630:490** ***Marketing Internship (3)***
Supervised involvement in a private, public, or nonprofit organization providing the student with an opportunity to apply concepts learned in a class to the work environment.
***Prerequisites: 33:630:301 or 29:630:301. Open to marketing majors by permission of the department.***

**33:630:491** ***Marketing Co-Op (3)***
Provides the opportunity to apply concepts learned in class to the work environment.
***Open to Rutgers Business School students. Juniors and seniors.***

**33:630:495,496** ***Honors Program Marketing (3,3)***
Independent research and preparation of a written thesis under direction of a faculty member.
***Prerequisites: Open to marketing seniors in honors program only. Both semesters must be completed to receive credit.***

**33:630:497** ***Digital Marketing (3)***
Introduces students to the growing world of digital marketing; provides knowledge of the digital media landscape, platforms, tools, and technologies.
***Prerequisites: 33:630:301 or 29:630:301. Open to Marketing majors. All except first-year students.***

**33:630:498** *Special Topics in Marketing: Brand Management (3)*
This course addresses the nature of brand management in the 21st century, and the challenges and skills needed to run a branded business within the framework of a corporate environment.
*Prerequisites: 33:630:301 or 29:630:301. Marketing majors only. All except first-year students.*

**33:630:499** *Marketing Consulting for Small Business (3)*
Builds upon academic marketing knowledge by working on real-life marketing consulting projects requested by small businesses enrolled with the Small Business Development Center program. Students in this course must identify and understand the key issues, formulate models, complete analyses, and apply course knowledge to solve real-world problems.
*Prerequisites: 33:630:301 or 29:630:301. Open to Marketing majors. Junior or senior status.*

# Supply Chain Management 799 (RBS-NB)

## SUPPLY CHAIN MANAGEMENT 799

For required courses for the supply chain management major, see the Programs of Study chapter. Additional information about the undergraduate program can be found here.

**33:799:301** *Introduction to Supply Chain Management (3)*
A broad overview of business logistics processes and strategies. Topics include revenue management and pricing, logistics and distribution strategies, warehousing and order fulfillment, supply chain design and integration, supply chain software--MRP/ERP systems, procurement and outsourcing, and project management.
*Prerequisites: Rutgers Business School majors and minors only.*

**33:799:305** *Procurement and Global Sourcing Strategy (3)*
Focuses on the fundamental tools, techniques, sourcing strategies, and processes used by world-class firms. Case studies are introduced to connect the course materials to the practices.
*Prerequisites: 33:799:301 or 29:799:301. Open to major 799 or CERT 620. Not open to first year students.*

**33:799:310** *Demand Planning and Fulfillment (3)*
Focuses on planning strategies and tools commonly used in business practices. Topics include demand forecasting, sales and operations planning (S&OP), inventory management, material requirement planning (MRP), and revenue management and pricing strategies.
*Prerequisites: 33:799:301 or 29:799:301. Open to Supply Chain Management majors. Not open to first year students.*

**33:799:330** *Business Logistics and Transportation (3)*
An introduction to the fundamentals of logistics and transportation. Examines the design of channels of distribution, management of inventory, evaluation of transportation alternatives, information flow, facility location, outsourcing logistics operations through third-party relationships, and the rapidly expanding field of logistics information technology. Explores the principles of transportation with emphasis on transportation modal and intermodal operations (rail, highway, air, water, and pipeline transportation) and transportation management.
*Prerequisites: 33:799:301 or 29:799:301. Open to Supply Chain Management majors. Not open to first year students.*

**33:799:380** *Introduction to Project Management (3)*
Introduction to the classical foundations of project management. Explores modern real-life project problems and key concepts of initiating, planning, organizing, controlling, and running a project, with particular emphasis on projects in the area of supply chain management. Extensive use of case studies.
*Prerequisites: 33:799:301 or 29:799:301. Open to Supply Chain Management majors. Not open to first year students.*

**33:799:410** *Service Management (3)*
Introduction to both the operational and marketing perspectives of service management. Explores the nature of services in the real business world. Covers key concepts of designing, managing, and supporting a service enterprise. Case studies and field trips are involved.
*Prerequisites: 33:799:301 or 29:799:301. Open to Supply Chain Management majors. Not open to first year students.*

**33:799:420** *SCMS Industry Client Projects (3)*
Gives a thorough understanding, firsthand knowledge, and working experience of industry supply chain management projects through team projects with real-life industry client contacts. Course is supplemented with guest lectures by distinguished executives and faculty on recent best practices and new challenges in the supply chain management field.
*Prerequisites: (33:799:305 or 33:799:330) and 33:799:380. Open to Supply Chain Management majors. Seniors only.*

**33:799:421** *Co-op in Supply Chain Management (3)*
Provides the opportunity to apply concepts learned in class to the work environment.
*Prerequisites: 33:799:301 or 29:799:301. Open to Supply Chain Management majors - juniors and seniors.*

**33:799:422** *Elective Co-op in Supply Chain Management (3)*
Provides the opportunity to apply concepts learned in class to the work environment.
*Prerequisites: 33:799:301 or 29:799:301. Open to supply chain management juniors and seniors by permission of the department.*

**33:799:430** *Security and Risk Management (3)*
Provides a broad overview of key supply chain security areas and issues in the context of homeland security. Explores the need to protect the supply chain and maintain business continuity in the wake of high-consequence, disruptive events.
*Prerequisites: 33:799:305 or 33:799:330. Open to Supply Chain Management majors. All except first-year students.*

**33:799:440** *Supply Chain Environmental Management and Green Purchasing (3)*
After building a comprehensive knowledge of green supply chain and purchasing techniques, this course will allow students to participate in several applied research projects. Projects will include designing green supply chain and procurement systems and products, integrated with economic, environmental, social, and ethical considerations and corporate reporting.
*Prerequisites: 33:799:301 or 29:799:301. Supply chain management majors only. All except first-year students.*

**33:799:450** *Fundamentals of Supply Chain Solutions with SAP (3)*
Provides a foundation for understanding the process integration of businesswide functions supported by ERP systems, examines the benefits of implementing ERP, and investigates the guidelines for ERP system implementation and application. Introduces SAP ECC 6.0 to illustrate the basic concepts, capabilities, and advantages of ERP.
*Prerequisites: 33:799:301 or 29:799:301. Supply Chain or BAIT majors only. All except first-year students.*

**33:799:455** *Supply Chain Transformation in the Digital Era (3)*
This course focuses on the growing impact of technology, data, and online marketplaces on supply chain management. Students will receive hands-on training in Tableau, a best-in-class data visualization platform, and be exposed to multiple other real-world analytics tools demonstrated by industry experts. The class builds on hands-on learning by incorporating an excursion to Boxed.com's state-of-the-art warehouse in Union, New Jersey, where robots are more common than humans. By utilizing engaging teaching tactics geared toward millennial learning styles, this course encourages big picture thinking on global ecommerce trends while teaching specific technical skills that are highly-valued in today's job market.
*Prerequisites: 33:799:301 or 29:799:301. Supply chain management majors only. All except first-year students.*

**33:799:460** *Introduction to Six Sigma and Lean Manufacturing (3)*
Provides fundamentals of six sigma, lean manufacturing, and tools and strategies to improve the performance of business processes. Case studies, team exercises, and simulations are utilized. Topics include six sigma improvement methodology and tools, lean-thinking tools and approaches, process mapping, dashboards, and other business improvement techniques. Emphasis is placed on the strategic importance of business improvement, the need for fact-based management, and how to deploy these tools in different parts of the value chain.
*Prerequisites: 33:799:301 or 29:799:301. Supply chain management majors only. All except first-year students.*

**33:799:465** *Special Topics: Blockchain & it's Application in Supply Chain Management (3)*
Blockchain technology in becoming increasingly more important as this technology, once associated primarily with financial transactions and cyber security, can provide value to an organization's supply chain through asset management, traceability, and information sharing.
*Open to Supply Chain Management majors. Junior and senior status.*

**33:799:470** *Business Intelligence for Supply Chains and Marketing (3)*
An overview of business intelligence in the field of supply chain management and marketing. Addresses how to leverage business intelligence systems to define KPIs, sharpen the accuracy of forecasting and planning, track business activities, and deliver dashboards, scorecards, strategic reporting, and operational/real-time reporting to enhance decision making for supply chain and marketing. SAP business intelligence solution is introduced to illustrate the concepts.
*Prerequisites: 33:799:301 or 29:799:301. Supply chain management majors only. All except first-year students.*

**33:799:475** *Supply Chain Analytics Essentials (3)*
This course introduces the emerging area of integrating data analytics with supply chain management via tools such as Excel and Python. The course will demonstrate how analytics can be applied to various domains of a supply chain to generate significant social and economic impact. By the course end, students will practice the skills learned by doing a real-life data-driven project in supply chain management.
*Prerequisites: 33:799:301 or 29:700:301. Open to Supply Chain Management majors. All except first-year students.*

**33:799:490** *Special Topics in Supply Chain Management: Global Logistics and Supply Chain Management (3)*
This course will introduce students to the logistical and regulatory issues that are part of overall supply chain management of global businesses. The course focuses on supply, sourcing, and distribution in an international environment, on managing global logistics, and on border processes including compliance with customs and trade conventions common around the world.
*Prerequisites: 33:799:301 or 29:799:301. Junior or senior status. Supply chain management majors only.*

**33:799:491** *Supply Chain Finance (3)*
Supply chain students will learn how corporate accounting, and the role of working capital, interrelate to supply chain actions and projects, as well as understand the scorecard of the CFO and how the supply chain can help achieve optimal financial health through effective strategies, investments, and product flows.
***Prerequisites: 33:799:301 or 29:799:301. Supply chain management majors only. All except first-year students.***

**33:799:492** *Special Topics: Pharma Strategy (3)*
The objective of this course is to provide students with the knowledge of pharmaceutical industry cost management structures, strategic sourcing processes, negotiation tactics, procurement processes and supply chain management strategies. With shorter product lifecycles and worldwide rivalries increasing, much success depends on effective global supply management being able to deliver the right product to the right market at the right time under appropriate regulatory governance.

**33:799:493** *Internship in Supply Chain Management (3)*
Supervised involvement in a private, public, or nonprofit organization providing the student with an opportunity to apply concepts learned in a class to the work environment.
***Prerequisites: 33:799:301 or 29:799:301. Open to supply chain management majors by permission of the department.***

**33:799:495,496** *Honors Program SCMS (3,3)*
Independent research and preparation of a written thesis under direction of a faculty member.
***Prerequisites: Open to supply chain management seniors in honors program only. Both semesters must be completed to receive credit.***

**33:799:498,499** *Independent Study in SCMS (BA,BA)*
Individual research and/or reading program under the guidance of a member of the department.
***Prerequisites: 33:799:301 or 29:799:301 and permission of the department. Open only to supply chain management majors with junior or senior status.***

# Real Estate 851 (RBS-NB)

## REAL ESTATE 851

**33:851:350** *Real Estate Law (3)*
This course enables students to recognize and evaluate legal principles and issues in order to guide their decision-making process with respect to real estate, whether as a business executive, an entrepreneur, or in their personal life. It is intended to introduce students to the transactional aspects of the real estate business, including acquisition, disposition, development, investment, management, leasing, tax implications, and negotiations.
***Not open to first-year students.***

**33:851:380** *Essentials of Real Estate Finance (3)*
This course provides the background and tools necessary to analyze value, risk, and return in commercial property markets. The initial emphasis of the course is on mortgage finance and applications; providing an overview of mortgage structure and mechanics in both residential and commercial markets. The focus then shifts to the evaluation of investment opportunities in property markets from the perspective of an institutional investor. Students will use lease and market information to develop pro forma cash flow projections for a given property and evaluate the associated risks and returns. Extensions include tax issues; the relationship between value, returns,

and leverage; partnership agreements; and/or real options. The course also provides extensive training and certification in ARGUS, a real estate industry-standard software package used for entering and compiling lease information.
*Prerequisite: 33:390:300 or 33:390:203 or 29:390:329. Not open to first-year students.*

**33:851:432** *Real Estate Development (3)*
This course provides an introduction and overview of real estate development of urban places, including the many challenges of the development process such as analyzing market sectors and development opportunities, comprehending the development context of regulation, public policy and politics, raising investment capital, assembling land, program formulation, building types, construction management, marketing, and sales. Examples of development projects will be presented, each focusing on particular aspects of the overall process.
*Prerequisites: 33:851:350 and 33:390:435 or 33:851:380 or 29:851:350 & 29:390:480.*

**33:851:470** *Commercial Debt Markets (3)*
Commercial Debt Markets provides an in-depth overview of both public and private sources of commercial debt financing for investment in real assets. The course includes an overview of the U.S. mortgage finance system, agency and nonagency residential mortgage-backed securities, structured mortgage products such as collateralized mortgage obligations, collateralized debt obligations stripped securities, commercial mortgage-backed securities, and limited partnerships. Coursework involves basic fixed-income mathematics and cash flow modeling in Excel.
*Prerequisite: 33:390:435 or 33:851:380 or 29:390:480.*

# Administration (RBS-NB)

## ADMINISTRATION

**Business School Leadership**

Lei Lei, Dean of Rutgers Business School

Petra Christmann, Vice Dean for Faculty and Research

Yaw Mensah, Interim Vice Dean for Innovation and Strategic Partnerships

Shen Yeniyurt, Vice Dean for Academic Programs and Learning Assistance

**Deans & Directors of the Undergraduate Programs-New Brunswick**

Robert Kurland, Senior Associate Dean

Alexandra Charles, Assistant Dean for Special Populations Advising

Felicia Norott, Assistant Dean & Director for Junior and Senior Advising

Kerstin Schnatter, Assistant Dean & Director for First-Year and Sophomore Advising

**Office of Undergraduate Programs-New Brunswick**

Melba Blanco, Assistant Dean

Alfred Blake, Student Counselor

Rose Distefano, Academic Advisor

Stephanie Elliott, Academic Advisor

Leidy Garcia-Cosbert, Assistant Dean

Devon Holman, Student Counselor

Nadia Khokhar, Assistant Dean

Tara Maluszczak, Administrative Assistant

Nicole Martinez, Assistant Dean

John Muth, Assistant Dean

Edna Rodriguez, Program Coordinator

Alexis White, Assistant Dean

Christine Yannuzzi, Enrollment Manager

# Faculty (RBS-NB)

## FACULTY

The Rutgers Business School-Newark and New Brunswick is organized into the following six departments:

Accounting and Information Systems

Finance and Economics

Management and Global Business

Management Science and Information Systems

Marketing

Supply Chain Management

These departments offer undergraduate major programs in accounting, business analytics and information technology, finance, leadership and management, marketing, and supply chain management.

# Department of Accounting and Information Systems

# Department of Accounting and Information Systems

**Chair:** Jay Soled

**Professors:**

Suresh Govindaraj, B.Tech., Institute of Technology (B.H.U., India); M.B.A., Delhi; M.A., Pennsylvania; Ph.D., Columbia

Alexander Kogan, M.S., Moscow; Ph.D., USSR Academy of Science

Yaw Mensah, B.S., Ghana; M.B.A., Ph.D., Columbia

Dan Palmon, B.S., M.B.A., Hebrew; Ph.D., New York

Bharat Sarath, Ph.D., Stanford; Ph.D., Calgary (Canada)

Glenn Shafer, A.B., Ph.D., Princeton

Jay Soled, B.A., Haverford College; J.D., Michigan; LL.M., New York

Miklos Vasarhelyi, B.S., Guanabara (Brazil); B.S., Rio de Janeiro; M.S., Massachusetts Institute of Technology; Ph.D., Southern California

**Associate Professors:**

Michael G. Alles, B.Econ., Australian National; Ph.D., Stanford

Divya Anantharaman, B.Sc., Oxford Brooks; Ph.D., Columbia

Helen Brown-Liburd, B.B.A., CUNY (Baruch); Ph.D., Wisconsin (Madison)

Valentin Dimitrov, B.S.M., Ph.D., Tulane

Alexander J. Sannella, B.B.A., M.B.A., Iona; M.Phil., Ph.D., New York

Michael Schoderbek, B.B.A., Iowa; M.S., Pennsylvania State; Ph.D., Indiana

Hilal Atasoy, Ph.D., University of Illinois

Feng Gao, B.A., Renmin (China); M.A., Tsinghua; M.S., Ph.D., Iowa; Ph.D., Rochester - Associate and Department Vice Chair

Hussein Issa, Ph.D., Rutgers

Kevin Moffitt, Ph.D., Arizona

Won Gyun No, B.A., M.S., Choonamm (South Korea); M.A.C.C.Y., Wisconsin; Ph.D., Waterloo (Ontario)

Li Zhang, B.A., M.A., Nanjing (China); Ph.D., London Business School and Department Vice Chair

**Assistant Professors:**

Michael Carniol, B.A., Northwestern; M.B.A., NYU Stern School of Business; Ph.D., Wharton

Soohyun Cho, Ph.D., Florida

Disen Huang, Ph.D., NYU Stern School of Business

Kyungha Lee, Ph.D., Northwestern

Ryan McDonough, Ph.D., Michigan

Chanta Thomas, Ph.D., Southern Illinois

Claire Yan, Ph.D., Houston

**Assistant Professors of Professional Practice:**

Irfan Bora, B.A., M.B.A., Rutgers

Michael Cohen, B.S., Rutgers

Abraham Miller, M.S., Columbia

Sarah O'Rourke, M.S. in Professional Accounting, Seton Hall

Savita Sahay, Ph.D., California

Gita Sharma, LL.M., NYU School of Law; J.D., Albany Law School of Union

C. Daniel Stubbs Jr., B.B.A., M.B.A., Pace

**Instructors of Professional Practice:**

Marshall E. Saunders, M.B.A., Pace

Evan Wasserman, M.B.A., Rutgers

**Instructors:**

Ann Medinets, B.A., Boston; B.Arch., NJIT; M.B.A., Ph.D., Rutgers

Faculty (RBS-NB)

# Department of Finance and Economics

# Department of Finance and Economics

**Chair:** Darius Palia

**Vice Chairs:** Ben Sopranzetti and Victor Glass

**Distinguished Professor:** Cheng-Few Lee, B.A., M.A., National Taiwan; M.S., West Virginia; Ph.D., SUNY (Buffalo)

**Professors:**

Ivan E. Brick, B.A., Yeshiva; Ph.D., Columbia

Morris A. Davis, B.A., Ph.D., Pennsylvania

Serdar Dinc, B.S., Bilkent University (Turkey); Ph.D., Stanford

Mahmud Hassan, M.A., Boston; M.B.A., Indiana; Ph.D., Vanderbilt

Simi Kedia, B.A., Lady Shri Ram College (India); Ph.D., New York

Farrokh Langdana, B.Tech., Indian Institute of Technology; M.B.A., M.A., Ph.D., Virginia Polytechnic Institute

Darius Palia, M.M.S., Bombay University; Ph.D., New York University Stern School of Business

Tavy Ronen, B.A., Wesleyan; M.Phil., Ph.D., New York

Ben Sopranzetti, B.S.E.E., Rutgers; M.S.E., Drexel; Ph.D., Illinois (Urbana-Champaign)

Menahem Spiegel, B.A., Jerusalem; M.A., Ph.D., Chicago

Daniel Weaver, B.A., Seton Hall; Ph.D., Rutgers

Yangru Wu, M.A., Delaware; Ph.D., Ohio State

**Associate Professors:**

Azi Ben-Rephael, B.A., Hebrew University of Jerusalem; Ph.D., Tel Aviv

Priyank Gandhi, M.F.E., California (Berkeley); Ph.D., California (Los Angeles)

Jin-Mo Kim, B.A., M.S., Korea University; Ph.D., Michigan State

Zhengzi Li, B.S., Nankai University (China); Ph.D., Duke

Rose Liao, B.S., Shandong Institute of Economics (China); Ph.D., Ohio State

Zhaodong Zhang, B.A., Fudan (China); M.A., Vanderbilt; Ph.D., Pennsylvania State

**Assistant Professors:**

Hosein Maleki, B.S., M.A., McGill; Ph.D., Concorida, McGill, HEC, UQAM

**Professors of Professional Practice:**

Victor Glass, M.B.A., Ph.D., Columbia

John Longo, M.B.A., Ph.D., Rutgers

**Associate Professors of Professional Practice:**

Arthur Guarino, B.A., M.B.A., Seton Hall; M.S., Syracuse; J.D., Rutgers

Mark Gunther, B.S.E., M.B.A., University of Michigan

David Frame, B.Sc., Minnesota; Ph.D., Carnegie Mellon

Fred Hoffman, B.A., Rutgers; M.A., Fairleigh Dickinson

Parul Jain, B.A., M.A., Delhi; Ph.D., Washington

Lisa Kaplowitz, B.A., Brown; M.B.A., Northwestern (Kellogg)

Mariya Naumova, M.S., Perm State (Russia); Ph.D., Rutgers

Ron Richter, B.S., Rutgers; M.B.A., New York

**Assistant Professors of Professional Practice:**

Ronnee Ades, B.A., SUNY; M.B.A., Temple

Kwame Adu-Gyamfi, B.B.A., Adelphi; M.B.A., Cornell; D.B.A., Rutgers

Ahmed Albrolisy, B.S., Mansoura University; M.B.A., D.B.A., Rutgers University

Lauren De Marco, B.S., St. John's; M.S., Stevens Institute of Technology

Mitchell Fillet, B.A., Boston; M.B.A., New York

Kenneth Freeman, B.S.., Rutgers; M.A.., Boston

Harvey Poniachek, Ph.D., SUNY (Albany)

Burton Scheaffer, B.A., Dickinson College; M.B.A., Cornell

Joseph Shatz, B.A., Cornell; MIMFA, Creighton

Faculty (RBS-NB)

# Department of Management and Global Business

# Department of Management and Global Business

**Chair:** Ajai Gaur

**Professors:**

Ted Baker, M.B.A., Chicago; M.A., Ph.D., North Carolina

Michael Barnett, M.B.A., Webster; Ph.D., New York

John Cantwell, M.Sc., University of London; Ph.D., Reading

Chao C. Chen, M.A., Ph.D., SUNY (Buffalo)

Petra Christmann, M.B.A., Kiel Institute for World Economy (Germany); Ph.D., California (Los Angeles)

Joanne B. Ciulla, M.A., Delaware; Ph.D., Temple

Farok Contractor, M.S., Michigan; M.B.A, Ph.D., Pennsylvania

Nancy DiTomaso, M.S., Ph.D., Wisconsin

Ajai Gaur, Ph.D. (Strategy), National University of Singapore

Mitchell Koza, Ed.M., Harvard; Ph.D., Chicago

Terri Kurtzberg, M.A., Chicago; M.S., Ph.D., Northwestern

Daniel Z. Levin, M.S., Ph.D., Northwestern

Jeffrey A. Robinson, M.S., Georgia Institute of Technology; M.Phil., Ph.D., Columbia

Danielle Warren, M.A., Ph.D., Pennsylvania

**Associate Professors:**

Michelle Gittelman, M.B.A./M.I.A., Columbia; Ph.D., Pennsylvania
Douglas Miller, M.A., Arizona; Ph.D., Ohio State

Aviad Peer, M.S., Technion Israel Institute of Technology; Ph.D., British Columbia

Oliver Sheldon, M.S., Ph.D., Cornell

Phyllis Siegel, B.A., B.S., Pennsylvania; M.Phil., Ph.D., Columbia

Markus Taussig, M.A., John Hopkins; Ph.D., Harvard

Danni Wang, M.S., Guanghua School of Management (China); Ph.D., Arizona State

**Assistant Professors:**

Anastasia Bailey, M.B.A., Florida A&M; Ph.D., Ohio State

Tony He, M.B.A., Harvard Business; Ph.D., Wharton Business School

Jerry W. Kim, A.M., Ph.D., Harvard

Junchao (Jason) Li, M.S.B.A., Ph.D., Washington

Tobey Scharding, M.A., Johns Hopkins; Ph.D., Stanford

Alexander Van Zant, M.S., Ph.D., (Berkeley)

Jaume Villanueva, M.B.A., Wisconsin; Ph.D., Minnesota

**Associate Professor of Professional Practice:**

Mason Ameri, M.A., M.S., Ph.D., Rutgers

Arturo Osorio Fernandez, M.B.A., Ph.D., Massachusetts

Denis Hamilton, M.B.A., Pennsylvania; Ph.D., Rutgers

Charlie Stevens, Ph.D., Ohio State

Jeana Wirtenberg, M.A., Ph.D., California (Los Angeles)

**Assistant Professors of Professional Practice:**

Douglas Brownstone, B.S., Cornell; M.B.A., Syracuse

Ramdas Chandra, M.B.A., University of Delhi; Ph.D., NYU, New York

Joydeep Chatterjee, M.B.A., George Washington; M.A., Ph.D., Pennsylvania

Smita Chopra, M.B.A., Ctr for Mgmt Dev, India; B.Sc., India

Jerome (Jerry) Flynn, M.B.A., Cleveland; Ph.D., Virginia Polytechnic

Mary Giordano, B.A., Rutgers; M.B.A., Rutgers Business School

Sharon Hellman, B.S., Rutgers; M.S., Stevens Institute of Technology

Ed Hubbard, A.B., Brown; M.B.A., Pennsylvania

Robert C. Hughes, M.A., Ph.D., California (Los Angeles)

Danielle Jenkins, B.S., Penn State, Mb.A., Pepperdine University

Anthony Lucas, M.A., Montclair; Ed.D., Rutgers

Gary Minkoff, B.A., Rutgers; M.B.A., Babson

Jonathan Ng, M.B.A., Nanyang Technological; Ph.D. Capella

Zeki Pagda, M.B.A.; Ph.D., San Diego

Mukesh Patel, B.A., Rutgers; J.D., Fordham

Lyneir Richardson, B.S., Bradley; J.D., Chicago

Pallavi Shukla, B.S., Birla Institute of Technology (India); Ph.D., Rutgers

Jeremy Vogelmann, S.B., Massachusetts Institute of Technology; M.B.A., New York

# Department of Management Science and Information Systems

# Department of Management Science and Information Systems

**Chair** : Michael Katehakis

**Vice Chairs:** Endre Boros & Sergei Schreider

**Board of Governors Professors:**

Andrzej Ruszczynski

**Distinguished Professors:**

Endre Boros, Ph.D., Eotvos Lorand (Budapest, Hungary)

Jonathan Eckstein, Ph.D., Massachusetts Institute of Technology

Michael Katehakis, M.S., University of South Florida; M.S., Ph.D., Columbia

Andrzej Ruszczynski, Ph.D., Warsaw University of Technology

Jaideep Vaidya, Ph.D., Purdue

Hui Xiong, Ph.D., Minnesota

**PROFESSOR EMERITUS-FTTRP**

Douglas Jones, M.S., Ph.D., Florida State

**Professors:**

Farid Alizadeh, Ph.D., Minnesota

Vijay I. Atluri, Ph.D., George Mason

Ted Szatrowski, M.S., Ph.D., Stanford

**Associate Professors:**

Mert Gurbuzbalaban Ph.D., New York

Thomas Lidbetter, Ph.D., London School of Economics

Xiaodong Lin, Ph.D., Purdue

Spiros Papadimitriou, Ph.D., Carnegie Mellon

Periklis Papakonstantinou, Ph.D., Toronto

Jian Yang, Ph.D., Texas (Austin)

**Assistant Professors:**

Shahrzad Haddadan, Ph.D., Dartmouth

Arunesh Sinha, Ph.D., Carnegie Mellon

Jalaj Upadhyay, Ph.D., University of Waterloo, Canada

**Associate Professors of Professional Practice:**

Berhanu Alemayehu, DrPH, University of Michigan

Kemal Gursoy, Ph.D., Rutgers

Nuria Diaz-Tena, Ph.D., The Wharton School of the University of Pennsylvania

Joann Ordille, Ph.D, University of Wisconsin-Madison

Janos Pinter, Ph.D., Moscow State (Lomonosow-Russia)

Sergei Schreider, Ph.D., Australian National University

**Visiting Associate Professors:**

Jin Wang, Ph.D., University of Hong Kong

**Assistant Professors of Professional Practice:**

Romulo Neves Ely, Ph.D., Coppe UFRJ (Rio de Janeiro)

Wajahat Gilani, Ph.D., Rutgers

Chon Lintakoon, D.B.A., Rutgers

Meng Qu, Ph.D., Rutgers

Michail Xyntarakis, MS NTU of Athens Greece and MS University of Texas - Austin

Gabriel Zenarosa, Ph.D., University of Pittsburgh

**Instructor of Professional Practice:**

Vladimir Gurvich, Ph.D., Moscow Institute of Physics and Technology

Sheema Mirchandani, M.C.A., University of Pune (India)

**Affiliated Faculty:**

James Calvin, Ph.D., Stanford

Suresh Govindaraj, Ph.D., Columbia

Dimitris Metaxas, Ph.D., Toronto

Marvin Nakayama, Ph.D., Stanford

Vladimir Pavlovic, Ph.D., Illinois (Urbana-Champaign)

Faculty (RBS-NB)

# Department of Marketing

# Department of Marketing

**Chair:** Chan Choi

**Vice Chair:** Can (John) Uslay

**Director of Marketing Education:** Erich Toncre

**Professors:**

Chan Choi, B.A., Seoul National University; M.B.A., Michigan State; Ph.D., Pennsylvania

Harsharanjeet (Sharan) Jagpal, B.A., North Bengal University (India); B.Sc., London School of Economics; Ph.D., Columbia

Alokparna (Sonia) Basu Monga, B.Pharm., Birla Institute of Technology and Science (India); M.B.A., Lancaster; Ph.D., Minnesota

Ashwani Monga, B.Tech., National Dairy Research Institute (India); M.B.A., Indian Institute of Management; Ph.D., Minnesota

Jerome Williams, B.A., Pennsylvania; M.S., Union College; Ph.D., Colorado

Sengun (Shen) Yeniyurt, B.S., Istanbul Technical University; M.B.A., Bogazici University (Turkey); Ph.D., Michigan State

**Associate Professors:**

Kristina Durante, B.S., Boston; M.A., Chicago; Ph.D., Texas (Austin)

Can (John) Uslay, B.S., Middle East Technical University (Turkey); M.B.A., Ph.D., Georgia Institute of Technology

**Assistant Professors:**

Kihyun (Hannah) Kim, B.A., M.B.A., Ewha Womans University (South Korea); M.S., Ph.D., Georgia State

Oscar Moreno, B.S., M.S., Ph.D., Utah

Richard Schaefer, B.A., Trinity; M.S., Ph.D., Texas (Austin)

Gabriela (Gabbie) Tonietto, B.S., Ph.D., Washington (St. Louis)

Ozge Turut, B.S., Bogazici University (Turkey); M.B.A., Carnegie Mellon; D.B.A., Harvard

**Assistant Professors of Professional Practice:**

Madhavi Chakrabarty, B.S., M.S., Indian Institute of Technology; Ph.D., New Jersey Institute of Technology

Yla Eason, B.A., Fitchburg State; M.B.A., Harvard; Hon. Ph.D., Bloomfield College

Marc Kalan, B.A., Pennsylvania; M.B.A., Columbia

Arnold Pollack, B.A., New York; M.B.A., Pennsylvania

Stacy Smollin Schwartz, B.A., Pennsylvania State; M.B.A., Harvard

Erich Toncre, B.A., Indiana; M.S., M.B.A., New Jersey Institute of Technology

Faculty (RBS-NB)

# Department of Supply Chain Management

# Department of Supply Chain Management

**Chair:** Lian Qi

**Vice Chairs:** Arash Azadegan and Rosa Oppenheim

**Professors:**

Arash Azadegan, Ph.D., Arizona State

Alok Baveja, Ph.D., SUNY (Buffalo)

Wayne Eastman, J.D., Harvard

Kevin Kolben, J.D., Michigan

Lei Lei, Ph.D., Wisconsin (Madison)

Benjamin Melamed, Ph.D., Michigan

Rosa Oppenheim, Ph.D., Brooklyn Polytechnic Institute

Lian Qi, Ph.D., Florida

Yao Zhao, Ph.D., Northwestern

**Adjunct Professor:**

Donald Klock, M.B.A., Rochester

**Associate Professors:**

Weiwei Chen, B.S., M.S., Tsinghua; Ph.D., Wisconsin

Rudi Leuschner, Ph.D., Ohio State

Xiaowei Xu, Ph.D., Northwestern

**Associate Professors of Professional Practice:**

Ann Bagchi, Ph.D., Wisconsin

Sharon Lydon, Ph.D., George Washington

Kevin Lyons, Ph.D., Sunderland (UK)

William McLaury, M.A.S., Fairleigh Dickinson

**Assistant Professors:**

Temidayo Adepoju, Ph.D., Boston U.

Xin (David) Ding, M.S., South China; Ph.D., Utah

David Dreyfus, Ph.D., Michigan State

Mark Rodgers, Ph.D., Rutgers

Matthew Walsman, Ph.D., Cornell

**Assistant Professors of Professional Practice:**

Joseph Agresta, M.B.A., Fairleigh Dickinson

G. Tony Bell, D.Mgt., U. of Maryland.

Warren Cohen, M.S., The New School

Luke Greeley, Ph.D., Rutgers

John Hellriegel, M.B.A., Fairfield

John Impellizzeri, M.B.A., St. John's

James King, M.B.A., Rutgers

Hussan Peavey, M.B.A., NY Institute of Technology

Sundar Raman, M.B.A., U. of Buffalo

Anthony Taitt, M.B.A., Rutgers

# History and Aims of the School (SC&I-U)

## HISTORY AND AIMS OF THE SCHOOL

The School of Communication and Information (SC&I) is a dynamic center of learning at the heart of the Rutgers University-New Brunswick College Avenue campus. Founded in 1982 with the merger of the Graduate School of Library and Information Studies, the School of Communication Studies, and the Department of Urban Journalism, SC&I research and teaching focuses on organizational communication, social and new media, library and information science, journalism and media studies, information technology, and health communication and information. The school's competitive and renowned programs prepare students for top careers in today's digital environment.

The school leads the university in the study of communication, information, and media processes, organizations, and technologies as they shape and define individuals, societies, and the relationships among them. Rapidly expanding communication and information technologies are drawing these distinct but allied fields closer together while, at the same time, extending beyond them and exerting a major influence on our society and its economic and cultural endeavors. As a community of scholars and teachers, SC&I is committed to educating individuals who will make lasting contributions to the interdisciplinary study and professional practice of communication, journalism and media, library and information science, and to society at large.

**Fast Facts**

- Almost 70 full-time faculty members in three departments: Communication, Journalism and Media Studies, Library and Information Science
- Over 1,900 undergraduate students pursuing one of three undergraduate majors: communication, information technology and informatics, journalism and media studies
- Over 400 students in two undergraduate minors: digital communication, information, and media; and gender and media
- Over 600 students--both on campus and online--in two master's programs: communication and media, and information
- Over 90 doctoral students
- On-site and online continuing education classes available
- About 150 part-time faculty members, most of whom are highly accomplished communication, information, and media professionals working in the metropolitan area
- Over 27,000 alumni
- Tuition is competitive with the top 10 national programs in these disciplines
- Located less than 40 miles from New York City and 60 miles from Philadelphia
- Faculty and students win national awards every year from scholarly and professional associations

The most up-to-date information about the School of Communication and Information may be found on the school's website here.

**Undergraduate Studies**

The School of Communication and Information (SC&I) offers undergraduate courses open to students across the university that are of general interest and may fulfill requirements of the Core Curriculum, such as Public Speaking; Intercultural Communication; Gender and Technology; Gender, Race, and Class in the Media; Health Message and Campaign Design.

The school offers the following majors and minors that may be taken as part of a bachelor's program:

- Communication major
- Information technology and informatics major
- Journalism and media studies major
- Digital communication, information, and media minor
- Gender and media minor

Each of these programs has specializations that are outlined in the catalog section Programs of Study.

The school does not admit first-year or transfer students directly to the university. Students enter through a Rutgers school such as the School of Arts and Sciences, the School of Environmental and Biological Sciences, or the Mason Gross School of the Arts, and may choose a major or second major or minor in a SC&I program. All students must conform to the requirements and policies of their four-year school as well as the policies of SC&I for their major and/or minor.

Because the curricula of the school reflect the very dynamic disciplines and professional fields in the areas of communication, information technology, journalism, and media, new programs and new specializations within those programs are regularly developed and offered. Check the school's website for the most up-to-date information about programs offered.

# Student Life (SC&I-U)

## STUDENT LIFE

Students of the School of Communication and Information (SC&I) have the opportunity to participate in residence life, dormitories, or nearby off-campus housing in New Brunswick. See the Residence Life website for further information.

Rutgers University-New Brunswick offers undergraduate students almost unlimited possibilities for co- and extracurricular activities. There are over 400 student organizations on campus, and their student leaders participate in advisement, organizational development programs, and support services. These groups range from academic to social action organizations and include the student government of the university, Rutgers University Student Assembly (R.U.S.A.). There are over 80 fraternities and sororities that offer opportunities for friendship, academic support, and housing. Rutgers has a wide range of intercollegiate and intramural athletics and is home to the Scarlet Knights

Within SC&I there are over a dozen student organizations that offer social, educational, service, and career development events. Most events are publicized and open to all students. Leadership opportunities are plentiful, and student leaders receive ongoing support and administrative assistance through the SC&I Office of Student Services.

The SC&I Leadership Council is an advisory group consisting of the presidents and vice presidents of each of the undergraduate and graduate student organizations recognized and supported by the school. The Leadership Council serves as a vehicle for collaborative opportunities and initiatives including: providing a voice for the student experience; promoting interactions and collaborations among student organizations; providing perspective and direct feedback to the school's administration; and developing models for leadership for all students.

# Admission (SC&I-U)

## ADMISSION

**Admission to the Majors**

The School of Communication and Information (SC&I) requires an application to its majors separate from the one through which students apply to the university. Students already enrolled at a Rutgers four-year school as well as new transfer students may obtain the most up-to-date information about admission procedures from the school's website here.

The majors offered by SC&I include: communication; information technology and informatics; journalism and media studies.

Students who wish to apply for admission to any one of the three majors in the School of Communication and Information must meet the following minimum requirements prior to applying:

1) have completed Expository Writing or an equivalent course or placement with a grade of C or better;
2) have completed at least 15 credits at Rutgers, or at least 15 transfer credits to Rutgers, with at least a 2.0 grade-point average; and
3) have completed with a grade of C or better the required course for the major of choice:

- For **communication major** applicants, the required prerequisite survey course is: **04:189:101 Introduction to Communication and Information Processes.**
- For **information technology and informatics major** applicants, the required prerequisite survey course is: **04:189:103 Information Technology and Informatics.**
- For **journalism and media studies major** applicants, the required prerequisite survey course is: **04:189:102 Introduction to Media Systems and Processes.**

The school has a competitive application process and meeting the minimum application requirements does not guarantee admission to a major. Students' applications, transcripts, and written statements are reviewed by an admissions committee to determine suitability for admission. The school is committed to admitting a highly motivated and diverse student body to the undergraduate programs.

Students who earn a D or F in the prerequisite survey course will be allowed to retake the course one time.

**Application Process**

The school accepts applications to the major during the fall, spring, and summer semesters. Deadlines for submitting the application, which is online on the school's website, are published each year and allow for decisions to be announced in time for students who are admitted to preregister for the following semester as a major.

The website is located here and includes details about majors, courses, and the school.

Students who complete the prerequisite survey course may continue to take some additional core requirements and department electives in each program before being admitted to the major:

Students planning to major in communication may take 04:192:200, 201, and 300 after completion of 04:189:101 before being admitted to the major.

Students planning to major in information technology and informatics may take 04:547:111, 200, 215, and 220 after completion of 04:189:103 before being admitted to the major.

Students planning to major in journalism and media studies may take 04:567:274, 275, 276, 278, 324, 333, 334, 335, 350, 365, 379, and 380 after completion of 04:189:102 before being admitted to the major.

Completion of any of these courses does not guarantee admission to any major. Only courses completed with a grade of C or better will count toward the major once accepted.

**Declaration of a Minor**

Students may declare a minor in digital communication, information, and media after successful completion of one 100- or 200-level course with a grade of C or better. Students may declare a minor in gender and media after successful completion of one of the foundational courses with a grade of C or better. School of Arts and Sciences (SAS) students may declare the minor through the SAS myMajor system; other students may use the declaration form on the SC&I website.

# Scholarships and Financial Aid (SC&I-U)

## SCHOLARSHIPS AND FINANCIAL AID

The School of Communication and Information (SC&I) does not admit students directly to Rutgers. Students enter through one of the four-year schools of the university and are eligible for all financial aid from the university and from their four-year school. Rutgers University-New Brunswick financial aid information may be found here.

Federal work-study employment may be offered as a self-help portion of a financial aid award. Application for this program is made by filing the Free Application for Federal Student Aid (FAFSA) available here. On-campus jobs are available in many areas. Selection for a particular job is based on skills, job availability, university needs, and student preference. The assigned employment opportunity is based on an expectation that the student will work between five and 15 hours weekly throughout the fall and spring academic semesters; in the case of summer assignments, the expectation is that the student will work between 20 and 35 hours per week. Off-campus employment, including paid community service positions and reading tutorial jobs in elementary schools, also are available. No job assignments are made until all paperwork required to accept the aid is complete.

SC&I offers a limited number of scholarships and a few prizes to high-achieving Rutgers undergraduates who are declared majors in the school. Continuing students are notified early in the spring semester of what scholarships will be available in the coming year, and have an opportunity to apply for them. Students' scholarship applications, transcripts, and written statements are reviewed by each program's scholarship committee to determine awards.

Detailed information about what scholarships and prizes were available in the most recent academic year can be found on the school's website here.

# Honors (SC&I-U)

## HONORS

**Honors Program**

Undergraduates in the School of Communication and Information have the opportunity to apply to a senior honors program within their major if they meet eligibility requirements. Students in an honors program undertake an independent research project and complete a thesis under the supervision of a faculty adviser. Students do not need to be part of their four-year school honors program (e.g., School of Arts and Sciences Honors Program, School of Environmental and Biological Sciences Honors Program) in order to apply.

Students interested in entering the honors program should contact the undergraduate program director of their major or the school's Office of Student Services to discuss the program, eligibility requirements, and current application procedures.

**Graduating with Honors in the Major**

To receive the scholastic designation of graduating with honors in the major, students must meet the following requirements:

1) Student must have achieved a minimum 3.65 GPA in coursework for the major

AND

2) Student must have achieved a minimum 3.25 GPA overall in undergraduate studies

Students do not have to be a part of an honors program to graduate with the distinction of honors in the major.

# Career Services (SC&I-U)

## CAREER SERVICES

The Office of Student Services provides targeted career support for students in all School of Communication and Information (SC&I) academic programs through career training workshops, job and internship fairs, and individual and group career counseling. SC&I students are also encouraged to seek additional career guidance and support through the university's Career and Exploration Success office.

SC&I cultivates relationships with employers and alumni to provide students with employment opportunities and information. In addition, each of our degree programs has an active internship program and most students do choose to participate in an internship as part of their academic experience.

For the most current information about career services and our placement portal, check the school's website here.

# Programs of Study (SC&I-U)

## PROGRAMS OF STUDY

The three undergraduate majors currently offered by the School of Communication and Information (SC&I) are communication, information technology and informatics, and journalism and media studies. Each major leads to a bachelor of arts degree. All students must satisfy the premajor requirements and the requirements of their major as well as the academic requirements of the four-year school through which they were admitted to the university. Most SC&I majors are based in the School of Arts and Sciences or the School of Environmental and Biological Sciences, but students from schools such as Mason Gross School of the Arts, Rutgers Business School, and the School of Nursing may choose a second major at SC&I. Students maintain their affiliation with their undergraduate school while enrolled at the School of Communication and Information.

The school offers two minors: digital communication, information, and media; gender and media. These are open to students from all Rutgers schools. Students should check with their four-year school to determine if the minor fulfills the requirements for that school or will count as elective credits. (New Brunswick School of Arts and Sciences students may use either program to fulfill their minor requirement.)

Students are urged to check the School of Communication and Information website for the latest requirements and course offerings. The school reserves the right, for any reason, to change or modify any course or program listed.

- Communication
- Information Technology and Informatics
- Journalism and Media Studies
- Digital Communication, Information, and Media Minor
- Gender and Media Minor

# Communication (SC&I-U)

## COMMUNICATION

The Department of Communication is dedicated to advancing knowledge about communication and its practice in society. The department examines how meaning is created and negotiated in human interaction to address the personal, professional, and public communication challenges and opportunities posed by 21st century life. Students become leaders in private, public and civil sectors by developing a deep and practical appreciation of how communication shapes the world in which we live. Research from SC&I's renowned faculty experts examines the complexity of communication processes.

The undergraduate major in communication provides a broad education, covering ideas and applications in preparation for communication careers in business, education, or government, for the pursuit of graduate degrees in communication and other social science fields, or as a supplement for students whose primary interests are in other areas such as political science, computer science, business, human resources, health care, and more.

Available concentrations allow students to demonstrate targeted skills in the job market. They include:

- Communication and Technology
- Health and Wellness Communication
- Leadership in Organizations and Community
- Relationship and Family Communication
- Strategic Public Communication and Public Relations

Graduates from the undergraduate program in communication gain:

- Competency in written communication in varied settings (including interpersonal, family, group, health, organizational, or mediated settings).
- Ability to use communication theories and concepts to analyze human behavior (including interpersonal, family, group, health, organizational, or mediated settings)
- Ability to apply communication theories and concepts to social and professional life (including issues of diversity, ethics, and civic engagement)
- Understanding of fundamental communication perspectives, theories, and concepts
- Proficiency in gathering and using evidence to study and understand communication processes and consequences (including asking questions and systematically attempting to answer them, understanding the value and limitations of the research processes and conclusions)
- Competency in oral communication in varied settings (including interpersonal, family, group, health, organizational, or mediated settings)

**Career Opportunities**

Communication graduates find opportunities in a wide variety of careers in business, education, government, and the nonprofit sectors. Skills in oral and written communication are some of the most sought-after characteristics all employers look for when hiring. Radio and TV, advertising and public relations, publishing, sales, and financial services are but a few of the many areas in which these graduates find employment. Any work that involves communicating as its focal point is a potential career field. The communications industry is a competitive one, however, and experience gives everyone an extra advantage. The communication program offers internship opportunities for credit. In addition, an advanced degree can offer an edge, and the school offers a five-year bachelor's/master's program; for more information, see below.

**Admission to the Major**

Admission to the communication major is competitive; meeting the minimum requirements does not guarantee acceptance. Minimum requirements for admission include

- completion of at least 15 credits at Rutgers, or 15 transfer credits, with a grade-point average of 2.0 or better;
- a grade of C or better in the required prerequisite course 04:189:101 Introduction to Communication and Information Processes (or an equivalent transfer course);
- a grade of C or better in Expository Writing or an equivalent course or placement; and
- completion of the application including a well-written personal statement.

The admissions committee seeks the following when reviewing student essays: (a) evidence of your interest in the major; (b) your future plans and their relationship to the major; (c) your strength as a writer; and (d) any other qualities that make you a strong candidate for admission to the communication major. Applications are available on the school's website. Students may be admitted for the fall, spring, and summer semesters; check the website for application deadlines each year. Students are strongly encouraged to consult the school's website for up-to-date information regarding admissions procedures.

**Major Requirements**

***Prerequisite survey course required before admission to the major (3 credits):***

04:189:101 Introduction to Communication and Information Processes (3)

***SC&I interdisciplinary requirement (3 credits):***

Either
04:189:102 Introduction to Media Systems and Processes (3)
or
04:189:103 Information Technology and Informatics (3)

Requirements for the remaining credits in the major include:

***Core Requirements (15 credits):***

04:192:200 Communication Theory (3)
04:192:201 Communication in Relationships (3)
04:192:300 Communication Research (3)
04:192:380 Public Speaking (3)
*At least one of the following four classes:*
04:192:354 Communication and Technology (3) or
04:192:355 Interpersonal Communication (3) or
04:192:357 Organizational Communication (3) or
04:192:359 Persuasive Communication (3)

***Upper-level electives (15 credits):***

Upper-level elective courses may include all 300- and 400-level courses and must include at least two 400-level courses except those completed as part of the core requirements. Courses 04:192:491,492 Independent Study in Communication and 04:192:495 Applied Study in Communication may not be used to fulfill this or the total credit requirement in the major. Students should check the communication website or undergraduate handbook to determine prerequisites for 300- and 400-level courses and should speak with an adviser for help in planning coursework for the major.

*Optional specializations:*

- Communication and Technology
- Health and wellness communication
- Leadership in organizations and community
- Relationship and family communication

- Strategic public communication and public relations

The specializations are designed to provide essential knowledge of communication methods and techniques and help students build the necessary skills to start a career. The specializations require the same credits as the communication major in general, but are focused in one of the areas above. Specializations can be combined with additional coursework to better create a narrative around a student's skills and knowledge. Combining specializations can expand career opportunities further. See the webpage for the most current information and additional details: Here.

Students must earn a grade of C or better in all 04:192 courses in order for those courses to count toward the major.

**Internships and Other Educational Opportunities**

The department encourages students to pursue internship experiences that complement their studies and potential career choices. Students must be accepted into the communication major in order to enroll in the internship. Students may apply up to 3 internship course credits toward their upper-division course electives in the major. Additional internship credits may be earned but do not apply to the communication major. Note that each four-year school in the university sets its own limits regarding the number of experiential credits a student may apply toward graduation.

Further information about the internship and about other educational opportunities such as specializations in the major is available at the communication program website.

**Course Transfers**

Courses that students have taken at other New Jersey colleges, which are articulated through the NJ Transfer system and recorded on a student's transcript with a communication course number, will be counted toward the major.

Students who wish to have a course they have taken elsewhere at Rutgers or externally at another university considered as one of their required or elective courses in the communication major must submit a request for transfer equivalency in writing to the SC&I Office of Student Services. To submit such a request, the letter of petition must include a copy of the full syllabus of the course, a copy of the student's transcript showing the grade achieved, a note which communication course it is requested to replace, and the reasons for consideration. The courses are evaluated in terms of their very close match of content and skills to the communication course, the level of the course, and the grade achieved, which should typically be a C or better. Students will be notified in writing of the outcome of the petition.

**Dual-Bachelor's/Master's Degree Program for Communication Majors**

Communication majors in their junior or senior year may apply to the master's program in communication and media (M.C.M.) for a dual-B.A./M.C.M. program that allows completion of both degrees in as little as five years. If accepted, students may enroll in up to four M.C.M. courses during their senior year that will count toward both the undergraduate degree and the master's. Once the bachelor's degree is completed, students will be in the master's program and complete the requirements. Two to three semesters of full-time study, or four semesters of part-time study, would allow a student to complete the remainder of the master's program.

Admission requirements for the dual degree program are the same as for all M.C.M. applicants. Details about the application process and degree requirements are on the school's website.

# Information Technology and Informatics (SC&I-U)

## INFORMATION TECHNOLOGY AND INFORMATICS

The information technology and informatics (ITI) major is a 39-credit program offered by the Department of Library and Information Science. This major emphasizes the evaluation, implementation, use, and management of information technologies for a wide range of organizations and corporations, as well as the social and organizational aspects of information and communication technologies. The major unites theories drawn from the humanities and social sciences with practical computer-based competencies. This combination prepares students to work in a diverse and highly competitive marketplace that demands individuals who understand the social, economic, and organizational impacts of technology locally and globally. The course of study combines rigorous thinking, problem-solving, and technology skills in a program that is based on sound research and current technology applications.

Upon successful completion of the major, students will be able to demonstrate these learning goals of the ITI program:

- *[CREATE]* Develop new technological solutions to real-world problems through innovative, collaborative, and computation approaches.
- *[COMMUNICATE]* Communicate to professional stakeholders utilizing evolving technological platforms.
- *[CRITICAL THINKING]* Analyze the ever-changing interactions of people and technology, regarding pertinent social, cultural, philosophical, ethical, legal, and economic issues.
- [COORDINATE] Evaluate, implement, use, and manage information technologies for a wide range of organizations and corporations.

**Career Opportunities**

New Jersey's growth industries--technology, pharmaceuticals, logistics, and finance--are driven by innovative applications of information technology. Graduates of the major in information technology and informatics seek positions in sectors such as government, health care, education, consulting, and finance where technology skills and an understanding of organizational and social informatics make them valuable employees. Examples of where ITI graduates have launched their careers include:

- Information technology analysis
- IT consulting and project management
- Technology policy analysis
- User experience analysis and design
- Web design and development
- Information assurance and cybersecurity
- Networking and systems administration and support

**Admission to the Major**

Admission to the information technology and informatics major is highly competitive; meeting the minimum requirements does not guarantee acceptance. Minimum requirements for admission include

- completion of at least 15 credits at Rutgers, or 15 transfer credits, with a grade-point average of 2.0 or better;
- a grade of C or better in the required prerequisite course 04:189:103 Information Technology and Informatics (or an equivalent transfer course);
- a grade of C or better in Expository Writing or an equivalent course or placement; and
- completion of the application including a personal statement.

The admissions committee considers the following criteria when reviewing student essays: (a) evidence of your interest in the major; (b) your future plans and their relationship to the major; (c) your strength as a writer; and (d) any other qualities that make you a strong candidate for admission to the ITI major. Applications are available on the school's website here. Students may be admitted for the fall, spring, and summer semesters; check the website for the application deadlines each semester. Students are strongly encouraged to consult the school's website for up-to-date information regarding admissions procedures.

**Major Requirements**

Students must earn a grade of C or better in 04:547 courses in order for those courses to count toward the major.

*Prerequisite survey course required before admission to the major (3 credits):*

04:189:103 Introduction to Information Technology and Informatics (3)

*SC&I interdisciplinary requirement (3 credits):*

Either
04:189:101 Introduction to Communication and Information Processes (3)
or
04:189:102 Introduction to Media (3)

*Core courses (12 credits):*

04:547:200 Social Informatics (3)
04:547:201 Information Technology Fundamentals (3)
04:547:202 Object-Oriented Programming (3)
04:547:210 Management of Technological Organizations (3)

*Elective courses (21 credits):*

ITI students must select seven elective courses from the course listing for the ITI major.

*Optional pathways:*

Several optional areas of focus are available within the information technology and informatics program, including cybersecurity and information assurance, data management and information visualization, and web design. These guided pathways allow students to develop more in-depth knowledge and skills in focused areas. Please check the website for current offerings and course options.

**Internships and Other Educational Opportunities**

The ITI program encourages students to complete a 3-credit internship, which includes both work experience and an academic component. The program offers an independent study option to students who want to investigate a particular topic more fully under the supervision of a faculty member. High achieving students who qualify may apply to participate in a senior thesis. Students interested in the senior thesis must first take Application Research for Information Technology (04:547:300) and then conduct a research project, taking the Senior Thesis Course (04:547:465).

**Course Transfers**

A maximum of 6 transfer credits may be counted toward the information technology and informatics major. Only courses with a grade of C or better will be accepted for transfer.

Courses that students have taken at other New Jersey colleges, which are articulated through the NJ Transfer system and recorded on a student's transcript with an ITI course number, will be counted toward the major. However, such courses do count as transfer courses to the major and therefore a maximum of 6 credits may be applied to the major.

Students who wish to have a course they have taken elsewhere at Rutgers or externally at another university considered as one of their required or elective courses in the ITI major must submit a request for transfer equivalency in writing to the SC&I Office of Student Services. To submit such a request, the letter of petition must include a copy of the full syllabus of the course, a copy of the student's transcript showing the grade achieved, a note which ITI course it is requested to replace, and the reasons for consideration. The courses are evaluated in terms of their very close match of content and skills to the ITI course, the level of the course, and the grade achieved, which should typically be a B or better. Students will be notified in writing of the outcome of the petition.

**Dual-Bachelor's/Master's Degree Program for ITI Majors**

This degree pathway allows students to earn a bachelor's degree with an ITI major and a master of information (M.I.) degree in five years of continuous, full-time study, or longer if completed part-time. Students who have completed at least 90 credits in their undergraduate program can be considered for admission into the dual-degree pathway to the M.I. degree.

ITI majors who are admitted into the dual-degree pathway take two graduate courses in each of the fall and spring semesters of their senior year. Those courses are selected based on student goals and M.I. program requirements. These four courses (12 credits) count both as an undergraduate (ITI electives) and fulfill graduate (M.I.) requirements as long as the student earns a grade of B or better. Upon successful completion of coursework in the senior year, dual-degree students will graduate from the undergraduate program and transition into the graduate program as a M.I. student.

Details about the application process and degree requirements are on the school's website.

# Journalism and Media Studies (SC&I-U)

## JOURNALISM AND MEDIA STUDIES

The journalism and media studies (JMS) major provides an opportunity to study print, broadcast, electronic journalism, and new media, including law and ethics as well as media theory, with an emphasis on how the media affects individuals, social groups, and political processes in a democratic society. The major provides undergraduate students with a broad spectrum of courses in the theory and practice of journalism and media, preparing them for professional careers in magazines, the creative industries, television, newspapers, radio, web production, media management, news agencies, and wire services, publishing, and public information service in the government and private sectors. Journalism and media studies students are encouraged to take electives outside the School of Communication and Information (SC&I) to complement both their studies in the major and their career interests.

Graduates who successfully complete the program will be able to:

- *[EXPRESSION]* Write fluently, produce content, and tell stories across evolving media platforms.
- *[ANALYSIS]* Demonstrate analytical and critical thinking, formulate research questions and use appropriate methods, evaluate and use appropriate sources, identify, and gather relevant data in journalism and media contexts.
- *[ETHICS]* Develop a critical understanding of the ethical standards and tensions in journalistic and media practices and institutions and apply this understanding to academic and professional activities.
- *[POWER]* Critically analyze issues of diversity, difference, social justice, and power in media in a global context.
- *[SYSTEMS]* Explain social, political, cultural, and economic dimensions of media technologies, institutions, practices, policies, and regulations.
- *[INNOVATION]* Innovate with tools and technologies appropriate for media professions.

**Career Opportunities**

The program offers a broad spectrum of courses in the theory and practice of journalism and media studies, preparing students for professional careers in print, broadcast, new media, advertising, public relations, and public information services in the government and private sectors. The courses focus on the practice of journalism and mass media and the impact of media on society, new technology and the media, public policy and understanding, and the planning and development of public information systems. The major also provides strong writing skills and academic preparation for students who are pre-professional for law school, M.B.A. programs, and other advanced degrees.

**Admission to the Major**

SC&I accepts applications to majors in the fall, spring, and summer semesters.

Admission to the journalism and media studies major is competitive; meeting the minimum requirements does not guarantee acceptance. General writing ability and communication skills, as evidenced in both the personal essay of the application and success in relevant courses are required. Minimum requirements for admission include

- completion of at least 15 credits at Rutgers, or 15 transfer credits, with a grade-point average (GPA) of 2.0 or better;
- a grade of C or better in the required prerequisite course 04:189:102 Introduction to Media Systems and Processes (or an equivalent transfer course);
- a grade of C or better in Expository Writing or an equivalent course or placement; and
- completion of the application including a personal statement.

If students do not earn a grade of C or better in 04:189:102, the course may be retaken one time.

Grades in other journalism and media studies courses will get particular attention, but applicants are not required to have taken such courses before applying. The admissions committee may seek evidence of interest in journalism and media studies including extracurricular involvement. The admissions committee considers the following criteria when reviewing student essays: (a) evidence of your interest in the major; (b) your future plans and their relationship to the major; (c) your strength as a writer; and (d) any other qualities that make you a strong candidate for admission to the journalism and media studies major. Students may be admitted for the fall, spring, and summer semesters; check the website for application deadlines each semester. Students are strongly encouraged to consult the school's website for up-to-date information regarding admissions procedures, program requirements, course offerings, and special programs.

Details about deadlines as well as application forms are available here.

**Major Requirements**

***Prerequisite survey course required before admission to the major (3 credits):***

04:189:102 Introduction to Media (3)

***SC&I interdisciplinary requirement (3 credits):***

Either
04:189:101 Introduction to Communication and Information Processes (3)
or
04:189:103 Information Technology and Informatics (3)

***Core Courses (6 credits):***

04:567:200 Writing for Media (3)
04:567:201 Media Ethics (3)

***Pathway courses (27 credits):***

Students are strongly encouraged to pursue one of three pathways:

Journalism and Emerging Media: Built upon the foundation of traditional media (broadcasting and print), this path offers students the opportunity to concentrate in newer journalistic pursuits such as online, social media, and citizen journalism.

Media and Society: Students study the impacts and effects of media, politics, social change, diversity, and other topics on the state, country, and world levels. This path is appropriate for students interested in a focus on media studies.

Creative Media Practice: Students learn different forms of media production, practice, and industry analysis. This path prepares students for careers emphasizing creative, managerial, and entrepreneurial media opportunities, including social media, entertainment media, and strategic communications. Students learn how to work with newer technologies and apply those skills in the ever-changing media environment. Creative media practice classes present the opportunity to analyze the role production plays in the development of media.

Within the chosen pathway, students must complete::

1 Foundation course (3)
2 courses in Practice and Innovation (6)
2 courses in Concept and Analysis (one must be at the 400 level) (6)
12 credits of electives

*Diversity, difference, and social justice:*
The Department of Journalism and Media Studies is committed to addressing issues of diversity, difference, and social justice. Majors must complete at least one of the following courses:

04:567:274 Consumer Media Culture
04:567:333 Media and Popular Culture
04:567:334 Gender, Race, and Class in the Media
04:567:351 Digital Media and Society
04:567:365 Mediating the Middle East
04:567:380 Media and Social Change
04:567:385 Irish Media, Politics, and Cultural Survival
04:567:420 Global News
04:567:457 Journalism and Civil Rights
04:567:475 International Media

Any of these courses will satisfy a track requirement if it is listed under either Practice and Innovation or Concept and Analysis.

Students may also opt to select a specialization in sports journalism or in global media.

Check the program's website for the most up-to-date list of courses and specializations.

Students may take any course in the major as an elective, including foundation courses from another track.

Students must earn a grade of C or better in all courses in order for those courses to count toward the major.

**Internships, Study Abroad, Honors, and Other Educational Opportunities**

An internship is a highly recommended capstone experience for JMS majors. Students pursue placements in major media outlets throughout the New Jersey, New York, and Philadelphia markets.

The department internship coordinator assists students in finding an internship. Students must qualify, receive permission, and then register for the 6-credit internship. To qualify, a student must be a major who completed a minimum of 75 overall credits and five journalism (567) courses, at least three of which must be skills courses; have an overall GPA of 2.5 or better; and have a 2.75 GPA or better in the major.

The JMS program offers a number of study abroad opportunities and financial aid is sometimes available to support participation.

Students with a cumulative GPA of 3.2 or better may apply to the JMS Honors Program. This program requires six credits of coursework that includes an independent project.

A second major is highly advantageous for students preparing for a career in mass media. Students are strongly encouraged to pursue a second major, or at least a minor, which must be outside of the School of Communication and Information since double majors within the school are not allowed.

The major demands that students carefully formulate their program of coursework. Students should consult an adviser for guidance at least once a year.

**Course Transfers**

A maximum of 6 credits from outside the JMS program may be counted toward the major. A maximum of 3 transfer credits (or one course) may be applied to the conceptual requirement and a maximum of 3 transfer credits (or one course) may be applied to the skills requirement.

Courses that students have taken at other New Jersey colleges, which are articulated through the NJ Transfer system and recorded on a student's transcript with a JMS course number, will be counted toward the major. However, such courses do count as transfer courses to the major and therefore a maximum of 6 credits may be applied to the major.

Students who wish to have a course they have taken elsewhere at Rutgers or externally at another university considered as one of their required or elective courses in the journalism and media studies major must submit a request for transfer equivalency in writing to the Office of Student Services. To submit such a request, the letter of petition must include a copy of the full syllabus of the course, a copy of the student's transcript showing the grade achieved, a note which JMS course it is requested to replace, and the reasons for consideration. The courses are evaluated in terms of their very close match of content and skills to the JMS course, the level of the course, and the grade achieved, which should typically be a B or better. Students will be notified in writing of the outcome of the petition.

**Dual-Bachelor's/Master's Degree Program for Journalism and Media Studies Majors**

JMS majors in their junior or senior year may apply to the master's program in communication and media (M.C.M.) for a dual-B.A./M.C.M. program that allows completion of both degrees in as little as five years. If accepted, students may take a limited number of M.C.M. courses in their senior year which will count toward both the undergraduate degree and the master's. Once the bachelor's degree is completed, students will be in the master's program and complete the requirements.

Admission requirements are the same as for all M.C.M. applicants. Details about the application process and degree requirements are on the school's website.

# Digital Communication, Information, and Media Minor (SC&I-U)

## DIGITAL COMMUNICATION, INFORMATION, AND MEDIA (DCIM) MINOR

The 18-credit digital communication, information, and media (DCIM) minor is open to all majors at Rutgers. This program prepares students to succeed in a diverse range of work environments through a combination of technical, analytical, interpersonal, and entrepreneurial skill sets. The DCIM program concludes with a capstone course that puts students in the driver's seat, defining and creating a project for their professional portfolio that they can use to launch their (next) career. The DCIM minor complements any major at Rutgers. Capstone projects can extend a student's particular interest in a major field of study, or take students in an entirely new direction. All courses are offered in hybrid format, with part of the course conducted in person and part of the course conducted online.

At the end of this program, students are able to:

- critically read, interpret, synthesize, and evaluate online information from a variety of media sources and effectively articulate an analysis and formulate opinions on the relevant topics;
- assess the influence of virtual environments on interpersonal and group interactions;
- identify communication opportunities and challenges when working with others in digital and virtual environments;
- successfully participate and enhance collaborative working relationships in virtual environments; and
- select and apply appropriate digital tools and media and design messages in order to communicate, persuade, and build relationships with stakeholders distributed across space, time, and cultures.

**Career Development**

Whether students are looking to enter the corporate, not-for-profit, or government sectors, whether in the life sciences, social services, business, or other fields, the DCIM program will enhance career possibilities by showing employers that they have proficiency in skills needed in all 21st-century workplaces.

**Declaration of the Minor**

Students may declare the minor after completing one 100-level or one 200-level DCIM course with a grade of C or better. For students in several Rutgers four-year schools, the declaration process is online; others can use a form on the School of Communication and Information (SC&I) website and submit it to the SC&I Student Services Office (SC&I Building, Rm 214). This form is available online.

**Requirements**

Students must take six courses (18 credits) in the program to complete the minor:

**Required:**

- 04:189:151 Virtual Team Dynamics (3)
- 04:189:152 The Structure of Information (3)
- 04:189:251 Strategic Presentation Methods in Digital Media (3)
- 04:189:351 Leadership in Digital Contexts (3)

**Choose one of these two:**

- 04:189:352 Self and Society in Virtual Contexts (3)
- 04:189:353 Digital Technology and Disruptive Change (3)

**Required:**

- 04:189:451 Capstone in Digital Communication, Information, and Media (3)

Students must earn a grade of C or better in 04:189 courses in order for those courses to count toward the minor. Courses can be double-counted for the digital communication, information, and media minor and for any other major or minor at the School of Communication and Information.

**Course Transfers**

Only 100- and 200-level courses that transfer to Rutgers as a substitute for courses in the minor may be applied to the program.

# Gender and Media Minor (SC&I-U)

## GENDER AND MEDIA MINOR

Complementing any major, the gender and media minor is a cross-unit, interdisciplinary undergraduate minor offered jointly by the School of Communication and Information and the School of Arts and Sciences women's, gender, and sexuality studies program. Students are introduced to the minor through a foundational course that offers a shared vocabulary for analyzing issues of power and representation within the media. Students then have the choice of taking two electives in media production, as well as two electives in critical media/feminist theory. At the end of the program, students apply skills and knowledge of gender and the media in the completion of a project in a capstone course that offers internship, service learning, and multimedia project options.

**Program-Level Learning Goals**

The gender and media minor provides a course of study designed for students interested in a combination of theory and practice perspectives on the representation and production of gender in the media.

- Students will apply technical skills as media producers with the ability to add their own critical voices and unique perspectives.
- Students will also demonstrate critical thinking skills that enable them to critique and improve current conditions of media production and consumption.

- Students will articulate, create, examine, inform, and improve systemic and individual power dynamics of the contemporary landscape for gender and media.

**Requirements**

The minor is open to all majors at Rutgers. Students are required to complete six 3-credit courses with a grade of C or better, for a total of 18 credits. Students are strongly encouraged to speak with an adviser to create a plan for completing the program.

Note that courses taken to fulfill requirements in the gender and media minor will count toward the requirements of any other major or minor in the School of Communication and Information and/or for the program in women's, gender, and sexuality studies.

*Foundation course (3 credits)*

Choose one of:

- 01:988:202 Gender, Culture, and Representation (3)
  or
- 04:567:215 Gender, Race, and Class in the Media (3)

*Practice/production courses (6 credits)*

- 01:988:200 Gender, Digital Media, and Social Curation (3) - required

Plus choose one of the following courses for the second course:

- 04:189:251 Strategic Presentation Methods in Digital Media (3)
- 04:567:200 Writing for Media (3)

*Conceptual courses (6 credits)*

Only one of the conceptual courses (3 of the 6 credits) may be taken at the 200 level; the other must be taken as a 300 level.

Choose one of the following SC&I classes for the first conceptual course:

- 04:567:274 Consumer Media Culture (3)
- 04:567:380 Media and Social Change (3)
- 04:547:340 Gender and Technology (3)
- Some special topics courses from SC&I may be allowed to count towards the minor; approval of the program director is required.

Choose one of the following women's, gender, and sexuality studies classes for the second conceptual course:

- 01:988:255 Gender, Art, and Society (3)
- 01:988:257 Gender and the Body: Representations of Pornography (3)
- 01:988:258 Gender, Race, and Contemporary Art (3)
- 01:988:259 Homosexuality and Visual Culture (3)

- 01:988:317 Gender and Consumption (3)
- 01:988:385 Theories of Women and Film (3)
- 01:988:341 Gender and Popular Culture (3)
- Some special topics courses offered by women's, gender, and sexuality studies may be allowed to count towards the minor; approval of the program director is required.

*Capstone course (3 credits):*

Students may enroll in the capstone after completing a minimum of 12 credits in the minor. Choose one of the following courses to fulfill the capstone requirement:

- 01:988:499 Capstone in Gender and Media - offered within the women's, gender, and sexuality studies program
- 04:567:499 Capstone in Gender and Media - offered within the journalism and media studies program

# Explanation of Three-Part Course Numbers (SC&I-U)

## EXPLANATION OF THREE-PART COURSE NUMBERS

The number preceding each course title is divided into three parts. The first two digits are the administrative code (standing for a faculty or a school), the next three digits are the subject code, and the final three digits are the course code.

*Administrative Codes*

The code for School of Communication and Information undergraduate programs is 04. For a complete list of administrative codes used in this catalog, see the beginning of the Programs of Study and Courses for Liberal Arts and Sciences Students section.

*Subject Codes*

A subject code comprises the third through fifth digits in all course numbers and indicates the subject matter of the course. Courses with the following subject codes are listed in this chapter (this does not constitute a list of majors).

189 Communication and Information (this includes courses in the Digital Communication, Information, and Media program)

192 Communication

547 Information Technology and Informatics

567 Journalism and Media Studies

*Course Codes*

The course code comprises the sixth, seventh, and eighth digits in all course numbers. Course codes from 100 to 299 indicate introductory and intermediate undergraduate courses. Codes from 300 to 499 indicate advanced undergraduate courses. Courses coded from 500 to 799 are graduate courses.

Two course codes separated by a comma indicate that each semester may be taken independently of the other (example: 04:189: 493,494). Two course codes separated by a hyphen indicate that satisfactory completion of the first semester is a prerequisite for the second semester; the first semester may be taken for credit without taking the second, except where a statement is added to indicate that both semester courses must be completed in order to receive credit.

Credits awarded for the successful completion of each course are indicated in parentheses following the course title. The notation BA indicates that the number of credits is determined by arrangement with the department offering the course.

# Communication and Information 189 (SC&I-U)

## COMMUNICATION AND INFORMATION 189

**04:189:101** *Introduction to Communication and Information Processes (3)*
Survey of the field of communication: interpersonal, group, organizational, speech, mass, intercultural, and international communication; public relations and advertising.

**04:189:102** *Introduction to Media (3)*
Historical development of mass media institutions and the role of media in society. Particular attention to news, government regulation, effects, economics, emerging technologies, and audience dynamics.

**04:189:103** *Information Technology and Informatics (3)*
As the foundation course for the ITI major, Information Technology and Informatics provides students with an overview of the key theoretical and professional themes across the entire ITI curriculum. Theoretical emphasis is placed on social informatics, human-computer interaction, management of information technology, the relationship between technology, race and gender, and information intelligence. Practical emphasis is placed on the effective and ethical use of information technologies including the World Wide Web, and on the development of critical thinking and problem solving skills appropriate for the workplace. This course provides an understanding of the concepts, culture, and underpinnings of the professions that encompass information technology and Informatics in society today.
***This course fulfills the SAS Permanent Core Curriculum learning goal I.c.: 21st-century challenge: analyze the relationship that science and technology have to a contemporary social issue.***

**04:189:151** *Virtual Team Dynamics (3)*
Students learn to understand and navigate the dynamics of the modern technology-infused workplace in which the ability to apply well-developed communication, writing, and technological skills/competencies in virtual settings is vital. Theory, research, and case studies will be analyzed with regard to virtual team building, managing conflict and power dynamics, enhancing creativity and innovation, gathering and disseminating information effectively and ethically, integrating virtual and face-to-face tasks and spaces as appropriate, embracing diversity and inclusion, and facilitating global, intercultural collaboration. The course takes a multi-disciplinary approach to these topics, blending insights from multiple disciplines including communication, psychology, sociology, business, and human resources management.
***This course counts toward the digital communication, information, and media minor.***

**04:189:152** ***The Structure of Information (3)***
Through the lens of different media such as newspaper articles, blogs, Wikipedia entries, social media posts, and news programs, students examine and judge the quality of information presented, analyze the economic and cultural factors that affect the availability and reliability of electronic information, and compare and contrast with other sources. After this exploration of information searching and evaluation, the class will address how information is organized and attributed.
***This course counts toward the digital communication, information, and media minor. SAS Core Learning Goal met by this course: ITR-z: Students will be able to analyze and critically assess information from traditional and emergent technologies.***

**04:189:196** ***School of Communication and Information Learning Community I (1.5)***
This course is the academic component of a SC&I Living Learning Community offered in the fall semester, for those who are participating in that community for the first or second semester.
Explores School of Communication and Information learning community themes through readings, weekly discussions, lectures, and interactions with faculty and visiting scholars. Students will develop and present research and/or action projects. Enrollment is limited to, and required of, participants in school learning communities. 04:189:196 is a fall class with enrollment by special permission only. Students participating in different learning communities will register for particular sections of the class.

**04:189:197** ***School of Communication and Information Learning Community II (1.5)***
This course is the academic component of a SC&I Living Learning Community offered in the spring semester, for those who are participating in that community for the first or second semester.
Explores School of Communication and Information learning community themes through readings, weekly discussions, lectures, and interactions with faculty and visiting scholars. Students will develop and present research and/or action projects. Enrollment is limited to, and required of, participants in school learning communities. 04:189:197 is a spring class with enrollment by special permission only. Students participating in different learning communities will register for particular sections of the class.

**04:189:210** ***Disinformation Detox: Communication, Media and Information Studies Approaches to Mis- and Dis-Information (3)***
Dis- and misinformation have toxic implications for the wellbeing of individuals, groups, and societies. As interconnected producers and consumers of information we bring our own cognitive biases and beliefs, and frequently find ourselves questioning what information sources to trust. This course draws on interdisciplinary perspectives from communication, media, and information studies to explore ways to understand, navigate, and thrive in a polluted ecology of digital social systems. Through active coursework, students will learn to engage in these systems as aware, empowered, and responsible communicators and information agents.

**04:189:215** ***Social Responsibility and Community Wellness (3)***
Examines intellectual, practical, and relational challenges faced in efforts to alleviate social disparities and risks to the quality of life that result from social choices and actions through required cross-disciplinary lectures and readings, service learning, and online peer collaborative learning.

**04:189:220** ***Data in Context (3)***
This course introduces students to the interplay between data and its surrounding societal context. It will cover the basics of data science, focusing on the ethical, legal, and social implications of data and algorithms. Students will learn to conceptualize and evaluate practical applications of data science in communication, information, and media contexts.

**04:189:251** *Strategic Presentation Methods in Digital Media (3)*
This course examines theories and techniques for analyzing, producing, and disseminating messages. Students will learn how to use web-based and multimedia presentation tools to connect with a variety of audiences and convey a desired message. Each student will craft a message to support some social change by developing and shaping the message into compelling digital media presentations in a range of formats.
***This course counts toward the digital communication, information, and media minor.***

**04:189:351** *Leadership in Digital Contexts (3)*
Students will use a variety of exercises and scenarios to employ creativity and innovation in problem solving, weigh risk, perform leadership and management roles with peers, and grapple with the consequences of making and implementing decisions in digital environments. Students will learn how to assess and select among various technologies for making and disseminating decisions. This course presents a framework for understanding the role of technology in leadership functions including planning, information dissemination, consensus building, negotiation and engagement with stakeholders for informed and participative decision-making in online and virtual settings.
***This course counts toward the digital communication, information, and media minor. Prerequisite: 04:189:151 or 152.***

**04:189:352** *Self and Society in Virtual Contexts (3)*
Students explore what it means to have multiple and merging "identities" in an online community. How are interpersonal relationships and group interactions manifested in virtual environments? How are identity and selfhood expressed? What is the impact on communication when gender, race, and other physical attributes are self-selected and represented digitally? What are the implications for privacy and security? What does this mean for the workplace? What do 'human rights' mean in a virtual society and is citizenship changed with purely online interaction? Students will evaluate the consequences of a digital context on the self and society.
***This course counts toward the digital communication, information, and media minor. Prerequisite: 04:189:251.***

**04:189:353** *Digital Technology and Disruptive Change (3)*
This course explores whether and how emerging digital technologies--such as social, mobile, wearable media; virtual worlds and games; sensor-laden devices and environments; robotics; drones; implantable chips; artificial intelligence--contribute to disruptive changes in relationships, organizations, societies, and selves. Multiple perspectives on communication, information, and media will be applied in analyzing the extent to which the structure, norms, and dynamics of modern social life have changed and have experienced continuity, and the conditions under which such changes can be considered disruptive. Micro- and macro-level processes and outcomes (interpersonal, cultural, political, global) of emerging digital technologies will be examined.
***This course counts toward the digital communication, information, and media minor.***

**04:189:396** *School of Communication and Information Learning Community III (1.5)*
This course is the academic component of a SC&I Living Learning Community offered in the fall semester, for those who are participating in that community in a second year. Explores School of Communication and Information learning community themes through readings, weekly discussions, lectures, and interactions with faculty and visiting scholars. Students will develop and present research and/or action projects. Enrollment is limited to, and required of, participants in school learning communities. 04:189:396 is an advanced fall class, primarily for juniors and seniors, with enrollment by special permission only. Students participating in different learning communities will register for particular sections of the class.
***Prerequisite: 04:189:196 or 197***

**04:189:397** ***School of Communication and Information Learning Community IV (1.5)***
This course is the academic component of a SC&I Living Learning Community offered in the spring semester, for those who are participating in that community in a second year. Explores School of Communication and Information learning community themes through readings, weekly discussions, lectures, and interactions with faculty and visiting scholars. Students will develop and present research and/or action projects. Enrollment is limited to, and required of, participants in school learning communities. 04:189:397 is an advanced spring class, primarily for juniors and seniors, with enrollment by special permission only. Students participating in different learning communities will register for particular sections of the class.
***Prerequisite: 04:189:196 or 197***

**04:189:398** ***Special Topics in Communication and Information (3)***
Special topics classes may be offered by the School of Communication and Information that are of interest to all undergraduates in the school. A recent special topics class offered was Event Management and Design.

**04:189:399** ***Service Learning Internship (1)***
A 1-credit service learning internship may be added to particular undergraduate courses in the school to allow students to add a service learning experience to a course. Contact the undergraduate program director of the major for details.
***Prerequisites: Must register for the associated SC&I course in the same semester.***

**04:189:441** ***Communication and Human Values (3)***
Seminar on communication and human values in a democratic society. Particular emphasis on the concept of cultural democracy in the formulation of public policy. A historical evaluation of the philosophical problems related to matters of private taste versus public good.
***Prerequisite: Permission of instructor. Course not offered on a regular basis.***

**04:189:451** ***Capstone in Digital Communication, Information, and Media (3)***
The capstone course is designed to facilitate students' synthesis of what they have learned in the program, through a directed project. Students will first work together in class to identify and refine projects or areas of research to complete. Capstone project presentations will be captured digitally for feedback from the larger community. Capstone projects may be done individually or in pairs. Projects will contribute to the students' websites; a portion of this class will include preparation of a website of material from the minor.
***This is one of six courses that count toward the digital communication, information, and media (DCIM) minor. Prerequisites: Completion of at least 15 credits within the minor, or completion of 12 credits and concurrent enrollment in one other DCIM course. The capstone is open only to declared DCIM students.***

**04:189:490** ***Senior Honors Seminar (3)***
For students admitted to the honors program. Senior Honors Seminar is offered on an ad hoc basis.
***Prerequisites: Permission of the department.***

# Communication 192 (SC&I-U)

## COMMUNICATION 192

**04:192:120** ***Beginning American Sign Language (3)***
Beginning skills in American Sign Language (ASL) and skills needed in communication with deaf persons.
***Offered only during Summer and Winter Sessions. Does not count toward the major.***

**04:192:121** ***Intermediate American Sign Language (3)***
Intermediate skills in American Sign Language (ASL) and skills needed in communication with deaf persons.
***Prerequisite: 04:192:120 or equivalent course, or permission of the instructor. Offered only during Summer and Winter Sessions. Does not count toward the major.***

**04:192:200** ***Communication Theory (3)***
Basic concepts, models, and theories examining the role of communication in human behavior.
***Prerequisite: 04:189:101.***

**04:192:201** ***Communication in Relationships (3)***
Patterns of human interaction, types and stages of relationships, verbal and nonverbal exchanges, and strategies and tactics.
***Prerequisite: 04:189:101.***

**04:192:211** ***Parliamentary Debate Practicum (1)***
This course will explore the nature of persuasive argumentation as applied through the specific lens of parliamentary-style debating.
***Prerequisite: Permission of the instructor. Corequisite: Participation in the Rutgers Parliamentary Debate Team. Does not count toward the major.***

**04:192:220** ***Fundamentals of Public Speaking (3)***
Development of effective oral presentation and participation skills in interpersonal, small group, and public settings. Particular attention is given to issues of diversity and multiculturalism in presentation and participation.
***Limited to noncommunication majors. Does not count toward the major.***

**04:192:300** ***Communication Research (3)***
Exploration of the uses of experimental, descriptive, historical-critical, and field research approaches to the study of communication.
***Prerequisite: 04:189:101.***

**04:192:301** ***Community Communication (3)***
This course examines types and qualities of civic infrastructure, civic engagement, and community leadership. Students are introduced to the methods and nature of community communication in varied contexts.

**04:192:305** ***Introduction to Social Media (3)***
Social media platforms such as Facebook and Twitter represent a new class of communication platforms that have become quickly interwoven into the everyday lives of millions of people around the world. In this course we will draw on competing communication perspectives to explore the reasons behind the widespread popularity of these

platforms. In doing so we will consider the role of individual choice, social influence, technological influence, and how these three perspectives can be combined. We will further explore the implications of social media for personal relationships, youth culture, organizations, social research, and personal privacy.

**04:192:307** ***Health Literacy (3)***
This class focuses on applying literacy principles to real-life health phenomenon, in clinical encounters, as well as in community and public health contexts with an emphasis on medically underserved and vulnerable populations.
***Prerequisites: 04:192:200.***

**04:192:313** ***Message Design for Public Relations and Organizational Communication (3)***
Theories and techniques for collecting, selecting, packaging, and disseminating information within organizations and between organizations and their constituencies.
***Prerequisites: 04:189:101; 04:192:200; 04:192:365.***

**04:192:315** ***Professional Writing and Communication (3)***
Analyzing and applying writing skills, techniques, design, and strategies to communication topics and processes. There are separate sections for research in the disciplines (popular culture, the family, globalization, technology, and society), writing for business and professions, and collaborative writing.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:333** ***Political Communication (3)***
This course provides an overview of the field of political communication. Accordingly, we will analyze the role of advertising, polling, media coverage, image construction, and ethics in political campaigns through a historical and case study perspective. We will also discuss the role of current communication theories and their effects on contemporary political messages. We will focus specifically on the communication dynamics of political campaigns.
***Prerequisites: 04:189:101; 04:189:102 or 103; 04:192:200; 04:192:201. Open only to communication majors. Note: This course fulfills a requirement for the leadership in organizations and community specialization within the communication major.***

**04:192:344** ***Language and Communication (3)***
Sociolinguistics, psycholinguistics, language acquisition and development, phonetics, and issues of bilingualism.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:346** ***Intercultural Communication (3)***
Process of communication among individuals from different cultures or subcultures; influence of value orientations, concepts of time, thought patterns, and nonverbal styles.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:347** ***Information Systems and Communication (3)***
Generation, classification, storage, retrieval, and use of information in human communication systems.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:350** ***Visual Communication (3)***
Critical evaluation of the aesthetic and social impacts of visual communication.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:354** ***Communication and Technology (3)***
Provides an overview of communication theory and research related to the use of a range of communication technologies in a variety of interpersonal, group, and societal contexts.
***Prerequisites: 04:189:101; 04:192:200. Open only to communication majors.***

**04:192:355** ***Interpersonal Communication (3)***
Critical examination of the theory and research concerning the dimensions, dynamics, and functions of interpersonal interaction.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:356** ***Group Communication (3)***
Principles of group communication, types of groups, group structure, leadership, and membership roles; techniques for working with groups.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:357** ***Organizational Communication (3)***
Communication in organizations, communication networks, management and communication, decision making, goal setting, and process consultation in varying organizational settings.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:359** ***Persuasive Communication (3)***
Principles and techniques in persuasive communication: credibility, audience analysis, assessment of effects, media selection, resistance to persuasion, and attitude change.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:360** ***Principles of Interviewing (3)***
Analysis of the interview as a unique communication context, including the application of theoretical concepts and practice in designing and conducting interviews of various types (e.g., surveys, employment, information giving, counseling).
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:365** ***Principles of Public Relations (3)***
Basic principles and policies of public relations and advertising; includes history, development, ethics, roles, functions, media selection methods, and message strategies of public relations.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:366** ***Organizational Reputation and Representation (3)***
Organizations represent themselves to various stakeholder groups, both inside the organization and within the environment. In doing so, organizations encounter issues of reputation and identity. Combining theoretical foundations and a case study approach, this course will examine these issues critically and analytically.
***Prerequisites: 04:189:101; 04:192:200. Open only to communication majors.***

**04:192:369** ***Internship in Communication I (3)***
Practical field experience in intercultural, international, interpersonal, group, organizational, or mass communication; or public relations and advertising.
Requires application to Internship coordinator. Students may register online provided prerequisites are complete.

***Prerequisites: 04:189:101; 04:192:200; and permission of instructor. Open only by application to communication majors who apply and are accepted to the School of Communication and Information.***

**04:192:370** ***Internship in Communication II (1-3)***
Continued practical field experience.
***Prerequisites: 04:192:369 and permission of instructor. Open only by application to communication majors accepted to the School of Communication and Information. Does not count toward the major.***

**04:192:372, 373, 374, 375** ***Topics in Communication I, II, III, IV (3,3,3,3)***
Topical seminars dealing with issues of concern to contemporary communication studies.
***Prerequisites are minimally 04:189:101, 200, 300, and being a communication major. Other prerequisites may vary with each offering.***

**04:192:380** ***Public Speaking (3)***
Principles of public speaking; practice in composition, delivery, and criticism of informative, persuasive, and entertaining speeches.

**04:192:381** ***Argumentation (3)***
Principles and techniques of persuasion through argument, evidence, and logical inference.
Practice in debate.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:382** ***Children and Media (3)***
This course examines children's and adolescents' interactions with media and technology and their influence on communication and social development.

**04:192:390** ***Approaches to Leadership (3)***
Provides a multidisciplinary and collaborative environment focused on leadership theory and current practice in public and private sector organizations through a communication lens. Leadership models will be analyzed and evaluated for effectiveness from a variety of perspectives providing opportunities to gain a greater understanding of theories, concepts, models, and approaches of leadership in diverse contexts (personal, team, group, organization, community, etc.). Students will also make connections with their own leadership philosophy, experiences, and areas for future growth.
***Prerequisites: 04:189:101; 04:192:200.***

**04:192:403** ***Conflict Negotiation and Resolution (3)***
This course examines features of interpersonal conflict situations, explores individual conflict styles, and identifies strategies for managing or resolving interpersonal conflict.
***Prerequisites: 04:189:101, 04:192:200, 04:192:300. Open only to communication majors.***

**04:192:404** ***Communicating about Relationship Challenges (3)***
Examines the role of interpersonal communication in managing a variety of challenging events in friendships, romantic relationships, and family relationships, such as hurt, conflict, jealousy, negotiating sexual intimacy, terminating relationships, etc.
***Prerequisites: 04:189:101, 04:192:200, 04:192:300. Open only to communication majors.***

**04:192:405** ***Communication and Gender (3)***
Effects of gender roles in interpersonal communication; examination of literature and research on differences between male and female patterns of interaction.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:406** ***Relationships and Identities in Interaction (3)***
Examines how relationships and identities are constructed in communication. Focuses on specific practices of interaction--the basic building blocks for communication--to discover those practices through which communicators build their actions and sometimes thereby, their relationships and identities.
***Prerequisites: 04:189:101, 04:192:200, 04:192:300. Open only to communication majors.***

**04:192:407** ***Health Communication (3)***
Exploration of communication demands of health care and the development of effective communication strategies and skills for use in health care practice.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:408** ***Health Message and Campaign Design (3)***
Design, implementation, and evaluation of public communication campaigns designed to change health behavior of individuals, groups, and entire populations.
***Prerequisites: 04:189:101, 04:192:200, 201, 300. Open only to communication majors.***

**04:192:409** ***Public Relations Management (3)***
Analysis and preparation of case studies in industry, labor, education, government, and trade organizations, and the application of public relations techniques.
***Prerequisites: 04:189:101; 04:192:200, 201, 300, 365. Open only to communication majors.***

**04:192:410** ***Media, Marketing, and Communication***
This course links communication theory to the practice of marketing and media planning. Students work to analyze current trends in media and marketing while applying skills learned in previous communication courses.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:411** ***Crisis Communication and Public Information (3)***
Examines the processes through which organizations handle and disseminate information to the public with a specific emphasis on crisis communication.
***Prerequisites: 04:189:101; and either 04:189:102 or 103; and 04:192:200, 201, 300.***

**04:192:412** ***Communication and Management in Media Organizations (3)***
This course introduces students to the organizational structure of media and advertising organizations and focuses on the central role of communication particular to media and advertising. The course is designed to expose students to core concepts and principles of organizational theory as they apply to these organizations. Students will learn how to navigate modern media and advertising organizations in the current technological landscape.
***Prerequisites: 04:189:101; 04:192:200; 04:192:201; 04:192:300***

**04:192:422** ***Communication and Facilitation (3)***
Theory and pragmatics of intrapersonal, interpersonal, and small-group process analysis, intervention, and facilitation.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:432** ***Communication, Technology, and Society (3)***
This course analyzes communication technologies, their consequences for society and individuals, and the social forces that affect their form and function. It critically examines the impact of communication technology on society through in-depth seminars and independent research.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:442** ***Supportive Communication (3)***
This course features critical exploration of the theory and research regarding personal and community experiences of social support, its influences on interpersonal relationships and health, and its social functions.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:443** ***Nonverbal Communication (3)***
Nonverbal aspects of human communication, including proxemics, kinesics, haptics, vocalics, eye behavior, human artifacts, and environments; the functions served by nonverbal behavior in interaction.
***Prerequisites: 04:189:101, and 102 or 103; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:444** ***Language, Behavior, and Communication (3)***
Sociolinguistic, psycholinguistic, and general semantic analysis of language as a component of human communication systems.
***Prerequisites: 04:189:101, and 102 or 103; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:446** ***Communication and Social Change (3)***
Role of communication in social change, diffusion of innovations, and national development.
***Prerequisites: 04:189:101, and 102 or 103; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:450** ***The Dark Side of Organizations (3)***
This course takes a communication-based approach to key workplace processes that operate in the shadows (e.g., violence, wrongdoing, harassment) and what are called hidden organizations (e.g., terrorist cells, informal economy, secret societies).

**04:192:458** ***Leadership in Groups and Organizations (3)***
Examines leadership from a communicative perspective, integrating theory and practice. Combines traditional informational components of university courses with experiential learning activities, such as interactive simulations, exercises, case studies, and an organizational simulation.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:459** ***Patient-Provider Communication in Health Care (3)***
This class explores facets of patient-provider communication and their impact on patient and provider satisfaction and health outcomes.
***Prerequisites: 04:189:101; 04:192:200, 04:192:300. Open only to communication majors.***

**04:192:460** ***Advanced Health Communication (3)***
Application of principles and techniques in a targeted health communication campaign; social norms theory, experiential learning theories, effects of misperceptions on behavior, and needs of special student populations.
***Prerequisites: 04:189:101; 04:192:200, 201, 300; and either 04:189:102 or 103. Open only to communication majors.***

**04:192:466** *Audience and Market Analysis (3)*
Covers principles and methods of identifying, categorizing, and segmenting mass audiences. The more specifically a public relations or marketing/communications professional identifies targets by demographic or other means, the easier.This course is designed to give the PR or MarCom professional these tools and awareness. This course is ideal for the PR and Marketing Communication student who is looking to learn, by better defining his/her target audience, how to expose hot buttons for copy content and style, SEO/SEM keywords, hook development, and more. Greater success of message delivery is gained by determining: where your target audience is, the best message placement, types of event development and venues, which will expose ideal strategic alliance and joint marketing opportunities, as well as develop and provide support for marketing and business decisions.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:470** *Research in Communication (3)*
Research projects conducted under the direction of individual faculty members. Requires application.
***Prerequisites: 04:189:101; 04:192:200, 201, 300; faculty sponsor; and approval of chair. Open only by application to communication majors.***

**04:192:472, 473, 474, 475, 477** *Topics in Communication V, VI, VII, VIII, IX (3,3,3,3,3)*
Advanced topical seminars dealing with issues of concern to contemporary communication studies.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors. Other prerequisites may apply depending upon the offering.***

**04:192:476** *Advanced Communication Theory (3)*
Issues in theory building in the field of communication.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:478** *Family Communication (3)*
Family communication theory, research, and practice. Includes assessment and measurement of interaction patterns, pathologies, and intervention strategies.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors.***

**04:192:481** *Advanced Research (3)*
Research trends in current literature in interpersonal, group, organizational, mass, and intercultural communication, and in public relations and advertising.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only to communication majors by permission of the instructor.***

**04:192:491,492** *Independent Study in Communication (3,3)*
Independent study projects in communication.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Faculty sponsor and approval of chair. Open only by application to communication majors. Does not count toward the major.***

**04:192:493** *Senior Thesis Independent Project I (1-3)*
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only by application to communication majors.***

**04:192:494** *Senior Thesis Independent Project II (1-3)*
***Prerequisite: 04:192:493. Open only by application to communication majors.***

**04:192:495** ***Applied Study in Communication (3)***
Supervised study in communication pedagogy and/or applied research.
***Prerequisites: 04:189:101; 04:192:200, 201, 300. Open only by application to communication majors. For tutors. Does not count toward the major.***

# Digital Communication, Information, and Media 189 (SC&I-U)

## DIGITAL COMMUNICATION, INFORMATION, AND MEDIA 189

**04:189:151** ***Virtual Team Dynamics (3)***
Students learn to understand and navigate the dynamics of the modern technology-infused workplace in which the ability to apply well-developed communication, writing, and technological skills/competencies in virtual settings is vital. Theory, research, and case studies will be analyzed with regard to virtual teambuilding, managing conflict and power dynamics, enhancing creativity and innovation, gathering and disseminating information effectively and ethically, integrating virtual and face-to-face tasks and spaces as appropriate, embracing diversity and inclusion, and facilitating global, intercultural collaboration. The course takes a multi-disciplinary approach to these topics, blending insights from multiple disciplines including communication, psychology, sociology, business, and human resources management.

**04:189:152** ***The Structure of Information (3)***
Through the lens of different media such as newspaper articles, blogs, Wikipedia entries, social media posts, and news programs, students examine and judge the quality of information presented, analyze the economic and cultural factors that affect the availability and reliability of electronic information, and compare and contrast with other sources. After this exploration of information searching and evaluation, the class will address how information is organized and attributed.

**04:189:220** ***Data in Context (3)***
This course introduces students to the interplay between data and its surrounding societal context. It will cover the basics of data science, focusing on the ethical, legal, and social implications of data and algorithms. Students will learn to conceptualize and evaluate practical applications of data science in communication, information, and media contexts.

**04:189:251** ***Strategic Presentation Methods in Digital Media (3)***
This course examines theories and techniques for analyzing, producing, and disseminating messages. Students will learn how to use web-based and multimedia presentation tools to connect with a variety of audiences and convey a desired message. Each student will craft a message to support some social change by developing and shaping the message into compelling digital media presentations in a range of formats.

**04:189:351** ***Leadership in Digital Contexts (3)***
Students will use a variety of exercises and scenarios to employ creativity and innovation in problem solving, weigh risk, perform leadership and management roles with peers, and grapple with the consequences of making and implementing decisions in digital environments. Students will learn how to assess and select among various technologies for making and disseminating decisions. This course presents a framework for understanding the role of technology in leadership functions including planning, information dissemination, consensus building,

negotiation, and engagement with stakeholders for informed and participative decision making in online and virtual settings.
***Prerequisite: 04:189:151 or 152; 04:189:251.***

**04:189:352** ***Self and Society in Virtual Contexts (3)***
Students explore what it means to have multiple and merging "identities" in an online community. How are interpersonal relationships and group interactions manifested in virtual environments? How are identity and selfhood expressed? What is the impact on communication when gender, race, and other physical attributes are self-selected and represented digitally? What are the implications for privacy and security? What does this mean for the workplace? What do "human rights" mean in a virtual society and is citizenship changed with purely online interaction? Students will evaluate the consequences of a digital context on the self and society.
***Prerequisite: 04:189:251.***

**04:189:353** ***Digital Technology and Disruptive Change (3)***
This course explores whether and how emerging digital technologies--such as social, mobile, wearable media; virtual worlds and games; sensor-laden devices and environments; robotics; drones; implantable chips; artificial intelligence--contribute to disruptive changes in relationships, organizations, societies, and selves. Multiple perspectives on communication, information, and media will be applied in analyzing the extent to which the structure, norms, and dynamics of modern social life have changed and have experienced continuity, and the conditions under which such changes can be considered disruptive. Micro- and macro-level processes and outcomes (interpersonal, cultural, institutional, political, global) of emerging digital technologies will be examined.
***SAS Core Learning Goals met by this course: CCO-2: Analyze the relationship that science and technology have to a contemporary social issue. Information Technology and Research (ITR) y: Employ current technologies to access information, to conduct research, and to communicate findings.***

**04:189:398** ***Special Topics in Communication and Information (3)***
At times, special topics classes may be offered as alternate electives in the digital communication, information, and media minor.

**04:189:451** ***Capstone in Digital Communication, Information, and Media (3)***
The capstone course is designed to facilitate students' synthesis of what they have learned in the program, through a directed project. Students will first work together in class to identify and refine projects or areas of research to complete. Capstone project presentations will be captured digitally for feedback from the larger community. Capstone projects may be done individually or in pairs. Projects will contribute to the students' websites; a portion of this class will include preparation of a website of material from the minor.
***Prerequisites: Completion of at least 15 credits within the minor, or completion of 12 credits and concurrent enrollment in one other DCIM course. Open only to declared DCIM minors.***

# Gender and Media 438 (SC&I-U)

## GENDER AND MEDIA 438

Courses in the gender and media minor draw from four different programs:

01:988 - Women's, Gender, and Sexuality Studies
04:189 - Communication and Information
04:547 - Information Technology and Informatics
04:567 - Journalism and Media Studies

Below is a list of all of the courses in the program. For requirements, check the gender and media minor description above. Descriptions for the 988 (women's, gender, and sexuality studies) courses may be found on the department's website or the program's section in this catalog.

01:988:200 Gender, Digital Media, and Social Curation

01:988:202 Gender, Culture, and Representation

01:988:255 Gender, Art, and Society

01:988:257 Gender and the Body: Representations of Pornography

01:988:258 Gender, Race, and Contemporary Art

01:988:259 Homosexuality and Visual Culture

01:988:317 Gender and Consumption

01:988:341 Gender and Popular Culture

01:988:385 Theories of Women and Film

01:988:396 Topics in Women's and Gender Studies

04:189:251 Strategic Presentation Methods in Digital Media

04:547:340 Gender and Technology

04:567:200 Writing For Media

04:567:215 Gender, Race, and Class in the Media

04:567:274 Consumer Media Culture

04:567:380 Media and Social Change

04:567:499 Capstone in Gender and Media

# Information Technology and Informatics 547 (SC&I-U)

## INFORMATION TECHNOLOGY AND INFORMATICS 547

**04:547:111** ***The Internet and the Information Environment: A Quantitative Approach (3)***
A quantitative and mathematically rigorous introduction to concepts that underlie the internet and web search

engines. A challenging problem will introduce each topic, and the exposition of principles and relevant theorems will be followed by an application to the internet and at least one other application in the social sciences (e.g., social networks) or the humanities (e.g., author identification).
***The course counts as one of the two mathematics courses that must be taken in order to meet the Rutgers graduation requirements in quantitative reasoning.***

**04:547:200** *Social Informatics (3)*
Provides a survey of the key social issues related to information technology development, decision making, and use. Focuses on the critical analysis of social, cultural, philosophical, ethical, legal, public policy, and economic issues relating to information technologies and how these interactions shape workplace decisions and technology use.
***Prerequisites: 04:189:103; Open to ITI majors only.***

**04:547:201** *Information Technology Fundamentals (3)*
As the introductory course to the technological concentration/area in the ITI program, Introduction to Computer Concepts explains the basic principles of computer systems and applications. It covers the basic mathematical-theoretical principles that govern the functioning of computers, the architecture and organization of computer systems, the role of hardware and software, and the role of creative thinking and problem solving in building software applications.
***04:189:103. Open only to ITI majors.***

**04:547:202** *Object-Oriented Programming (3)*
Introduces students to the principles of object-oriented analysis, design, and programming. The focus is on developing creative thinking for analyzing a problem domain and designing a solution, and on using the Java programming language (or other appropriate programming language) to implement it.
***Prerequisite: 04:547:201.***

**04:547:210** *Management of Technological Organizations (3)*
Presents the fundamental concepts of management and organizational theory applied to the technological marketplace and organizational settings. Focuses on project management with emphasis on decision support systems and management information systems in corporate environments. The course considers information as an organizational resource; students explore how information systems support corporate and organizational goals.

**04:547:215** *Social Impacts of Video Games (3)*
This course will examine video games from a cultural and social perspective. Rather than focusing on game design, it will explore the ways culture, socialization, and values are a part of gaming. Using a variety of theoretical and methodological approaches, a range of topics will be discussed in an attempt to understand not only the internal workings and social dynamics of computer games, but their place in the broader culture. Topics include: community management and maintenance in games; social processes and interaction; games as communication spaces and virtual worlds; intellectual property and commodification in games; players as producers of game content; political/ideological analysis of games; gender and race in gaming; and design and values.
***Some sections open only to ITI majors.***

**04:547:220** *Retrieving and Evaluating Electronic Information (3)*
Students examine and analyze the information retrieval process in order to more effectively conduct electronic searches, assess search results, and use information for informed decision making. Major topics include search engine technology; human information behavior; evaluation of information quality; business, economic, and cultural factors that affect the availability and reliability of electronic information; and the future of search.

**04:547:221** *Fundamentals of Big Data Curation and Management (3)*
This course introduces students to the use of large data sets and prepares them for work in organizational and research settings. The students will learn the basics of acquiring and curating practical data, discovering patterns, and managing large datasets with databases. Students will work multiple modalities of data such as textual, networked, and numerical datasets.
***Prerequisites: 04:547:202 or BOTH 01:198:142/01:960:142 AND 01:960:291 Students should have some elementary understanding of computer programming.***

**04:547:230** *Human-Computer Interaction (3)*
Studies how best to design the interface between human users and computer systems. Emphasis is placed on learning how to involve the user at different stages in the design process to improve the interface in a cost-effective way. In particular, experience with iterative user-centered design, rapid prototyping, and usability testing methods are developed. Students evaluate several computer interfaces as well as iteratively design and evaluate an interface prototype.
***Open only to ITI majors.***

**04:547:240** *Digital Hardware Basics (3)*
This course provides students the opportunity to develop the basic computer skills needed to manage an information technology operation in the business world. The class includes a broad coverage of technology concepts and trends underlying current and future developments in IT operations. We start by introducing the workplace environment of your staff, then moving to the background of the computer and its hardware devices components. The students will end with a broad base of knowledge and competency in hardware operations management including installation, configuration, diagnosing, preventative maintenance, and basic networking.

**04:547:300** *Application of Research in Information Technology (3)*
Provides an introduction to systematic inquiry in information technology and informatics using quantitative and qualitative approaches with an emphasis on individual and organizational users of information working in electronic environments. It includes the analysis, synthesis, evaluation, and reporting of applied and theoretical research in the information technology field. Computer laboratory sessions are used to facilitate statistical, textual, and graphical analyses of data. Methodologies of research in information technology are critically evaluated.
***Prerequisite: 04:547:220.***

**04:547:310** *Strategic Leadership in Informatics (3)*
Focuses on leadership theory and its applicability in understanding the role of leadership in dynamic organizations. Places emphasis on cultural concerns and the importance of diversity in ensuring competitiveness in the increasingly diverse marketplace. It addresses global issues in information and communication technology, the importance of effective leadership at all levels in organizations, and the relationship between leadership and organizational success. An additional focus is the necessity for collaboration and ethical practices.
***Prerequisite: 04:547:210. Open only to ITI majors.***

**04:547:315** *Game Design Methodology (3)*
Examines the theory, practice, and methodology of the modern game designer. Content will cover everything from simple board game mechanics to the inner workings of massively multiplayer experiences. From developing ideas for new product concepts, to writing strong game design documentation, to fine-tuning gameplay mechanics, this course provides a survey of the best practices, key challenges, and unique opportunities for game designers.
***Prerequisite: 04:547:201.***

**04:547:320** ***Web Design (3)***
Focuses on the role that webpages play in an organization's public profile, and on establishing linkages between specific content and organizational and client needs in a web-based environment. Addresses principles and skills of web design using current W3C standards, website access, usability and evaluation. It also addresses developing website content tailored to specific audiences.
***Prerequisite: 04:547:201 or equivalent course; open only to ITI majors.***

**04:547:321** ***Information Visualization (3)***
Students learn how to effectively present complex information using the web, multimedia, or information visualization techniques. The course develops an understanding of how best to leverage human perceptual capabilities to communicate information or gain insights into large and abstract data.
***Prerequisite: 04:547:201 OR 01:198:142/01:960:142 AND 01:960:291; open only to ITI majors.***

**04:547:330** ***Database Technologies (3)***
Introduces students to basic database design principles and applications, and the use of database technologies for the organization and management of large information systems. Focuses on development of data structures, database design principles, relational structures, database testing and use, query language, as well as translating organizational needs into database applications.
***Prerequisite: 04:547:202. Open only to ITI majors.***

**04:547:331** ***Networking and Internet Technology (3)***
This course provides an introduction to computer network and internet technologies. It emphasizes the distinction between various logical concepts and entities such as networks, the internet at large, and the World Wide Web. Universal protocols and services such as SMTP, HTTP, DNS, and SNMP are explored. In addition, students will learn to deconstruct and identify components of common technologies. The context of these technologies within society and business is also introduced
***Prerequisite: 04:547:201.***

**04:547:332** ***Advanced Web Design Technologies (3)***
With the advent of the Extensible Markup language, web developers have the opportunity to build richer, more fully interactive sites by tapping into the power of a series of flexible and robust technologies that permit more effective sharing of information between organizations. Students will be starting with the fundamentals of XML and moving on into discussions and implementations of XHTML, Schema, DTDs, RSS, Web Services, AJAX, and other XML-based frameworks for web development. Particular attention will be paid to the issues surrounding open source development efforts and the business case for various technologies and their alternatives.
***Prerequisite: 04:547:201 or 04:547:320. Open only to ITI majors.***

**04:547:340** ***Gender and Technology (3)***
The course analyzes gender in relation to race, class, nationality, culture, religion, and sexuality in the context of technological innovation. Its focus is on fundamental concepts, the feminist critique of technoscience, and the impact of gender issues on the workplace inclusiveness and equity, in a transnational and historical perspective. It examines the effects of gender on the development and use of information technologies and on gender-based information and technology preferences.

**04:547:400** ***Information Policies, Politics, and Power (3)***
Prepares students for policy development in organizations. Analyzes and synthesizes concerns and conflicts related to information technology, information access and dissemination, freedom of information, copyright, intellectual

property rights and responsibilities, privacy, filtering and information security, and computer crime. Legal, political, social, and ethical issues and how they contribute to policy development will be considered. Against this backdrop, the course provides opportunity for students to undertake organizational policy development.
*Prerequisites: 04:547:200 and 210. Open only to ITI majors.*

**04:547:410** *Electronic Commerce (3)*
Examines the technologies used to transact business electronically. Investigates a range of social, economic, and security issues related to such transactions and the design of websites that facilitate these transactions.
*Prerequisite: 04:547:202 or equivalent course (such as 01:198:113 or 01:198:211). Open only to ITI majors.*

**04:547:415** *Digital Game Creation (Game Design) (3)*
Creating a digital game involves merging the skills of many disciplines into a single cohesive whole. It involves applying principles from computer programming, two- and three-dimensional digital art, animation, physics, mathematics, artificial intelligence, user interface and experience design, psychology, narrative design, and visual communication to provide an incomplete list. This course focuses upon understanding and demonstrating the technical implementation of game play mechanics within a game engine framework. It is designed to expand upon the work done in Game Design Methodology (04:547:315) to provide an introduction in working with these disparate skill sets by building subsets of a complete game in a digital form.
*Prerequisites: 04:547:201 and 315.*

**04:547:420** *Economics of Information Technologies (3)*
Examines economic theories related to information technologies and systems. The concept of information as commodity is considered. Quantitative methods such as cost-benefit analysis and return on information technology investment evaluation are introduced. Alternative methods such as measuring the human costs associated with information technology implementations are also addressed.
*Prerequisite: 04:189:210. Open only to ITI majors.*

**04:547:421** *Data Analytics for Information Professionals (3)*
Data analytics linked to storage, curation, management, and mining with attention to alternative methodological approaches. The course will demonstrate various methods to explore how big data might be analyzed, stored, and retrieved.

**04:547:432** *Information Security (3)*
An introduction to the various technical and administrative aspects of information security and assurance. This course provides the foundation for understanding the key issues associated with protecting information assets, determining the levels of protection and response to security incidents, and designing a consistent, reasonable information security system, with appropriate intrusion detection and reporting features. The purpose of the course is to provide the student with an overview of the field of information security and assurance. Students will be exposed to the spectrum of security activities, methods, methodologies, and procedures. Coverage will include inspection and protection of information assets, detection of and reaction to threats to information assets, and examination of pre- and post-incident procedures, technical and managerial responses, and an overview of the information security planning and staffing functions.
*Prerequisite: 04:547:201 or equivalent course. Open only to ITI majors.*

**04:547:440** *Information Technology and Learning (3)*
Focuses on understanding how organizations learn and how information technology can be used for the design and development of instructional systems and materials within the organization to facilitate workplace learning.

It addresses workplace learning needs, learning styles, learning outcomes, representation of knowledge, problem solving, and assessment of the usability of e-learning systems in the workplace.
***Prerequisite: 04:547:210. Open only to ITI majors.***

**04:547:445** ***Certification Practicum in ITI (3)***
This course will operate like an independent study course, where the students' work will be directed toward passing an IT certification test. Selected certificates--ones that are in demand by companies and organizations--will be options presented to the students. Certification options may include, but are not limited to,: A+, CCNA, MCTS, etc.
***Prerequisite: Permission by the department. Open only to ITI majors.***

**04:547:450** ***ITI Internship (1-3)***
The student negotiates or gains a work placement of approximately 50 to 150 hours. The internship provides supervised professional work experience in a corporate, research, or educational setting, where there is opportunity to apply and further develop knowledge and skills acquired in the Information Technology and Informatics coursework.
***Prerequisites: Completion of 24 credits of ITI courses. Open only to ITI majors. Approval of proposed project by ITI program director and ITI faculty supervisor, with the approval form filed prior to registration.***

**17:547:455** ***Capstone in Information Technology and Informatics (3)***
The Capstone in Information Technology and Informatics is designed to synthesize what students have learned in the ITI program through a directed project identified by the coordinator and the ITI director. Throughout the semester, students work together in teams to complete the selected project. Students may also complete written assignments that document the progress of the team, produce a final paper, and participate in a final presentation experience to showcase their work.
***Prerequisites: Open to ITI majors only. Completion of at least 18 credits in the major and preferable in the last semester of the major. Permission of the department.***

**04:547:460** ***Independent Study (3)***
Students design, negotiate and manage a program of study under the advisement of a faculty member based on their existing experience and knowledge and on their career intentions. The study builds on existing knowledge and skills acquired during the major in an area not available through elective courses in the ITI major.
***Prerequisites: 04:547:200; 04:547:201; 04:547:202; 04:547:210. Completion of 27 credits of ITI courses. Open only to ITI majors. Approval of proposed project by Program Director and LIS Faculty Supervisor***

**04:547:465** ***Senior Thesis (3)***
Honors students will conduct original research under the supervision of a faculty adviser and an honors thesis committee. Students must be accepted into the honors program in order to enroll in this course.
***Prerequisites: 04:547:300; special permission of the department. Open only to ITI majors.***

**04:547:470,471,472,473,474,475,476** ***Topics in Information Technology I,II,III,IV,V,VI,VII (3,3,3,3,3,3,3)***
Special topics relevant to contemporary studies in information technology and informatics.
***Prerequisites: To be determined on the basis of each semester's offering.***

# Journalism and Media Studies 567 (SC&I-U)

## JOURNALISM AND MEDIA STUDIES 567

Please check the listing of JMS courses on the SC&I website for the most up-to-date information about courses.

**04:567:200** ***Writing for Media (3)***
Fundamentals of writing across media platforms. By the end of the course, students will be able to write in many journalistic and media-based styles using basic and accepted techniques accepted by each discipline. This course will serve as a foundation for understanding and using different styles of writing, research, and content development. (Required course)

**04:567:201** ***Media Ethics and Law (3)***
Legal issues and ethical problems confronting journalists. (Required course)
***Open only to journalism and media studies majors.***

**04:567:205** ***Digital News Writing and Reporting (3)***
Fundamentals of gathering information and journalistic writing. By the end of the course, students will learn basic journalistic news writing and reporting techniques, including writing in journalistic style, fact-gathering, conducting observation, freedom of information, and ethics. (Foundational course)
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:206** ***Broadcast News Writing and Reporting (3)***
News writing for radio, with review of television news writing approaches for comparison. (Foundational course)
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:207** ***Design and Digital Editing (3)***
Fundamentals of copyediting and layout. (Foundational course)
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:210** ***Media Management and Strategy (3)***
Focuses on the key economic and strategic concepts, challenges, and opportunities that are central to the management of contemporary media organizations. The course is grounded in the growing academic and professional literatures examining the unique nature of media products and services and the unique and rapidly changing marketplace dynamics in which media organizations operate. Given the ongoing convergence of media industries and technologies, this course focuses on concepts, analytical tools, and issues that have relevance across the full range of media industry sectors. (Foundational Course)
***Prerequisites: 04:567:200. Open only to journalism and media studies major.***

**04:567:211** ***Exploring New Media (3)***
This course examines the nature and impact of emerging media technology. Students study four primary ways new technology influences media, including 1) how media professionals do their work; 2) the nature of media content; 3) the relationships between and among media and relevant publics; and 4) the structure, culture, and management of media organizations and systems. Five areas of media technology are studied, including 1) acquisition tools; 2)

storage technologies; 3) processing devices; 4) distribution technologies; and 5) display, access, or presentation tools. (Foundational course)
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:212** ***Digital Media Production (3)***
Digital media production is the study of media creation and display through online and interactive experiences. This includes audio and video steaming in online contexts, but it also covers other types of new media that are hybrids of the two. Using various multimedia systems and formats, you will explore the foundations of development, content creation and distribution across multiple platforms. Focusing on multi-platform digital media, you will have the opportunity to write, produce and edit your own digital media content for online distribution.
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:215** ***Gender, Race, and Class in the Media (3)***
Content, treatment, and effects of women and minority group coverage in television, newspapers, magazines, popular music, and film. (Foundational course)

**04:567:216** ***Digital Media and Society (3)***
Historical and contemporary social, cultural, political, and economic issues related to digital media in society. (Foundational course)

**04:567:217** ***Foundations of Media Analysis (3)***
Survey of critical approaches to the analysis of media and its impact on society. (Foundational course)

**04:567:250** ***Children and Media (3)***
This course examines children's relationship to media in its historic, economic, political, and social contexts. It begins by reviewing theories of child development as they inform children's relationship with and understanding of media. Next, it considers the political and economic forces that shape the landscape of children's media. Against this backdrop, the course examines research on the effects of media on children's physical, cognitive, social, and emotional development. Class time consists of lectures, screenings, and visits from professionals working in the field. Students in this course produce a proposal or prototype for an educational children's media property as their final project. (Concept and Analysis Course)

**04:567:274** ***Consumer Media Culture (3)***
Provides a critical understanding of advertising's role in modern society. Examines the history of advertising, the commercial and social aspects of the messages conveyed by ads, and the advertising industry's influence on social relations and institutions, such as journalism. The basic orientation of the course is to study consumer media culture (advertising, public relations, and branded space) as a form unique to modern society. (Concept and Analysis course)

**04:567:275** ***Social Media and Participatory Culture (3)***
This course takes a critical approach to understanding new media environments, especially with regard to what has been called at various moments "social media," "participatory culture," "digital media," "convergence," "Web 2.0," "social web," and "interactive media," among other things. Rather than focus on these emerging media practices as purely technological phenomena, the course situates them in broader social, political, and historical contexts. We will examine key dimensions of cultural life that make up our selves, including friendship, intimacy, labor, celebrity, power, gender, control, race, sexuality, activism, and privacy. (Concept and Analysis course)

**04:567:276** ***Musical Cultures and Industries (3)***
This course looks at the invisible power of music over lives, exploring how music can influence how people feel, what they think, and how they think. Exploration of music's social power, delving into its rich history at the center of politics, religion, and a multibillion dollar global industry. Consideration of music's relationship to technology and how changes in the media landscape are altering the role music plays in human life. (Concept and Analysis course)

**04:567:278** ***News Media and Government in America (3)***
Examines the relationship between media and institutions and the processes through which people and societies make political choices. (Concept and Analysis course)

**04:567:314** ***Photojournalism (3)***
Fundamentals of still photography in print and audiovisual mass media with a primary focus on print journalism. (Practice and Innovation course) Must have a 35mm camera.
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:317** ***Writing the Mediterranean (3)***
Students will draw inspiration from great Mediterranean journeys, and learn to write compelling journey stories of their own. They will travel with Homer, Mark Twain, Ernest Hemingway, Martha Gellhorn, George Orwell, and other notable authors through one of the world's grandest regions, as they explore its legacy of war and exodus, cooking and eating, and romance and revenge. This course includes a spring break reporting trip to a Mediterranean country, such as Spain, Italy, or Turkey.
***Prerequisites: 04:567:200. Open to majors and MCM digital media track students only, except by special permission.***

**04:567:318** ***Fashion Journalism (3)***
Fashion Journalism is a course for advanced students in the journalism and media studies major who have an interest in writing about fashion, a key industry in New York City. The course provides students with an overview of writing about fashion, the different types of fashion journalism, and the numerous formats for fashion journalism. Students will also look at how fashion journalism has changed and how digital has transformed coverage. Throughout the semester, students will use readings, televised fashion coverage as well as online documentaries and collection showings to learn about the fashion journalism industry and to practice reporting techniques. Assignments will incorporate a multimedia focus with students working to produce a full range of fashion journalism that reflects the variety of journalism commonly produced in the industry. (Practice and Innovation Course)
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:319** ***Podcasting and Audio Documentary (3)***
By the end of the course, students learn the basics of the production, writing, and journalistic process required to use audio as a nonfiction storytelling language. Students will participate in the completion of at least one podcast episode. (Practice and Innovation Course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:326** ***Multimedia Reporting (3)***
Advanced reporting, writing, and research using new media technology. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206. Open only to journalism and media studies majors.***

**04:567:327** ***Public Information and Public Relations (3)***
Techniques of public information with focus placed on government, public affairs, and public interest issues. (Practice and Innovation course)
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:328** ***The Hyperlocal Newsroom (3)***
This class will give students hands-on experience with traditional and digital journalism, including work in both written and multimedia formats, through the creation and management of a news-based website covering Rutgers and the city of New Brunswick. Students will report; write and edit stories; create video, audio, and graphics; take photos; and learn about the various uses of social media within the journalism field. Students will collaborate on a news-based website that will synthesize learned skills, journalistic practices, and knowledge of information and technology. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206, or 04:567:212. Open only to journalism and media studies majors.***

**04:567:329** ***International Reporting (3)***
This course prepares students to write about life in other countries and to cover international issues from the United States. Students analyze award-winning global journalism and learn about and practice techniques foreign correspondents use. (Practice and Innovation course)
***Prerequisites: 04:567:200. Open only to journalism and media studies majors.***

**04:567:331** ***Digital Media Lab (3)***
Students use experimental new media tools to transform news reporting, media storytelling, and other media processes. Augmented reality, e-reader technology, 360-degree cameras, immersive media, the Mobile Journalist Workstation, 3D imaging and audio, 3D printing, interactive video, video as input, geotagged content, animation and news, and other emerging new media tools are applied to journalism and media to create and test new story formats that in an analog world would be impossible, but in a digital, networked world can engage individuals across time and space; and provide much-needed context and customization, and in-depth, context-sensitive news and mediated entertainment.
***Open only to journalism and media studies majors.***

**04:567:333** ***Media and Popular Culture (3)***
Examines the relationship between media and popular culture and their impact on society. This course introduces students to the shifting trends, ideas, and competing forces that will lay the foundation for the cultural battleground of the future. (Concept and Analysis course)

**04:567:335** ***Mass Communication and the American Image (3)***
Mass communication and America's traditional self-imagery. Critical analysis of the ways in which the American experience is now, and has been, interpreted by the mass media; the relationship of myth to reality. (Concept and Analysis course)

**04:567:340** ***Science and Health Journalism (3)***
To introduce students to the specialized fields of science, health, and technology writing. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206. Open only to journalism and media studies majors.***

**04:567:345** *Media Publishing and Design (3)*
Computer-based writing, design, and pagination for newsletters, websites, magazines, and newspapers. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:207 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:347** *Information Design for Web Journalists (3)*
Creation, design, and development of webpages as primary sites for distributing news content and to supplement other technologies for news transmission. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:207 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:350** *Development of Media (3)*
This course examines what media are and what they do; how specific media technologies affect democratic discourse; how media shape narratives of class, race, ethnicity, and gender; the long-running conflict between information and propaganda, and how media conglomerates came to wield such enormous power in modern society. (Concept and Analysis course)

**04:567:365** *Mediating the Middle East (3)*
Media in the US have tended to present the Middle East in a negative light casting Muslim majority countries as static, violent, undemocratic, and sexist. This course will critically analyze racial and religious stereotypes and caricatures by foregrounding the rich and complex history of interaction between the West and the Near East. While the course begins in the 7th century, the emphasis will be on popular discourse in the United States over the last half century. We will study films, news media reports, television shows, video games, and a range of other outlets through which our understanding of the Middle East is mediated. Note: Students who completed Islam, Media, and the Western Imagination (04:567:365) in prior years cannot enroll in this course for credit.

**04:567:370** *Journalism in American Film (3)*
The course is designed to expose students to many of the best known and classic American films about journalism, and to examine how American (U.S.) film has depicted the practice and societal impact of journalism. The course aims to deeply immerse students in a broad range of challenging and critical questions about journalistic practice in the United States, as represented in American film. Among the goals of the course is to have students consider whether popular, filmic depictions of American journalists are accurate and have bases in fact. Similarly, students consider whether the image, or the reality of journalistic practice, keeps changing in the United States, or whether, perhaps, there has been very little if any change in either, or at all, over the 75 years of film the course covers. And if there is change, or there is no change in reality or film, how might we understand the forces behind change or stability (Concept and Analysis course)
***Prerequisites: Open only to junior and senior journalism and media studies majors.***

**04:567:373** *Editing for Multimedia (3)*
In this course, students will learn the workflows associated with editing audio, video, graphics, and text. A strong emphasis is placed on demonstration and hands-on experience in this course. Students will become familiar with developing editing scripts, managing content, importing media, editing, and encoding for distribution across multiple platforms. Instructors will also discuss editing concepts which provide a thorough understanding of

technique and theory used by professional editors. Exploring these concepts will provide a better understanding of how messages and stories are told through editing. Editing media will be provided for all exercises and projects.
***Prerequisites: 04:567:200 and one foundation course; Open only to journalism and media studies majors.***

**04:567:374** ***Media Field Production (3)***
This course introduces students to the working principles of Electronic Field Production (EFP). Special attention is given to on-location creative and technical aspects of media production. Valuable EFP knowledge and skills will be gained through production exercises, projects, and readings. Students will learn the constraints and benefits of shooting on-location while producing, directing, and operating production equipment.
***Prerequisites: 04:567:200 and one foundation course; Open only to journalism and media studies majors.***

**04:567:375** ***Television Reporting (3)***
Fundamentals of television reporting and electronic news gathering with students assigned to various projects. (Practice and Innovation course)
***Prerequisites: 04:567:206. Open only to journalism and media studies majors.***

**04:567:376** ***Advanced Television Reporting (3)***
Advanced television reporting and electronic news gathering with students assigned to various projects. (Practice and Innovation course)
***Prerequisite: 04:567:375. Open only to journalism and media studies majors.***

**04:567:379** ***Media and Politics (3)***
Examines who controls the media and how the media differentially serve the public and power holders. Attention to both news and entertainment media. (Concept and Analysis course)
***Prerequisite: Open only to junior or senior majors in journalism and media studies.***

**04:567:380** ***Media and Social Change (3)***
This course looks at how past and present social movements (e.g., environmental, civil rights, labor movements) challenge dominant social, economic, and political structures and how they have been portrayed in the mass media. It also examines how social activists use media technologies to organize themselves and communicate their messages to wide audiences in order to achieve social change. (Concept and Analysis course)

**04:567:384** ***Media and the Struggle for Democracy in Central America (3)***
This course takes students to Guatemala for 10 days to study the role of media in historic and contemporary struggles for democracy. The class meets with Guatemalan journalists, human rights activists, Indigenous associations, women's collectives, and other community groups. Students visit news agencies, community radio and TV stations, and the office of the country's first and only feminist magazine. Using Guatemala as a case study, students will learn about the regional effects of colonization, US military intervention, and neoliberal economic policies in the Central American region, as well as the key role of media in local struggles for political autonomy, human rights, and democracy.
***Prerequisites: 04:567:215 or 04:567:380***

**04:567:385** ***Irish Media, Politics and Cultural Survival (3)***
This embedded course takes students to Ireland for 8 days to study the role of Irish (Gaelic) journalism and media in historic and current struggles for political autonomy and cultural identity. There are six 3-hour class meetings before we travel. In the heart of Galway's Irish-Gaelic speaking region, students will spend a few days in the lovely rural village of Carraroe, where Gaelic is the main language spoken (although everyone is bilingual in English). They

will also spend two days in the cultural hub of historic Galway City, and two days in the county's bustling capital, Dublin. Through readings, films, lectures, and site visits, students will learn the history of British colonialism in Ireland and the role of Irish-Gaelic journalism in the country's struggles for political independence from England. They will meet Irish civil rights activists who fought in the 1960s and 70s for the right to have Irish/Gaelic radio and TV stations in Ireland and will visit Gaelic radio, TV, print, and online news outlets to speak with journalists and other media makers. Focused on the political and cultural importance of native language media for minoritized and formerly colonized populations, students will see examples of Irish-language journalism and cultural programming such as documentaries, websites, children's cartoons, sports, music videos, and soap operas (subtitled in English), and gain familiarity with contemporary debates about whether the Irish government should continue funding Irish language media. Connections will be emphasized between struggles for Gaelic media in Ireland and struggles by minoritized and indigenous populations in other parts of the world for the right to have media in their native languages.
***Prerequisites: 04:567:380 or 04:567:215. Majors only***

**04:567:388,389** ***Independent Study in Journalism and Media Studies I,II (3,3)***
Independent study in journalism and media studies topics under faculty supervision. (Elective course)
***Prerequisites: Approval by department chair and supervising instructor of a written project proposal. 04:567:200; 75 or more overall credits, five (5) courses in major, one foundation. Open only to junior or senior majors in journalism and media studies. Minimum 2.50 GPA overall, and 2.75 in the major, and permission of instructor.***

**04:567:393** ***3-Credit Internship in Journalism and Media Studies (3)***
Supervised field experience at professional media outlets. Before registering, students must meet with the internship coordinator to determine eligibility and receive approval of the placement. Students must work at their site a minimum of 15 hours per week during the semester. Off-site (virtual) positions will not be accepted. Students will complete weekly journals and attend several in-class meetings during the semester. Students will be allowed to take both the 3-credit internship and the 6-credit internship, but are not allowed to take both of them in the same semester. Also note that students are limited to a maximum of 9 out-of-classroom credits in the major; the courses that fall under this heading are: Internship, Practicum, and Independent Study.
***Prerequisites: 04:567:200; 75 or more overall credits, five (5) courses in major, one foundation. Open only to junior or senior majors in journalism and media studies. Minimum 2.50 GPA overall, and 2.75 in the major, and permission of instructor.***

**04:567:394** ***6-Credit Internship in Journalism and Media Studies (6)***
Supervised field experience at professional media outlets. Before registering, students must meet with the internship coordinator to determine eligibility and receive approval of the placement. Students must work at their site a minimum of 24 hours per week during the semester. Off-site (virtual) positions will not be accepted. Students will complete weekly journals and attend several in-class meetings during the semester. Students will be allowed to take both the 3-credit internship and the 6-credit internship, but are not allowed to take both of them in the same semester. Also note that students are limited to a maximum of 9 out-of-classroom credits in the major; the courses that fall under this heading are: Internship, Practicum, and Independent Study.
***Prerequisites: 04:567:200; 75 or more overall credits, five (5) courses in major, one foundation. Open only to junior or senior majors in journalism and media studies. Minimum 2.50 GPA overall, and 2.75 in the major, and permission of instructor.***

**04:567:405** ***Writing about Social Issues (3)***
Students will cover the game-changing stories of our time, from the widening gap between the rich and the poor; to battles over immigration; to the climate change wars that may determine our very survival. They'll analyze groundbreaking journalism, and have an opportunity to write and shoot commanding stories of their own. (Practice

and Innovation course)
***Prerequisites: 04:567:215 or 04:567:380; 04:567:205 or 04:567:206 or 04:567:328 or 04:567:329 or 04:567:445. Open only to journalism and media studies majors.***

**04:567:410** ***Magazine Writing (3)***
Magazine writing for publication, including consumer, trade, and business magazines. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567.206. Open only to journalism and media studies majors or by permission of the instructor.***

**04:567:413** ***Literary Journalism***
This course analyzes great examples of nonfiction writing from the last century to appreciate what makes for enduring non-fiction writing-- journalism that rises to the level of literature.

**04:567:415** ***Media and Climate Change (3)***
This course will consider the intersections of science, media, and society. With a focus on both theory and practice, it explores the media's role in understanding and communicating about the most critical science and environmental issues of our day. (Concept and Analysis course)
***Prerequisite: Open only to junior or senior journalism and media studies majors.***

**04:567:420** ***Global News (3)***
Investigates, analyzes, and discusses global production, distribution, and consumption of news. Issues include global news flows, journalistic cultures and practices, and international news coverage. (Concept and Analysis course)
***Prerequisite: Open only to junior or senior journalism and media studies majors or by permission of the instructor.***

**04:567:423** ***Communication Law (3)***
Examines laws and regulations governing U.S. mass media. (Concept and Analysis course)
***Prerequisite: Open only to juniors or seniors or by permission of the instructor.***

**04:567:425** ***Copyright, Media, and Culture (3)***
In this course we will discuss one of the most powerful social, cultural, economic, and political institutions of our day: intellectual property (IP). How did we arrive at the notion that creative works and ideas can be owned, bought, and sold like tangible commodities? What impact does this concept have on the way we view the world? How does it help us achieve our social goals, and how does it present obstacles to reaching those goals? And, in the age of digitized information and networked communication, how can we understand the role of IP in light of the rapidly changing developments in the way culture is produced and consumed? In our efforts to better understand these issues, we will read both primary and secondary materials, covering subjects ranging from the birth of copyright to the latest developments in the global "copyfight" over information in the digital age; view relevant and interesting documentary films; and enjoy guest lectures from a variety of knowledgeable speakers. (Concept and Analysis course)
***Prerequisite: Only open to journalism and media studies juniors or seniors.***

**04:567:430** ***Sports Writing and Reporting (3)***
Fundamentals of sports writing, reporting, and commentary for print and online media. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206. Open only to journalism and media studies majors.***

**04:567:432** ***Multimedia Sports Reporting (3)***
This course will explore the many facets of multimedia sports reporting, from conventional newspaper websites to robust sports sites and the use of social networking services to transmit sports news.
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:434** ***Critical Issues in Sports Media (3)***
Examines the critical issues in sports and sports media, including race, gender, class, politics, culture, economics, and the role of sport in society.
***Prerequisite: Open only to journalism and media studies majors.***

**04:567:438** ***Media and Data (3)***
Who decides what we watch, read, and listen to in the digital media age? Increasingly the answer is not a person at all, but an algorithm that studies our online behavior and tries to predict what we'll click, like, and share next. This course will look at how media industries--such as TV, film, music, book publishing, and journalism--are using Big Data to compete in a fierce battle for audiences' attention. How are data and algorithms shaping the movies we watch on Netflix, the songs we hear on Spotify, the books we read on Kindle, and the news we consume on Facebook and Twitter? What are the potential benefits and drawbacks of this transformation? (Concept and Analysis course)
***Prerequisites: 04:567:215 or 04:567:216 or 04:567:217. Open only to journalism and media studies majors.***

**04:567:445** ***Media, Movement, and Community Engagement (3)***
This course will enable students to participate in the development of a journalism and media production project. They will also learn how to harness technology and study its implementation and impact on social change. (Concept and Analysis and/or Practice and Innovation course; student may only use this course to satisfy one requirement.)
***Prerequisite: 04:567:215 or 04:567:380.***

**04:567:450** ***Promotional Media (3)***
What is a promotional culture? Bringing together elements of media studies, visual culture, critical branding/ marketing studies, and consumer culture, this course is designed to provide advanced undergraduate students with analytical tools to understand the extent to which promotional language, communication, and habits suffuse our everyday lives.
***Prerequisites: 04:567:274. Only open to journalism and media studies juniors or seniors.***

**04:567:451** ***Topics in Journalism and Emerging Media I (3)***
Specialized topics related to the practice of journalism are offered on a regular basis. (Practice and Innovation Course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:207 or by permission. Open only to journalism and media studies majors.***

**04:567:452** ***Topics in Journalism and Emerging Media II (3)***
Specialized topics related to the practice of journalism are offered on a regular basis. (Practice and Innovation Course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:207 or by permission. Open only to journalism and media studies majors.***

**04:567:453** *Topics in Journalism Emerging Media III (3)*
Specialized topics related to the practice of journalism are offered on a regular basis. (Practice and Innovation Course)
***Prerequisites: 04:567:205 or 04:567:206 or 04:567:207 or by permission. Open only to journalism and media studies majors.***

**04:567:454** *Practicum in Journalism and Media Studies (3)*
Specific directed project work conducted under faculty supervision. (Practice and Innovation Course)
***Prerequisites: Permission of the instructor required. Open only to sophomore, junior, and senior majors in journalism and media studies.***

**04:567:457** *Journalism of the Civil Rights Movement (3)*
Students read and study the journalism of the U.S. civil rights movement (1954-1968) to understand its historical role.

**04:567:458** *Media, Government, and Politics (3)*
Examines interactions between media and political institutions, actors and processes, in light of theories of journalism, communication, and political practice. (Concept and Analysis course)
***Prerequisite: Open only to junior and senior journalism and media studies majors.***

**04:567:459** *Media, Democracy, and the Public (3)*
The course explores how the news media have figured in constituting a public sphere in American history. Readings juxtapose classics of political philosophy with historical or sociological works describing democracy in practice in the United States. (Concept and Analysis course)
***Prerequisite: Open only to junior and senior journalism and media studies majors.***

**04:567:460** *News, Entertainment, and Politics (3)*
Examines the influence of entertainment media on political news, opinion, knowledge, and behavior. (Concept and Analysis course)
***Prerequisite: Open only to junior and senior journalism and media studies majors.***

**04:567:465** *Documentary Filmmaking and Storytelling (3)*
Long-form video journalism storytelling developed over a significant period of time teaching students critical thinking, research, writing skills, and various production techniques. (Practice and Innovation course)
***Prerequisites: 04:567:206 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:470** *Critical Analysis of News (3)*
Surveys and critiques of social science research on news, journalists, and the news media. (Concept and Analysis course)
***Prerequisite: Open only to junior and senior journalism and media studies majors.***

**04:567:471** *Topics in Media and Society I (3)*
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. (Concept and Analysis course)
***Prerequisites: 04:567:200 and 04:567:215 or 04:567:216 or 04:567:217. Open only to journalism and media studies majors.***

**04:567:472** ***Topics in Media and Society II (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. (Concept and Analysis course)
***Prerequisites: 04:567:200 and 04:567:215 or 04:567:216 or 04:567:217. Open only to journalism and media studies majors.***

**04:567:473** ***Topis in Media and Society III (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. (Concept and Analysis course)
***Prerequisites: 04:567:200 and 04:567:215 or 04:567:216 or 04:567:217. Open only to journalism and media studies majors.***

**04:567:474** ***Topics in Media and Society IV (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. (Concept and Analysis course)
***Prerequisites: 04:567:200 and 04:567:215 or 04:567:216 or 04:567:217. Open only to journalism and media studies majors.***

**04:567:475** ***International Media (3)***
Analyze debates about media and cultural globalization, and theories about international media. (Concept and Analysis course)
***Prerequisites: Open only to junior and senior journalism and media studies majors.***

**04:567:476** ***Topics in Creative Media Practice I (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. Note: Please check with the journalism and media studies coordinator of undergraduate studies or the School of Communication and Information Office of Student Services each semester to find out if the course is conceptual or skills.
***Prerequisites: 04:567:200 and 04:567:210 or 04:567:211 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:477** ***Topics in Creative Media Practice II (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. Note: Please check with the journalism and media studies coordinator of undergraduate studies or the School of Communication and Information Office of Student Services each semester to find out if the course is conceptual or skills.
***Prerequisites: 04:567:200 and 04:567:210 or 04:567:211 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:478** ***Topics in Creative Media Practice III (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. Note: Please check with the journalism and media studies coordinator of undergraduate studies or the School of Communication and Information Office of Student Services each semester to find out if the course is conceptual or skills.
***Prerequisites: 04:567:200 and 04:567:210 or 04:567:211 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:479** ***Topics in Creative Media Practice IV (3)***
Upper-level seminar on specialized topics relating to journalism media studies. Examples of recent topics: Covering the World, Design for the World Wide Web, History of Sports Journalism. Note: Please check with the journalism and media studies coordinator of undergraduate studies or the School of Communication and Information Office of Student Services each semester to find out if the course is conceptual or skills.
***Prerequisites: 04:567:200 and 04:567:210 or 04:567:211 or 04:567:212. Open only to journalism and media studies majors.***

**04:567:484** ***Workshop in Journalism and Media Practice I (1.5)***
Specialized topics directed at enhancing or introducing journalism and/or media-related skill sets. These are intense seven-week workshops teaching students specific skills applicable to the field. The specialized focus can be an accelerated introduction to basics or an advanced training in particular skills learned in previous offerings.
***Prerequisites: 04:567:205, 04:567:206, or 04:567:212. Open only to journalism and media studies majors.***

**04:567:485** ***Workshop in Journalism and Media Practice II (1.5)***
Specialized topics directed at enhancing or introducing journalism and/or media-related skill sets. These are intense seven-week workshops teaching students specific skills applicable to the field. The specialized focus can be an accelerated introduction to basics or an advanced training in particular skills learned in previous offerings. (Practice and Innovation course)
***Prerequisites: 04:567:205, 04:567:206, or 04:567:212. Open only to journalism and media studies majors.***

**04:567:488** ***Independent Study in Media Studies (3)***
Independent study in media studies topics under faculty supervision. (Elective course)
***Prerequisites: 75 or more overall credits, five (5) courses in major, one foundation, 567:200, 2.75 major GPA, 2.5 overall GPA, and permission of instructor. Open only to junior and senior journalism and media studies majors.***

**04:567:489** ***Independent Study in Journalism (3)***
Independent study in journalism topics under faculty supervision. (Elective course)
***Prerequisite: 75 or more overall credits, five (5) courses in major, one foundation, 567:200, 2.75 major GPA, 2.5 overall GPA, and permission of the instructor. Open only to junior and senior journalism and media studies majors.***

**04:567:490** ***Senior Thesis/Project (3)***
Honors thesis or project under faculty supervision. (Elective course)
***Prerequisites: 04:567:488 or 04:567:489. Permission of instructor. Must meet certain GPA requirements. Open only to senior journalism and media studies majors.***

**04:567:495** ***Investigative and In-Depth Reporting (3)***
In-depth reporting project using public records and other investigative journalism techniques. (Practice and Innovation course)
***Prerequisites: 04:567:205 or 04:567:206. Open only to journalism and media studies majors.***

**04:567:499** ***Capstone in Gender and Media (3)***
In this capstone to the gender and media minor, students will develop, discuss, produce, and critique a project related to gender, media, and technology. Students will articulate and present the project in written and oral formats and will have the option to also (1) create an in-depth multimedia component to the project; 2) complete an internship; or 3) complete a service-learning experience. Note: Students in the minor, especially those who are not

otherwise SC&I majors, may choose to enroll in the capstone through the program in women's and gender studies, course number 01:988:499.
***Prerequisite: Minimum of 12 credits in the gender and media minor must be completed before enrolling in the capstone.***

# Administration (SC&I-U)

## ADMINISTRATION

Dafna Lemish, Interim Dean and Distinguished Professor of Journalism and Media Studies

Mark Aakhus, Associate Dean for Research and Professor of Communication

Karen Hundert Novick, Associate Dean for Administration

Narda Acevedo, Director of Business and Administration

Kevin J. Ewell, Assistant Dean for Student Services

Bernadette Gailliard, Assistant Dean for Diversity, Equity, and Inclusion

Jon L. Oliver, Assistant Dean for Information Technology

Brenda Sheridan, Director of Strategic Communication

Sharon Stoerger, Assistant Dean for Instructional Support and Assessment

# Faculty (SC&I-U)

## FACULTY

The Master of Communication and Media (M.C.M.) degree is offered and administered by the Department of Communication and the Department of Journalism and Media Studies, with the M.C.M. Director chosen from among the faculty. The M.C.M. Executive Committee includes representatives from the program faculty who work with the director on all issues related to the program's administration. Teaching faculty includes the full-time members of each of the three departments in the School of Communication and Information: communication, journalism and media studies, and library and information science.

# About the School (SSW-U)

## ABOUT THE SCHOOL OF SOCIAL WORK

Established in 1954, the School of Social Work has a distinguished record of instruction, research, and public service. Classes were first offered during the Great Depression to meet the state's need for social workers. Today,

the school offers undergraduate and graduate-professional degree programs; holds classes at Rutgers University-New Brunswick, Rutgers University-Newark, and Rutgers University-Camden; and is affiliated with social service agencies locally and worldwide.

**Mission**

The mission of the School of Social Work is to develop and disseminate knowledge through social work research, education, and training that promotes social and economic justice and strengthens individual, family, and community well-being in the diverse and increasingly global environment of New Jersey and beyond.

**Location**

The school offers classes in New Brunswick, Newark, and Camden. The Office of the Dean is located at 120 Albany Street, Tower One, Suite 200 near the university's historic Rutgers University-New Brunswick campus. Each location is close to major highways and rail systems and within easy commuting distance of New York City and Philadelphia.

**School of Social Work at a Glance**

- One of the largest schools in the nation devoted to education and research on social welfare
- Classes offered online, in New Brunswick, Newark, and Camden and at other sites throughout New Jersey
- Offers a B.A. with a major in social work, M.S.W., M.S.W./M.A .in C.J., M.S.W./M.P.H., M.S.W./M.P.P., M.S.W./J.D, M.S.W./M.Div. M.S.W./Ph.D., Ph.D. and D.S.W.
- Fully accredited by the Council on Social Work Education
- Approximately 1,750 students enrolled in degree programs
- More than 400 continuing education events offered each year
- More than 200 full-time faculty members and part-time lecturers

Additional information is available on the School of Social Work website here.

National Association of Social Workers Code of Ethics

Nondiscrimination Policy Standards of the Council of Social Work Education

# National Association of Social Workers Code of Ethics (SSW-U)

## NATIONAL ASSOCIATION OF SOCIAL WORKERS CODE OF ETHICS: SUMMARY OF MAJOR PRINCIPLES

The following broad ethical principles are based on social work's core values of service, social justice, dignity and worth of the person, importance of human relationships, integrity, and competence. Developed by the National Association of Social Work (NASW), these principles set forth ideals to which all social workers should aspire.

**Value: Service**

*Ethical Principle: Social workers' primary goal is to help people in need and to address social problems.*

Social workers elevate service to others above self-interest. Social workers draw on their knowledge, values, and skills to help people in need and to address social problems. Social workers are encouraged to volunteer some portion of their professional skills with no expectation of significant financial return (pro bono service).

**Value: Social Justice**

*Ethical Principle: Social workers challenge social injustice.*

Social workers pursue social change, particularly with and on behalf of vulnerable and oppressed individuals and groups of people. Social workers' social change efforts are focused primarily on issues of poverty, unemployment, discrimination, and other forms of social injustice. These activities seek to promote sensitivity to and knowledge about oppression and cultural and ethnic diversity. Social workers strive to ensure access to needed information, services, and resources; equality of opportunity; and meaningful participation in decision-making for all people.

**Value: Dignity and Worth of the Person**

*Ethical Principle: Social workers respect the inherent dignity and worth of the person.*

Social workers treat each person in a caring and respectful fashion, mindful of individual differences and cultural and ethnic diversity. Social workers promote clients' socially responsible self-determination. Social workers seek to enhance clients' capacity and opportunity to change and to address their own needs. Social workers are cognizant of their dual responsibility to clients and to the broader society. They seek to resolve conflicts between clients' interests and the broader society's interests in a socially responsible manner consistent with the values, ethical principles, and ethical standards of the profession.

**Value: Importance of Human Relationships**

*Ethical Principle: Social workers recognize the central importance of human relationships.*

Social workers understand that relationships between and among people are an important vehicle for change. Social workers engage people as partners in the helping process. Social workers seek to strengthen relationships among people in a purposeful effort to promote, restore, maintain, and enhance the well-being of individuals, families, social groups, organizations, and communities.

**Value: Integrity**

*Ethical Principle: Social workers behave in a trustworthy manner.*

Social workers are continually aware of the profession's mission, values, ethical principles, and ethical standards, and practice in a manner consistent with them. Social workers act honestly and responsibly, and promote ethical practices on the part of the organizations with which they are affiliated.

**Value: Competence**

*Ethical Principle: Social workers practice within their areas of competence and develop and enhance their professional expertise.*

Social workers continually strive to increase their professional knowledge and skills and to apply them in practice. Social workers should aspire to contribute to the knowledge base of the profession.

To view the NASW Code of Ethics in its entirety, including the ethical standards, go here.

# Nondiscrimination Policy Standards of the Council of Social Work Education (SSW-U)

## NONDISCRIMINATION POLICY STANDARDS OF THE COUNCIL OF SOCIAL WORK EDUCATION

The School of Social Work adheres to the university's policy on nondiscrimination. The school also follows the standards of the Council on Social Work Education by conducting its programs without discriminating on the basis of race, color, gender, age, creed, ethnic or national origin, disability, or political or sexual orientation.

# Institute for Families (SSW-U)

## Institute for Families

Founded in 2007, the Institute for Families (IFF) harnesses the extensive resources of Rutgers University to create a more humane, just, and equitable society. We develop and disseminate knowledge and information throughout New Jersey and beyond that leads to a greater understanding of a range of social issues, and implementation of capacity-building strategies and systems improvements to better address them.

We invite and enjoy strong partnerships and professional collaborations throughout the human service community, including the New Jersey Department of Human Services, the New Jersey Department of Children and Families, the New Jersey Department of Education, and various other community, state, and national organizations, foundations, and professional networks. For more information, visit here.

**Mission**

The mission of the Institute for Families at the Rutgers School of Social Work is to support and strengthen individuals, families, and communities by increasing the capacity of human service professionals and organizations. They achieve this through a three-pronged approach that mirrors and supports the university's mission of instruction, research, and public service:

- training, technical assistance, and professional development;
- applied research and evaluation; and
- direct service and advocacy.

# Center for Gambling Studies (SSW-U)

## Center for Gambling Studies

Founded in 2007, The Center for Gambling Studies (CGS) is an international, multidisciplinary center for the study of gambling-related issues. The center's mission is to promote empirical research, to evaluate gambling-related policies and serve as a legislative resource, and to provide nationally accredited training for compulsive gambling counselors. The CGS is housed in the School of Social Work at Rutgers University-New Brunswick.

The mission of the Center for Gambling Studies is twofold: to drive global decision-making on issues relative to gambling and gaming by conducting strategic, non-partisan research and policymaking and to benefit individuals and families adversely affected by problems with interactive technology through innovative prevention, training, and intervention programs.

Additional information is available online here.

# Office of Global Social Work Programs (SSW-U)

## Office of Global Social Work Programs

The Office of Global Social Work Programs works to bring the world into the classroom through global content that is infused throughout the curriculum as well as provided through specialized international education courses. It strives to expand international research, education, and service opportunities for students and faculty.

Our mission is to promote global citizenship and professional action among social work students, graduates, faculty, and practitioners. We achieve this through education, advocacy, research, and community service locally and globally.

Additional information is available online here.

# Center for Leadership and Management (SSW-U)

Established in 2014, the Center for Leadership and Management (CLM) seeks to bridge the discipline of social work with the fields of leadership and management from both academic and practice perspectives. It assists local, state, national, and global businesses, nonprofits, and governmental agencies in building their management and leadership talents and is dedicated to capacity-building, consultation, scholarship, and service activity across industries and sectors.

Drawing on the wealth of experience and talent available at the School of Social Work, as well as the emerging expertise of our management and policy program interns, CLM offers consultative services to nonprofits and governmental entities in New Jersey.

Additional information is available online here.

# Center for Prevention Science (SSW-U)

## Center for Prevention Science

The Center for Prevention Science was established in 2016 with a focus on community-level approaches to prevention. Our mission is to develop and disseminate knowledge through research that builds the capacity of community-based organizations to create changes in public policy or environmental conditions that cause social and health disparities.

The center has opened its doors to new opportunities and growth. Although much of the center's work has focused on substance abuse prevention, research in other areas of prevention has also been conducted (e.g., the prevention of sexual assault; child abuse and neglect). Research areas of the center include community organizing, substance abuse prevention, heath disparities, program evaluation, as well as empowerment theory and measurement.

# Center for Research on Ending Violence (SSW-U)

## Center for Research on Ending Violence

Founded in 2007, as the Center on Violence Against Women and Children's (VAWC) at the Rutgers School of Social Work, the Center for Research on Ending Violence strives to eliminate all forms of violence and the power imbalances that permit them. We accomplish our mission through a collaborative approach that focuses on multidisciplinary research, education, and community engagement. The mission is to work to eliminate physical, sexual, and other forms of violence against women and children and the power imbalances that permit them. These goals are accomplished through a collaborative approach that focuses on multidisciplinary research, education, and community engagement.

Our work is focused on the three major branches of the center:

- research and evaluation
- education
- community engagement

Additional information is available online here.

# Huamin Research Center (SSW-U)

## Huamin Research Center

The Huamin Research Center was established in 2012 through collaboration between the Huamin Charity Foundation and Rutgers University, and is based at Rutgers School of Social Work. The center's mission is to develop and disseminate knowledge through research and exchange that promotes professional development of nonprofit organizations and strengthens individual, family, and community well-being in China.

This is achieved through research projects and the exchange of information through conferences, workshops, training programs, visiting scholars, and book translations. The center cooperates with a number of major Chinese and American universities and research institutions and has a strong network of partners. Each year the center hosts several Chinese visiting scholars.

More information is available here.

# Degree Programs (SSW-U)

## DEGREE PROGRAMS

The School of Social Work offers four degree programs: the bachelor of arts with a major in social work (B.A.), master of social work (M.S.W.), doctorate in social work (D.S.W.), and, in conjunction with the School of Graduate Studies, the doctor of philosophy (Ph.D.). The bachelor of arts and the master of social work degrees are accredited by the Council on Social Work Education.

Bachelor of Arts (B.A.) Degree with Social Work Major

Master of Social Work Program (M.S.W.)

Doctorate in Social Work (D.S.W.)

Doctoral Program (Ph.D.)

# Bachelor of Arts (B.A.) Degree with Social Work Major (SSW-U)

## BACHELOR OF ARTS (B.A.) DEGREE WITH SOCIAL WORK MAJOR

The bachelor of arts with a major in social work (B.A.), offered by the School of Social Work at both Rutgers University-New Brunswick and Rutgers University-Camden, is a professional degree program that prepares graduates for beginning social work practice. Students are prepared for professional practice as well as graduate study in social work and related fields. The focus for practice includes work with special populations, including the poor, the oppressed, and other at-risk groups. The program is fully accredited by the Council on Social Work Education. It stresses research-based instruction, individualized work with students, and "hands-on" experience as part of the learning process. Participants are expected to acquire the knowledge base and professional ethics, values, and skills to work effectively within individual, family, group, organizational, and community levels of practice.

The bachelor of arts degree program is offered through the School of Arts and Sciences at Rutgers-New Brunswick and the College of Arts and Sciences at Rutgers-Camden. Additional information is available online here.

Additional information about undergraduate courses can be found in the New Brunswick Undergraduate Catalog at http://catalogs.rutgers.edu/generated/nb-ug_current.

**Newark Campus**

A separate accredited undergraduate program leading to a bachelor of arts degree in social work is offered at Rutgers University-Newark through both the Newark College of Arts and Sciences and University College-Newark. For further information about the program in Newark, call 973-353-5092, visit here.

Bachelor of Arts (B.A.) Degree with Social Work Major (SSW-U)

# Undergraduate Admission

# UNDERGRADUATE ADMISSION

**Admission to the Bachelor of Arts with a Social Work Major**

Undergraduate students begin the social work major in their junior year, having completed approximately 60 credits. Students should plan to declare the major during the spring semester of their sophomore year. Prospective B.A.S.W. students are notified of approval for the major by the School of Social Work Office of Admissions.

**Qualifications**

In order to be approved for the major, students must have achieved the following:

1. Admission to the university in either the School of Arts and Sciences at Rutgers University-New Brunswick or the Camden College of Arts and Sciences at Rutgers University-Camden;

1. A cumulative grade-point average of 3.0 or better. Exceptions to the grade-point average requirement may be made on an individual basis.
2. Completion of approximately 60 credits, including the majority of prerequisites below:
    1. Basic Psychology
    2. Introduction to Sociology
    3. Human Biology
    4. Statistics
    5. Two liberal arts courses from the following areas (1 each): Anthropology, Art, Communication/ speech, Geography, History, Literature, Music, Philosophy, Religion, or Theater

For information about admission to the social work major, call 848-932-7520, or visit here. For information about admission to the university, visit the Office of University Undergraduate Admissions website or call 732-445-INFO (Campus Information Services).

# Continuing Education and Professional Development (SSW-U)

## CONTINUING EDUCATION AND PROFESSIONAL DEVELOPMENT

The Rutgers School of Social Work's Office of Continuing Education delivers courses for professional development and lifelong learning for social workers and other human service professionals.

Workshops are offered at the postbaccalaureate and post-master's levels. Learning activities are designed to help licensed and certified social workers in the state meet the continuing educational requirements for licensing and certification. All workshops, certificate programs, and training are approved by the New Jersey Board of Social Work Examiners. Information and brochures are available from the Office of Continuing Education, Rutgers School of Social Work, 390 George Street, 3rd Floor, New Brunswick, NJ 08901.

**For More Information**

Call: 848-932-8758
Online: Here

# Professional Credit Courses (Nonmatriculated) (SSW-U)

## PROFESSIONAL CREDIT COURSES (NONMATRICULATED)

Professional credit courses consist of nondegree, graduate-level courses. These courses provide an excellent opportunity for individuals who may be considering the master's program in social work to explore introductory classes without committing to a matriculated program. The courses are equivalent to those offered during the first half of the master's program. Upon acceptance into the Rutgers master's program in social work, up to 18 credits may be applied toward your degree.

Please note:

- A baccalaureate degree from an accredited college or university is the prerequisite for admission.
- Taking professional credit courses in no way guarantees admission to the School of Social Work. Anyone interested in the master's program should apply online here.

**Courses**

There are five required M.S.W. degree courses and several electives offered through the professional credit program. All courses are 3 credits. Please note: If you are accepted into the master's program, only one elective will be credited toward your degree.

Courses are offered online. Classes are limited in size, and applications are processed on a first-come, first-serve basis.

For more information about admission, locations, and course offerings, visit here.

# Financial Aid (SSW-U)

## FINANCIAL AID

The impact of educational expenses on students and their families is sizable, even though tuition at Rutgers covers only a small portion of the actual cost of instruction for each student. In order to allow students with limited financial resources to attend, every effort is made to assist these students in finding the funds to finance their education.

A majority of full-time graduate students at the university receive some financial aid. The amount of support each student receives depends, in part, upon the availability of funds. The level of support often is dependent upon the specific graduate program and the student's degree status. Limited funds are available to students from scholarships, fellowships, assistantships, grants, low-interest loans, and part-time employment. To apply for grants, loans, and employment, students must complete the Free Application for Federal Student Aid (FAFSA). For additional information, applicants should visit the Rutgers Office of Financial Aid.

**School of Social Work Scholarships**

The School of Social Work offers a limited number of scholarships for its students. Students are notified by the Office of Student Affairs at the School of Social Work as applications are made available.

# Course Listings (SSW-U)

## COURSE LISTINGS

**Explanation of Three-Part Course Numbers**

Throughout this catalog in course listings, the number preceding each course title is divided into three parts. The first two digits are the administrative code (standing for the school or faculty offering the course), the next three digits are the subject code, and the final three digits are the course code.

*Administrative Codes*

The following administrative codes are used in this catalog:

09 School of Social Work (Undergraduate)

16 School of Graduate Studies (Ph.D. program)

19 School of Social Work (M.S.W. program)

*Subject Codes*

The subject code indicates the subject matter of the course. The subject code for social work is 910.

*Course Codes*

Course codes for 100 to 499 indicate undergraduate courses; course codes from 500 to 799 indicate graduate courses.

Credits awarded for the successful completion of each course are indicated in parentheses following the course title.

# Administration (SSW-U)

## ADMINISTRATION

George S. Leibowitz, Dean and Distinguished Professor; M.S.W., Ph.D., Denver

Richard L. Edwards, Interim Dean (7/01/2023 - 6/30/2024) and Distinguished University Professor and Chancellor Emeritus, Rutgers - New Brunswick; A.M., Chicago; Ph.D., SUNY (Albany)

Antoinette Y. Farmer, Associate Dean for Diversity, Equity and Inclusion, Interim Associate Dean for Academic Affairs and Professor; M.S., Ph.D., Pittsburgh

N. Andrew Peterson, Director, Center for Prevention Science and Distinguished Professor; M.A., Ph.D. Missouri (Kansas City)

Lia Nower, Associate Dean for Research and Director, Center for Gambling Studies and Co-Director of the Addiction Counselor Training (A.C.T) Certificate Program and Distinguished Professor; J.D. St. Louis., Ph.D., Washington

Victoria Banyard, Vice Provost for Academic Affairs and Distinguished Professor: M.A., Ph.D., Michigan

Sharon Fortin, Associate Dean for Administration and Finance; M.H.R.M., Rutgers

Laura A. DiMarcantonio, Assistant Dean for Admissions and Recruitment; M.Ed., Virginia Commonwealth, Ph.D., Liberty University Virginia

Arlene M. Hunter, Assistant Dean for Student Affairs; M.A., Bowling Green State

Christine Morales, Assistant Dean for Lecturer Support and Assistant Professor of Teaching; M.S.W., University of Southern California, Ed.D., Rutgers

Christine Chapais, Director of Online MSW Programs and Assistant Professor of Teaching; M.S.W., Kean

Allison Zippay, *Director, Center for Leadership and Management* and Professor; M.S.W., Ph.D., California (Berkeley)

E. Goldblatt Hyatt, Director, D.S.W. Program and Associate Professor of Professional Practice for Reproductive Justice; M.S.W., M.B.E.; D.S.W. (Pennsylvania)

Cassandra Simmel, Director, Ph.D. Program and Associate Professor; M.S.W., Ph.D., California (Berkeley)

Judith L. McCoyd, Associate Director, Ph. D. Programs and Associate Professor; M.S.W., Columbia, Ph.D., Bryn Mawr

Edward J. Alessi, Director, Master of Social Work Programand Professor;; M.S.W., Columbia, Ph.D. New York

Jack Lewis, Director, Intensive Weekend Program and Associate Professor of Professional Practice; M.S.W., D.S.W., Pennsylvania

V. DuWayne Battle, Assistant Dean of Baccalaureate Programs, Director, BASW Program in New Brunswick and Teaching Professor; M.S.W., Rutgers; D.Min., Southeastern Seminary; Ph.D., Rutgers

Mark W. Lamar, Executive Director of Practicum Learning and Associate Professor of Professional Practice; M.S.W., M.B.A., Rutgers

Lia Nower, Associate Dean for Research, Director, Center for Gambling Studies and Co-Director of the Addiction Counselor Training (A.C.T.) Certificate Program, and Distinguished Professor, J.D., St. Louis, Ph.D., Washington

Natalie Bembry, Director, Baccalaureate (BASW) Program in Camden, and Assistant Professor of Teaching, M.S.W., Monmouth, M.A., Phoenix, Ed.D., Rowan

Theresa McCutcheon, Director, Institute for Families; M.S.W., Rutgers

Rebecca Davis,  Director, Office of Global Social Work Programs and Associate Professor of Professional Practice; M.S.W., North Carolina (Chapel Hill)  Ph.D., North Carolina (Greensboro)

Sarah McMahon,  Director, Center for Research on Ending Violence, Professor and special advisor to the president for sexual misconduct prevention and response; M.S.W., Ph.D., Rutgers

Chien-Chung Huang, Associate Dean for Faculty Development and Professor; M.S.W., Chung-Cheng (China),  Ph.D., Columbia

Doulgas Behan, Director of Continuing Education and Associate Professor of Professional Practice; M.S.W., D.S.W., Rutgers

# Faculty (SSW-U)

## FACULTY

The following list includes faculty from the bachelor's, master's, and doctoral degree programs offered through the School of Social Work.

Ayse Akincigil, Associate Professor; M.A., Ph.D., Rutgers

Edward Alessi, Professor and Director of the Master of Social Work (M.S.W.); M.S.W., Columbia; Ph.D., New York

Mary Beth Ali, Assistant Professor of Teaching; M.S.W., Fordham

Wen (Vivien) Li Anthony, Associate Professor); M.S.W., Ph.D., North Carolina (Chapel Hill)

Victoria Banyard, Distinguished Professor and Vice Provost for Academic Affairs; M.A., Ph.D., Michigan

V. DuWayne Battle, Teaching Professor and Assistant Dean of the Bachelor's Programs and Director of the BASW Program in New Brunswick; M.S.W., Rutgers; D.Min., Southeastern Seminary; Ph.D., Rutgers

Danielle Beatty-Moody, Associate Professor and Chenceloor-Provost's Scholar for Inclusive Excellence in Multilevel Racism and Life Span Health and Aging; M.A, North Carolina Central, Ph.D., City University of New York

Doug Behan, Associate Professor of Professional Practice and Director of Continuing Education; M.S.W., D.S.W., Rutgers

Natalie Bembry, Assistant Professor of Teaching and Director of the Baccalaureate (BASW) Program in Camden; M.S.W., Monmouth; Ed.D., Rowan

Mariann Bischoff, Assistant Professor of Teaching and Management and Policy Practicum Specialist; M.S., Cornell; M.S.W., Monmouth

Marla Blunt-Carter, Associate Professor of Professional Practice for Political Social Work; M.S.W., Rutgers

Emily Adlin Bosk, Associate Professor; M.S.W., Ph.D., Michigan (Ann Arbor)

Qiana Brown, Assistant Professor; M.P.H., M.S.W., Alabama; Ph.D. Johns Hopkins

Elsa Candelario, Professor of Professional Practice and Director of the Latina/o/x Initiatives for Service, Training, and Assessment (L.I.S.T.A.) Certificate Program; M.S.S.W., Columbia

Chistine Chapais, Assistant Professor of Teaching and Director or Online MSW Programs, M.S.W., Kean

Ryon Cobb, Assistant Professor and Chancellor-Provost's Scholar for Inclusive Excellence in Research on Black Americans; Ph.D., FLorida

Sandra Crewe, Sojourner Truth Social & Racial Justice Visiting Professor: M.S.W., Catholic University, Ph.D., Howard

Stephen Crystal, Distinguished Research Professor; M.A., Ph.D., Harvard

Laura Cuesta, Associate Professor; M.A., Ph.D., Wisconsin (Madison)

Julia Cusano, Assistant Professor of Research; M.S.W., Ph.D., Rutgers

Maxine Davis, Assistant Professor and Chancellor-Provost's Scholar for Inclusive Excellence in Intimate Partner Violence Prevention & Intervention; M.S.W., M.B.A., Dominican, Ph.D., Washington (St. Louis)

Rebecca Davis, Director, Associate Professor of Professional Practice and Director of the Office of Global Social Work Programs; M.S.W., North Carolina (Chapel Hill); Ph.D., North Carolina (Greensboro)

Ryan DiMeglio, Teaching Instructor and Co-Director for the Addiction Counselor Training (A.C.T.) Certificate Program; M.S.W., Rutgers

Richard L. Edwards, Chancellor Emeritus, University Professor, Distinguished Professor and Interim Dean 2023-2024; M.A.S.W., Chicago; Ph.D., SUNY (Albany)

Antoinette Y. Farmer, Professor, Associate Dean for Diversity, Equity and Inclusion and Interim Associate Dean for Academic Affiars; M.S., Ph.D., Pittsburgh

Adrian Gale, Assistant Professor; M.S.W., Ph.D., Michigan

E. Goldblatt Hyatt, Associate Professor of Professional Practice for Reproductive Justice and Director of the Doctoral (D.S.W.) Program; ;M.B.E., M.S.W., D.S.W., Pennsylvania

Emily Greenfield Cohen, Professor and Director of the Hub for Aging Collaboration; M.S., Ph.D., Wisconsin (Madison)

Anna Haley, Associate Professor; M.A., Ph.D., Chicago

Caroline Harmon-Darrow, Assistant Professor; M.S.W., Ph.D., Maryland (Baltimore)

Bernardo Hiraldo, Assistant Teaching Professor and Associate Director of Practicum Learning and Camden Campus Coordinator; M.S.W., New York

Chien-Chung Huang, Professor and Associate Dean for Faculty Development; M.S.W., Chung-Cheng (China); Ph.D., Columbia

Tawanda L. Hubbard, Associate Professor of Professional Practice; M.S.W., D.S.W., Rutgers

Amml F. Hussein, Associate Professor of Teaching, M.S.W., Rutgers, Ed.D., East Stroudsburg

Ashley Jackson, Assistant Professor; M.S.W., Chicago, Ph.D. Washington (St. Louis)

Rachel John, Assistant Professor and Chancellor-Provost's Scholar for Inclusive Excellence for Immigrant and Refugee Health;M.S.W., Pennsylvania, M.P.H., Drexel, Ph.D., Boston

Michael Myungkook Joo, Associate Professor; M.S.W., South Carolina; Ph.D., Washington (St. Louis)

Woojin Jung, Assistant Professor; M.S.W., Washington (St. Louis); Ph.D., California (Berkeley)

Christine E. Kephart, Writing Instructor, D.S.W. Program; M. Phil. Eng. Lit., Ph.D., Drew

Rupa Khetarpal, Associate Professor of Teaching and Director of the Interpersonal Violence & Trauma (I.V.T.) Certificate Program; M.A., Jadavpur (India); M.S.W., Rutgers

Joy Jeounghee Kim, Associate Professor; M.S.W., South Carolina; Ph.D., Washington (St. Louis)

Mark W. Lamar, Associate Professor of Professional Practice and Executive Director, Practicum Learning ; M.S.W., M.B.A., Rutgers

George S. Leibowitz, Dean and Distinguished Professor; M.S.W., Ph.D., Denver

Jack Lewis, Associate Professor of Professional Practice and Director of the Intensive Weekend Program; M.S.W., D.S.W., Pennsylvania

Jamey Lister, Associate Professor; M.S.W., Michigan; Ph.D., Rutgers

Angela Malorni, Assistant Professor; M.S.W., M.P.A., Ph.D., Washington

Katherine Marçal,, Assistant Professor, M.S.W., Ph.D.,Washington (St. Louis)

Judith McCoyd, Associate Professor and Associate Director of Doctoral Programs; M.S.W., Columbia; Ph.D., Bryn Mawr College

Sarah McMahon, Professor and Director, Center for Research on Ending Violence and Special Advisor to the president for sexual misconduct prevention and response; M.S.W., Ph.D., Rutgers

Christine Morales, Assistant Professor of Teaching and Assistant Dean of Lecturer Support; M.S.W., Southern California; Ed.D., Rutgers

Cory Morton, Assistant Research Professor: M.S.W., East Tennessee State, Ph.D., Rutgers

Felix Muchomba, Associate Professor; M.P.H., Ph.D., Columbia

Lenna Nepomnyaschy, Professor; M.S.W., Rutgers; Ph.D., Columbia

Lia Nower, Distinguished Professor and Associate Dean for Research, Director, Center for Gambling Studies and Co-Director of Addiction Counselor Training Certificate Program; J.D., St. Louis; Ph.D., Washington

Margaret O' Donoghue, Assistant Professor of Professional Practice and Director of the Certificate on Child Well-Being (C.H.A.P.) Program; M.S.W., Hunter, Ph.D., New York

Michael Park, Assistant Professor and Chancellor-Provost's Scholar for Inclusive Excellence in Racial Minority Health; M.S., Ph.D., Chicago

N. Andrew Peterson, Distinguished Professor and Director of the Center for Prevention Science; M.A., Ph.D., Missouri (Kansas City)

Cathryn C. Potter, Dean Emerita and Distinguished Professor; M.S.W., Washington; Ph.D., Denver

Kristen Gilmore Powell, Associate Research Professor and Associate Director, Center for Prevention Science and Director of the Northeast & Caribbean Prevention Technology Transfer Center; M.S.W., Ph.D., Rutgers

Chiara Sabina, Associate Professor and Associate Director, Center for Research on Ending Violence and Chancellor's Scholar for Inclusive Excellence in Interpersonal Violence Research; M.A., Ph.D., Loyola (Chicago)

Raymond Sanchez Mayers, Professor Emeritus ; M.S.W., Barry; Ph.D., Brandeis

Tangela Sawyerr, Assistant Teaching Professor and Assistant Director of Student Affairs (Camden); M.S.W., M.A. in Criminal Justice and D.S.W., Rutgers

Nancy Schley, Assistant Professor of Teaching and Associate Director of Practicum Learning; M.S.W., Columbia

Gina L. Sharpe, Assistant Professor of Teaching and Assistant Director, Continuing Education; M.S.W., New York

Cassandra Simmel, Associate Professor and Director of the Ph.D. Program; M.S.W., Ph.D., California (Berkeley)

Karun Singh, Professor of Teaching; M.S.W., Ph.D., Columbia

Lauren Snedeker, Assistant Professor of Teaching and Director of the Aging and Health (A&H) Certificate Program; M.S.W., New York, D.S.W., Rutgers

Jackie Stanmyre, Research Associate and Assistant Director of the Center for Gambling Studies; M.S.W., Rutgers

Amy Strickler, Assistant Professor of Teaching and Assistant Director, Intensive Weekend Program; M.S.W., Columbia

Trinay V. Thomas, Assistant Professor of Teaching, Associate Director of Practicum Learning and Newark Campus Coordinator; M.S.W., Rutgers

Emmy Tiderington, Associate Professor; M.S.W., Michigan (Ann Arbor); Ph.D., New York

Mark van der Maas, Assistant Professor; M.A., Ph.D., Toronto

Grant Victor, Assistant Professor; M.S.W., Ph.D., Kentucky

Abigail Williams, Assistant Professor; MA., M.S.W., Illinois (Urbana-Champaign); Ph.D., Michigan

Allison Zippay, Professor and Director, Center for Leadership and Management; M.S.W., Ph.D., California (Berkeley)

Karen Zurlo, Associate Professor; M.B.A., M.S.W., Ph.D., Pennsylvania

# History of the School (ENG)

## HISTORY OF THE SCHOOL

Instruction in engineering began at Rutgers in 1864, when the State of New Jersey designated the Rutgers Scientific School as the State College for the Benefit of Agriculture and Mechanic Arts. The College of Engineering was established as a separate entity in 1914. In 1999, the name was changed to the School of Engineering to reflect the comprehensive nature of its programs, including undergraduate education, graduate education, state-of-the-art research, and public service. Today instruction and research are provided at the bachelor of science (B.S.), master of science (M.S.) and master of engineering (M.E.), and doctor of philosophy (Ph.D.) levels.

# Mission Statement of the School (ENG)

## MISSION STATEMENT OF THE SCHOOL

**Educate and train the future engineers for a complex, diverse, and global workplace.**

- Provide innovative, high-quality, relevant education to undergraduate and graduate students using the latest technology and educational techniques.
- Engage a diverse student body that exemplifies the core values of an engineering education for the purpose of improving and developing systems that solve complex problems and improve quality of life.

**Conduct state-of-the-art and relevant research that embraces technology to address societal challenges of a multifaceted United States and a globally connected world.**

- Conduct cutting-edge research in strategically important engineering areas.
- Create an environment to encourage and assist faculty to become research leaders in their fields, gaining further national and international recognition.

**Serve as a resource to local, state, and regional stakeholders to advance the public interest.**

- Promote economic development through technology, entrepreneurship, and innovation.

# Accreditation (ENG)

## ACCREDITATION

Four-year undergraduate curricula leading to the degree of bachelor of science are offered in the fields of aerospace engineering, environmental engineering (joint degree with SEBS), biomedical engineering, chemical engineering, civil engineering, electrical and computer engineering, industrial engineering, materials science and engineering, and mechanical engineering. These curricula are accredited by the Engineering Accreditation Commission of ABET. In addition, a flexible four-year curriculum in applied sciences in engineering is administered by an interdepartmental committee. The field of applied sciences in engineering is not a professional engineering curriculum and is not subject to ABET accreditation.

Numerous areas of concentration are available within these disciplines, such as biochemical engineering, financial engineering, communications, computer engineering, pharmaceutical engineering, energy systems, and packaging engineering. Five-year, dual-degree programs are offered by the School of Engineering in cooperation with the School of Arts and Sciences. This program leads to a bachelor of science (B.S.) degree in any of the engineering fields listed above, and a bachelor of arts (B.A.) or a B.S. degree from the School of Arts and Sciences in any of its majors.

Finally, the School of Engineering welcomes transfer students to our community of learning and engagement. If you've attended a college or university after graduating from high school, you are considered as a transfer student. Each year, the school admits transfer students from other schools within Rutgers as well as colleges/universities in the United States and around the world. Please keep in mind that the School of Engineering is a full-time day program. You are expected to be a full-time student. Only if there are extenuating circumstances may our students request to be part-time students.

# Learning Goals of the School (ENG)

## LEARNING GOALS OF THE SCHOOL

The undergraduate curricula at the School of Engineering are designed as such that the students are expected to attain by the time of graduation

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;

2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors;
3. an ability to communicate effectively with a range of audiences;
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts;
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions; and
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

# The Engineering Profession (ENG)

## THE ENGINEERING PROFESSION

Engineering is a profession in which a knowledge of the mathematical and natural sciences, gained by study, experience, and practice, is applied to develop ways to use the materials and forces of nature economically for the benefit of humanity.

Engineering touches every phase of modern life. It extends human physical power through machines; human reasoning power through computers; and human powers of observation through instruments, enabling people to explore the tiniest microscopic structure or the far reaches of the universe. It creates vehicles to move people rapidly and safely to all parts of the earth and into the space surrounding it. It makes possible complex production and distribution systems for providing ample food to urban populations. It permits rapid communication of information among people throughout the world. It has given people great power to control their environment and, with this power, the responsibility to control it wisely. It has provided people with the most sophisticated art form, the art of engineering design.

# Administration (ENG)

## ADMINISTRATION

Alberto Cuitiño, Dean

Susan Kilduff, Vice Dean for Administration and Planning

Peng Song, Associate Dean for Undergraduate Education

Wade Trappe, Associate Dean for Academic Programs

**UNDERGRADUATE EDUCATION**

Ilene Rosen, Associate Dean for Student Services

Jean Patrick Antoine, Assistant Dean and Director of Honors Academy

Michael Brown, Assistant Dean and Director of Educational Opportunity Fund

Philip Brown, Associate Professor, Engineering Education

Jesenia Cadena, Assistant Dean, First Year Students

Priscilla Calderon, Assistant Dean, Academic services

Robert Ciervo, Assistant Dean, Transfer Services

Aiesha Long, Assistant Dean, Academic Services

Arron Rodriguez, Assistant Dean, Outreach & Engagement

Candiece White, Assistant Dean, Educational Opportunity Fund

# Faculty (ENG)

## FACULTY

Faculty (ENG)

## Department of Biomedical Engineering

## Department of Biomedical Engineering

**Chair:** David Shreiber

**Professors:**

Ioannis P. Androulakis, B.S., Athens; M.S., Ph.D., Purdue

Francois Berthiaume, Ph.D., Pennsylvania State

Nada Boustany, Ph.D., Massachusetts Institute of Technology-Harvard

Helen M. Buettner, B.S., Minnesota; Ph.D., Pennsylvania

Li Cai, Ph.D., University of Medicine and Dentistry of New Jersey

Gary M. Drzewiecki, Ph.D., Pennsylvania

Joseph Freeman, Ph.D., Rutgers

Noshir A. Langrana, B.E., Bombay; M.S., Ph.D., Cornell

John K-J Li, Ph.D., Pennsylvania

Adrian Mann, D.Phil., Oxford

Prabhas V. Moghe, B.S., Bombay; Ph.D., Minnesota

Charles M. Roth, B.S.E., Pennsylvania; Ph.D., Delaware

Troy Shinbrot, B.A., Ph.D., Maryland

George K. Shoane, Ph.D., California (Berkeley)

David I. Shreiber, Ph.D., Pennsylvania

Maribel Vazquez, Sc.D., Massachusetts Institute of Technology

Martin L. Yarmush, B.S., Yeshiva; M.D., Yale; Ph.D., Rockefeller; Ph.D., Massachusetts Institute of Technology

Jeffrey D. Zahn, Ph.D., California (Berkeley)

**Associate Professors:**

Biju Parekkadan, Ph.D., Massachusetts Institute of Technology-Harvard

Mark Pierce, Ph.D., Manchester

**Associate Teaching Professors:**

Kristen Labazzo, Ph.D., Rutgers

**Associate Research Professors:**

Rene Schloss, Ph.D., Harvard

**Assistant Professors:**

Adam Gormley, Ph.D., Utah

Simiao Niu, Ph.D., Georgia Institute of Technology

Valerie Tutwiler, Ph.D., Drexel University

**Assistant Research Professors:**

Rick Cohen, Ph.D., Rutgers

Anil Shrirao, Ph.D., Rutgers

Faculty (ENG)

# Department of Chemical and Biochemical Engineering

# Department of Chemical and Biochemical Engineering

**Chair:** Helen M. Buettner

**Professors:**

Ioannis P. Androulakis, B.S., Athens; M.S., Ph.D., Purdue

Tewodros (Teddy) Asefa, B.Sc., Addis Ababa (Ethiopia); M.Sc., SUNY (Buffalo); Ph.D., Toronto

Helen M. Buettner, B.S., Minnesota; Ph.D., Pennsylvania

Benjamin J. Glasser, B.Sc., M.Sc., Witwatersrand (South Africa); Ph.D., Princeton

Diane Hildebrandt, B.Sc., M.Sc., Ph.D., Witwatersrand (South Africa)

Prabhas V. Moghe, B.S., Bombay; Ph.D., Minnesota

Fernando J. Muzzio, B.S., Universidad de Mar del Plata (Argentina); Ph.D., Massachusetts

Alexander V. Neimark, M.S., Moscow State; Ph.D., Institute of Chemical Industry (Russia); D.Sc., Moscow State

Henrik Pedersen, B.Ch.E., Rochester; M.S., M.Phil., Ph.D., Yale

Rohit Ramachandran, B.Eng., M.Eng., National University of Singapore; Ph.D., Imperial College (London)

Charles M. Roth, B.S.E., Pennsylvania; Ph.D., Delaware

M. Silvina Tomassone, B.S., Buenos Aires; Ph.D., Northeastern

**Associate Professors:**

Fuat E. Celik, B.S.E., M.Eng., Princeton; Ph.D., California (Berkeley)

Shishir P.S. Chundawat, B.Tech., Institute of Chemical Technology (Mumbai); Ph.D., Michigan State

Meenakshi Dutt, B.S., Delhi; Ph.D., Duke

Nina C. Shapley, A.B., Harvard; Ph.D., Massachusetts Institute of Technology

George Tsilomelekis, B.S., M.Sc., Ph.D., Patras (Greece)

Haoran Zhang, B.S., M.S., Xiamen (China); Ph.D., Tufts

**Assistant Professors:**

Gregory Dignon, B.S., Rensselaer Polytechnic Institute; Ph.D., Lehigh

Ashley Z. Guo, B.S., Caltech; Ph.D., Chicago

Benjamin S. Schuster, B.S., Minnesota; Ph.D., Johns Hopkins

**Assistant Teaching Professor:**

Nicholas J. Corrente, B.S., Seton Hall; B.S., New Jersey Institute of Technology; M.S., Rutgers

# Department of Civil Engineering

# Department of Civil Engineering

**Chair:** Nenad Gucunski

**Professors:**

Perumalsamy N. Balaguru, B.S., Madras (India); M.S., Indian Institute of Science; Ph.D., Illinois (Chicago)

Nenad Gucunski, B.S.E., Zagreb (Croatia); M.S.E., Ph.D., Michigan

Qizhong Guo, B.S., Tianjin (China); M.S., Ph.D., Minnesota; P.E.

Ali Maher, B.S., Michigan; M.S., Northeastern; M.S., Ph.D., Michigan

Franklin Moon, B.S., M.C.E., Delaware; Ph.D., Georgia Tech

Husam S. Najm, B.E., AUB (Lebanon); M.S., Michigan State; Ph.D., Michigan; PE, SE

Hani A. Nassif, B.S., M.E., Detroit; Ph.D., Michigan; P.E.

Trefor P. Williams (Emeritus), B.S., Syracuse; M.S., Ph.D., Georgia Institute of Technology; P.E.

Yook-Kong Yong, B.S., Lafayette; M.S., Ph.D., Princeton; P.E.

Hao Wang, B.S., M.S., Southeast University (China); M.S., Virginia Tech; Ph.D., Illinois (Urbana-Champaign)

**Associate Professors:**

Monica A. Mazurek, B.S., Ph.D., University of California (Los Angeles)

Nicole Fahrenfeld, B.S., Johns Hopkins; M.S., Clemson; Ph.D., Virginia Tech

Jie Gong, B.S., Shanghai Jiao Tong (China); M.S., Texas Tech; Ph.D., Texas (Austin)

Jing Jin, B.S., Tsinghua (China); M.S., Ph.D., Wisconsin (Madison)

Xiang Liu, B.S., Shanghai Jiao Tong (China); M.S., Ph.D., Illinois (Urbana-Champaign)

Efthymios Nikolopoulos, B.E. Technical University of Crete; M.S., University of Iowa, Ph.D., University of Connecticut

**Assistant Professors:**

Tyler Othes, B.S., UC-Davis; M.S., UC-Davis, Ph.D., UC-Davis

Ruoqian Wang, B.S., Beihang University (China); M.S., Singapore Stanford Partnership; Ph.D., Massachusetts Institute of Technology

# Department of Electrical and Computer Engineering

# Department of Electrical and Computer Engineering

**Chair:** Yingying Chen

**Professors:**

Waheed U. Bajwa, B.E., NUST (Pakistan); M.S., Ph.D., Wisconsin

Aggelos Bletsas, M.Sc. Massachusetts Institute of Technology, PH.D. Massachusetts Institute of Technology

Yingying Chen, B.S., Nanjing (China); M.S., North Carolina State; Ph.D., Rutgers

Kristin Dana, B.S., New York; M.S., Massachusetts Institute of Technology; Ph.D., Columbia

Zoran Gajic, Dipl. Eng., Belgrade (Serbia); M.S., Ph.D., Michigan State

Sasan Haghani, B.Sc., Isfahan (Iran); M.Sc., Ph.D., University of Alberta (Canada).

Mehdi Javanmard, B.S., Georgia Institute of Technology; M.S., Ph.D., Stanford

Shantenu Jha, M.Sc., Indian Institute of Technology; Ph.D., Syracuse

Narayan Mandayam, B.S., Indian Institute of Technology; M.S., Ph.D., Rice

Ivan Marsic, B.S., M.S., Zagreb (Croatia); Ph.D., Rutgers

Laleh Najafizadeh, B.Sc., Isfahan (Iran); M.Sc., Alberta (Canada); Ph.D., Georgia Institute of Technology

Athina Petropulu, Diploma, National Technical University of Athens; M.S., Ph.D., Northeastern

Dario Pompili, Laurea, B.S., M.S., Ph.D., Rome La Sapienza (Italy); Ph.D., Georgia Institute of Technology

Shriram Ramanathan, B.S., IIT Madras, M.S., University of Houston, Ph.D., Stanford

Dipankar Raychaudhuri, B.Tech., Indian Institute of Technology; M.S., Ph.D., SUNY (Stony Brook)

Deborah Silver, B.S., Columbia; M.A., M.S.E., Ph.D., Princeton

Predrag Spasojevic, Diploma Ing., Sarajevo (Bosnia); M.S., Ph.D., Texas A&M

Emina Soljanin, Diploma, University of Sarajevo (Bosnia); M.S., Ph.D., Texas A&M

Wade Trappe, B.A., Texas (Austin); M.S., Ph.D., Maryland

**Associate Professors:**

Salim El Rouayheb, Diploma, Lebanese University; M.S., American University of Beirut; Ph.D., Texas A&M

Umer Hassan, B.S., Lahore: M.S., Ph.D, Illinois

Dov Kruger, B.E. Stevens Institute of Technology, M.S. Stevens Institute of Technology, PhD Stevens Institute of Technology

Anand D. Sarwate, B.S., Massachusetts Institute of Technology; M.S., Ph.D., California (Berkeley)

Matteo Turilli, B.S., University of Amsterdam, (Netherlands), M.S., University of Padua, (Italy), Ph.D., University of Oxford (UK)

Sheng Wei, Ph.D., California (Los Angeles)

Chung-Tse Wu, B.S., National Taiwan; M.S., Ph.D., California

Bo Yuan, B.S, M.S., Nanjing (China); Ph.D., Minnesota

**Assistant Professors:**

Shirin Jalali, B.S., M.S., Sharif University of Technology, M.S., Ph.D., Stanford

Bokyung Kim, M.S. Ewha Womans University, Seoul, South Korea, PH.D. Duke University, Durham, NC

Yao Liu, B.S., Nanjing University, Ph.D., George Mason University

Jorge Ortiz, B.S., Massachusetts Institute of Technology M.S., Ph.D., California (Berkeley)

Maria Striki, Diploma, National Technical University of Athens; Ph.D., Maryland

Guosong Yang, B.S., Hong Kong University of Science and Technology, M.S., Ph.D., University of Illinois

Yuqian Zhang, B.S., Xi'an Jiaotong University, Ph.D., Columbia

Minning Zhu, B.E. Harbin Institute of Technology, M.S. Shanghai University, Ph.D., Rutgers University

**Instructors:**

Demetrios Lambropoulos, B.S. Rutgers University, M.S. Rutgers University

Faculty (ENG)

# Department of Industrial and Systems Engineering

# Department of Industrial and Systems Engineering

**Chair:** Mohsen Jafari

**Professors:**

Melike B. Gürsoy, B.Sc., M.S., Bogazici (Turkey); Ph.D., Pennsylvania

David Coit, B.S., Cornell; M.B.A., Rensselaer Polytechnic Institute; M.S., Ph.D., Pittsburgh

Elsayed A. Elsayed, B.S., M.S., Cairo; Ph.D., Windsor (Canada); P.E.

Mohsen A. Jafari, B.S., M.S., Ph.D., New York

Myong K. Jeong, Ph.D., Georgia Institute of Technology

Tugrul Ozel, B.S., Istanbul Technical (Turkey); M.S., Dokuz Eylol (Turkey); Ph.D., Ohio State

Hoang Pham, B.S., Northeastern; M.S., Illinois; M.S., Ph.D., SUNY

**Associate Professors:**

Weihong (Grace) Guo, B.S., Tsinghua (China); M.S., Ph.D., Michigan

Zhimin Xi, B.S., M.S., University of Science and Technology (China); Ph.D., Nanyang (Singapore), Michigan (Houghton)

**Assistant Professors:**

Ahmed Aziz Ezzat, B.S., M.S., Arab Academy for Science Technology and Maritime Transport (Egypt), Ph.D., Texas A&M

Farzad Yousefian, B.S., M.S., Sharif University of Technology (Iran), Ph.D., University of Illinois (Urbana-Champaign)

**Assistant Teaching Professor:**

Randy A. Reagan, B.S., NJIT, M.S., University of Michigan, M.B.A., New York, Ph.D., New Jersey Institute of Technology

Elin M. Wicks, B.S., M.S., Rutgers; Ph.D., Virginia Tech

Faculty (ENG)

# Department of Materials Science and Engineering

# DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

**Chair:** Richard L. Lehman

**Professors:**

Glenn Amatucci, B.S., M.S., Ph.D., Rutgers

Dunbar P. Birnie III, B.S., Ph.D., Massachusetts Institute of Technology

Stephen H. Garofalini, B.S., B.A., Rutgers; M.S., Washington; Ph.D., Stanford

Richard A. Haber, B.S., M.S., Ph.D., Rutgers

Lisa C. Klein, S.B., Ph.D., Massachusetts Institute of Technology

Richard L. Lehman, B.S., M.S., Ph.D., Rutgers

Adrian Mann, B.Sc., M.Sc., Nottingham (UK); D.Phil., Oxford

M. John Matthewson, B.S., M.A., Ph.D., Churchill College (UK)

Richard E. Riman, B.S., Rutgers; Ph.D., Massachusetts Institute of Technology

Ahmad Safari, B.S., M.S., Tabriz (Iran); Ph.D., Pennsylvania State

Thomas Tsakalakos, B.S., Athens; Ph.D., Northwestern

John Wenzel, B.S., Stanford; Ph.D., Chicago

**Associate Professors:**

Laura Fabris, B.S., M.S., D.Sc., Padua (Italy)

Deirdre M. O'Carroll, B.E., Ph.D., Cork (Ireland)

**Assistant Professors:**

Ashutosh Goel, Ph.D., Aveiro (Portugal)

Ryan Sills, B.S., M.S., Ph.D., Stanford

**Assistant Teaching Professor:**

Koray Akdogan, B.S., M.S., METU (Turkey); M.S., Ph.D., Rutgers

**Research Professors:**

Philip Batson, Ph.D., Cornell

Jennifer Lynch, B.S., Washington & Lee; Ph.D., Rutgers

Thomas Nosker, B.S., Georgia Institute of Technology; Ph.D., Rutgers

Faculty (ENG)

# Department of Mechanical and Aerospace Engineering

# DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

**Chair:** Assimina Pelegri

**Professors:**

Prosenjit Bagchi, B.E., Jadavpur (India); M.E., Indian Institute of Technology; Ph.D., Illinois (Urbana-Champaign)

Haim Baruh, B.S., Bogazici (Turkey); M.S., Ph.D., Virginia Tech

Haym Benaroya, B.E., Cooper Union; M.S., Ph.D., Pennsylvania

William J. Bottega, B.E., CUNY (City College); M.S., Cornell; Ph.D., Yale

Alberto Cuitiño, Civil Eng., University of Buenos Aires (Argentina); M.S., Ph.D., Brown

Philip Demokritou, Ph.D., National Technical University of Athens

Mitsunori Denda, B.E., M.E., Kyoto; M.S., Ph.D., Harvard

F. Javier Diez-Garias, B.S., M.S., Saint Louis; Ph.D., Michigan (Ann Arbor)

Ellis H. Dill, B.S., M.S., Ph.D., California (Berkeley)

German Drazer, Ph.D., National University of Cuyo (Argentina)

Hae Chang Gea, B.S., National Taiwan; M.S., Southern California; Ph.D., Michigan (Ann Arbor)

Yuebin Guo, B.S., Shandong University (China), M.S., Tsinghua (China); M.E., California (Berkeley); Ph.D., Purdue

Zhixiong (James) Guo, B.S., M.S., Beijing; Ph.D., Polytechnic University of New York

Yogesh Jaluria, B.S., Indian Institute of Technology; M.S., Ph.D., Cornell

Doyle D. Knight, B.A., Occidental College; B.S., M.S., Ph.D., California Institute of Technology

Noshir A. Langrana, B.E., Bombay; M.S., Ph.D., Cornell; P.E.

Hao Lin, B.S., Peking; Ph.D., California (Berkeley)

Liping Liu, Ph.D., Minnesota (Twin Cities)

Michael R. Muller, B.S., Rochester; M.S., Ph.D., Brown

Andrew N. Norris, B.S., M.S., National University of Ireland; Ph.D., Northwestern

Assimina A. Pelegri, Diploma, National Technical University of Athens (Greece); M.S., Ph.D., Georgia Institute of Technology

Jerry Shan, B.S., M.S., Ph.D., California Institute of Technology

Stephen D. Tse, B.S.E., Princeton; M.S., Ph.D., California (Berkeley)

George J. Weng, B.S., National Taiwan; M.Phil., Ph.D., Yale

Jingang Yi, B.S., Zhejiang (China); M.E., Tsinghua (China); M.A., Ph.D., California (Berkeley)

Qingze Zou, Ph.D., Washington (Seattle)

**Associate Professors:**

Xiaoli Bai, Ph.D., Texas A&M

Onur Bilgen, Ph.D., Virginia Tech

Kimberly Cook-Chennault, B.S.E., Michigan; M.S.E., Stanford; Ph.D., Michigan

Aaron Mazzeo, Ph.D., Massachusetts Institute of Technology

Rajiv Malhotra, Ph.D., Northwestern

Jonathan Singer, Ph.D., Massachusetts Institute of Technology

**Assistant Professors:**

Laurent Burlion, Ph.D., University of Paris Sud

Edward DeMauro, Ph.D., Rensselaer Polytechnic Institute

Amin Reihani, Ph.D., University of Michigan

**Assistant Teaching Professors:**

Xi Gu, Ph.D., Michigan

Jennifer Lynch, Ph.D., Rutgers

Annalisa Scacchioli, Ph.D., University of L'Aquila (Italy)

**Associate Research Professor:**

Gerardo Callegari, Ph.D., University of Buenos Aires (Argentina)

# Labs and Facilities (ENG)

## LABS AND FACILITIES

The facilities of the School of Engineering for laboratory instruction and other services are housed in buildings on the Busch campus, except for the laboratories of the program in bioenvironmental engineering, which are located on the George H. Cook campus. The Engineering Center on Busch campus contains spacious quarters for instruction and research in the fields of biomedical, chemical and biochemical, civil and environmental, electrical and computer, industrial and systems, materials science and engineering, and mechanical and aerospace engineering. The following summary of laboratories and equipment is organized by department.

- Biomedical Engineering
- Chemical and Biochemical Engineering
- Civil and Environmental Engineering
- Electrical and Computer Engineering
- Environmental Engineering
- Industrial and Systems Engineering
- Materials Science and Engineering
- Mechanical and Aerospace Engineering

- Computers
- Libraries

# Biomedical Engineering (ENG)

## Biomedical Engineering

***BME Teaching Facility.*** The first floor of the Biomedical Engineering (BME) building is designated for the classrooms and teaching laboratory space. This facility serves as the focus of biomedical engineering educational and training activities on the Rutgers campus. The first floor occupies an auditorium and classroom facilities for student instruction, teaching laboratories in molecular and cell biology, biomechanics, and bioinstrumentation, student computer laboratories, and student reading room and student society room.

***BME Research Facilities.*** Biomedical engineering has research facilities located on the second and third floors. Each floor contains three self-contained tissue culture rooms. Each room is equipped with four temperature controlled water-jacketed incubators, three biosafety cabinets, a refrigerator/freezer, a tabletop centrifuge, an inverted microscope, an upright microscope, and a water bath.

In addition, the lab is equipped with inverted and upright microscopes, a digitized fluorescence microscopy station, a fluorescence activated cell sorter, an autoclave, and cryopreservation facilities. A confocal microscope, housed in the basement of the building is also available for our experimental use. The cell and tissue engineering laboratory is thus suitable for mammalian tissue culture, cell function analysis, cell separation, and protein expression evaluation. The cell and tissue analysis and characterization lab contains a full complement of biochemical and molecular biological equipment including vertical and horizontal gel boxes, power supplies, a spectrophotometer, a gel imaging and analysis workstation, several microcentrifuges, a -80°C freezer, and all necessary biochemicals and electrophoresis supplies needed for protein and nucleic acid separation and analysis. This facility also contains three biosafety cabinets and a light cycler for nucleic acid isolation, purification, amplification, and general PCR technology. In addition, a separate bacterial culture and analysis laboratory contains a bacterial culture incubator, independent centrifuges, and electrophoresis gel boxes. These laboratories are thus equipped for dynamic evaluation of cells and tissues from the macroscopic and microscopic levels to molecular analysis of protein and gene expression.

***Optical Imaging and Microscopy Laboratories.*** The lab has optical coherence tomography and laser scanning confocal microscopy instruments which can be customized for imaging *in vivo* or *ex vivo* cells and tissues. The lab is equipped with an 8' x 4' vibration isolated optical table, four networked PCs, a fiber-optic polisher, and general purpose test and measurement equipment including power supplies, a function generator, and an oscilloscope. The lab is also equipped with an inverted microscope, Zeiss Axiovert 200M with DIC 63x NA 1.4 oil, and 20x NA 0.75, Phase 40, 20, 10x and Fluorescence: FITC/GFP, TRITC, YFP, DAPI capabilities. The microscope has also been customized for central dark field/optical scatter imaging for sizing and morphological assessment.

***BioMEMS and Microfabrication Laboratory.*** This laboratory integrates micro- and nanotechnology within various engineering disciplines with life sciences and medical applications, which are rapidly converging to spawn new platforms for point-of-care diagnostics, biomedical imaging, and regenerative therapies, creating a highly technical and thoroughly collaborative biomedical engineering environment. The laboratory supports research, training, and

education to prepare the next generation of scientists and engineers. It maintains a fully equipped 1,000-square-foot clean room microfabrication facility housed within the BME building with photolithography, physical vapor deposition, plasma etching, and other capabilities.

***Stem Cell Biology and Bioengineering Laboratory.*** This laboratory is equipped for all cellular, histological, and molecular recombinant DNA techniques, with a dedicated microscope room for imaging analysis. A modern animal facility is available in the basement of the BME building for rodent animal model research. It is equipped with surgical areas and a biosafety cabinet. Major equipment items include: PCR machine for recombinant DNA applications; BTX ECM 830 electroporator for in vivo/ovo electroporation experiments; Thermo 620E cryostat for tissue sectioning; fluorescence stereomicroscope (Leica M16FA); injection station for mouse and chick embryos; epifluorescence upright microscope (Zeiss Axio Imager M1) for image data analysis.

# Chemical and Biochemical Engineering (ENG)

## Chemical and Biochemical Engineering

The department's instructional laboratories for chemical engineering majors contain modern analytical instruments and process engineering apparatus. Most equipment, such as the computer-coupled, closed-loop, continuous-flow distillation unit, features advanced microprocessor design, representing the state-of-the-art in automation.

As a special feature, the department's research equipment is available for students conducting undergraduate research, whether by individual arrangement or through programs such as the Chemical and Biochemical Engineering Research Scholars Academy and the James J. Slade Scholars Program. The impetus for this unique offering stems from the department's strong commitment to research and its active involvement with sponsored research projects at the university and state high-tech centers. Research is in such areas as advanced materials, bioengineering and biotechnology, sustainable energy and biofuels, process systems engineering, kinetics and catalysis, pharmaceutical engineering, and polymer science.

The department's major instructional laboratories include a chemical process engineering laboratory, a biochemical engineering laboratory, and pharmaceutical engineering laboratories.

The ***Chemical-Process Engineering Laboratory*** is devoted to the study of chemical reactions and physical phase separations for multicomponent systems. Typical apparatus includes distillation, gas absorption, liquid extraction, wiped-film evaporation, falling-film evaporation, and computer-coupled process control units. Special devices are used for the study of fluid flow in pipe systems and heat transfer in heat exchangers. Analyses of changes in chemical compositions are aided by gas chromatographs, UV and IR spectrophotometers, refractometers, and many other modern analytical instruments.

The department's ***Biochemical Engineering Laboratory*** is devoted to the study of biochemical engineering processes and the detection and separation of biospecies resulting from these bioprocesses. Specific experiments in enzyme and fermentation kinetics, for batch and continuous systems, are provided. This fully equipped biolaboratory contains a wide range of analytical instruments and specialized devices, including a Pharmacia Fine-Chemicals microprocessor-controlled and automated liquid chromatograph analyzer, and a computer-coupled BIOFLOW III fermentor system.

The ***Reaction Engineering Laboratory*** contains custom built quartz tube reactors with attached Raman, UV, and IR spectrophotometers for *in situ* measurements. Gas and liquid chromatography are also available. For synthetic work, there is a wide range of synthetic equipment to prepare various nanostructured materials, catalysts, and electrocatalysts. It includes rotovaps, vacuum lines, centrifuges, ultrasonicators, ovens, tube furnaces, and oven furnaces.

The ***Soft Materials Characterization Laboratory*** contains various equipment, especially for particle synthesis and characterization, including an optical microscope, UV/Vis spectrophotometer, benchtop Nutsche filter, and Abbe refractometer, as well as syringe pumps, filters, blenders, and homogenizers. There is additional catalyst manufacturing equipment, such as impregnators, and drying equipment. There also is a facility for the investigation of theoretical properties of polymers and soft materials by thermodynamics and statistical mechanics and other methods, and for computer modeling of their behavior.

The ***Pharmaceutical Engineering Laboratories*** are environmentally controlled and capable of reproducing moisture and temperature conditions used in pharmaceutical manufacturing. In total, these modern facilities contain over 20 laminar flow hoods, three temperature and humidity-controlled rooms, and laboratory bench space designed for both small and large equipment and instruments. Equipment that relates to the synthetic production and purification of active pharmaceutical ingredients include stirred tanks, crystallizers, granulators, a rotating fluidized bed coater, dryers, a wipe-film evaporator, batch distillation column, liquid-liquid extractors, and a Particle Imaging Velocimeter/Laser-Induced Fluorometer. The research facility currently contains extensive solids-processing equipment used by major pharmaceutical, food, and agrochemical companies for the formulation of new products. This combination of equipment is rare in educational engineering programs. For example, the program currently owns a pan-coater, two tablet press, mills, fluidized-bed equipment, and essentially every category of powder blenders used in the industry, including a five-cubic-foot capacity ribbon blender and a 10-cubic-foot capacity bin blender. The Continuous Pharmaceutical Advanced Manufacturing Laboratory is a fully integrated, control-enabled, commercial-scale pilot plant for continuous manufacturing. This facility is the only one of its kind at a university anywhere in the world and has served as a model for numerous commercial facilities around the world.

# Civil and Environmental Engineering (ENG)

## Civil and Environmental Engineering

The curriculum requires that all students obtain firsthand experience in the use of a wide range of modern experimental equipment. The purpose of the laboratory instruction is to complement the theoretical and analytical coursework and to verify the fundamentals learned in the courses. The department's laboratory facilities are located in the Civil Engineering Laboratory Building and the Civil Engineering Building, which are equipped to carry out a broad spectrum of sophisticated research and instruction in virtually all aspects of civil engineering.

***Visualization and Building Information Modeling (BIM) Laboratory.*** The Building Information Modeling (BIM) Laboratory is a computational laboratory that provides a network of advanced graphic workstations and a full suite of building and infrastructure modeling, remote sensing data analysis, energy simulation, data mining, and software development software packages to both graduate and undergraduate students for learning computational tools that will be indispensable to their future career. The laboratory allows the students to design and engineer building

and infrastructure systems in a highly collaborative and interactive manner and to analyze their performance as it provides the basic network structure for data synchronization and information sharing. The laboratory will also provide continued education opportunities related to BIM to the general public.

***Computing Laboratory.*** Undergraduates use this facility extensively for course and laboratory work and computer graphics. The laboratory is equipped with the latest personal computers. Several software packages are available for computer-aided design, construction engineering, geotechnical engineering, structural engineering, and water resources. The laboratory is updated continually as computer technology advances.

***Concrete Materials Laboratory.*** This laboratory has facilities for instrumentation and testing for failure of reinforced and prestressed long-span beams, columns, connections, and large-panel slabs. The equipment includes a 1,000,000 lb. capacity compression tester; a 650,000 lb. capacity girder and frame tester for testing simple and continuous girders; a 350,000 lb. capacity slab, pipe, and frame tester; two Hewlett-Packard 100-channel data acquisition and processing systems; a 20 x 25-foot temperature- and humidity-controlled environmental chamber; and facilities for rapid freezing and thawing tests.

***Environmental Engineering Laboratory.*** This laboratory is equipped for performing the analysis of water and wastes and the unit processes associated with treatment. Molecular level and advanced analytical chemical measurements are available for complex environmental samples, including water and air matrices. The microbiological equipment includes a cell homogenizer for DNA extraction, quantitative PCR (qPCR), PCR, fluorescent microscope, microcentrifuge, electrophoresis equipment, gel imager, constant-temperature water baths, incubators, and laminar flow hoods. Analytical chemistry equipment includes an FTIR-microscope, high-pressure liquid chromatograph (HPLC) with UV detection, a total carbon/total nitrogen analyzer, pH meters, field meters for conductivity/pH/ORP, chemical fume hood, drying and annealing ovens, centrifuge, mixing devices, chemical metering pumps, spectrophotometers (including Hach), and turbimeters. A variety of field sampling equipment, devices to simulate unit processes (e.g., jar test, annular biofilm reactor, sunlight simulator), and refrigerated storage is available.

***Large-Scale Structures Laboratory.*** This laboratory features a 25 x 50-foot reaction floor having tie-down points designed to resist uplift forces of 30 kips each. A five-ton bridge crane spans the floor. "Erector set"-type fixtures are utilized to provide maximum flexibility for testing a variety of full-scale structural components. Hydraulic jacks with capacities of up to 100 tons are available for application of structural loads. An MTS Closed Loop Electrohydraulic Test System capable of more than 125,000 lb. of force and velocities of up to 350 in. per minute is available for the application of dynamic and repeated loads.

***Soil Mechanics Laboratory.*** This laboratory contains up-to-date equipment for the performance of soil identification and classification tests and for the determination of physical, hydraulic, and mechanical properties. The equipment includes standard as well as back-pressured consolidometers; direct, triaxial, and laboratory vane shear strength devices; and various permeameters. An automatic triaxial testing system also is available.

***Solid Mechanics Laboratory.*** This laboratory is equipped to determine the strength and physical properties of engineering materials. There are universal testing machines, with a maximum capacity of 60,000 lb. for tension and compression tests; a torsion machine; Brinell and Rockwell hardness testers; an impact machine; beam-testing rigs; and strut buckling apparatus.

***Sustainable Infrastructure Laboratory.*** This laboratory is equipped to perform field evaluation of infrastructure and geotechnical systems. The infrastructure evaluation is supported by a wide range of nondestructive evaluation (NDE) equipment: from acoustic and electrical to electromagnetic and electrochemical systems. The geotechnical system evaluations concentrate on studying wave propagation characteristics through soil and rock, the basic dynamic properties of particulate materials, and the interaction between foundation structures and underlying soils. A cross-hole apparatus are available for subsurface investigation.

***Urban and Coastal Water System Laboratory (Fluid Mechanics Lab, Hydro-environmental Informatics Lab).*** Urban and Coastal Water System Laboratory, consisting of fluid mechanics lab and hydro-environmental informatics lab, is dedicated to addressing water resources engineering challenges through fundamental and applied research taking the advantage of our advanced lab, field, and computational facilities. The Fluid Mechanics Lab is equipped with a hydraulic, wave, and sediment flume, hydrology apparatus, volumetric hydraulic benches with a variety of experimental modules, various field flow and water quality monitoring devices, and a stormwater green infrastructure testing platform. The Hydro-environment Informatics Lab houses environmental modeling and informatics facilities with access to the leading-edge computational clusters, a real-time environment monitoring center, and a sensor fabrication space with testing equipment.

# Electrical and Computer Engineering (ENG)

## Electrical and Computer Engineering

***Departmental Computer Facilities.*** The Department of Electrical and Computer Engineering has three computer labs available at all times to students studying electrical and computer engineering. The EE103/EE105 computer labs have 63 PCs with two printers. Each PC has both Windows 10 and Linux operating systems. The EE219 VLSI computer lab is also open to all students at all times. The software installed on each computer includes PSpice for circuit design and simulation, Matlab for mathematical programming, Visual Studio for programming languages including C, C++ and Java. Microsoft Office is available for writing lab reports, homework, and research papers. VLSI design software from both Cadence and Synopsys is available on each computer for designing integrated circuits. The Eclipse software workbench with the Android software development kit is available for programming mobile apps on cellphones. National Instruments LabView with the modulation toolkit is installed for communications students to program software programmable radios. More specialized instructional labs associated with the digital signal processing (DSP), virtual reality, and VLSI design classes also have dedicated computer lab rooms.

*Teaching Labs:*

***Computer Architecture Laboratory.*** This laboratory consists of experimental stations that provide students with opportunities to gain experience with the internal workings of a microcomputer, learn assembly programming for a standard commercial microprocessor, and learn how to interface input/output memory, serial I/O, and parallel I/O chips to a standard microprocessor.

***Digital Logic Design Laboratory.*** This laboratory provides practical experience with the design and hardware implementation of digital circuits for sophomore students. The laboratory is based on the understanding of basic waveforms to simulate and debug a circuit that is then implemented in hardware using SSI and MSI ICs. The experiments cover all the relevant topics about combinational and sequential logic with circuits of increasing complexity.

***Electronics Laboratory.*** This laboratory contains equipment for the study of solid-state devices and circuits. Experiments involve studies of biasing and low-frequency operations of discrete solid-state devices, frequency response, and the effect of feedback on single- and multistage BJT and MOSFET amplifiers. Further studies include OP-AMP parameters, frequency response, and OP-AMP linear and nonlinear circuits and systems. The laboratory is well equipped for a range of student projects in electronic circuit designs.

***Embedded System (FPGA).*** The Embedded System laboratory provides opportunities for the students to gain hands on exercises in building embedded systems. The laboratory is equipped with Altera DE2-115 FPGA boards and computer work stations to train students with skills required for modeling and implementing embedded systems.

***Power Electronics Laboratory.*** This laboratory provides opportunities for students to gain hands-on experiences with devices and circuits used in power electronics applications. Students become familiar with the practical aspect of various topics including modern power semiconductor devices, power inductor design, thermal management methods, power rectification, and DC/DC converter design.

***Software-Defined Radio Instructional Laboratory.*** This laboratory is available for undergraduate and graduate instruction and special projects. National Instruments-funded software-defined radio stations operating Universal Software Radio Peripherals and LabView programming software provide flexibility in the design and analysis of various real-time end-to-end algorithms. Experiments in digital communications introduce students to design and testing of the basics as well as radio frequency phenomena. The setup provides opportunities for advanced capstone project designs involving analog filtering (National Instrument's my-DAQs) as well as human-computer interfaces (Microsoft Kinect).

***Solid-State Electronics Laboratory.*** In addition to the facilities provided by the Micro-nanofabrication and Characterization Facility, facilities exist for the study of microwave devices; high-current switching devices; electro-optical modulation; heterojunction lasers; and electrical characterization of materials, as well as their use in communications, different solar cells, and related devices.

In addition to the above-mentioned laboratories, students interested in special projects in electrical and computer engineering may take advantage of the many well-equipped, faculty-supervised research laboratories, available in such specialties as robotics, computer graphics, computer database design, speech processing, image processing, machine vision, and software engineering.

***Research Labs:***

***Cyber Physical Systems Laboratory (CPS Lab***). The Cyber Physical Systems Laboratory's (CPS Lab) overarching mission is to propose novel sensing paradigms to transform raw sensed heterogeneous data into valuable information (by giving semantic meaning to the collected data) and, finally, into knowledge through information fusion and integration. The paradigms will apply to those distributed systems that need to timely react to sensor information with an effective action such as cyber-physical systems, which feature a tight combination of, and coordination between, the system's computational and physical elements. The significance of the research is to leverage the acquired knowledge to broaden the potential of cyber-physical systems in several dimensions, including: augmentation of human capabilities, understanding of human activities, coordination of heterogeneous (infrared) cameras, operation in dangerous or inaccessible environments, and efficiency. The multidisciplinary research team comprising of graduate and undergraduate students as well as of visiting researchers is guided by Dr. Dario Pompili, Professor of Electrical and Computer Engineering, Rutgers University.

***Data Analysis and Information SecuritY (DAISY) Lab.*** Dr. Yingying Chen leads Data Analysis and Information Security (DAISY) Lab in Electrical and Computer Engineering Department at Rutgers University. DAISY lab has extensive equipment to support research activities in the general areas of: Applied Machine Learning in Mobile Computing and Sensing, Internet of Things (IoT), Security in AI/ML Systems, Smart Healthcare, and Deep Learning on Mobile Systems. The lab consists of an experiment room located on the 5th Floor of the CoRE building in Busch Campus, Rutgers University. It has 4 Dell Precision high-performance workstation servers installed with high-end Intel Xeon CPUs (3 equipped with NVIDIA GV100/P4000 GPUs for deep learning acceleration), 5 desktops, 12 laptops, and 5 mini PCs, for data processing and machine learning computation. The lab has 17 802.11 Intel 5300 WiFi network interface cards, 20 Atheros WiFi network interface cards, 10 Texas Instruments xWR1642 millimeter-wave radars, 1 ImpinJ Speedway R420 RFID reader, 200 Avery Dennison RFID tags, 1 Avisoft Ultrasonic Speaker equipped with 1 Avisoft amplifier, 1 Tektronix oscilloscope, and 2 Keysight function generators, to support broad mobile sensing topics. Additionally, we have 16 Android phones, 2 Android Tablets, 3 Google Wear OS smartwatches,18 Raspberry Pis, 4 programmable robot cars, 7 drones, 2 3D printers, and 1 ECG monitor, for long-term data collection on diverse smart IoT platforms for applied machine learning.

***Information, Networks, and Signal Processing Research (INSPIRE) Lab.*** Dr. Waheed Bajwa. The INSPIRE Lab within the Department of Electrical and Computer Engineering at Rutgers University, New Brunswick, is a research lab that focuses on providing fundamental mathematical understanding of and theoretically optimal, computationally efficient, and algorithmically robust solutions for some of the most pressing problems arising in information processing an umbrella term that subsumes mathematical signal processing, high-dimensional statistics, and machine learning, and networked systems, such as the internet of things, multiagent systems, (online) social networks, wireless sensor networks, and brain networks.

***Laboratory of Immuno-Engineering and Micro/Nano-technologies for Personalized Healthcare (LIMPH).*** Dr. Umer Hassan. The laboratory contains equipment and tools needed to develop, test, and validate biomedical sensors. Equipment includes Formlabs 3D printer, Flow Cytometer, Spectrophotometer, ELISA plate reader, Fluorescence Microscopy, PCR Thermocycler, Infusion pumps, ZI Lock in amplifier, current preamplifiers, data acquisition cards, smartphones, and computers.

***Integrated Systems & NeuroImaging Laboratory.*** Dr. Laleh Najafizadeh. The NeuroImaging Laboratory accommodates single-subject and hyperscanning functional neuroimaging experiments using EEG. The laboratory is equipped with computer stations for stimuli presentation and recording behavioral responses, E-prime 2.0 professional software for designing cognitive tasks and stimuli presentations, and high-end EEG recording systems. Students will gain experience in designing functional neuroimaging experiments, collecting data and processing the signals.

***Oxide Electronics Laboratory.*** Dr. Shriram Ramanathan. The laboratory comprises facilities for growth of thin film semiconductor crystals with tailored structure and doping; measurement of electrical transport properties in devices. Principal goals include design of quantum materials for emerging computing technologies and adaptive electromagnetic systems.

***Virtual Reality Laboratory.*** This laboratory provides facilities for students to gain hands-on experience with several virtual reality (VR) specific interfaces, such as stereo glasses, 3-D trackers, force feedback joysticks, and sensing gloves. It also trains students in the intricacies of 3-D graphics and authoring real-time simulation.

***Wireless Information Network Laboratory (WINLAB).*** WINLAB At the Electrical and Computer Engineering Department and Computer Science Department, Rutgers University, has extensive laboratory and equipment facilities to support research activities in the general areas of:

- Software defined radio (SDR) hardware and software, RF circuits and FPGA
- Emulation, simulation, and analysis of large scale complex wireless systems
- Software-defined radio (SDR) and software-defined networking (SDN)
- 5G/6G radio access and mobile core networks
- Edge cloud computing systems
- Security and privacy of wireless networks
- Internet of Things (IoT) devices and systems

WINLAB has the capability of fabricating prototype devices and printed circuits with K&S wedge bonder, SMT rework equipment as well as various FPGA development platforms and programmable embedded platforms (APTIX, GNU radio USRP, etc.). The laboratories are also equipped with various network analyzers, RF spectrum analyzers, high-speed digitizing oscilloscopes, function generators, power meters and other general purpose laboratory equipment (shielded enclosures, antennas, etc.). WINLAB also maintains state-of-the-art computing facilities including 12 compute servers, 4 storage servers, a 20-processor HPC cluster and 12 high-performance workstations, and over 200 networked computers and laptops. The center maintains software licenses for a variety of simulation tools including Matlab, OPNET, all major hardware design tool chains including Cadence, Synopsys and Mentor Graphics, as well as specialized wireless communications tools like EEs of EDA, Wise, XFDTD and numerous other public domain simulation tools. In addition, WINLAB operates and maintains two NSF community research testbeds - ORBIT and COSMOS - for large-scale reproducible wireless experiments and real-world evaluation of 5G/6G systems respectively. These testbeds can be accessed by experimenters over the Internet, and are also connected to national research networks including GENI, Fabric and Internet2.

# Environmental Engineering (ENG)

## Environmental Engineering

**Environmental Engineering Process Laboratories (Cook Campus)**

These laboratories are equipped to establish, monitor, and analyze physical, chemical, and biological processes in engineered and natural systems. A Gas Chromatography (GC) system equipped with Flame Ionization and Electron Capture detection is used for quantifying volatile compounds in gas samples. There are two high-performance liquid chromatography (HPLC) systems used for quantifying chemical pollutants or microbial metabolites. An Ion Chromatography (IC) system is available for quantifying dissolved charged chemical species in natural and treated water. An Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES) system is available for the quantitation of trace elements in soils or water. A supercritical $CO_2$ extractor is used for activated carbon regeneration and extraction of organic pollutants from soil and sediment matrices. The laboratory is equipped for analyses of microbial communities via: phase-contrast microscopy for enumeration and identification; spread or membrane plating for selective cultivation; and DNA extraction, visualization, polymerase chain reaction (PCR) amplification, and quantitative PCR for detection and identification. A UV-visible spectrophotometer, various ovens, dissolved oxygen meters, pH meters, and electronic balances are also available.

Physical and chemical processes are demonstrated using a computer-controlled flow-through reactor system with multiple sensors. The system allows students to establish and monitor processes in a plug flow reactor (PFR), a completely mixed flow reactor (CMFR), CMFRs in series, and other reactor configurations used in water and wastewater treatment. Jar test systems are available for investigation of interparticle interactions resulting in turbidity removal. Bench scale batch reactors are employed for investigation of chemical reactions, ion exchange, and adsorption processes. Computer software packages for activated carbon adsorber design, air stripper design, and modeling of pollutant distributions among multimedia are available.

Biological processes are investigated using small-scale reactors. Students establish anaerobic digesters that are monitored for COD removal, fatty acid production, and methane production. Nonlinear curve-fitting is used to parameterize a biokinetic model of the digestion process. Bioremediation techniques are tested in microcosms using soils collected by students. Removal of gasoline and chlorinated solvents are evaluated by monitoring contaminant profiles and microbial populations. In situ water quality is measured in the field using handheld meters equipped with probes for dissolved oxygen, pH, conductivity, and turbidity. Biochemical oxygen demand (BOD), chemical oxygen demand (COD), bacterial indicator plate counts, and nutrient (phosphorus and nitrogen) analysis are carried out using standard methods or commercial (Hach) kits.

**Environmental Engineering Laboratory (Busch Campus)**

This laboratory is equipped for performing the analysis of water and wastes and the unit processes associated with treatment. Molecular level and advanced analytical chemical measurements are available for complex environmental samples, including water and air matrices. The microbiological equipment includes a cell homogenizer for DNA extraction, quantitative PCR (qPCR), PCR, fluorescent microscope, microcentrifuge, electrophoresis equipment, gel imager, constant-temperature water baths, incubators, and laminar flow hoods. Analytical chemistry equipment includes an FTIR microscope, high-pressure liquid chromatograph (HPLC) with UV detection, a total carbon/total nitrogen analyzer, pH meters, field meters for conductivity/pH/ORP, chemical fume hood, drying and annealing ovens, centrifuge, mixing devices, chemical metering pumps, spectrophotometers (including Hach), and turbimeters. A variety of field sampling equipment, devices to simulate unit processes (e.g., jar test apparatus, annular biofilm reactor, sunlight simulator), and refrigerated storage is available.

**Air Sampling and Analysis Laboratory (Cook Campus)**

This laboratory is equipped to provide students with experience in ambient and indoor air sampling. Students learn how to use air flow rate and velocity measurement devices (i.e., wet test meter, dry gas meter, bubble calibrator, mass flow meter, rotameters, S-type and regular pitot tubes), particle samplers (i.e., Button inhalable aerosol sampler, IOM inhalable aerosol sampler, PM2.5 impactor, cyclone), particle measurement instruments (i.e., optical particle counter, condensation particle counter, aerosol mass photometer), and bioaerosol samplers (i.e., 1-stage Anderson impactor, 6-stage Anderson impactor, and portable bioaerosol samplers). Students gain experience in analyzing gases using Draeger tubes and ozone meters.

**Soil and Water Laboratory (Cook Campus)**

This laboratory is equipped to teach students how to determine the properties of soils. Ovens and electronic balances are available for soil moisture content analysis. pH meters are available for characterization of soil and water samples. Instruments for manual or automated measurement of soil particle size distributions; and sensor-enabled measurement of soil water content and pressure potential are available. Pressure extractors and automatic systems to measure water retention curves and saturated hydraulic conductivity, along with two types of tension

infiltrometers that can be connected to data loggers for automatically quantifying water movement through unsaturated soils and sediments enable study of flow in porous media. A physical aquifer model allows students to visualize and manipulate movement of water and contaminants in a groundwater environment.

# Industrial and Systems Engineering (ENG)

## Industrial and Systems Engineering

***Advanced Simulation Laboratory.*** This laboratory is intended to serve student term projects in the areas of simulation, design, statistical modeling, and machine learning. With access to large screens, fast computers, and different media tools, the students are able to analyze and simulate large volumes of data and build models using R, Phyton, MATLAB, ARENA, LINDO, and other commercial tools. The lab also includes 3-D modeling tools such as Solid-Works and FactoryTalk for student projects. There is also a PLC server that can be connected to remote devices and robots for real-time motion and supervisory controls, and for cyber-physical systems controls. This PLC is usually used in two or three student design projects every year.

***Automation Laboratory.*** The laboratory is equipped with two CNC milling machines, a CNC lathe, an automated storage and retrieval system, and testing equipment and devices that support undergraduate courses (e.g., Manufacturing Processes and Design I and II). There are also two ROS stations for robot-to-robot communication and control applications. This lab is also home to a number of machines and systems that were developed in the prior student design projects (including two autonomous tennis ball collectors, a soccer ball collector). This equipment is used for departmental tours and for lecturing Design I classes. The laboratory has a prototype sheet-folding machine capable of folding creative patterns for different applications.

***Automation and Mechatronics Laboratory.*** This laboratory provides students with hands on experience in motion and supervisory controls. With WiFi connection to the ISE remote PLC and a host of PLCs and instructional kits (with motors, sensors, I/O boards) in the lab where students are able to work on hands-on projects that involve control of devices, motors, actuators, and higher level supervisory controls. This lab is used primarily for the Automation and Systems Design course and lab. The lab also includes a small-scale physical simulation of IOT sensors and devices for student projects.

***Design Laboratory.*** The Department of Industrial and Systems Engineering (ISE) has shared space for ISE and mechanical and aerospace engineering (MAE) design projects. The shared space is intended to promote interdisciplinary design activities and will include primary tools that can be used for system assembly and testing, with remote access to other department resources. This lab is located in the Richard Weeks Hall building (second floor).

***Energy Laboratory.*** This lab has been developed to allow students to have hands-on experience on how Industrial & Systems Engineering concepts and methods in data analytics, reliability engineering, and efficiency/productivity analysis can be used to improve the operation of energy systems. The laboratory has a wide array of energy-related equipment, ranging from renewable energy sensors (solar pyranometers, sun tracker, sky imager, etc.), a solar generation array, battery testing equipment, and a visual/thermal inspection drone Building energy simulation software is also available for educational and research activities.

***Manufacturing Processes Laboratory.*** Basic machine tools such as turning, milling, drilling, grinding, and measuring machines are available to help the student become familiar with metal-processing operations. In the academic year 2016-2017, the Department of Industrial and Systems Engineering acquired two CNC machines: conversational milling and turning machines. It also acquired an array of 3-D printing machines that are frequently used in undergraduate courses and design projects. The equipment is also used to perform laboratory experiments in heat treatment, chip formation, tool life, cutting forces, temperature, chip metallurgy, and power consumption.

***Quality and Reliability Engineering Laboratory.*** This laboratory allows students to have hands-on experience in actual methods of quality control and reliability engineering. A variety of software for control charts, sampling plans, and design of experiments is available. The laboratory has a wide array of metrology equipment such as digital calipers and micrometers, roundness measuring equipment, surface profilometers, and a coordinate measuring machine. It also has various materials testing equipment such as voltage stressing equipment and measuring microscopes. LABVIEW, Minitab, and STATGRAPHICS software are available for student use.

# Materials Science and Engineering (ENG)

## Materials Science and Engineering

The Department of Materials Science and Engineering contains extensive instructional and research facilities focusing on the analysis, characterization, manufacturing, and control of the wide variety of conventional and advanced materials including ceramics; glasses; composites; electrical, optical, and magnetic materials; and nanomaterials required by modern technology. Students who utilize the laboratory equipment and facilities learn to solve problems related to the design, processing, and evaluation of conventional and specialty materials. Special equipment exposes our students to the preparation and evaluation of the newer types of ceramics, metals, polymers, and composites required in aerospace, advanced engine, biotechnology, photonics, and electromagnetic applications.

An attractive feature of the department is the small class sizes, which makes instruction more interactive. The curriculum includes a large number of laboratory courses, which provide hands-on experience and learning to students. Generally, the laboratories are located within the A-wing of the Engineering Building, the McLaren Center for Ceramic Research Building, or the Fiber Optic Materials Research Building. Equipment is housed in an instructional facility and several advanced technology centers, including the Center for Ceramic Research, the Fiber Optic Materials Research Center, the Center for Advanced Materials via Immiscible Polymer Processing (AMIPP), and the Corning Glass Science and Engineering Laboratory. Major grants from industry and the New Jersey Commission on Science and Technology have provided these instructional and research facilities.

***Evaluation and Measurement.*** Microscopy equipment includes petrographic and metallographic microscopes, a transmission electron microscope, and scanning electron microscopes. Several X-ray diffraction units provide the capability of identifying phases, with computer-automated, high-resolution systems available for advanced study of particle size, strains, and quantitative phase analysis. Chemistry can be evaluated with techniques such as energy dispersive spectroscopy, atomic absorption, inductively coupled plasma, Fourier transform IR, and laser Raman. Energy dispersive X-ray analysis systems used with the scanning electron microscopes permit microchemical analysis. Virtually all types of particle-size analysis are represented. A surface analysis system provides scanning Auger microscopy coupled with secondary ion mass, X-ray photoelectron, and ion scattering spectroscopies. Thermal analysis equipment includes simultaneous differential thermal analysis, thermogravimetric analysis,

differential scanning calorimetry, thermomechanical analysis, and high-temperature X-ray diffraction. Dielectric properties of ceramic materials can be measured over a frequency range from 0.01 hertz to 10^10 hertz. There is equipment for measuring heat capacity, thermal expansion, thermal conductivity, and thermal diffusivity over a wide temperature range. Mechanical properties that may be measured and that are currently being studied include elasticity, viscosity, and plasticity. Mechanical testing instrumentation includes microhardness, toughness, and modulus- and strength-testing equipment, including advanced computer-controlled servo-hydraulic, electromechanical, and high-temperature creep systems. Various room- and elevated-temperature viscometers permit rheology to be determined. An advanced torque rheometer permits optimization of such industrial processes as mixing, extrusion, and injection molding. Tribology is studied with a specially designed, automated machine that measures friction and wear.

***Processing and Forming.*** Microprocessor- and computer-controlled furnaces with carefully controlled atmospheres and closely regulated temperatures are especially suitable for materials studies. Hot pressing and hot extrusion may be done in a wide range of presses and furnaces, including both cold and hot isostatic presses, atmosphere-controlled hot presses, nitriding furnaces, and injection molders. Advanced materials production technologies include special equipment for composites; laser synthesis of ultrafine powders; R.F./D.C. film sputtering; chemical vapor deposition; and evaporation-deposition. The properties of electronic substrates, packages, and magnetic and superconducting materials and devices can be studied in the Howatt Laboratory for Electronic Ceramics.

**Laboratories**

***Computer Laboratory.*** This laboratory is equipped with many networked computers with links to the Rutgers computer center for massively parallel computing and to supercomputers at the national level. Computations are performed in CAD/CAM related to design, manufacture, and properties of materials; in molecular dynamic simulations of materials; and in theory of materials.

***Electron Microscopy Laboratory.*** This laboratory is equipped with a Zeiss field emission scanning electron microscope (FESEM), a transmission electron microscope, JOEL 2010F, and a Nion UltraSTEM Electron Microscope with 10 meV energy-loss spectroscopy resolution. The supporting equipment includes an evaporator, ion-milling, and chemical and electropolishing units for thin foils.

***Mechanics of Materials Laboratory.*** The facilities of this laboratory are used for instruction in determining the mechanical and physical properties of various materials. The available facilities include a hydraulically controlled Instron testing machine with a high- and low-temperature environmental chamber, an Instron universal testing machine, a torsional pendulum apparatus, a sonic modulus tester, a differential scanning calorimeter, an infrared apparatus, a density gradient column, and an apparatus for the study of surface friction.

***Nanomaterials and Devices Laboratory.*** This laboratory is equipped with state-of-the-art synthesis as well as electrical measurement apparatuses for nanoscale devices. The laboratory has RF sputtering, thermal evaporation, and filtered cathodic arc apparatuses for catalyst and thin film deposition. In addition to nanomaterials synthesis, we have also set up a fully automated probe station with a semiconductor parametric analyzer for electrical characterization of our nanoelectronic devices.

***Scanning Probe Laboratory.*** Scanning probe microscopes can be used to study a wide range of properties with a resolution of one namometer or less. The laboratory is equipped with atomic force microscopes including a Digital Instruments Nanoscope IV and a Park Instruments AFM. These are used to study nanoscale surface morphology, surface forces, frictional forces, structure of physisorbed films, and the conformation of biomolecules. In addition,

there is a near-field scanning optical microscope that enables optical characterization to be performed with a resolution of around 25 nm. Nanoscale mechanical characterization is performed using a Hysitron Triboindenter which combines many features of an AFM with the mechanical capabilities of a nanoindentation system.

***X-Ray Laboratory.*** This laboratory provides a variety of equipment used to determine chemistry and crystal structure, map out defect structure, identify unknown crystalline phases, measure lattice parameters, quantify phase mixtures, measure residual stresses, study surface roughness at the atomic level, determine the interfacial roughness in a thin film structure, prepare reciprocal space maps, analyze rocking curves of near-perfect crystals, and measure misfit strains. Three diffractometers are available for these studies. Two Siemens D500 instruments are available for routine powder analysis, while the Panalytical X'Pert MRD is available for high-end research work that requires the highest resolution. The Panalytical system is equipped with a variety of beam conditioners, a Eulerian cradle for x-y-z-omega-phi-psi sample movements, and detector stages to convert the instrument into a double-crystal or triple-crystal diffractometer. Jade software is available for routine phase ID, lattice parameter measurements, residual stress, and quantitative analysis on all the instruments. Additional software is available for the Panalytical instrument to obtain pole figures and perform a variety of tasks related to single crystals and thin films.

# Mechanical and Aerospace Engineering (ENG)

## Mechanical and Aerospace Engineering

The laboratory curriculum in mechanical and aerospace engineering has been structured to help students integrate physical understanding with theoretical knowledge, and to familiarize them with advanced engineering systems and instrumentation for multidisciplinary problem solving in the 21st century. Laboratory exercises begin with introductions to basic measurement concepts and culminate in the exploration of complex, open-ended engineering problems. Facilities are continuously upgraded to provide an effective learning environment. State-of-the-art facilities, which are integral parts of the undergraduate laboratory experience, include a stereolithography rapid prototyping machine, a Mach 4 supersonic wind tunnel, and a pair of industrial-quality robotic arms. The undergraduate and research laboratory space is integrated physically to provide personal, often informal, contact and communication among undergraduate students, graduate students, and faculty. Undergraduate participation in research is widespread and strongly encouraged. A summary listing of facilities comprising the undergraduate laboratories follows.

***Design and Manufacturing.*** Mechanical and aerospace engineering analysis, design, and synthesis problems are investigated in the computer-aided design (CAD) laboratory. Students gain hands-on experience on CAD workstations through exercises in computer-aided drafting, 3-D solid modeling and parametric design, simulation of kinematic and dynamic problems, and stress analysis using finite element methods. Extensive software is available, including AutoCAD, Inventor, Pro/Engineer, ANSYS, Matlab, Maple, and programming in C/C++ and Fortran. Exposure to advanced manufacturing techniques is provided through machine-shop training as well as utilization of two Rapid Prototyping (RP) machines (3-D Viper System and Stratasys Fused Deposition 3000 System). CAD and RP are available on the internet and the design iteration cycles have been reduced significantly. A complete design cycle experience from concept to fabrication, followed by evaluation, has been implemented.

***Dynamics and Controls.*** Prediction and control of the response of structures subject to dynamic loadings are a central component of mechanical and aerospace engineering design and analysis. Experiments have been designed to illustrate dynamic response of single and multiple degree of freedom systems, as well as to carefully examine frequency and amplitude response of structural components. Diagnostics are conducted using advanced laboratory computers and digital spectrum analyzers, in addition to conventional strain gages and impact hammers.

***Fluid Dynamics.*** Fundamental principles and advanced systems involving fluid flows, ranging from demonstrating Bernoulli's principle to assessing the lift and drag characteristics of airfoil designs, are examined in the undergraduate curriculum. Facilities include four low-speed wind tunnels and a mach 4 supersonic wind tunnel; a large free-surface water tunnel also is used for undergraduate participation in independent or sponsored research. Advanced instrumentation includes hot-film anemometry with computerized data acquisition and optical diagnostics techniques.

***Material Characterization.*** Mechanical properties of materials are examined in the newly completed solid mechanics laboratory. Facilities include three Instron tensile testing machines with digital data acquisition and control and three hardness-testing machines. Laboratory exercises have been structured to highlight phenomena associated with deformation and failure of engineering materials. Additional research-quality facilities available to undergraduates include larger MTS and Instron testing machines. These instruments are used in research on biomechanical systems and composite materials, respectively. Undergraduate research also may be conducted in a high pressure, ~100,000 psi, materials testing/processing laboratory.

***Nanomaterials.*** Nanostructured materials synthesis and characterization are examined in the laboratories. Facilities include flame-based chemical vapor condensation/deposition chambers and plasma reactors. Laboratory exercises involve synthesis of nanoparticles and carbon nanotubes, probing of the processing flow field using laser-based spectroscopic techniques, and characterization of the properties of the resulting nanomaterials. The lab courses include introduction to atomic force microscopy, scanning electron microscopy, X-ray diffraction, and scanning mobility particle sizing. These dual-purpose educational/research laboratories engage significant undergraduate independent research, as well as high school outreach through internships.

***Robotics and Mechatronics.*** Critical concepts in system control as well as advanced theories of robotics and mechatronics are investigated using a series of industrial robots including a three-axis SCARA robot (Adept Cobra s600), a three-axis planar transportation system (Genmark AVR-3000), and two five-axis general purpose robots (Mitsubishi RV-M2). Kinematics, motion planning, hybrid force/position control for object manipulation, and automated assembly operations are the topics addressed in the laboratory exercises. This dual-purpose educational/research laboratory enjoys a particularly high degree of undergraduate student participation in the research component.

***Particle Image Velocimetry.*** Particle image velocimetry (PIV) data will be obtained using a LaVision stereoscopic-PIV system, consisting of a pair of 16-bit scientific CMOS (sCMOS) cameras, with a pixel resolution of 2560-2160 pixels. The cameras can be arranged in a stereoscopic configuration to provide for correction to out-of-plane particle motion and slight misalignment of the laser sheet with the viewing plane. A pair of 105 mm Nikon Nikkor lenses can be used for large field of view imaging of the flow field, while zoomed-in measurements can be made using a pair of 200 mm lenses. The lenses will be mounted to Scheimpflug adapters. As the tunnel operates for a minimum of 10 seconds, 150 vector fields can be obtained during a single run, whereas 10-20 runs may be required for converged statistics for a given flow condition.

The light source for the PIV will be provided by a Quantel Evergreen 200 mJ/pulse double-pulsed Nd:YAG laser, which produces 532 nm light at a maximum rate of 15 Hz. The laser will be expanded into a thin laser sheet, with a desired thickness of ~1.5 mm. Timing for the cameras and the laser will be provided through either a LaVision programmable timing unit (PTU) or externally using a Stanford Research Systems digital delay generator. Processing of the PIV raw images will be performed using LaVision DaVis v8.3 software.

Seeding options for SWT are currently under investigation. Constraints for the selection of proper seeding include safety, particle size, and particle response. To address the safety and environmental concerns, mineral oil options are being considered. Use in comparable tunnel facilities have confirmed particle sizes of 1 mm or less, which allows for Stokes numbers of under 0.1. As has been demonstrated by Samimy & Lele (1991), this is sufficient for faithfully tracking the flow.

***Schlieren Imaging.*** The schlieren system is a z-type configuration, using a 29.21 cm diameter parabolic mirror to collimate light prior to passing through the test section. The light source for the schlieren system is a Thorlabs mounted LED, which produces white light. A second parabolic mirror reflects the light to a set of optics that help to steer the beam into a CCD camera. For schlieren experiments, data can be obtained with the knife edge positioned either vertically or horizontally, to image density gradients tangential or normal to the flow direction, respectively. Images are recorded using a LaVision 12-bit Pro-X camera. The camera is a thermo-electrically cooled CCD camera with a resolution of 1600 x 1200 pixels, and a maximum quantum efficiency of 55% at 500 nm. The camera can operate at a maximum frame rate of 29 Hz; therefore, the data obtained are not time-resolved. Imaging of the full field of view is performed with a Nikon Nikkor 105 mm camera lens. Timing for the system is accomplished using a LabSmith LC880 programmable experiment controller, that supplies a 5 V square-wave TTL signal trigger to the camera. Finally, post-processing of the acquired images is in Matlab.

***Supersonic Wind Tunnel.*** Rutgers University's Mach 3.45 supersonic wind tunnel (SWT) facility is a fixed-Mach number, blowdown-to-atmosphere tunnel with dried air as the test gas. SWT is fed by a compressed air storage system, that supplies a total volume of 8 m3 of air, pressurized to 16.6 MPa. Expansion of the flow is accomplished using a half-nozzle, creating Mach 3.45 flow at the entrance to the test section. The test section is a square cross-sectional area measuring 152 mm x 152 mm. SWT operates at a typical stagnation temperature (290 K), and variable stagnation pressure typically around 1.5 MPa. These conditions correspond to a freestream velocity of 641 m/s and a unit Reynolds number of 4.9 x 107/m . Typical run times at these conditions are approximately 10-15 seconds. The tunnel boundary layer develops naturally and is fully turbulent at the entrance to the test section. Previous measurements have established a boundary layer momentum thickness of 0.85 mm.

***Thermal Sciences.*** A variety of energy-related experiments are offered in the undergraduate curriculum from basic sciences of thermodynamics and heat transfer to assessing the performance and environmental impact of a steam turbine power generating system. Specific experiments include convection and radiation heat transfer exercises, and experiments carried out in an internal combustion engines laboratory and the steam power generator facility. A partnership with local industry to design the applied engineering laboratories has provided students with realistic simulations of actual engineering problems and scenarios.

# Computers (ENG)

## Computers

Computer facilities are available at the university, school, and departmental levels. The university's computing services are managed by the Office of Information Technology (OIT). School of Engineering facilities are managed by Engineering Computing Services (ECS). Each School of Engineering department also maintains its own computer laboratories that provide specialized software for the use of its students and faculty. On the New Brunswick campuses there are over 15 public computer laboratories or hubs provided by New Brunswick Computing Services; many are located near the engineering buildings. Scanning and printing services and a wide range of software are provided in these computer labs.

Engineering Computing Services maintains two major instructional laboratories within the engineering complex. These include the Design, Simulation, and Visualization (DSV) Lab and the Engineering Information Technology (EIT) Lab. Each facility is available for instruction, research, and general student use. The EIT lab has 45 workstations and the DSV Lab has 60 workstations. Both computer labs support a variety of engineering specific software including MATLAB, SolidWorks, AutoCad, and SPICE.

# Libraries (ENG)

## Libraries

With holdings of over three million volumes, the Rutgers University Libraries rank among the nation's top research libraries. Composed of 26 libraries, centers, and reading rooms at Rutgers University-New Brunswick, Rutgers University-Camden, and Rutgers University-Newark, and RU-Online, a digital library, the libraries provide the resources and services necessary to support the university's mission of teaching, research, and service. Details regarding facilities and services are available here.

Engineering students and faculty are primarily served by the Library of Science and Medicine located on the Busch campus near the engineering complex. Other smaller specialized libraries on the Busch campus house collections in chemistry, mathematical sciences, and physics. Students and faculty can also access the catalog, a wide variety of electronic indexes and abstracts, full-text electronic journals and research guides, and other library services online, both from campus and remotely. At the Library of Science and Medicine, professional librarians, including an engineering librarian, assist students and faculty with engineering resources. Library instruction classes are also available to improve students' information-seeking skills for lifelong learning.

# Degree Requirements (ENG)

## DEGREE REQUIREMENTS

Students must complete a prescribed program of study in their declared major, outlined in the Programs of Study chapter, including the distribution requirements for departmental, technical, general, and humanities/social sciences electives. The total number of credits required for graduation varies from 120 to 132 credits in the four-year program, depending on the major.

The degree of bachelor of science from the School of Engineering is not awarded to any candidate who has earned fewer than 30 credits at Rutgers. Not more than 12 of the last 42 credits for the degree may be taken outside Rutgers.

The degree of bachelor of science from the School of Engineering is not awarded to any candidate whose university cumulative grade-point average is less than 2.000 or whose cumulative grade-point average in the major as designated by "M" prefixes is less than 2.000.

**Graduation and Diploma.** Degrees are conferred by the university upon recommendation of the faculty only at annual commencement at the end of the spring semester. Students completing degree requirements in August or January may ask the registrar for a certificate attesting to their completion of degree requirements. Students must complete a Diploma Application, and diplomas will be distributed by the Registrar's Office soon thereafter (in July for May grads, in October for August grads, in March for January grads).

**Graduation with Honors.** Honors are noted on the student's diploma and in the list of degrees and honors conferred. Students whose cumulative grade-point averages at the end of the senior year are at least 3.200, 3.400, or 3.650 may be graduated with "Honors," "High Honors," or "Highest Honors," respectively.

# Programs of Study (ENG)

## PROGRAMS OF STUDY

The following curricula are offered by the School of Engineering. The numbers indicate the curriculum code for each major program. Curricula shown below are listed by the name of the department. In several cases the specific title of the bachelor of science degree is different than the name of the department. All programs except Applied Sciences in Engineering (073) are accredited by the Engineering Accreditation Commission of ABET.

| Curriculum Code | Curriculum |
|---|---|
| 021 | Aerospace Engineering |
| 073 | Applied Sciences in Engineering |
| 125 | Biomedical Engineering |
| 155 | Chemical Engineering |
| 180 | Civil Engineering |
| 332 | Electrical and Computer Engineering |
| 366 | Environmental Engineering |
| 540 | Industrial Engineering |
| 635 | Materials Science and Engineering |
| 650 | Mechanical Engineering |

Students in the first year of a four-year curriculum are assigned curriculum code 004. Students who elect to take nonengineering courses for a semester to prepare for transfer are assigned curriculum code 001.


- First-Year Program
- Aerospace Engineering
- Applied Sciences in Engineering
- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Electrical and Computer Engineering
- Environmental Engineering
- Industrial Engineering
- Materials Science and Engineering
- Mechanical Engineering
- Other Programs of Study


# First-Year Program (ENG)

## FIRST-YEAR PROGRAM

Curriculum Code 004

(common to all four-year curricula)

*First Semester*

01:160:159 General Chemistry for Engineers (3)

01:160:171 Introduction to Experimentation (1) *

01:355:101 Expository Writing I (3) or 14:440:127 Introduction to Computers for Engineers (3)

01:640:151 Calculus for Mathematical and Physical Sciences (4)

01:750:123 Analytical Physics I (2)

14:440:100 Engineering Orientation Lectures (1) #

humanities/social sciences elective (3) ^

*Second Semester*

01:160:160 General Chemistry for Engineers (3) &

01:640:152 Calculus for Mathematical and Physical Sciences (4)

01:750:124 Analytical Physics I (2)

14:440:127 Introduction to Computers for Engineers (3) or 01:355:101 Expository Writing I (3)

14:440:221 Engineering Mechanics: Statics (3)

humanities/social sciences elective (3)^

***Total Credits = 35***

* May be taken in the second semester.
# Equivalent courses include 14:440:191 for honors academy students and 14:440:115 for DELLC students.
^ Does not have to be taken in the first year.
& Not required for electrical and computer engineering.

# Aerospace Engineering (ENG)

## AEROSPACE ENGINEERING

Aerospace Engineering (ENG)

## Field of Study

## Field of Study

The aerospace engineering degree at Rutgers provides a broad education on unmanned aerial systems, airplane and space vehicle design and performance, propulsion, flight technology, aerodynamics and astrodynamics, aerospace materials and structures, and aerospace systems, among other areas. Regardless of the particular product involved, aerospace engineers rely upon knowledge of matter and energy conversions, motions, and forces obtained from computer simulations and experimental investigations of processes and systems. Each aerospace engineer is able

to learn and apply the fundamentals of aircraft and spacecraft design while applying their knowledge from courses such as spacecraft mission design, propulsion, system dynamics and controls, orbital mechanics, aerodynamics, and flight control dynamics to name a few. The curriculum in aerospace engineering provides these skills and prepares students for graduate study and research.

The undergraduate program in aerospace engineering trains students in a technically sound, challenging, and professional manner, laying the foundation for a productive career and enabling graduates to make positive contributions to their profession and society. This is achieved with a thorough preparation in the humanities, mathematics, and basic sciences as well as up-to-date aerospace engineering fundamentals and applications using the most advanced tools and methods available. In the senior year, the capstone aerospace design course allows students to solve open-ended, multicriteria engineering problems. Emphasis is placed on teamwork, project management, conceptualization, detailed design, computational analysis, and manufacturing. At the end of the yearlong course, students will have experienced a full product development cycle from concept to construction and testing.

Career prospects for aerospace engineers extend beyond the aeronautics and astronautics fields into other industrial sectors such as manufacturing, energy, and automotive.

Aerospace Engineering (ENG)

# Four-Year Undergraduate Curriculum

# Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 021

The aerospace engineering curriculum provides a broad and multidisciplinary education in the fundamentals of aircraft and spacecraft design. An energy systems concentration is available with careful planning of the coursework. The degree awarded upon completion of any of these options is the B.S. in aerospace engineering which is professionally accredited by the Engineering Accreditation Commission of ABET.

**First Year**

See First-Year Program (35)

**Sophomore Year**

*First Semester*

14:440:222 Engineering Mechanics: Dynamics (3)*

01:640:251 Multivariable Calculus (4)

14:650:210 Introduction to Aerospace Engineering (3)

01:750:227 Analytical Physics IIA (3)

01:750:229 Analytical Physics IIA Laboratory (1)

14:650:291 Mechanics of Materials (3)*

*Second Semester*

14:540:343 Engineering Economics (3)*

01:640:244 Differential Equations for Engineering and Physics (4)

14:650:351 Thermodynamics (3)*

14:650:361 Introduction to Mechatronics (4)*

14:650:388 Computer-Aided Design in Mechanical and Aerospace Engineering (3)*

**Junior Year**

*First Semester*

01:640:421 Advanced Calculus for Engineering (3)*

14:650:312 Fluid Mechanics (3)*

14:650:342 Design of Mechanical Components (3)*

14:650:350 Mechanical Engineering Measurements with Lab (4)*

humanities/social science elective (200+) (3)

*Second Semester*

14:650:401 Dynamic Systems and Controls (3)*

14:650:449 Aerospace Materials (3)

14:650:458 Aerospace Structures (3)

14:650:460 Aerodynamics (3)

14:650:471 Aircraft Flight Dynamics (3)

**Senior Year**

*First Semester*

14:650:431 Mechanical and Aerospace Engineering Laboratory I (2)

14:650:439 Multiphysics Simulations (3)*

14:650:457 Spacecraft and Mission Design (3)

14 :650:465 Orbital Mechanics (3)

14:650:487 Aerospace Engineering Design I (2)

technical elective (3)

*Second Semester*

14:650:433 Aerospace Engineering Laboratory (3)

14:650:463 Compressible Fluid Dynamics (3)

14:650:488 Aerospace Engineering Design II (2)

humanities/social science elective (200+) (3)

technical elective (3)

*Total Credits = 132*

**Notes**

*May be taken during the first or second semester, within the listed year.
All mechanical and aerospace engineering department electives may count for technical electives.

**Department Electives** (select two from the lists below; can mix and match)

14:650:443 Vibrations (3)
14:650:447 Probabilistic Models in Mechanical and Aerospace Systems (3)
14:650:451 Vehicle Dynamics (3)
14:650:455 Design of Mechanisms (3)
14:650:481 Heat Transfer (3)

**Energy Electives** (select three for energy concentration; i.e., two department electives and one technical elective)

14:650:461 Internal Combustion Engines (3)
14:650:462 Power Plants (3)
14:650:474 Alternative Energy Systems I (3)
16:650:605 Renewable Energy (3)

# Applied Sciences in Engineering (ENG)

## APPLIED SCIENCES IN ENGINEERING

Applied Sciences in Engineering (ENG)

## Field of Study

## Field of Study

The curriculum in applied sciences in engineering is intended to meet the needs of students whose goals might not be served by the professional engineering programs. The curriculum permits the development of a wide range of interdisciplinary programs individually tailored to the needs of the student outside the accredited or professional

engineering fields. A faculty committee advises each student in the preparation of a sound educational program from courses available in the regular engineering programs. The applied sciences in engineering curriculum is not accredited as a professional engineering program.

Courses are not offered specifically for this curriculum, but must be chosen from among those scheduled by the professional engineering programs. Several areas of specialization currently are available, such as packaging engineering, engineering physics, and preparatory programs for law school or medical school.

Applied Sciences in Engineering (ENG)

# Four-Year Undergraduate Curriculum

# Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 073

**First Year**

See First-Year Program (35)

**Sophomore Year**

*First Semester*

01:640:251 Multivariable Calculus (4)

01:750:227 Analytical Physics IIA (3)

01:750:229 Analytical Physics II Laboratory (1)

engineering or technical elective (6)

humanities/social sciences elective (3)

*Second Semester*

01:220:102 Introduction to Microeconomics (3)

01:640:244 Differential Equations for Engineering and Physics (4)

01:750:228 Analytical Physics IIB (3)

01:750:230 Analytical Physics II Laboratory (1)

engineering or technical elective (3)

engineering or technical elective (3)

The last two years of the program must be developed with the assistance of the designated faculty adviser. The overall program must meet the student's career objectives and must be sufficiently different from the accredited engineering programs so as not to permit incorporation into an existing program. *Applied sciences in engineering is not accredited as a professional engineering program; it is an individualized interdisciplinary program that is not subject to professional accreditation.*

The minimum degree requirement is 120 credits. In addition to other specific requirements, the following distribution of courses must be completed:

Humanities/social sciences electives: 12 credits

Engineering electives: 10 courses of 3 credits or more

Technical electives: 30 credits

Some examples of possible concentrations in applied sciences in engineering are listed below. Other fields may be covered to meet the special interests of engineering students. Courses are not offered specifically for this curriculum (except for courses in packaging engineering). Appropriate courses are to be selected from those offered by the departments (see Course Listing). Since departmental course offerings may change from year to year, availability of a particular course cannot be guaranteed.

*Biomedical Science and Engineering (Premed).* This specialty is intended primarily for those students who plan to go on to medical school or graduate study in biomedical engineering and who wish to take advantage of the flexibility in curriculum planning that the applied sciences program offers. Engineering electives may be chosen from any engineering discipline, including undergraduate courses offered by the Department of Biomedical Engineering.

*Engineering Physics.* This concentration allows students to combine a background in the basic engineering subjects with the courses of a physics curriculum. It provides preparation for work in a physics research laboratory, for further study in engineering, or for graduate study in physics. The first two years are the same as those in any of the regular engineering curricula, although some substitutions are suggested. The last two years include courses in modern physics, electricity and magnetism, thermal physics, solid-state physics, and partial differential equations. Coupled with these are laboratory courses and other courses in engineering, physics, computer science, mathematics, or other sciences, to be chosen in consultation with an adviser in the Department of Physics. Students in this option generally would simultaneously complete a second major in physics.

*Packaging Engineering.* The packaging engineering concentration is designed to prepare engineers and scientists for a major role in the field of packaging. The program is structured to meet the technical requirements for the development and growth of total packaging systems. Details are available here and on the catalog page here.



# Packaging Engineering Concentration

# Packaging Engineering Concentration

Four-Year Curriculum Code 073

**First Year**

See First-Year Program (35)

**Sophomore Year**

*First Semester*

01:640:251 Multivariable Calculus (4)
01:750:227 Analytical Physics IIA (3)
01:750:229 Analytical Physics IIA Laboratory (1)
14:440:301 Introduction to Packaging Engineering (3)
14:540:343 Engineering Economics (3)
_____ Humanities/Social Sciences (3)

Total Credits: 17

*Second Semester*

33:799:301 Introduction to Supply Chain (3)
01:640:244 Differential Equations for Engineering and Physics (4)
14:440:222 Engineering Mechanics: Dynamics (3)
14:440:302 Computer-Aided Design (CAD) for Packaging Engineering (3)
14:440___ Packaging Elective (3)*

Total Credits: 16

***Junior Year***

*First Semester*

14:440:371 Packaging Evaluation Methods (3)
14:440:470 Packaging Lab I (2)
14:440:419 Innovation and Design (3)
_____Mechanics (3)*
_____ Statistics (3)*

Total Credits: 14

*Second Semester*

01:355:302 Scientific and Technical Writing (3)
14:440:473 Packaging Lab II (2)
14:440:471 Distribution Packaging (3)
14:440:490 Special Problems in Packaging (3)
_____Junior Elective (3)*

Total Credits: 14

**Senior Year**

*First Semester*

14:440:373 Packaging Manufacturing Methods (3)
14:440:___Packaging Elective (3)*
14:440:___Packaging Elective (3)*
_____ Technical Elective (3)
_____ Technical Elective (3)

Total Credits: 15

*Second Semester*

14:440:420 Senior Project (3)
14:440:___Packaging Elective (3)*
14:440:___Packaging Elective (3)*
_____Humanities/Social Sciences (3)
_____ Technical Elective (3)

Total Credits: 15

***Total Credits Required: 120***

***Notes***

Packaging Electives: 14:440:378, 14:440:406, 14:440:408, 14:440:468, 14:440:489, 14:440:490, 16:731:5xx
Mechanics Electives: 14:635:314, 14:635:407, 14:180:243, 14:650:291
Statistics Electives: 01:960:379, 01:960:384, 01:960:401
Science Electives: 14:155:208, 14:635:206, 14:650:351, 01:160:209, 01:160:307, 14:635:361, 14:635:312

# Biomedical Engineering (ENG)

## BIOMEDICAL ENGINEERING

Biomedical Engineering (ENG)

## Field of Study

## Field of Study

The undergraduate program in Biomedical Engineering is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria and Program Criteria for Bioengineering and Biomedical Engineering. This program offers a core engineering, mathematics, and science curriculum organized into three main options, called tracks: (1) biomedical computing, imaging, and instrumentation (BCII); (2) biomechanics and rehabilitation engineering (BRE); and (3) tissue engineering and molecular bioengineering (TEMB). The BCII track is designed to train students who are interested in academic or industrial careers that involve the measuring and modeling of physiological systems, medical imaging, medical image processing and analysis, and the graphics and visualization industries. Emphasis is placed both on understanding the physiological system as well as the engineering and development of new sensors and measurement devices. The BRE track offers instruction on mechanical aspects of the body and on the development of load-bearing devices for improved human performance.

The biomechanics option has added emphasis on tissue and fluid mechanics, whereas the rehabilitation option has an emphasis on prosthetics and assisted devices. The TEMB track is designed for students who desire to apply engineering principles to develop new biocompatible materials for the fields of tissue engineering and regenerative medicine, and to study and solve problems on the cellular and molecular scales.

The broad education provided by these tracks allows students to choose from a wide variety of careers. The degree program is designed to prepare qualified graduates for graduate study leading to the master of science (M.S.) or doctor of philosophy (Ph.D.) degree in biomedical engineering. In addition, students are prepared to meet the graduate entrance requirements for medical and law schools, business administration, and other professional disciplines. Aspiring graduates with industrial experience and outlook can work in large corporations and smaller companies as practicing biomedical engineers. Curricular emphasis on innovation and entrepreneurship helps prepare students to pursue opportunities at start-up companies or develop their own ideas into marketable products. Increasing numbers of graduates are finding rewarding jobs in state and federal institutions, including the National Laboratories.

The achievements of biomedical engineering constantly touch our daily lives. Past and current breakthroughs that were pioneered at Rutgers include heart-assisted devices for cardiac surgery; techniques for online analysis and operating room lesioning of brain tissue for Parkinson's disease; an artificial hand with finger dexterity; the use of virtual reality in the rehabilitation of limbs; revolutionary techniques for making large numbers of new biopolymers for implants; and rapid NMR analysis of protein structure. There are several exciting opportunities for undergraduates in biomedical engineering to further their training and experience. The Honors Academy is designed for those high-achieving students who will immerse themselves in an accelerated research program. Internship and co-op programs allow students to gain industrial experience within their education and training. The department also participates in the James J. Slade Scholars Program. These selective programs can serve as springboards for qualified students who wish to begin working toward an M.S. or Ph.D. degree in their senior year.

Biomedical Engineering (ENG)

# Four-Year Undergraduate Curriculum

# Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 125

The degree awarded upon completion of this program is the B.S. in biomedical engineering, which is professionally accredited by the Engineering Accreditation Commission of ABET.

**First Year**

See First-Year Program (35)

**Sophomore Year**

*First Semester*

01:119:115 Biology I (4)

01:640:251 Multivariable Calculus (4)

01:750:227 Analytical Physics IIA (3)

01:750:229 Analytical Physics II Laboratory (1)

14:125:201 Introduction to Biomedical Engineering (3) (also offered in second semester)

humanities/social sciences elective (3)

*Second Semester*

01:119:117 Biology Lab (2)

14:540:343 Engineering Economics (3)

01:640:244 Differential Equations for Engineering and Physics (4)

01:750:228 Analytical Physics IIB (3)

01:750:230 Analytical Physics II Laboratory (1)

14:125:255 BME Systems Physiology (3) (also offered in first semester)

**Junior Year**

*First Semester*

14:125:303 Biomedical Transport Phenomena (3) (also offered second semester)

14:125:305 Numerical Modeling in Biomedical Systems (3) (also offered second semester)

14:125:309 Biomedical Devices and Systems (3)

14:125:310 Biomedical Devices and Systems Laboratory (1)

14:125:308 Introduction to Biomechanics (3) (also offered second semester)

technical elective (3)

*Second Semester*

14:125:304 Introduction to Biomaterials (3) (also offered first semester)

14:125:306 Kinetics and Thermodynamics of Biological Systems (3) (also offered first semester)

14:125:315 BME Measurement and Analysis Laboratory (2)

technical elective (3)

life science elective (3)

**Senior Year**

*First Semester*

14:125:401 Biomedical Engineering Senior Design I (1)

14:125:421 Biomedical Engineering Senior Design Projects I (2)

14:125:___ departmental elective (3)

14:125:___ departmental elective (3)

technical elective (3)

humanities/social sciences elective (3)

*Second Semester*

14:125:402 Biomedical Engineering Senior Design II (1)

14:125:422 Biomedical Engineering Senior Design Projects II (2)

14:125:___ departmental elective (3)

14:125:___ departmental elective (3)

technical elective (3)

general elective (3)

***Total Credits = 129***

**Notes**

Organic Chemistry I,II and laboratory are required for the premedical option and strongly recommended for the tissue engineering and molecular biology (TEMB) track (total of 9 credits counted as three technical electives). Students not in the premedical or TEMB track may choose technical electives in place of organic chemistry and laboratory.

# Chemical Engineering (ENG)

## CHEMICAL ENGINEERING

Chemical Engineering (ENG)

## Field of Study

## Field of Study

Chemical engineering deals with the chemical, biological, and physical processes for converting raw materials to valuable products and with the design of such products. Students apply principles of physics, chemistry, mathematics, biology, and health and safety sciences to the analysis, design, and automatic control of these processes. The biochemical engineering option focuses on biochemical and biological processes that require the integration of biochemistry and molecular biology with the core chemical engineering curriculum and other basic

sciences. Special programs are available for those who wish to pursue careers as chemical engineers in medicine or biomedical engineering, polymer process engineering and science, environmental engineering, energy engineering, pharmaceutical engineering, and food engineering.

The achievements of chemical and biochemical engineering constantly touch our daily lives. Past and current breakthroughs include the large-scale production of antibiotics; plastics, synthetic rubber, and polymeric fabrics; semiconductors; gasoline and aviation fuel; hydrocarbon-based chemicals from oil, coal, and renewable resources; water and air purification systems; management of hazardous wastes; fertilizers, nutritional synthetic foods, and dietary supplements; dyes, paints, and solvents; kidney dialysis machines and artificial skin; biological production of alcohol or methane gas from controlled microbial digestion of natural and industrial waste materials; and development of bioreactors using enzymes and cells to enhance production of foods, drugs, and specialty chemicals.

The broad education provided by these options and special programs allows students to choose from a wide variety of careers. Many graduates work in large corporations as well as smaller companies as practicing chemical or biochemical engineers. The degree program also prepares qualified students for graduate study leading to the master of science (M.S.) or doctor of philosophy (Ph.D.) degree in chemical and other engineering disciplines, including specialties in biomedical, environmental, polymer, food, energy, and pharmaceutical engineering. In addition, students are prepared to meet the graduate entrance requirements for medical and law schools, business administration, and other professional disciplines.

The curriculum is designed to prepare and train students for entry into the profession equipped with the fundamental knowledge in core sciences required for problem solving and critical thinking. Graduates will have the tools needed to design and analyze complex chemical engineering systems. Training in ethical, health and safety, and societal concerns as they relate to the chemical engineering profession is also provided. Graduates further learn effective communication skills and gain valuable experience working in a team environment. The undergraduate program in Chemical Engineering is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria and Program Criteria for Chemical, Biochemical, Biomolecular Engineering.

**Program Educational Objectives**

***The current educational objectives of the Chemical Engineering program are:***

- Graduates will meet the expectations of employers of chemical engineers
- Graduates will pursue advanced study if desired
- Graduates will pursue leadership positions in their profession and/or communities

Chemical Engineering (ENG)

# Four-Year Undergraduate Curriculum

# Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 155

The undergraduate program in Chemical Engineering is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria and Program Criteria for Chemical, Biochemical, Biomolecular Engineering.

**First Year**

See First-Year Program (35)

**Sophomore Year**

(common to both chemical and biochemical options)

*First Semester*

01:160:307 Organic Chemistry I (4)1

01:640:251 Multivariable Calculus (4)

01:750:227 Analytical Physics II (3)

01:750:229 Analytical Physics II Laboratory (1)

14:155:201 Chemical Engineering Material and Energy Balances (3)

14:155:298 Professional Skills Development (1)

*Second Semester*

Chemical Science Elective (4)1,2

14:540:343 Engineering Economics (3)

01:640:244 Differential Equations for Engineering and Physics (4)

14:155:208 Chemical Engineering Thermodynamics I (3)

14:155:210 Biological Foundations of Chemical Engineering

***Chemical Option***

**Junior Year**

*First Semester*

01:160:311 Organic Chemistry Laboratory (2)3

14:155:303 Transport Phenomena in Chemical Engineering I (3)

14:155:307 Computational Methods in Chemical Engineering (3)

14:155:309 Chemical Engineering Thermodynamics II (3)

technical elective (3)

humanities/social sciences elective (3)

*Second Semester*

14:155:304 Transport Phenomena in Chemical Engineering II (3)

14:155:324 Separation Processes (3)

14:155:341 Chemical Engineering Kinetics (3)

14:635:407 Mechanical Properties of Materials (3)

humanities/social sciences elective (3)

**Senior Year**

*First Semester*

14:155:411 Biochemical Engineering (3)

14:155:415 Process Engineering Laboratory I (4)

14:155:422 Process Simulation and Control (3)

technical elective (3)

general elective (3)

*Second Semester*

14:155:416 Process Engineering Laboratory II (4)

14:155:428 Chemical Engineering Design II (4)

technical elective (3)

general elective (3)

***Total Credits = 130.0***

**Notes**

1 01:160:315,316 are accepted in place of 01:160:307,308.

2 Students select one course from the following list: 01:160:308 Organic Chemistry II; 01:160:351 Inorganic Chemistry I; 16:155:541 Pharmaceutical Materials Engineering; 16:155:571 Sustainable, Renewable, Clean Energy; 14:635:205 Crystal Chemistry and Structure of Materials; 14:635:440 Electrochemical Materials and Devices.

3 01:160:309 (2.5 cr) is accepted in place of 01:160:311 (2.0 cr), and may be taken with 01:160:308.

***Biochemical Option***

**Junior Year**

*First Semester*

01:447:390 General Microbiology (4)4

14:155:303 Transport Phenomena in Chemical Engineering I (3)

14:155:307 Computational Methods for Chemical Engineers (3)

14:155:309 Chemical Engineering Thermodynamics II (3)

technical elective (3)

*Second Semester*

01:694:301 Introductory Biochemistry and Molecular Biology (3)5

01:694:313 Introductory Biochemistry Laboratory (1)6

14:155:304 Transport Phenomena in Chemical Engineering II (3)

14:155:324 Separation Processes (3)

14:155:341 Chemical Engineering Kinetics (3)

humanities/social sciences elective (3)

**Senior Year**

*First Semester*

14:155:411 Biochemical Engineering (3)

14:155:415 Process Engineering Laboratory I (4)

14:155:422 Process Simulation and Control (3)

technical elective (3)

humanities/social sciences elective (3)

*Second Semester*

14:155:416 Process Engineering Laboratory II (4)

14:155:428 Chemical Engineering Design II (4)

14:635:407 Mechanical Properties of Materials (3)

general elective (3)

*Total Credits = 130.0*

**Notes**
4 May complete 01:447:390 or 11:680:390.
5 May complete 01:694:301 or 11:115:301.
6 May complete 01:694:313 or 11:115:313.

# Civil Engineering (ENG)

## CIVIL ENGINEERING

Civil Engineering (ENG)

## Field of Study

## Field of Study

Civil engineering is one of the broadest of the engineering disciplines, extending across many technical specialties. Civil engineers plan, design, and supervise the construction of facilities essential to modern life. These facilities vary widely in nature, size, and scope and include high-rise buildings, long-span bridges, space launching platforms, offshore structures, retractable roof stadiums, tunnels, highways, transit systems, dams, airports, harbors, water supply and wastewater treatment plants, and other infrastructure facilities. All of the forces of nature, static and dynamic, are included in this field of civil engineering, as are the properties of materials, including the soil and rock mantle of the earth. In addition, civil engineering is concerned with the interlocking influences of structures, systems, forces, and materials on one another and on society. Civil engineers work in many diverse areas, such as structural engineering, geotechnical engineering, water resources engineering, transportation engineering, ocean and coastal engineering, and construction engineering.

Civil engineering activities are intimately involved with the activities of many other professions, such as architecture, planning, education, and health; with agencies of local, state, and federal governments; and with the business community in general.

The undergraduate program in civil engineering provides a broad and thorough education for students in civil engineering fundamentals, applications, and design in order to prepare graduates for the practice of professional engineering. To enable graduates to meet challenges posed by an ever-changing society and advancing technology, the program provides a broad background in many of the different areas of civil engineering and sound exposure to engineering sciences, humanities, and social sciences. The undergraduate curriculum permits students to have an area of concentration in structural engineering, geotechnical engineering, construction engineering, transportation engineering, and water resources. Students have considerable freedom to select a variety of departmental electives, technical electives, and, in the senior year, the students should do a senior design or capstone course in one of the concentration areas of study. The bachelor of science program in civil engineering is accredited by the Engineering Accreditation Commission of ABET.

Civil Engineering (ENG)

## Four-Year Undergraduate Curriculum

## Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 180

The degree awarded upon completion of this program is the B.S. in civil engineering which is professionally accredited by the Engineering Accreditation Commission of ABET.

**First Year**

See First-Year Program (35)

**Sophomore Year**

*First Semester*

01:355:302 Scientific and Technical Writing (3)

01:640:251 Multivariable Calculus (4)

01:750:227 Analytical Physics IIA (3)

01:750:229 Analytical Physics II Laboratory (1)

14:440:222 Engineering Mechanics: Dynamics (3)

Humanities/social sciences elective (3)

*Second Semester*

01:640:244 Differential Equations for Engineering and Physics (4)

14:180:216 Introductory Computer-Aided Design and Drafting (3)

14:180:243 Mechanics of Solids (3)

Science elective (3)

Humanities/social sciences elective (3)

**Junior Year**

*First Semester*

01:960:379 Basic Probability and Statistics (3)

14:180:305 Construction Engineering (3)

14:180:318 Elements of Structures (3)

14:180:387 Fluid Mechanics (3)

14:180:389 Fluid Mechanics Laboratory (1)

14:635:407 Mechanical Properties of Materials (3)

*Second Semester*

14:180:320 Design of Steel Structures (3)

14:180:345 Properties of Materials Laboratory (1)

14:180:364 Transportation Engineering I (3)

14:180:372 Soil Mechanics (3)

14:180:374 Soil Mechanics Laboratory (1)

14:540:343 Engineering Economics (3)

**Senior Year**

*First Semester*

14:180:411 Reinforced Concrete (3)

14:180:421 Reinforced Concrete Laboratory (1)

14:180:429 Water and Wastewater Engineering (3)

14:180:430 Introduction to Transportation Planning (3)

14:180:473 Foundation Engineering (3)

Technical elective (3)

*Second Semester*

14:180:482 Professional Issues in Civil Engineering (1)

14:180:___ departmental elective (capstone design) (4)

14:180:___ departmental elective (3)

Technical elective (3)

General elective (3)

***Total Credits = 128***

1. Departmental courses may be used for technical electives, but technical courses outside the department may not be used as departmental electives. The department publishes annually a list of acceptable technical electives in the undergraduate handbook.

2. At least one of the following capstone design courses is required:

14:180:407 Construction Projects (4)

14:180:426 Structural Design (4)

14:180:431 Design of Environmental Engineering Facilities (4)

14:180:438 Transportation Engineering II (4)

14:180:474 Geotechnical Engineering Design (4)

3. With a combination of the required and elective departmental courses and the available general and technical electives, a student may pursue a general program or a program having an area of concentration in structural engineering, geotechnical engineering, construction engineering, transportation engineering, or water resources/ environmental engineering.

# Electrical and Computer Engineering (ENG)

## ELECTRICAL AND COMPUTER ENGINEERING

Electrical and Computer Engineering (ENG)

## Field of Study

## Field of Study

Electrical and computer engineering (ECE) is a rapidly developing and diverse field ranging from integrated circuits and submicron devices to powerful computational systems and wireless communication networks. Over the past two decades, increasing numbers of electrical and computer engineering graduates have been engaged in the development and application of data and information processing, cybersecurity, embedded systems, high performance computer systems, software engineering, and automatic control systems of increasing sophistication.

To prepare its graduates to compete in a fast-changing technical environment, the department depends upon a curriculum with a strong core of required courses in mathematics, physical sciences, and engineering science. In addition, students have considerable freedom to choose electives in these and other areas of study. As a result, electrical and computer engineering undergraduates may structure their programs to accommodate the changes of the electrical and electronic industry and to prepare for graduate study in such diverse areas as control and power systems, communication systems, digital signal processing, computer engineering, solid-state electronics, wireless information networks, human-computer interaction, and others. The wide range of subject matter enhances the student's opportunity for challenging employment and graduate study.

The department offers two curriculum options for undergraduate students: electrical engineering and computer engineering. The electrical engineering option follows a traditional set of required courses with equal emphasis on all main areas of electrical engineering, yet allows a student to favor one area over another by appropriate selection of elective courses. The computer engineering option, while giving a broad background in electrical engineering, prepares students for careers in the area of computer hardware, software engineering, and human-computer interaction. The undergraduate program in Electrical and Computer Engineering is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs.

*Program Objectives*

The current educational objectives of the Electrical and Computer engineering program are that within 3-5 years:

-Expectation: graduates will exceed the expectations of employers of electrical and computer engineers;

-Advanced Study: qualified graduates will pursue advanced study if they so desire; and

-Leadership: graduates will pursue leadership positions in their profession and/or communities.

Electrical and Computer Engineering (ENG)

# Four-Year Undergraduate Curriculum

# Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 332

The electrical and computer engineering curriculum includes two options: electrical engineering and computer engineering. The degree awarded upon completion of either option is the B.S. in electrical and computer engineering which is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs.

**First Year**

See First-Year Program (32)

**Sophomore Year**

(common to both options)

*First Semester*

01:640:251 Multivariable Calculus (4)

01:750:227 Analytical Physics IIA (3)

01:750:229 Analytical Physics II Laboratory (1)

14:332:221 Principles of Electrical Engineering I (3)

14:332:223 Principles of Electrical Engineering I Laboratory (1)

14:332:231 Digital Logic Design (3)

14:332:233 Digital Logic Design Laboratory (1)

*Second Semester*

01:640:244 Differential Equations for Engineering and Physics (4)

14:332:222 Principles of Electrical Engineering II (3)

14:332:224 Principles of Electrical Engineering II Laboratory (1)

14:332:226 Probability and Random Processes (3)

14:332:252 Programming Methodology I (4)

*Electrical Engineering Option*

**Junior Year**

*First Semester*

14:332:331 Computer Architecture and Assembly Language (3)

14:332:333 Computer Architecture Laboratory (1)

14:332:345 Linear Systems and Signals (3)

14:332:361 Electronic Devices (3)

14:332:363 Electronic Devices Laboratory (1)

humanities/social sciences elective (200+)(3)

14:332:__ Restricted electrical elective (3)

*Second Semester*

14:332:312 Discrete Mathematics (3)

14:332:346 Digital Signal Processing (3)

14:332:348 Digital Signal Processing Lab (1)

14:332:366 Digital Electronics (3)

14:332:368 Digital Electronics Laboratory (1)

14:332:393 Professionalism/Ethics (1)

14:540:343 Engineering Economics (3)

**Senior Year**

*First Semester*

14:332:449 Introduction to Capstone Design (1)

14:332:__ electrical elective (3)

14:332:__ electrical elective (3)

science/math/engineering elective (3)

technical elective (3)

humanities/social sciences elective(200+) (3)

*Second Semester*

14:332:448 Capstone Design in ECE (3)

14:332:___ electrical elective (3)

technical elective (3)

general elective (3)

***Total Credits = 123***

***Computer Engineering Option***

**Junior Year**

*First Semester*

14:332:331 Computer Architecture and Assembly Language (3)

14:332:333 Computer Architecture Laboratory (1)

14:332:345 Linear Systems and Signals (3)

14:332:351 Programming Methodology II (3)

14:332:___ Restricted computer elective (3)

humanities/social sciences elective (200+) (3)

*Second Semester*

14:332:434 Introduction to Computer Systems (3)

14:332:312 Discrete Mathematics (3)

14:540:343 Engineering Economics (3)

14:332:452 Software Engineering (3)

14:332:393 Professionalism/Ethics (1)

technical elective (3)

**Senior Year**

*First Semester*

14:332:437 Digital Systems Design (3)

14:332:449 Introduction to Capstone Design (1)

computer elective (3)

computer elective (3)

science/math/engineering elective (3)

humanities/social sciences elective (200+) (3)

*Second Semester*

14:332:448 Capstone Design in ECE (3)

computer elective (3)

technical elective (3)

general elective (3)

***Total Credits = 123***

# Environmental Engineering (ENG)

## ENVIRONMENTAL ENGINEERING

Environmental Engineering (ENG)

## Field of Study

## Field of Study

Environmental engineers utilize engineering principles and physical, chemical, and biological science fundamentals to devise effective solutions for current and emerging environmental problems related to human activities. Environmental engineers practice in many areas: green infrastructure for urban stormwater and flood management; air pollution prevention and control; safe drinking water production and supply; sustainable treatment of wastewater and solid wastes; remediation of contaminated sites; ensuring industry compliance with environmental regulations; environmental health and safety in the workplace; alternative energy technologies; design of green buildings; and analysis and modeling of big data to guide societal responses to global environmental change.

This program prepares students for immediate employment as practicing engineers with engineering consulting firms; green energy and sustainable development companies; drinking water, wastewater, solid waste, and air pollution treatment facilities; manufacturing industries; environmental regulatory and planning agencies; industry and academic research laboratories; international development agencies; and public-interest groups.

The environmental engineering curriculum provides a strong foundation in engineering and the physical, chemical, and biological sciences during the freshman and sophomore years. In the upper-level major courses these fundamentals are applied to multidisciplinary problem solving in various environmental engineering fields. The faculty has extensive experience in teaching, research, and consulting with private firms and government agencies, and close ties to our strong alumni network.

The environmental engineering program is a unique joint program between the School of Engineering and the School of Environmental and Biological Sciences. Students matriculate into the environmental engineering program through the School of Engineering. The undergraduate program in Environmental Engineering is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria and Program Criteria for Environmental Engineering. The program prepares graduates for taking the Fundamentals of Engineering (FE) examination pursuant to becoming a licensed professional engineer (PE).

Environmental Engineering (ENG)

# Four-Year Undergraduate Curriculum

# Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 366

The undergraduate program in Environmental Engineering is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria and Program Criteria for Environmental Engineering.

**First Year**

See First-Year Program (35)

**Sophomore Year**

*First Semester*

01:119:103 Principles of Biology (4)

01:640:251 Multivariable Calculus (4)

01:750:227 Analytical Physics IIA (3)

01:750:229 Analytical Physics II Laboratory (1)

14:180:215 Engineering Graphics (1)

14:440:222 Engineering Mechanics: Dynamics (3)

*Second Semester*

01:160:209 Elementary Organic Chemistry (3)

01:640:244 Differential Equations for Engineering and Physics (4)

11:117:333 Environmental Engineering Tools (3)

14:180:243 Mechanics of Solids (3)

General elective (3)

**Junior Year**

*First Semester*

01:160:211 Elementary Organic Chemistry Laboratory (1)

11:375:201 Biological Principles of Environmental Sciences (3)

11:375:202 Chemical Principles of Environmental Sciences (3)

11:375:303 Numerical Methods in Environmental Sciences or 300-400 level statistics (3)

14:180:387 Fluid Mechanics (3)

14:180:389 Fluid Mechanics Laboratory (1)

*Second Semester*

11:117:462 Design of Solid Waste Treatment Systems (3)

11:375:423 Environmental Fate and Transport (3)

14:180:448 Elements of Hydrology (3)

14:540:343 Engineering Economics (3)

14:650:351 Thermodynamics (3)

Humanities/social sciences elective (3)

**Senior Year**

*First Semester*

11:117:413 Unit Processes in Environmental Engineering I (3)

11:117:423 Environmental Engineering Unit Processes Laboratory I (1)

11:117:474 Air Pollution Engineering (3)

11:117:488 Environmental Engineering Design I (2)*

11:375:322 Energy Technology and its Environmental Impact (3)

Option elective (3)

*Second Semester*

11:117:414 Unit Processes in Environmental Engineering II (3)

11:117:424 Environmental Engineering Unit Processes Laboratory II (1)

11:117:489 Environmental Engineering Design II (2) or 14:180:431 Design of Environmental Engineering Facilities (4)*

Humanities/social sciences elective (3)

Option elective (3)

Option elective (3)

*Total Credits = 129*

**Notes**

*For the water resources concentration, it is optional to take 14:180:431 instead of 11:117:488/489.

*Option electives may be selected for one of four concentrations from the following:*

Water Resources: 11:117:494, 11:117:495, 11:117:497, 11:117:498, 11:372:232, 233, 11:375:434, 14:180:372, 374, 14:180:382, 14:180:443; 11:682:451; 11:628:425

Environmental Unit Processes and Remediation: 11:117:468, 11:117:494, 11:117:497, 11:117:498, 11:375:340, 11:375:407, 11:375:411, 11:375:434, 11:375:444, 11:375:453, 11:680:201

Air Quality: 11:117:497, 11:117:498, 11:375:346; 11:375:407, 11:375:424, 11:375:434, 11:670:453, 14:650:461

Sustainable Environmental Systems: 11:117:468, 11:117:497, 11:117:498, 11:375:360; 11:375:430, 11:375:434, 11:375:450, 11:375:474; 11:776:382; 14:332:443; 14:635:405; 14:440:378: 10:971:202: 11:020:340

# Industrial Engineering (ENG)

## INDUSTRIAL ENGINEERING

Industrial Engineering (ENG)

## Field of Study

## Field of Study

In today's complex and competitive world, industrial engineers are in great demand to design, improve, and operate integrated *systems* of people, materials, equipment, and energy. The industrial and systems engineering (ISE) discipline applies fundamentals from the mathematical, physical, and engineering sciences to efficiently design and analyze large systems that serve industry and government both in manufacturing and service sectors. The bachelor of science program in industrial engineering is accredited by the Engineering Accreditation Commission of ABET. The undergraduate industrial and systems engineering program at Rutgers provides students with a broad engineering education along with specialization in the industrial engineering and manufacturing fields. We believe

that a broad education is necessary to understand the impact of engineering solutions in a global/societal context. Academic strength in mathematics, physics, and basic engineering science is required. Specialization is offered in mathematical modeling, quality engineering and statistical techniques, computer-aided design, computer-aided manufacturing, simulation, manufacturing processes, engineering economics, production planning and control, design of engineering systems and information technology. Students have access to state-of-the-art laboratory facilities where hands-on instruction is emphasized in robotics, machine vision, manufacturing, automated material handling, quality engineering, electronic and sensor devices, simulation, and computer information systems.

The undergraduate program focuses on classroom instruction fostered by learning in multidisciplinary project-teams. These teams frequently formulate and find engineering solutions to real-world industry problems. The ability to communicate effectively is emphasized by having students provide both oral and written reports.

ISE graduates work in a number of areas including electronic, pharmaceutical, and other manufacturing; health services, transportation, distribution, and communication; and computers, finance, marketing, and management. Students pursue graduate studies in engineering and in management at leading institutions.

The ISE faculty are dedicated to excellence in teaching, research, and professional service. They bring experience, real-life industrial problems, and enthusiasm to the classroom, setting a standard for students to follow in their professional careers.

Industrial Engineering (ENG)

# Four-Year Undergraduate Curriculum

# Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 540

The degree awarded upon completion of this program is the B.S. in industrial engineering which is professionally accredited by the Engineering Accreditation Commission of ABET.

**First Year**

See First-Year Program (35)

**Sophomore Year**

*First Semester*

01:640:251 Multivariable Calculus (4)

01:750:227 Analytical Physics IIA (3)

01:750:229 Analytical Physics II Laboratory (1)

14:540:201 Work Design and Ergonomics (3)

14:540:202 Work Design and Ergonomics Laboratory (1)

14:540:213 Industrial Engineering Laboratory (2)

33:010:310 Accounting for Engineers (3)

*Second Semester*

14:540:343 Engineering Economics (3)

01:640:244 Differential Equations for Engineering and Physics (4)

14:440:222 Engineering Mechanics: Dynamics (3)

14:540:210 Engineering Probability (3)

01:355:302 Science and Technology Writing (3)

**Junior Year**

*First Semester*

14:540:320 Statistics for Engineers (3)

14:180:215 Engineering Graphics (1)

14:332:221 Principles of Electrical Engineering I (3)

14:540:338 Probability Models in Operations Research (3)

14:540:382 Automation and Systems Design (3)

14:540:383 Automation and Systems Design Laboratory (1)

14:635:407 Mechanical Properties of Materials (3)

*Second Semester*

14:540:303 Manufacturing Processes (3)

14:540:304 Manufacturing Processes Laboratory (1)

14:540:311 Deterministic Models in Operations Research (3)

14:540:384 Simulation Models in Industrial Engineering (3)

14:540:399 Design of Engineering Systems I (3)

departmental or technical elective (List B)* (3)

**Senior Year**

*First Semester*

14:540:400 Design of Engineering Systems II (3)

14:540:433 Quality Engineering (3)

14:540:434 Quality Engineering Laboratory (1)

14:540:453 Production Planning and Control (3)

14:332:402 Sustainable Energy (3)

*Second Semester*

14:540:462 Facilities Layout and Materials Handling (3)

departmental or technical elective (List A)* (3)

humanities/social sciences elective (3)

humanities/social sciences elective (3)

*Total Credits = 129*

**Notes**
*List of electives (List A and List B) are published each year by the department.

# Materials Science and Engineering (ENG)

## MATERIALS SCIENCE AND ENGINEERING

Materials Science and Engineering (ENG)

## Field of Study

## Field of Study

The Department of Materials Science and Engineering (MSE) has a fascinating history that goes back to 1902 when the School of Ceramics was founded to support the growing ceramics industry in the state. The department provided critical technical support to the U.S. Army during and after World War II, principally in the area of electronic materials. The department expanded into technical engineered ceramics under the leadership of Drs. John Koenig and Malcom G. McLaren in the postwar period. A shift to all types of materials occurred in the 1995-2005 time frame as the department became MSE (officially named in 2007).

Materials engineers and scientists study the synthesis, processing, and characterization of substances within these general classes of materials: polymers, metals, semiconductors, ceramics, glass, and composites. An understanding of the molecular structure and well-designed processing are the keys to engineering materials with outstanding properties. Novel materials are tailored to meet the needs of targeted applications and become the foundation for all engineering disciplines. Such materials enable many new technologies and are found in various forms in electronics, optics, architecture, transportation, biomedicine, aviation and aerospace, pharmaceuticals, energy

generation, environmental engineering, and numerous other industrial systems. Our graduates are in high demand by industry and are employed at excellent salaries by prominent companies. Those going on to graduate school are well prepared and are highly recruited by prestigious graduate schools worldwide.

Students in the MSE curriculum study the chemical and physical nature of materials at the macro, micro, and nano scales. Early on, students will take courses in crystal chemistry and physics of materials, followed by more focused study of phase equilibria and the measurement of thermal, electrical, and optical properties. The later stages of the curriculum emphasize the intricate but defining relationships between structure, properties, and processing of engineering materials, with emphasis on applications and materials design. In the junior and senior year, undergraduates design their capstone course in preparation for graduate studies or an industrial career in the materials industry in a diverse range of categories that include research, development, marketing, process engineering, and technical sales.

The MSE program encourages a student to select an area of focus in one of the following areas: biomaterials, nanomaterials, polymers, electronic and optical materials, and energy conversion and storage. This concentration is accomplished via the selection of technical electives in the targeted area and is determined in consultation with a faculty adviser. The MSE faculty is highly regarded in many materials areas, such as biomaterials, photovoltaics, glass, polymers, structural ceramics, composites, nanomaterials, piezoelectric and ferroelectric ceramics, advanced thin-film engineered materials, fiber optics, microelectronics, packaging materials, battery materials, ceramic and metallic surfaces, and materials theory and computational modeling. The department also maintains some of the most advanced materials characterization facilities in the region.

The undergraduate curriculum leads to a bachelor of science degree in materials science and engineering. The curriculum is designed to allow the student exceptional flexibility in designing a program that fits specific needs, interests, and goals. The curriculum is accredited by the Engineering Accreditation Commission of ABET.

*Internship Programs*

Students also may participate in a variety of internship programs ranging from a student technician program to the co-op internship. The co-op internship provides the student with the opportunity to practice and/or apply knowledge and skills in various materials engineering professional environments. This internship is intended to provide a real-world experience to the student's undergraduate studies by integrating prior coursework into a working engineering environment.

*Educational Mission of the Department*

The Mission of the Department of Materials Science and Engineering is to provide qualified students with a relevant education in Materials Science and Engineering preparing them for a productive and rewarding career. While this mission is consistent with the overall mission of the university and the School of Engineering, the department focuses on providing an education that is both learning and practice oriented. With its high faculty-to-student ratio, the department provides unique course options, extensive laboratory experiences, along with research and co-op internships that have adapted to the changing requirement of employers and graduate schools. Through continuous feedback from students, alumni, and employers the department maintains an up-to-date curriculum that emphasizes basic science, engineering, and design. Moreover, the curriculum provides flexibility and diversity in allowing students to select areas of concentration that are in the forefront of technology today.

*Educational Objectives*

Within the scope of the MSE mission, the objectives of the Materials Science and Engineering program are to produce graduates with an education relevant to current science and engineering and an education that will lead

to a productive and rewarding career. Graduates of the program are expected within a few years of graduation to have: used their engineering skills, enhanced through the onset of lifelong learning, to apply innovative solutions to assist in solving critical engineering problems to provide economic, ethical, environmental, and societal value; worked individually or with teams of professionals to provide innovative concepts and technologies that address the scientific or engineering needs of academia, industry, commerce, and society; and demonstrated a track record of professional leadership characterized by scientific or engineering accomplishments and productivity in one or more of the broad industries for which Materials Science and Engineering is the enabling foundation.



# Four-Year Undergraduate Curriculum

# Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 635

The degree awarded upon completion of this program is the B.S. in materials science and engineering, which is professionally accredited by the Engineering Accreditation Commission of ABET.

**First Year**

See First-Year Program (35)

**Sophomore Year**

*First Semester*

01:640:251 Multivariable Calculus (4)
01:750:227 Analytical Physics IIA (3)
01:750:229 Analytical Physics IIA Lab (1)
01:960:xxx* Statistics (*211, 384, 401, 490) (3)
14:635:203 Introduction to Materials Science Engineering (3)
14:635:205 Crystal Chemistry and Structure of Materials (3)

*Second Semester*

01:640:244 Differential Equations (4)
14:635:204 Materials Processing (3)
14:635:206 Thermodynamics of Materials (4)
14:635:212 Physics of Materials (3)
14:635:252 Laboratory I (2)

**Junior Year**

*First Semester*

14:635:305 Materials Microprocessing (3)
14:635:307 Kinetics of Materials Processing (3)
14:635:309 Characterization of Materials (3)
14:635:314 Strength of Materials (3)
14:635:353 Laboratory II (2)
___:___ elective (Dept/Tech) (3)

*Second Semester*

14:540:343 Engineering Economics (3)
14:635:316 Electrical, Optical, and Magnetic Properties of Materials (3)
14:635:354 Laboratory III (2)
14:635:401 Senior MSE Lab I (3) OR (only one of 401/411 is required)
14:635:411 MSE Eng Design I (3)
___:___ elective (Dept/Tech) (3)

**Senior Year**

*First Semester*

14:635:402 Senior MSE Lab II (3 ) OR (only one of 402/412 is required)
14:635:412 MSE Eng Design I (3)
14:635:403 MSE Seminar (1)
___:___ elective (Dept/Tech) (3)
___:___ elective (Dept/Tech) (3)
___:___ elective (Dept/Tech) (3)
___:___ humanities/social science elective (300+) (3)

*Second Semester*

14:635:404 MSE Seminar (1)
___:___ elective (Dept/Tech) (3)
___:___ elective (Dept/Tech) (3)
___:___ humanities/social science elective (300+) (3)
___:___ general elective (3)

***Total Credits at Graduation: 128***

**Electives**

Aside from the humanities/social science electives, the materials science and engineering (MSE) program contains eight elective slots (four department, three technical, and one general) that can be used to tailor your degree. You can concentrate in specific areas of MSE, dual major, or prepare for specialized professional training after graduation.

***Department Electives***

Take a minimum of two department electives from this list (you may take more):
14:635:312 Glass Engineering (3)
14:635:360 Ceramics Engineering (3)
14:635:361 Materials Science and Engineering of Polymers (3)
14:635:362 Physical Metallurgy (3)

Select remaining department elective(s) from this list:
14:635:320 Introduction to Nanomaterials (3)
14:635:321 Structural, Mechanical, and Chemical Applications of Nanostructures and Nanomaterials (3)
14:635:322 Photonic, Electronic, and Magnetic Applications of Nanostructures and Nanomaterials (3)
14:635:405 Solar Cell Design and Processing (3)
14:635:410 Biological Applications of Nanostructures and Nanomaterials (3)
14:635:413 Materials Science and Engineering: Venture Analysis (3)
14:635:416 Physical and Chemical Properties of Glass (3)
14:635:440 Electrochemical Materials and Devices (3)
14:635:505 Advanced Optical Materials (3)

*Technical Electives*

Three technical electives may be selected from the department electives list or from the list below:
01:119: Biological Sciences: only 119:100-103, 131, 140, and 148
01:146: Cell Biology and Neurosciences: all except 146:302
01:160: Chemistry: all 160:3xx and 4xx
01:198: Computer Sciences: all except 198:105, 107, 110, and 170
01:447: Genetics and Microbiology: all except 447:302
01:460: Geological Sciences: all except 460:206
01:640: Mathematics: 640:250 and all 640:3xx and 4xx except 640:336, 338, 339, and 436
01:694: Molecular Biology and Biochemistry: all
01:750: Physics: 750:228/230 and all 750:3xx and 4xx
01:960: Statistics: all
11:115: Biochemistry: all 115:3xx and 4xx
11:126: Biotechnology: all
11:127: Bioresource Engineering: all
11:375: Environmental Sciences: all
11:400: Food Sciences: only 400:201, 304, 401, and 411
11:628: Marine Sciences: all
11:670: Meteorology: all
14:125: Biomedical Engineering: all 125:2xx and 3xx
14:155: Chemical and Biochemical Engineering: all
14:180: Civil and Environmental Engineering: all
14:332: Electrical and Computer Engineering: all except 301
14:440: Packaging
14:540: Industrial Engineering: 540:201/202 and all 540:3xx and 4xx
14:635: Materials Science and Engineering: all except 407
14:650: Mechanical and Aerospace Engineering: all except 650:351

*Statistics*

One of the following courses must be taken to satisfy the statistics requirement:
01:960:211 Statistics I (3)
01:960:384 Intermediate Statistical Analysis (3)
01:960:401 Basic Statistics for Research (3)
01:960:490 Introduction to Experimental Design (3)

**Options in MSE**

The MSE department presently has seven areas of concentration in which you may specialize and receive a certificate upon graduation. These are highly relevant areas in science and engineering that are favored by graduate schools and employers. To receive a certificate in any one of these areas you must take at least three of the courses listed for each concentration for your electives. You may earn multiple certificates.

*Biomaterials*
Note: One course from each of the two groups marked with ** and # is required.
01:119:101 General Biology I (3)**
01:119:102 General Biology II (3)
01:160:307 Organic Chemistry I (4)**
01:694:214 Introduction to Molecular Biology Research (3)
14:125:404 Introduction to Biomaterials (3)#
14:635:410 Biological Applications of Nanomaterials (3)#

*Electronic and Optical*
14:635:322 Photonic, Electronic, and Magnetic Applications of Nanostructures and Nanomaterials (3)
14:635:405 Solar Cell Design and Processing (3)
14:635:413 Solar Technology Venture Analysis (3)
14:332:466 Opto-Electronic Devices (3)
14:635:505 Advanced Optical Materials (3)
01:750:305 Modern Optics (3)
01:750:406 Introductory Solid State Physics (3)

*Energy Conversion and Storage*
11:375:322 (F) Energy Technology and its Environmental Impact (3)
14:635:405 (F) Solar Cell Design and Processing (3)
14:332:402 (S) Sustainable Energy: Choosing among Options (3)
14:635:440 (S) Electrochemical Devices (3)
14:332:361 (S) Electronic Devices (prerequisite: 14:332:222 Principles of Electrical Engineering II) (3)
14:332:460 (S) Power Electronics (prerequisite: 14:332:361 Electronic Devices) (3)

*Metallurgy*
Note: For this concentration, a student must take all four of the listed courses
14:635:206 Thermodynamics of Materials (3)
14:635:307 Kinetics of Materials Processing (3)
14:635:314 Strength of Materials (3)
14:635:363 Physical Metallurgy (3)

*Nanomaterials*
14:635:320 Introduction to Nanomaterials (3)
14:635:410 Biological Applications of Nanomaterials (3)
16:635:604 Introduction to Nanoscience and Nanotechnology (3)
16:635:321 Structural, Mechanical, and Chemical Properties of Nanomaterials (3)

*Packaging Materials*
Note: For this concentration, a student must take at least two of the three 635 courses
14:635:312 Glass Engineering (3)
14:635:361 Polymer Engineering (3)
14:635:362 Physical Metallurgy (3)
14:440:301 Introduction to Packaging Engineering (3)
14:440:302 CAD for Packaging Engineering (3)

*Polymers*
Note: For this concentration 14:635:361 is required
01:160:307 Organic Chemistry I (4)
14:635:361 Materials Science and Engineering of Polymers (3)
16:155:551 Polymer Science and Engineering I (3)
14:440:301 Introduction to Packaging Engineering (3)

# Mechanical Engineering (ENG)

## MECHANICAL ENGINEERING

Mechanical Engineering (ENG)

## Field of Study

## Field of Study

The evolution of our technology into the 21st century has reinforced the importance of the broad technical and professional training of both the mechanical and the aerospace engineer. Each may make his or her professional contribution in many diverse industries, ranging from the automobile and aerospace industries to the manufacture of computers, biomedical devices, and the automation and control of systems. Regardless of the particular product involved, mechanical engineers rely upon knowledge of matter and energy conversions, motions, and forces obtained from computer simulations and experimental investigations of processes and systems. Mechanical engineers are able to design mechanisms, machines, and structures to serve a specific purpose, such as the manufacture of high-tech materials, including ceramics, composites and biomaterials, and high-tech equipment, including spacecraft, robots, and human implants. They also are trained to determine, both experimentally and theoretically, the heat, energy, and mechanical stress that occurs within engineering devices. Examples include internal combustion engines, electronic equipment, robots, solar energy systems, artificial organs, rocket engines, steam and gas turbines, and nuclear reactors. The curriculum in mechanical and aerospace engineering provides these skills and prepares students for graduate study and research.

The undergraduate program in mechanical engineering trains students in a technically sound, challenging, and professional manner, laying the foundation for a productive career and enabling graduates to make positive contributions to their profession and society. This is achieved with a thorough preparation in the humanities, mathematics, and basic sciences as well as up-to-date mechanical and aerospace engineering fundamentals and applications using the most advanced tools and methods available. In the senior year, the capstone design and manufacturing course allows students to solve open-ended, multicriteria engineering problems. Emphasis is placed on teamwork, project management, conceptualization, detailed design, computational analysis, and manufacturing. At the end of the yearlong course, students will have experienced a full product development cycle from concept to construction and testing.

The bachelor of science program in mechanical engineering is accredited by the Engineering Accreditation Commission of ABET.

Mechanical Engineering (ENG)

# Four-Year Undergraduate Curriculum

# Four-Year Undergraduate Curriculum

Four-Year Curriculum Code 650

The mechanical engineering curriculum includes three options: mechanical, aerospace, and energy. The degree awarded upon completion of any of these options is the B.S. in mechanical engineering which is professionally accredited by the Engineering Accreditation Commission of ABET.

**First Year**

See First-Year Program (35)

**Sophomore Year**

*First Semester*

14:440:222 Engineering Mechanics: Dynamics (3)*

01:640:251 Multivariable Calculus (4)

14:650:388 Computer-Aided Design in Mechanical and Aerospace Engineering (3)*

01:750:227 Analytical Physics IIA (3)

01:750:229 Analytical Physics IIA Laboratory (1)

14:650:289 Professional Development and Leadership in MAE (1)

*Second Semester*

01:640:244 Differential Equations for Engineering and Physics (4)

14:650:291 Introduction to Mechanics of Materials (3)

14:650:361 Introduction to Mechatronics (4)*

01:750:228 Analytical Physics IIB (3)

01:750:230 Analytical Physics IIB Laboratory (1)

technical elective (3)

**Junior Year**

*First Semester*

14:650:351 Thermodynamics (3)*

01:640:421 Advanced Calculus for Engineering (3)*

14:650:312 Fluid Mechanics (3)*

14:650:350 Mechanical Engineering Measurements with Lab (4)*

humanities/social sciences elective (3)

*Second Semester*

01:540:343 Engineering Economics (3)

14:635:407 Mechanical Properties of Materials (3)*

14:650:342 Design of Mechanical Components (3)*

14:650:439 Multiphysics Simulations (3)*

humanities/social sciences elective (3)*

**Senior Year**

*First Semester*

14:650:431 Mechanical and Aerospace Engineering Laboratory I (2)

14:650:467 Design and Manufacturing I (2)

14:650:481 Heat Transfer (3)*

14:650:4__ MAE dept., aerospace, energy electives (3)

14:650:4__ MAE dept., aerospace, energy electives (3)

technical elective (3)

*Second Semester*

14:650:401 Dynamic Systems and Controls (3)

14:650:432/3/5 ME, Aerospace, Energy Lab (2)

14:650:468 Design and Manufacturing II (2)

14:650:4__ MAE dept., aerospace, energy elective (3)

technical elective (3)

general elective (3)

*Total Credits = 131*

**Notes**
*May be taken during the first or second semester, within the listed year. All mechanical and aerospace engineering department electives may count for technical electives.

**Department Electives** (select three from the lists below; can mix and match)

14:650:443 Vibrations (3)
14:650:451 Vehicle Dynamics (3)
14:650:455 Design of Mechanisms (3)

**Energy Electives** (select three for energy concentration)

14:650:461 Internal Combustion Engines (3)
14:650:462 Power Plants (3)
14:650:474 Alternative Energy Systems I (3)
14:650:477 Alternative Energy Systems II (3)

**Aerospace Electives** (select three for aerospace engineering concentration)

14:650:447 Probabilistic Models in Mechanical and Aerospace Engineering Systems (3)
14:650:449 Aerospace Materials (3)
14:650:457 Spacecraft and Mission Design (3)
14:650:458 Aerospace Structures (3)
14:650:459 Aerospace Propulsion (3)
14:650:460 Aerodynamics (3)
14:650:463 Compressible Fluid Dynamics (3)
14:650:465 Orbital Mechanics (3)
14:650:471 Aircraft Flight Dynamics (3)

# Other Programs of Study (ENG)

## OTHER PROGRAMS OF STUDY

Other Programs of Study (ENG)

# Honors Academy

# Honors Academy

The Rutgers School of Engineering Honors Academy is designed to challenge, inspire, and sustain a select group of highly self-motivated engineering students who demonstrate remarkable **academic ability**, **enthusiasm**, **intellectual curiosity**, and a **clear potential to make a difference as a leader in whatever field of engineering they pursue**.

While serving the community, with the goal of propelling students into a purposeful and richly rewarding future, the Honors Academy offers a unique opportunity for students to reach their full potential inside and outside the classroom. Through selective academic courses and living together in residential halls during a portion of their time as undergraduates, scholars enjoy an environment that facilitates strong intellectual bonds and personal growth. The students are challenged with accelerated courses and have the opportunity to participate in the prestigious James J. Slade research program which culminates in a final presentation and an honors thesis. With numerous cocurricular programs, the Honors Academy is designed to enrich the educational opportunities for outstanding students.

Please visit the Engineering Honors Academy website for more information on honors curriculum, honors housing, honors living-learning community, and honor cocurricular programs and activities.



# Five-Year B.S./B.A. Dual-Degree Program with SAS

# Five-Year B.S./B.A. Dual-Degree Program with SAS

The five-year, dual-degree program in engineering and the liberal arts/sciences is offered by the School of Engineering (SoE) in cooperation with the School of Arts and Sciences (SAS). The five-year program leads to a bachelor of science (B.S.) degree in any of the engineering programs and a bachelor of arts (B.A.) or B.S. degree in any major offered by the SAS.

For students interested in the five-year B.S./B.A. program, the best path is to start at the School of Engineering from the first year. Typically, students apply to the SAS during their fourth year to complete the five-year B.S./B.A. program. Some students may be able to complete the B.S./B.A. program in four years, in which case, they will need to apply to the SAS in their third year. Students starting at the SAS can also apply to the B.S./B.A. program, in which case, students must apply for a School-to-School transfer into the SoE during their second year in order to complete the dual-degree program. With this option, admission to the SoE is not guaranteed, and students must meet the School-to-School transfer requirement to join the program.

To qualify for both degrees, students must satisfy all the SoE requirements including humanities/social science, technical, and general electives; SAS major requirements and the Core Curriculum requirements; as well as completing a minor in a humanity/social sciences area if students choose a technical major (such as math or computer science) for the B.A. degree. SoE students who are enrolled jointly with SAS in the B.S./B.A. program must earn 30 degree credits beyond the total degree credits required for the B.S. engineering degree alone. Courses used

to satisfy requirements for the liberal arts degree may also be used simultaneously to satisfy SoE humanities/social sciences, technical, and general electives if such courses are acceptable for credit toward the B.S. in engineering degree. There is no limit to the number of credits that may be used to simultaneously satisfy the B.S. and B.A. degree requirements.

The program requires that both degrees must be conferred at the same time even if requirements for one degree are completed before the other. The degrees are conferred before the end of the fifth year or earlier if students can complete the requirement for both degrees in four years. Students who complete the B.S./B.A. program will receive two separate degrees/diplomas, one from each school.

Other Programs of Study (ENG)

# Accelerated Bachelor of Science/Master's Programs

# Accelerated Bachelor of Science/Master's Programs

Rutgers School of Engineering students are eligible to apply for admission to a variety of accelerated master's programs. Admission to any of these programs typically requires a cumulative grade-point average of at least 3.200 and junior year status. In some cases an aptitude test such as the GRE or GMAT is also required. These prestigious programs allow students to complete a master's degree in one extra year while simultaneously integrating an undergraduate engineering experience with that of a graduate program. With the higher demands of the workplace in today's world, the bachelor of science (B.S.)/master's programs ensure that students remain competitive by mastering new techniques and extending their expertise within their subject area and/or in the related areas of business.

Please visit the website for more information on the accelerated master's programs in engineering, science, education, and business.

Other Programs of Study (ENG)

# Minors and Second Majors

# Minors and Second Majors

Students enrolled at the School of Engineering are eligible to earn minors and/or second majors offered by any program at the School of Arts and Sciences (SAS). Students declare the minor or second major at the School of Engineering Office of Academic Services, and are responsible for meeting the requirements set by the departments in SAS. Completion of the minor or second major is certified by the corresponding SAS department in the last semester before graduation, and is recognized by a notation on the student's academic transcript. Students who wish to have the second major associated with a second degree must apply and be accepted by the School of Arts and Sciences for enrollment in the five-year, dual-degree program. (See the SAS section of this catalog for more information.)

Other Programs of Study (ENG)

# Study Abroad

# Study Abroad

Engineering students may enroll in programs coordinated by the Rutgers Center for Global Education (here). The assistant dean for transfer services should be contacted for detailed information and advising.



# Transfer Programs

# Transfer Programs

The School of Engineering admits transfer students from other schools within Rutgers as well as colleges/universities in the United States and around the world.

For more information on transfer requirements and application guidelines, please visit:

Transferring from Outside of Rutgers (U.S. and international)

Transferring from Within Rutgers (school-to-school transfer)



# Graduate Programs

# Graduate Programs

Extensive engineering programs at the graduate level also are available. The degrees of master of science, master of engineering, and doctor of philosophy are given in a wide range of fields as listed at Rutgers School of Graduate Studies.

# Explanation of Three-Part Course Numbers (ENG)

## EXPLANATION OF THREE-PART COURSE NUMBERS

The number preceding each course title is divided into three parts. The first two digits are the administrative code (standing for a faculty or a school), the next three digits are the subject code, and the final three digits are the course code.

***Administrative Code (School Code)***

The School of Engineering administrative code is **14**. For a complete list of administrative codes used in this catalog, see the beginning of the Programs of Study and Courses for Liberal Arts and Sciences Students section.

*Subject Code*

A subject code comprises the third through fifth digits in all course numbers and indicates the subject matter of the course. Courses with the following subject codes are listed in this chapter. For information on engineering majors, please visit Programs of Study. Note that the subject codes may be different from the curriculum codes. For example, 021 Aerospace engineering courses are listed under subject code 650 through the Department of Mechanical and Aerospace Engineering, and 366 Environmental Engineering courses are currently listed under subject code 117.

Applied Sciences in Engineering (including Packaging Engineering Concentration)

Biomedical Engineering

Chemical Engineering

Civil Engineering

Electrical and Computer Engineering

Environmental Engineering

General Engineering

Industrial Engineering

Materials Science and Engineering

Mechanical and Aerospace Engineering

*Course Code*

The course code comprises the sixth, seventh, and eighth digits in all course numbers. Course codes from 100 to 299 are used for introductory and intermediate undergraduate courses usually offered in the first two years. Codes from 300 to 499 indicate advanced undergraduate courses normally taken in the junior and senior years. Courses coded from 500 to 799 are graduate courses.

Two course numbers separated by a comma indicate that each semester may be taken independently of the other (example: 14:155:491,492). Two course numbers separated by a hyphen indicate that satisfactory completion of the first semester is a prerequisite to the second semester (example: 14:332:221-222); the first semester may be taken for credit without taking the second, except where a statement is added to indicate that both semester courses must be completed in order to receive credit.

Credits awarded for the successful completion of each course are indicated in parentheses following the course title. The notation BA indicates that the number of credits is determined by arrangement with the department offering the course.

Unless otherwise indicated, a course normally meets for a number of lecture hours equal to the number of credits to be earned. Special hours or modes of class, other than lecture, are usually indicated in italics below the course title.

Consult the Undergraduate Schedule of Classes for the name(s) of the faculty member(s) teaching each course.

# Aerospace Engineering 021 (ENG)

## AEROSPACE ENGINEERING 021

Aerospace Engineering (021) courses are listed under subject code 650 Mechanical and Aerospace Engineering.

# Applied Sciences in Engineering 073 (ENG)

## APPLIED SCIENCES IN ENGINEERING 073

Courses for 073 Applied Sciences in Engineering, Packaging Engineering Concentration are listed using the subject code 440.

**14:440:301** ***Introduction to Packaging Engineering (3)***
A required course for all students wishing to pursue a major or certificate in packaging. The course introduces the student to the concept of packaging and provides an overview of the main technologies used to create packages. Technologies include graphic creation, printing and decoration, plastic molding, metal forming, films and foils, and distribution packaging.

**14:440:302** ***Computer-Aided Design for Packaging Engineering (3)***
CAD applications of analysis, synthesis, and design for packaging engineering. Automated drafting. Development of general-purpose functions, components. Hands-on experience on CAD workstations.

**14:440:371** ***Packaging Evaluation Methods (3)***
Covers materials characteristics of the major materials and the strength assessment of those materials in connection with the packaging applications. The major packaging materials such as paper and paperboards, plastics, steel, and glass are evaluated in terms of strength properties. In evaluation of materials, the fundamental knowledge of those materials in terms of physical, chemical, mechanical, and electrical properties are discussed in relation to the packaging applications.

**14:440:373** ***Packaging Manufacturing I (3)***
Covers the basic manufacturing technologies of major packaging materials such as paper and paperboards; conversion of paperboards; plastic containers, including films and bottles; aluminum and steel containers; glass containers; and wooden boxes. Students learn how different kinds of materials are converted into some types of containers and meet all the required packaging conditions and qualities.

**14:440:378** ***Sustainable Packaging (3)***
The design and development of sustainable packaging based on quantitative and qualitative metrics. Introduction to Life Cycle Assessment processes and related impacts on packaging development for consumer goods industries.

**14:440:403** ***Safety Packaging (3)***
Identification and measurement of hazards in physical distribution. Packaging hazardous materials. Product classes, use of regulations, exceptions, authorized packaging, and the performance testing program.

**14:440:406** ***Packaging Printing/Decoration (3)***
Position and importance of package graphics and structure in consumer packaging and marketing. Printing and decoration methods and technologies for paper, plastic, and other materials. Preparation, production, application, and economics of package graphics operations.

**14:440:408** ***Pharmaceutical Manufacturing (3)***
The course covers manufacturing and packaging processes and practices in the pharmaceutical industry. The processes include blending, granulation, size reduction, drying, compressing, and coating of tablets, as well as capsule and liquid filling. Packaging discussions start with bottle feeding up to case packing and the operations in between. There is an emphasis on facility layout, safety, and maintenance issues related to cGMP of pharmaceutical manufacturing.

**14:440:418** ***Packaging Development Process (3)***
Learn modern package development process through case studies; apply packaging engineering technologies, project management, team interactions, tool development, and commercial start-up technologies to the package development process.

**14:440:419** ***Innovation and Design (3)***
A course devoted to the case study of recently launched new consumer packages. Students study the package development process using real commercial packages with mentors from the companies that introduced new packages. The process of innovating the application packaging technologies is included with this study.

**14:440:420** ***Senior Project (3)***
Seniors are given the opportunity to conduct individual research on consumer packaging issues. Projects are proposed by students or submitted by partner companies.

**14:440:468** ***Packaging Machinery (3)***
This course covers the fundamentals related to packing and packaging of all forms of products including such materials as gases, liquids, and solids. Emphasis placed on the characteristics of the products, the packaging materials and forms, the selections of packaging machines regarding the compatibilities with the contents and packaging materials, and packaging economy. Also emphasized are the functions of important parts involved with a specific packaging machine and a line of packaging system as a whole.

**14:440:470** ***Packaging Lab I (2)***
Covers physical and mechanical tests of all major packaging materials including paper, paperboards, corrugated fibreboards, plastic films and bottles, metal containers, and glass containers using ASTM and TAPPI test methods. Packaging students learn how to operate moisture vapour and oxygen gas transmission rate testers and learn how to use the data to determine the materials' constants in terms of transmission rates of plastic materials. Students learn how to figure out the shelf-life of flexible and rigid plastic containers through permeation tests.

**14:440:471** ***Distribution Packaging (3)***
Covers the right selection of containers to ship diversified articles in different material characteristics, shapes, and sizes and different fragility levels. All-weather protection of the packaging and packaged products from the distribution environment is the goal of this course. The study of the distribution environment for various packaged products in the world is an important part of this course.

**14:440:473** *Packaging Lab II (2)*
Covers the heavy and bulky packaging tests including major national and international test procedures, ASTM, TAPPI, and other packaging test procedures authorized by the government. Packaging students learn how to determine the fragility factors of articles, how to evaluate the protective materials for cushioning capability, and how to use the cushioning data to make a protective design.

**14:440:477** *Packaging Manufacturing II (3)*
Review of packaging materials and processes from a packaging manufacturing perspective.

**14:440:489** *Special Problems in Packaging (Fall 1-3)*
Presentations of detailed studies on specialized aspects of packaging.

**14:440:490** *Special Problems in Packaging (Spring 1-3)*
Selected topics of interest to graduate packaging students.

**14:440:498** *Packaging Engineering Co-op Internship (Spring 3-6)*
Supervised professional experience in the field of packaging offered through corporations and other businesses throughout the United States.

**14:440:499** *Packaging Engineering Co-op Internship (Fall 3-6)*
Supervised professional experience in the field of packaging offered through corporations and other businesses throughout the United States.

# Biomedical Engineering 125 (ENG)

## BIOMEDICAL ENGINEERING 125

**14:125:201** *Introduction to Biomedical Engineering (3)*
Overview of applications of engineering in medicine and health care. Introduction to biological and biomedical problems using fundamental concepts and tools from electrical, mechanical, and chemical engineering.

**14:125:255** *BME System Physiology (3)*
Introduction to quantitative modeling of physiological systems geared toward the biomedical engineering student. Covers fundamental topics in physiology ranging from cell membrane models and chemical messengers to neuronal signaling and control of body movement. Specific physiological systems are discussed in detail, including the cardiovascular, pulmonary, and visual systems. Furthermore, pharmacokinetic models provide quantitative assessment of the dynamics of drug distribution and compartmental interactions.

**14:125:303** *Biomedical Transport Phenomena (3)*
Biomedical mass transport processes involving diffusion, diffusion-convection, and diffusion-reaction schemes; introduction to biofluid dynamics; transport processes in the cardiovascular system, hemorheology, extracorporeal mass transport devices, and tissue engineering.

**14:125:304** *Introduction to Biomaterials (3)*
Introduction to material properties, testing, biomaterial requirements, and device design. The main objective is to convey basic knowledge of this large volume of information and to provide an elementary understanding of the terminology used in academic and commercial settings as preparation for future study or work.

**14:125:305** ***Numerical Modeling in Biomedical Systems (3)***
Introduction to modeling and simulation techniques in the analysis of biomedical systems. Application of numerical methods for the solution of complex biomedical process problems. Development and use of PC software for the analysis and solution of engineering problems.

**14:125:306** ***Kinetics and Thermodynamics of Biological Systems (3)***
Fundamentals of thermodynamics and kinetic analysis as applied to biomedical systems and technologies. Essential principles in thermodynamics introduced, including First Law, Second Law, and interrelationships among thermodynamic variables. Fundamental tools in kinetic analysis are also covered, including interpretation of rate data, enzyme kinetics, and pharmacokinetics. Application to biological systems and biomedical technologies are provided.

**14:125:308** ***Introduction to Biomechanics (3)***
Relationship between applied and resultant forces and stresses acting on the musculoskeletal system. Basic concepts of vectors, internal and external forces, functional anatomy, trusses and equilibria of spatial force systems, moments, and work and energy concepts. Stress and strain tensors, principal forces, viscoelasticity, and failure analysis from classical mechanics.

**14:125:309** ***Biomedical Devices and Systems (3)***
Time and frequency domain analysis of electrical networks; hydrodynamic, mechanical, and thermal analogs; basic medical electronics; and energy conversion systems. Design of biological sensors.

**14:125:310** ***Biomedical Devices and Systems Laboratory (1)***
Experiments and demonstrations dealing with basic medical electronics and signal analysis. Provides an overview of current biomedical technology and its uses.

**14:125:315** ***BME Measurement and Analysis Laboratory (2)***
Experiments and demonstrations dealing with the measurement and analysis of various physiological quantities of cardiovascular and respiratory systems, and the measurement of cellular viability, metabolism, morphogenesis, and protein and nucleic acid composition.

**14:125:401,402,421,422** ***Biomedical Engineering Senior Design I, II Projects (1,1,2,2)***
Students gain design experience in the biomedical engineering field by completing a design project under the supervision of a faculty member. Project typically involves experimental or computational study of a design-oriented problem in biomedical engineering.

**14:125:403** ***Cardiovascular Engineering (3)***
Introduction to modeling and measurement methods for the cardiovascular system, analysis of blood-flow dynamics, the function of the heart, and noninvasive approaches. Applications to cardiovascular instrumentation, basic cardiovascular system research, assist devices, and disease processes.

**14:125:409** ***Introduction to Prosthetic and Orthotic Devices (3)***
Introduces the application of mechanical engineering principles to the design of artificial limbs and braces. Teaching includes basic anatomy and physiology of limb defects, biomechanics, motion analysis, and current device designs. Design and visualization tools will include MatLab and other application software.

**14:125:411** ***Bioelectric Systems (3)***
Introduction to the understanding of bioelectric phenomena that occur in physiological systems. This includes the origin of biopotentials; the use of biopotential electrodes in their measurements and subsequent amplification; signal processing; and analysis of their physiological relevance. Applications of physical principles and basic electric engineering techniques are emphasized.

**14:125:417** ***Introduction to Musculoskeletal Mechanics (3)***
Introduction to motion-actuating, force-generating, and load-supporting mechanisms in the musculoskeletal system, as explained from basic engineering principles. Elucidation of function-structure relationships from both ultrastructural and mechanical analyses. Experimental and analytical approaches to solve realistic orthopedic and recreational problems.

**14:125:424** ***Biomedical Instrumentation Laboratory (3)***
Practical hands-on designs of biomedical instrumentation including biopotential and physiological signal processing amplifiers; electrodes; biosensors and transducers; and electro-optical, acoustic, and ultrasonic devices.

**14:125:431** ***Introduction to Optical Imaging (3)***
Introductory overview of optical phenomena and the optical properties of biological tissue. The course is specifically focused on optical imaging applications in biology and medicine. Topics will include reflection, refraction, interference, diffraction, polarization, light scattering, fluorescence and Raman techniques, and their application in biomedical imaging and microscopy.

**14:125:432** ***Cytomechanics (3)***
Structural and mechanical components of cells, with emphasis on the regulatory roles of physical forces in cell function. Emphasis on processes that drive tissue growth, signaling and metabolism, gene expression, and biomechanical properties of cells and their components.

**14:125:433** ***Fundamentals and Tools of Tissue Engineering (3)***
Fundamentals of polymer scaffolds and their use in artificial tissues. Regulation of cell responses in the rational design and development of engineered replacement tissue. Understanding the biological, chemical, and mechanical components of intra- and intercellular communication. Preliminary discussions on real-life clinical experiences.

**14:125:434** ***Tissue Engineering II: Biomedical and Biotechnological Applications (3)***
Applications of tissue engineering; builds upon the prior course fundamentals and tools. Emphasis is placed on applying the fundamental principles and concepts to problems in clinical medicine and large-scale industrial manufacturing. Topics include skin replacement, cartilage tissue repair, bone tissue engineering, nerve regeneration, corneal and retinal transplants, ligaments and tendons, blood substitutes, artificial pancreas, artificial liver, tissue integration with prosthetics, vascular grafts, cell encapsulation, and angiogenesis.

**14:125:437** ***Computational Systems Biology (3)***
Introductory overview of some key issues in computational systems biology. Defines systems and biological components independently to provide an appreciation of the special features of both elements. Introduction of medical informatics concepts.

**14:125:445** ***Principles of Drug Delivery (3)***
Fundamental concepts in drug delivery from an engineering perspective. Biological organisms are viewed as highly interconnected networks where the surfaces/interfaces can be activated or altered chemically and physically/

mechanically. The importance of intermolecular and interfacial interactions on drug delivery carriers is the focal point of this course. Topics include: drug delivery mechanisms (passive, targeted); therapeutic modalities and mechanisms of action; engineering principles of controlled release and quantitative understanding of drug transport (diffusion, convection); effects of electrostatics, macromolecular conformation, and molecular dynamics on interfacial interactions; thermodynamic principles of self-assembly; chemical and physical characteristics of delivery molecules and assemblies (polymer based, lipid based); significance of biodistributions and pharmacokinetic models; and toxicity issues and immune responses.

**14:125:455** ***BME Global Health (3)***
Overview of how biomedical technologies are developed and translated into clinical practice. Major diseases facing industrialized and developing countries and technological advances that can be used to solve these problems. Economic, ethical, social, and regulatory constraints on these new technologies will be examined.

**14:125:465** ***BME Microfluidics (3)***
Understanding of fluid mechanics at small-length scales. Low Reynolds number flow, electrokinetic flows, and bioseparations in microfluidic devices.

**14:125:470** ***Advanced Biomedical Devices Laboratory (3)***
Applies the background obtained from the Biomedical Devices and Systems lecture and laboratory courses (125:309 and 310) that are restricted to linear systems and devices. Introduces advanced nonlinear electronics and devices. The Advanced Biomedical Devices lab will also cover: device standards and precision laboratory test methods; introduction to medical device interface systems; biomedical device power sources; wireless data transmission; basic radio systems; the blue tooth standard. Students will learn how to apply nonlinear data reduction methods to process long duration wireless data records that they will obtain during lab exercises.

**14:125:489 or 490** ***Advanced Research in Biomedical Engineering (3) **Junior Year***
Advanced research immersion activity and the supporting educational tools for members of the Biomedical Engineering Honors Academy who participate within a formalized two-year research experience. Students work independently with faculty members on a research project of relevance to biomedical engineering. In addition, students meet monthly for roundtable discussions of a wide range of scientific, ethical, and professional issues.

**14:125:491,492** ***Special Problems in Biomedical Engineering (3,3)***
Independent study under the guidance of a faculty member in specific areas of interest in biomedical engineering.

**14:125:493,494** ***Advanced Research in Biomedical Engineering (3,3) **Senior Year***
Advanced research immersion activity and the supporting educational tools for members of the Biomedical Engineering Honors Academy who participate within a formalized two-year research experience. Students work independently with faculty members on a research project of relevance to biomedical engineering. In addition, students meet monthly for roundtable discussions of a wide range of scientific, ethical, and professional issues.

**14:125:496,497** ***Co-op Program in Biomedical Engineering (3,3)***
Provides the student with the opportunity to practice and apply knowledge and skills in various biomedical engineering environments. Provides a capstone experience to the undergraduate experience by integrating prior coursework into a working engineering environment.

**Course Note**

Please check Student Handbook online for updated prerequisites. The handbook explains what the biomedical engineering program offers.

# Chemical Engineering 155 (ENG)

## CHEMICAL ENGINEERING 155

**14:155:201** ***Chemical Engineering Material and Energy Balances (3)***
Introduction to the major. Conservation of mass and energy, and application to chemical engineering systems. Solution of material and energy balance problems for complex processes. Focus on open systems at steady-state.
***Prerequisites: 01:160:160, 01:640:152.***

**14:155:208** ***Chemical Engineering Thermodynamics I (3)***
Thermodynamics from a chemical engineering viewpoint. First Law as it applies to nonflow and steady-flow processes, pressure-volume-temperature behavior of fluids and heat effects, the Second Law and its applications, thermodynamic properties of pure fluids and fluid mixtures, phase equilibria, and chemical reaction equilibria. Thermodynamics of polymers and biosystems.
***Prerequisite: 14:155:201.***

**14:155:210** ***Biological Foundations of Chemical Engineering (3)***
Biochemistry and biophysics of proteins and nucleic acids; cellular composition and metabolism; tools for manipulating cells; introduction to biological products and processes.
***Prerequisites: 01:640:152, 01:160:307.***

**14:155:291,292** ***Undergraduate Research for Sophomores (BA,BA)***
Individual research project under the guidance of a faculty adviser in a specific area of chemical or biochemical engineering. Interdisciplinary cooperation encouraged where applicable. Projects may be one or two semesters in length. No more than 3 credits are awarded per semester.
***Prerequisite: Permission of department.***

**14:155:298** ***Professional Skills Development (1)***
Seminar on career topics and skills to aid students in finding jobs and succeeding as professionals.
***Corequisite: 14:155:201. Graded pass/no credit.***

**14:155:303** ***Transport Phenomena in Chemical Engineering I (3)***
Introduction to fluid dynamics of chemical systems. Application of basic equations to steady-state and unsteady-state flow processes. Description of laminar and turbulent-flow regimes leading to the determination of velocity distributions and friction factors. Design equations for flowing fluids, with computer applications.
***Prerequisites: 14:155:208, 01:640:244.***

**14:155:304** ***Transport Phenomena in Chemical Engineering II (3)***
Heat and mass transfer in chemical engineering processes, with computer applications. Steady-state and unsteady-state heat conduction and molecular diffusion. Energy and mass transfer in fluids undergoing flow, phase change, and/or chemical reaction. Radiant heat transfer. Heat exchangers and mass transfer equipment.
***Prerequisites: 14:155:303, 309.***

**14:155:307** ***Computational Methods in Chemical Engineering (3)***
Introduction to modeling and simulation techniques in the analysis of chemical and biochemical engineering systems. Application of numerical methods for the solution of complex chemical process problems. Development and use of PC software for the analysis and solution of engineering problems.
***Prerequisites: 14:155:201, 14:440:102 OR 14:440:127, 01:640:244.***

**14:155:309** ***Chemical Engineering Thermodynamics II (3)***
Thermodynamic properties of mixtures. Ideal gas and ideal solution models. Partial fugacity of gaseous and liquid phases. Properties change of mixing and partial molar properties. Excess functions and activity coefficients for nonideal solutions. Phase equilibrium and phase diagrams. Phase equilibrium calculations. Colligative properties. Chemical reaction equilibrium.
***Prerequisite: 14:155:208.***

**14:155:324** ***Separation Processes (3)***
Application of mass transfer theory to the design and analysis of chemical engineering separation processes. Distillation, liquid extraction, gas absorption, and other separation processes. Computer software for the design and analysis of various separation processes.
***Prerequisites: 14:155:303, 307, 309.***

**14:155:341** ***Chemical Engineering Kinetics (3)***
Fundamental theories of kinetics. Ideal reactor analysis; single reactions; parallel and series reactions. Consideration of real reactors and reactor design. Principles of heterogeneous catalysis, combined mass transfer/kinetic phenomena, and approaches to catalytic reactor design using computer methods.
***Prerequisites: 14:155:303, 307.***

**14:155:391,392** ***Undergraduate Research for Juniors (BA,BA)***
Individual research project under the guidance of a faculty adviser in a specific area of chemical or biochemical engineering. Interdisciplinary cooperation encouraged where applicable. Projects may be one or two semesters in length. No more than 3 credits are awarded per semester.
***Prerequisite: Permission of department.***

**14:155:407** ***Processing and Properties of Materials (3)***
Atomic/molecular-level structure of fundamental materials, including metals, ceramics, polymers, and composites. Properties, such as mechanical properties, are understood in terms of the microstructure of materials. Focus is placed on the relationship between the structure and the properties of materials.
***Prerequisites: 01:160:159, 01:750:123, 14:440:221.***

**14:155:411** ***Biochemical Engineering (3)***
Integration of the principles of chemical engineering, food science, biochemistry, cell and molecular biology, and microbiology with applications to the analysis, control, and development of industrial, biochemical, and biological processes. Quantitative, problem-solving methods emphasized.
***Prerequisites: 14:155:210, 303, 307, 309.***

**14:155:415** ***Process Engineering Laboratory I (4)***
Original experiments developed using existing pilot-scale or bench-scale equipment. Working independently under faculty supervision, students use modern instruments, operate equipment under various open- and closed-loop

control conditions, perform experiments, take data and assay samples, and write reports of professional quality. OSHA-type laboratory safety and health practices taught and utilized.
*Lec. 1 hr., lab. 9 hrs. Prerequisites: 14:155:304, 324, 341.*

**14:155:416** *Process Engineering Laboratory II (4)*
Projects differ in type and scale from those of the first semester. Emphasis on professional-quality data and individual contributions, particularly process evaluation, scale-up, and design criteria. Also, orientation on careers, job opportunities, professional societies, licensing, rights and responsibilities of licensed engineers, and safety-risk management.
*Lec. 1 hr., lab. 9 hrs. Prerequisites: 14:155:415, 341.*

**14:155:422** *Process Simulation and Control (3)*
Modern simulation techniques and automatic control theory as applied to process dynamics of chemical and biochemical engineering systems. Use of analytical methods and computer software for solving complex problems. Structure and design of closed-loop, computer-controlled processes. Discussion of safety engineering in the final process of control design.
*Prerequisites: 14:155:307, 324, 341.*

**14:155:427** *Chemical Engineering Design I (3)*
First course in a two-semester, capstone design sequence (155:427,428) that covers the principles of product design, process design, and economic considerations for building and operating chemical or biochemical plants. Reflecting recent advances in chemical engineering education, we are integrating product design and process design in this sequence. Specifically, starting from the identification of marketable products, we proceed to develop ideas for making the products, select workable methods, and then design the best processes for both upstream (reactor design and batch, semibatch, or continuous operation) and downstream processing (separations and purifications) to produce the said product profitably. In the fall semester, rate-based separations and batch-process design for the production of biochemicals and specialty chemicals will be covered.
*Prerequisites: 01:160:308; 14:155:304, 324, 341.*

**14:155:428** *Chemical Engineering Design II (4)*
The capstone design course covers the principles of product design, process design, and economic considerations for building and operating chemical or biochemical plants. Reflecting recent advances in chemical engineering education, we are integrating product design and process design in this sequence. Specifically, starting from the identification of marketable products, we proceed to develop ideas for making the products, select workable methods, and then design the best processes for both upstream (reactor design and batch, semibatch, or continuous operation) and downstream processing (separations and purifications) to produce the said product profitably. The design details and economic considerations involved in the design, construction, and operation of chemical plants using basic principles and modern computer software. Engineering ethics, plant safety practices, and OSHA concerns.
*Prerequisite: 14:155:415.*

**14:155:491,492** *Undergraduate Research for Seniors (BA,BA)*
Individual research project under the guidance of a faculty adviser in a specific area of chemical or biochemical engineering. Interdisciplinary cooperation encouraged where applicable. Projects may be one or two semesters in length. No more than 3 credits are awarded per semester.
*Prerequisite: Permission of department.*

**14:155:495** *Internship in Chemical and Biochemical Engineering (BA)*
Provides students with the opportunity to practice and/or apply knowledge and skills in various chemical or biochemical engineering professional environments.
***Prerequisite: Permission of department. Graded pass/no credit.***

**14:155:496,497** *Co-op in Chemical and Biochemical Engineering (3,3)*
Provides a capstone experience to the student's undergraduate studies by integrating prior coursework into a working chemical or biochemical engineering professional environment. Credits earned for the educational benefits of the experience and granted only for a continuous, six-month, full-time assignment.
***Prerequisites: Permission of department. Graded pass/no credit.***

# Civil Engineering 180 (ENG)

## CIVIL ENGINEERING 180

**14:180:215** *Engineering Graphics (1)*
Principles of computer-aided design and drafting (CADD): graphic entities, hatch patterns, layering, part file creation, and information extraction. Two-dimensional drafting and pictorial drawings using a CADD system. Introduction to three-dimensional modeling and surface revolution.
***Lab. 3 hrs. Not for civil engineering major.***

**14:180:216** *Introductory Computer-Aided Design and Drafting (3)*
Principles of computer-aided design and drafting (CADD): graphic entities, hatch patterns, layering, part file creation, and information extraction. Two-dimensional drafting and pictorial drawings using a CADD system. Introduction to three-dimensional modeling and surface revolution. Descriptive geometry. CADD applications in civil engineering.
***Lec. 1 hr., lab. 3 hrs., rec. 1 hr.***

**14:180:243** *Mechanics of Solids (3)*
Axial force, shear, moment, and torque in structural members; stress, strain, and stress-strain relations; principal stresses and strains; torsion of circular shafts; bending of singly symmetric beams; compound loading; buckling of columns; statically indeterminate systems.
***Prerequisites: (14:440:221 or 14:440:291) and (01:640:152 or 01:640:192 or 21:640:235 or 50:640:221). Corequisite: 01:640:244.***

**14:180:305** *Construction Engineering (3)*
An introduction to construction and the construction industry. Topics include construction contracts, scheduling, estimating, and cost control.
***Prerequisite: 14:180:243.***

**14:180:318** *Elements of Structures (3)*
Structural analysis of statically determinate trusses, frames, cables, and arches. Computation of deflections in trusses and plane frames. Influence lines for beams and trusses. Introduction to indeterminate structures.
***Prerequisites: 14:180:243, 14:440:222.***

**14:180:320** ***Design of Steel Structures (3)***
Design of bolted and welded connections; design of components of structural systems in tension, compression, bending, and combined axial and bending loads. Use of computers for design and detailing.
***Lec. 2 hrs., rec. 1 hr. Prerequisites: 14:180:243, 318; 14:440:222.***

**14:180:331** ***Elements of Environmental Engineering (3)***
Engineering management of the environment with particular emphasis on chemical contaminants in water, wastewater, and air. Effects of energy-related pollutants and industrial emissions on environmental systems. Federal regulation and management of chemical contaminants.

**14:180:345** ***Properties of Materials Laboratory (1)***
Mechanical properties and behavior of structural elements under a variety of load conditions.
***Prerequisite: 14:180:243.***

**14:180:364** ***Transportation Engineering I (3)***
Principles of transportation engineering with application to various modes; planning, selection, formulation, and administration of transportation systems. Economic, environmental, and political constraints; land-use studies; applications.
***Prerequisite: 14:180:243.***

**14:180:372** ***Soil Mechanics (3)***
Elements of engineering geology; mechanical and hydraulic properties of soils; soil-water systems and fluid flow; stresses in soils; compressibility, consolidation, and settlement; shearing resistance; lateral earth-pressures; slope stability; bearing capacity; numerical methods and computer applications.
***Prerequisites: 14:180:243, 387.***

**14:180:374** ***Soil Mechanics Laboratory (1)***
Engineering classification of soils and rocks. Laboratory studies of physical properties and shear strength of soils such as Atterberg limits, compaction, permeability, unconfined compression, and direct shear tests.
***Lab. 3 hrs. Corequisite: 14:180:372.***

**14:180:382** ***Hydraulic and Environmental Engineering (3)***
Basic concepts of viscous flows; conservation laws (mass, momentum, and energy); pipe flows and open-channel flows; water distribution systems; hydraulic modeling (stream and marine pollution); air, stream, and marine pollution problems. Computer applications.
***Prerequisite: 14:180:387.***

**14:180:387** ***Fluid Mechanics (3)***
Fluid properties, statics and kinematics; concepts of system and control volume; mass, momentum, and energy conservation principles; laminar and turbulent flows in conduits and channels; boundary layer theory; drag and lift; ideal fluid flow.
***Prerequisites: 14:440:222, 01:640:244.***

**14:180:389** ***Fluid Mechanics Laboratory (1)***
Experimental applications and demonstrations; measurement of fluid properties; applications of mass, energy, and momentum principles; energy losses; forces on immersed bodies; flow measurement devices.
***Corequisite: 14:180:387.***

**14:180:402** ***Finite Element Methods in Civil Engineering (3)***
Finite element method of analysis for problems in structures and solid, fluid, and soil mechanics. Fundamentals of the finite element method. Variational formulation of boundary value problems, Galerkin approximations, matrix equations, finite element interpolation, error estimates, computer program algorithms and codes.
***Prerequisites: 14:180:243, and 01:960:379 or equivalent.***

**14:180:406** ***Construction Engineering Management (3)***
Construction planning, scheduling, and control. Use of computer-based information systems for project management. Value engineering. Critical path method and PERT scheduling techniques. Computer-drawn scheduling networks. Schedule compression. Resource allocation leveling and optimization. Project organization and financial control. Decision-making.
***Prerequisites:14:180:305, 01:960:379.***

**14:180:407** ***Construction Projects (4)***
Application of skills and theories of construction engineering management to actual projects. Students are assigned to a project and work with managers to budget, schedule, and control operations. Topics include utilization of heavy construction equipment, computer simulation of construction, and information technology in construction.
***Prerequisites: 14:180:305, 406.***

**14:180:411** ***Reinforced Concrete (3)***
Strength theories for the analysis and design of beams, slabs, columns, and floor systems in flexure, diagonal tension, torsion, serviceability, and load factors, including computer applications.
***Prerequisites: 14:180:318, 320.***

**14:180:412** ***Behavior of Concrete Materials and Systems (3)***
Material behavior under uniaxial, multiaxial, and time-dependent loading. Various methods of testing and computer aids for quality control. Analysis of structural members. Recent developments in cementitious composites.
***Prerequisite: 14:180:411.***

**14:180:413** ***Theory of Indeterminate Structures (3)***
Force method for solving simple indeterminate structures. Classical methods of slope-deflection and moment distribution. Formulation and algorithms for matrix method. Application of computers for analyzing indeterminate trusses and frames.
***Prerequisite: 14:180:318.***

**14:180:417** ***Masonry and Wood Design (3)***
Introduction to masonry and wood terminology and materials as well as ASTM-related specifications. ASD and LRFD design of structural elements such as masonry and wood beams, lintels, and columns. Reinforced and unreinforced masonry design. Masonry and wood shear wall design. Introduction to prestressed masonry. Connection design. Sustainability and energy efficiency, fire rating, and cost analysis.
***Prerequisite: Open to senior civil engineering majors only.***

**14:180:421** ***Reinforced Concrete Laboratory (1)***
Experimental stress analysis of concrete structures, including test to failure of beams, plates, and prestressed elements; control testing and design of concrete mixtures.
***Lab. 3 hrs. Corequisite: 14:180:411.***

**14:180:426** ***Structural Design (4)***
Design of steel or concrete structures; prestressed concrete design of beams and slabs. Design project with working drawings for a bridge or high-rise building. Economic and ethical considerations. Comprehensive report.
***Lec. 3 hrs., lab. 3 hrs. Prerequisites: 14:180:318, 320, 411, 421.***

**14:180:429** ***Water and Wastewater Engineering (3)***
Design principles for water and wastewater engineering systems, water supply and distribution, wastewater collection and disposal, water treatment, and wastewater treatment.
***Prerequisites: 14:180:387, 389.***

**14:180:430** ***Introduction to Transportation Planning (3)***
Discusses the various aspects of transportation demand forecasting problems. Introduces the classic four-step modeling process and the new activity-based modeling approach. Students will have the chance to use some of the state-of-the-art transportation planning software packages, such as Cube, VISUM, and TRANSCAD to conduct case studies of transportation planning problems during labs.
***Prerequisites: 14:180:364 and (01:960:379 or 01:960:401).***

**14:180:431** ***Design of Environmental Engineering Facilities (4)***
Analysis and design considerations for environmental engineering facilities, such as water supply and wastewater treatment plants; physical engineering management of solid and hazardous wastes; resource recovery; economic and ethical considerations. Comprehensive report.
***Prerequisites: 14:180:387, 389, 429.***

**14:180:434** ***Land Development - Elements of Urban Infrastructure (3)***
Introduction to urban infrastructure; introduction to civil design plans then a review of the function, alternatives, design, and construction of civil infrastructure elements such as grading, hydrology, storm water management, grading and earthwork, erosion and sediment control, storm and sanitary sewer systems, dry utilities, curb and flexible pavements, improvements to existing infrastructure.
***Prerequisites: 14:180:372, 387.***

**14:180:438** ***Transportation Engineering II (4)***
Training in state-of-the-art transportation planning and operations software such as HCS, Synchro, VISSIM, and CUBE. Students will work in teams to conduct traffic studies at given sites/corridors. Traffic improvement alternatives will be used to address the identified transportation problems. Such alternatives to study may include redesigning geometric layout, signal optimization, adding traffic signs and control, and ITS (intelligent transportation) equipment and systems.
***Lec. 3 hrs., lab. 3 hrs. Prerequisite: 14:180:364.***

**14:180:443** ***Advanced Hydraulics (3)***
Hydraulic engineering fundamentals: boundary layer, surface roughness, resistance in viscous flows; design of erodible and nonerodible canals; gradually varied flow, backwater analysis in rivers; computational methods; hydraulic jump; hydraulic applications in channel transitions and controls; flow over spillways; pollution problems in rivers and streams.
***Prerequisite: 14:180:387.***

**14:180:448** *Elements of Hydrology (3)*
Hydrologic cycle; weather and hydrology; precipitation; evaporation and transpiration; stream flow and subsurface hydrology; stream flow hydrographs; unit hydrograph theory; stream flow routing; computer simulation of hydrologic processes; probability concepts in hydrology; models for frequency distribution of floods; time series analysis.
***Prerequisite: 14:180:387.***

**14:180:471** *Elements of Environmental Geotechnology (3)*
Geotechnical aspects of analysis design and construction of waste containment systems.
***Prerequisite: 14:180:372.***

**14:180:473** *Foundation Engineering (3)*
Subsurface exploration; bearing capacity, settlement, and design of shallow foundations; design of rigid and flexible retaining structures; bearing capacity, settlement, and design of deep foundations.
***Lec. 2 hrs., rec. 1 hr. Prerequisites: 14:180:372, 374.***

**14:180:474** *Geotechnical Engineering Design (4)*
Subsurface investigation; construction dewatering; design concepts and procedures for shallow and deep foundations; application of numerical methods; safety and economy. Comprehensive report.
***Prerequisites: 14:180:372, 374, 473.***

**14:180:482** *Professional Issues in Civil Engineering (1)*
Principles of design of civil engineering projects from the viewpoint of the whole; interactions between individual parts (subsystems) and the effect of each on the overall system; overview of design process, quality of design, risk and liability, ethics, and economic considerations; report writing.
***Prerequisite: Completion of all required courses through fall semester of senior year.***

**14:180:491,492** *Special Problems in Civil Engineering (BA,BA)*
Individual investigation in a branch of civil engineering of particular interest to the student.
***Prerequisite: Open only to seniors with departmental permission.***

**14:180:493,494** *Special Problems in Environmental Engineering (BA,BA)*
Individual investigation in a branch of environmental engineering of particular interest to the student.
***Prerequisite: Open only to seniors with departmental permission.***

**14:180:496,497** *Co-op Internship in Civil and Environmental Engineering (3,3)*
Provides a capstone experience to the student's undergraduate studies by integrating prior coursework into a working civil and environmental engineering professional environment. Credits earned for the educational benefits of the experience and granted only for a continuous, six-month, full-time assignment.
***Prerequisite: Permission of department. Graded pass/no credit.***

# Electrical and Computer Engineering 332 (ENG)

## ELECTRICAL AND COMPUTER ENGINEERING 332

**14:332:221** ***Principles of Electrical Engineering I (3)***
Circuit elements, independent sources, dependent sources, circuit analysis in DC and AC steady state, network theorems, operational amplifiers, power computations.
***Prerequisites: [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:124)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:116)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:201)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:203)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:271)] Corequisites:14:332:223.***

**14:332:222** ***Principles of Electrical Engineering II (3)***
Passive and active filter circuit design, Butterworth filter design, transient analysis by classical methods and by Laplace transform analysis, step and impulse response, two-port networks, introduction to Fourier series, three phase circuits.
***Prerequisites: [(14:332:221 or 50:750:234) and (01:640:251)] or [(50:640:221 or 21:640:235) and (14:332:221)] or [(01:640:291 or 21:640:235) and (14:332:221)] Corequisites:14:332:224.***

**14:332:223** ***Principles of Electrical Engineering I Laboratory (1)***
Experimental exercises in use of laboratory instruments. Voltage, current, impedance, frequency, and waveform measurements. Rudiments of circuit modeling and design.
***Prerequisites: [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:124)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:116)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:201)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:203)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:271)] Corequisite: 14:332:221.***

**14:332:224** ***Principles of Electrical Engineering II Laboratory (1)***
Experimental exercises in use of laboratory instruments; Filter design, construction, and simulation; Measuring Fourier components of a periodic signal
***Prerequisites: 14:332:221, 14:332:223 Corequisites: 14:332:222.***

**14:332:226** ***Probability and Random Processes (3)***
Probability and its axioms, conditional probability, independence, counting, random variables and distributions, functions of random variables, expectations, order statistics, central limit theorem, confidence intervals, hypothesis testing, estimation of random variables, random processes and their characterization, autocorrelation function.
***Prerequisite: 01:640:251 or 01:640:291***

**14:332:231** ***Digital Logic Design (3)***
Binary arithmetic, Boolean algebra, K-maps. Combinational circuit synthesis, combinational MSI circuits. Sequential logic. Synchronous-state machine design. Sequential MSI circuits.
***Prerequisites: [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:123)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:116)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:201)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:203)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:271)] Corequisite: 14:332:233.***

**14:332:233** *Digital Logic Design Laboratory (1)*
Hands-on experiments with digital circuits of increasing complexity from simple gates to state machines.
***Prerequisite: 1 [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:123)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:116)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:201)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:203)] or [(01:640:152 or 01:640:154 or 01:640:192) and (01:750:271)] Corequisite: 14:332:231.***

**14:332:252** *Programming Methodology I (3)*
Basics of programming and data structures in C++, basic data types, loops, arrays recursion, and pointers. Object-oriented design: classes, inheritance, overloading, and polymorphism. Abstract data types: lists, linked lists, stacks, and queues. Introduction to algorithm analysis: O notation, searching, and sorting. Introduction to Large Language Models like ChatGPT for programmers.
***Prerequisite: 14:440:127.***

**14:332:301** *Forces and Strategies That Shaped the Wireless Revolution (3)*
A broad view of how business strategies are created based on examples from cellular and other wireless systems. Historical overview of communications and communication systems, basics of wireless technology, technology and politics of cellular, basics of corporate finance, economics of cellular systems and spectrum auctions, case studies in wireless business strategy, the strategic implications of unregulated spectrum, a comparison of 3G and WiFi, sensor networks and the wireless future.

**14:332:312** *Discrete Mathematics (3)*
An application-driven course based upon the study of events that occur in small, or discrete, segments in business, industry, government, and the digital world. The student will be introduced to the mathematical tools of logic and set theory, combinatorics, number theory, and graph theory. Practical applications will be introduced throughout the course.
***Prerequisites: 01:640:251 or 01:640:291***

**14:332:322** *Principles of Communications Systems (3)*
Analog communication; random processes and noise; quantization; digital communication.
***Prerequisites: (14:332:226 or 01:198:206 or 01:640:477) and 14:332:345***

**14:332:331** *Computer Architecture and Assembly Language (3)*
History and principles of computer architecture. Computer organization, assembly language and machine code, computer arithmetic, ALU design, computer performance, data path and control, pipelining, memory hierarchy, I/O devices, multi-core architectures, multi-processor and distributed architectures, mobile and graphics processors.
***Prerequisites: 14:332:231 and 233. Corequisite: 14:332:333.***

**14:332:333** *Computer Architecture Laboratory (1)*
Assembly language programming for one of the standard commercial RISC-V microprocessors. Design and implementation of a simple microprocessor-based, single-user computer.
***Prerequisites: 14:332:231 and 233. Corequisite: 14:332:331.***

**14:332:345** ***Linear Systems and Signals (3)***
Introduction to continuous- and discrete-time systems and signals, linear time-invariant (LTI) systems, analysis of signals and systems using Laplace and Z-transforms, frequency-domain representations using Fourier transforms, and applications in communications, control, and signal processing.
***Prerequisites: 14:332:222, 14:332:224, (01:640:244 or 01:640:252 or 01:640:292 or 21:640:314 or 50:640:314)***

**14:332:346** ***Digital Signal Processing (3)***
Introduction to digital signal processing, sampling and quantization, A/D and D/A converters, discrete time systems, convolution, z-transforms, transfer functions, digital filter realizations, fast Fourier transforms, analog & digital filter design, digital audio applications
***Prerequisites: 14:332:345, 14:440:127. Corequisite: 14:332:348.***

**14:332:348** ***Digital Signal Processing Laboratory (1)***
The objective of this course is to provide a basic understanding of digital signal processing (DSP) via hands-on implementation. This course extends Fourier and Laplace transforms and concepts to the field of discrete-time systems. Major parts of the course will concentrate on signal analysis using Fourier transforms, linear system analysis, Filter design and a few more advanced topics.
***Prerequisites: 14:332:345, 14:440:127. Corequisite: 14:332:346.***

**14:332:351** ***Programming Methodology II (3)***
In-depth analysis of algorithms using object-oriented techniques. Comparative algorithm analysis, in-depth sorting algorithms, graphs, NP Completeness, object-oriented design. Emphasis is on programming and practical applications in Electrical and Computer Engineering. Students are assumed to know how to write basic programs in C/C++.
***Prerequisites: 14:332:252 or 01:198:111***

**14:332:361** ***Electronic Devices (3)***
Fundamentals of semiconductor devices and microelectronic circuits, terminal characteristics of p-n and Zener diodes, diode circuits, principles of MOSFET and BJT operation, biasing technology, single stage transistor circuit analysis at mid band frequencies.
***Prerequisites: 14:332:222 and 14:332:224 Corequisite: 14:332:363.***

**14:332:363** ***Electronic Devices Laboratory (1)***
Laboratory experiments in microelectronic circuits using semiconductor devices, including diodes, MOSFETs and BJTs. Employing a learn-by-doing approach, emphasizing the hands-on-experimental experiences and computer simulation.
***Prerequisites: 14:332:222 and 224. Corequisite: 14:332:361.***

**14:332:366** ***Digital Electronics (3)***
Principles of digital electronics, implementation of logic gates with MOSFETs and BJTs. Understanding and analysis of different logic families including NMOS CMOS, TTL and ECL. Fundamentals of digital memory circuits.
***Prerequisites: 14:332:361 and 363. Corequisite: 14:332:368.***

**14:332:368** ***Digital Electronics Laboratory (1)***
Laboratory experiments in transistor-level realization of CMOS, BiCMOS, TTL and ECL logic gates. Employing a learn-by-doing approach, emphasizing the hands-on-experimental experiences and computer simulation.
***Prerequisites: 14:332:361 and 363. Corequisite: 14:332:366.***

**14:332:376** ***Virtual Reality (3)***
Introduction to virtual reality (VR), input/output devices, haptic interfaces, dedicated hardware, VR modeling, VR programming, human factors in VR simulations, applications, the future of VR.
***Prerequisite: (14:332:331 or 01:198:211) Corequisite: 14:332:378.***

**14:332:378** ***Virtual Reality Laboratory (3)***
Introduction to Unity 3D, stereoscopic display programming, scene graphs and hierarchical models, game 3D controllers, force feedback interfaces, 3D sound and interaction techniques, term project.
***Prerequisite: (14:332:331 or 14:125:309 or 01:198:211) Corequisite: 14:332:376.***

**14:332:382** ***Electromagnetic Fields (3)***
Field theory of static, stationary, and moving charges explored. Basic laws of Coulomb, Gauss, Faraday, and Ampere discussed in the context of engineering applications. Knowledge of vector analysis assumed.
***Prerequisites: (01:640:152 or 01:640:154 or 01:640:192; 01:750:227; 14:332:222)***

**14:332:393** ***Professionalism/Ethics (1)***
An undergraduate seminar on the topics of entrepreneurship, ethics, and professionalism. The emphasis is on social, ethical and economic factors that go hand-in-hand with the practice of engineering.
***Prerequisite: Junior standing***

**14:332:402** ***Sustainable Energy: Choosing among Options (3)***
The course is comprised of three parts: an introductory part that provides just-in-time analysis tools from engineering economics, thermodynamics, and sociopolitical analysis; a part dealing with all the major nonrenewable energy sources and technologies; and a part analyzing all major renewable energy sources and technologies.
***Prerequisite: Junior Standing***

**14:332:411** ***Electrical Energy Conversion (3)***
Principles of magnetic circuit concepts, transformers, DC machines, synchronous machines, induction machines, special purpose machines.
***Prerequisite: 14:332:222 or 50:750:234***

**14:332:415** ***Introduction to Automatic Control Theory (3)***
The theory of automatically controlled systems and their dynamic behavior.
***Prerequisite: 14:332:345.***

**14:332:417** ***Control Systems Design (3)***
This course presents the theory of feedback control systems, with a focus in linear control theory and applications to electrical systems. Topics include stability concepts, Routh-Hurwitz and Nyquist stability criteria, PID controllers, state space representation and control design, state feedback and state observers, optimal control, and Kalman filter.
***Prerequisite: 14:332:345.***

**14:332:421** ***Wireless Communications (3)***
This course provides an introduction to the basic principles and applications of wireless communications. It covers the following topics: The wireless channel; Cellular systems from 1G to 5G: multiple access and interference management; Point-to-point communication (Free space loss): Over-the-air signal detection, diversity schemes and

channel uncertainty; Capacity of wireless channels; Multiuser capacity and opportunistic communication; MIMO I: spatial multiplexing and channel modeling. MIMO III Diversity multiplexing tradeoff, Universal space time codes.
*Prerequisite: 14:332:345*

**14:332:423** *Computer and Communication Networks (3)*
Network protocol design principles, reliable transport protocols, routing, quality of service, multimedia networking, internet telephony, and wireless networks.
*Pre-Requisite: (14:332:226 or 01:198:206 or 01:640:477)*

**14:332:424** *Introduction to Information and Network Security (3)*
Classical cryptosystems, modular arithmetic, modular exponentiation, Fermat and Euler theorem, DES, modes of operation for block ciphers, breaking DES, Rijndael, public key cryptography, primality and prime testing, secret-sharing schemes, Needham-Schroeder, Kerberos, public key infrastructure, password systems, and information theoretic security and applications to network security.
*Prerequisites: (14:332:226 and 14:332:312)*

**14:332:427** *Communication Systems Design (3)*
Methods and laboratory experiments dealing with practical aspects of analog and digital communications schemes. Experiments involve component level circuit construction, interconnection of modular subsystems, and use of interactive, graphics-based, system simulation software packages.
*Prerequisite: 14:332:322.*

**14:332:434** *Introduction to Computer Systems (3)*
Multi-processing systems, Parent and Children processes interacting with system calls, Interprocess Communications (IPCs) using: pipes, shared memory, signals, properties of signals, threads and multi-threaded processes, signals on threads, synchronization primitives on threads, physical and virtual memory, multicore architecture, multicore CPU management, multicore job scheduling, thread synchronization, cache, coherency, multicore memory management, multicore file system, I/O.
*Prerequisites: [(01:198:112 or 01:198:112 or 14:332:351) and (14:332:331)]*

**14:332:435-436** *Topics in Electrical and Computer Engineering (3,3)*
Topics of current interest and importance in electrical and computer engineering. Typically one topic per semester is studied intensively.

**14:332:437** *Digital Systems Design (3)*
Hardware description, simulation, and synthesis using the Verilog language. Design methodologies for combinational and sequential logic circuits and systems. Characteristics of microprocessor.
*Prerequisites: [(14:332:331 or 01:198:211) and (14:332:351)] or [(14:332:331 or 01:198:211) and (01:198:112)]*

**14:332:443** *Machine Learning for Engineers*
This course, which is open to all engineering and non-engineering majors, introduces students to the fundamentals of machine learning through a blend of mathematical and statistical descriptions, hands-on programming exercises, and real-world engineering problems. Additional emphasis is placed on discussing various practical aspects of machine learning systems that include ethics and bias.
*Prerequisite: Prerequisites for this course include undergraduate-level probability theory and linear algebra courses. For probability: 14:332:226 or 14:540:210, or 01:960:211 or 01:960:401 or 01:640:477 or 01:198:206. For linear algebra: 01:640:250.*

**14:332:445-446** ***Topics in Electrical and Computer Engineering (3,3)***
Topics of current interest and importance in electrical and computer engineering. Typically one topic per semester is studied intensively.

**14:332:447** ***Digital Signal Processing Design (3)***
Applications of DSP algorithms in the areas of speech processing, image processing, radar, pattern recognition, and adaptive filtering using software implementations applied to realistic signals.
***Prerequisite: 14:332:346.***

**14:332:449** ***Introduction to Capstone Design in ECE***
This course focuses on the basics of project design and development of team-oriented projects involving one discipline or another or interweaving of multiple areas in electrical and computer engineering. The course will focus on project development under realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. In addition, project management and team building skills will be developed to expand already amassed theoretical knowledge.
***Class level: Senior***

**14:332:448** ***Capstone Design in ECE (3)***
This course focuses on gaining design experience in team-oriented projects involving one discipline or another or interweaving of multiple areas in electrical and computer engineering. In addition to already amassed theoretical knowledge, projects require application of standards and realistic engineering constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
***Prerequisite: 14:332:345 and 14:332:449.***

**14:332:451** ***Introduction to Parallel and Distributed Programming (3)***
Parallel and distributed architectures, fundamentals of parallel/distributed data structures, algorithms, programming paradigms, introduction to parallel/distributed application development using current technologies.
***Prerequisites: (14:332:331 and 14:332:351) or (1:198:211 and 14:332:351)***

**14:332:452** ***Software Engineering (3)***
Software development life cycle, object-oriented software engineering, system specification, software measurement and estimation, and software design patterns.
***Prerequisite: 14:332:351 or 01:198:112***

**14:332:453** ***Mobile App Engineering and User Experience (3)***
Essential principles, techniques, tools, and methods for designing and implementing robust mobile applications and user experiences. Covers the basics of programming on a specific mobile platform, cell phone localization, energy efficiency, prototyping, security, user-centered design, and usability testing.
***Prerequisite: 14:332:351.***

**14:332:456** ***Network-Centric Programming (3)***
Advanced programming with a focus on developing software for networked systems using Linux as a reference platform. Topics include: programming tools, software design, programming techniques, environment of a UNIX process, memory allocation, garbage collection, process control, process relationships, signals, reliable signals, threads, I/O multiplexing, datagram and stream sockets, multicasting, device driver and kernel programming, secure programming.
***Prerequisite: 14:332:351 or 01:198:112***

**14:332:460** ***Power Electronics (3)***
Principles of power electronics including understanding of power semiconductor devices, passive components, basic switching circuits, AC/DC, DC/DC, DC/AC converters and their applications.
***Prerequisite: 14:332:361.***

**14:332:463** ***Analog Electronics (3)***
The objective of this course is to present the concepts of design and analysis of single and multistage BJT/FET amplifiers, biasing circuits, frequency response, negative feedback and stability. By the end of semester, students well develop skills in designing and analyzing multistage operational amplifiers.
***Prerequisite: 14:332:361.***

**14:332:464** ***RF Integrated Circuit Design (3)***
Basic concepts in RF design. Analysis and design of RF circuits used in modern wireless systems.
***Prerequisites: 14:332:361 and 463.***

**14:332:465** ***Physical Electronics (3)***
Semiconductor fundamentals, p-n diodes, bipolar transistors, Schottky diodes, JFETs, MESFETs, and MOSFETs.
***Prerequisite: 14:332:361.***

**14:332:466** ***Optoelectronic Devices (3)***
Overview of design and applications of optoelectronic devices, relationship between human vision and the design of optoelectronic displays, e.g., cathode-ray tubes, light-emitting diodes, liquid crystal displays, and plasma displays; concepts of laser physics with emphasis on semiconductor lasers; and fiber-optic waveguides and their coupling to various sources and detectors.
***Prerequisites: 14:332:361 and 382.***

**14:332:467** ***Microelectronic Processing (3)***
Overview of microelectronic processing technology, lithography, etching, oxidation, diffusion, implantation and annealing, film deposition, epitaxy growth, metallization, process integration, and simulation.
***Prerequisite: 14:332:361.***

**14:332:472** ***Robotics and Computer Vision (3)***
This course provides a comprehensive exploration of computational methods in robot vision, emphasizing both classical and modern techniques. Students will learn to apply linear algebra and 3D reconstruction methods, as well as design and evaluate deep learning models for image classification, object detection, and semantic segmentation. Advanced topics include deep reinforcement learning, preparing students for cutting-edge research and applications in robotic vision systems.
***Prerequisites: 14:332:345 and 14:332:346***

**14:332:474** ***Introduction to Computer Graphics (3)***
Computer display systems, algorithms, and languages for interactive computer graphics. Vector, curve, and surface generation. Hidden line and surface algorithms.
***Prerequisite: 14:332:252.***

**14:332:479** ***VLSI Design (3)***
This course introduces the fabrication and layout techniques necessary to design Very Large Scale Integrated circuit (VLSI) systems. Specific topics include: CMOS digital logic, fabrication process technology, MOSFET theory,

layout design rules including all the factors required for an effective circuit design, and case study of IC chips and microprocessors.
***Prerequisites: 14:332:252, 14:332:331, 14:332:366***

**14:332:481** ***Electromagnetic Waves (3)***
Beginning with Maxwell's equations and the constitutive relations, the interaction of electromagnetic waves in various media will be presented. Practical applications in optoelectronics, fiber optics, and communications presented throughout the course.
***Prerequisite: 14:332:382.***

**14:332:482** ***Deep Submicron VLSI Design for ECE (3)***
Advanced topics in deep submicron and nanotechnology VLSI design and fabrication. Logic and state machine design for high performance and low power. Tree adders and Booth multipliers. Memory design. Timing testing for crosstalk faults. Design economics. Emerging nanotechnology devices.
***Prerequisite: 14:332:479.***

**14:332:491,492** ***Special Problems: Independent Study (3,3)***
Individual investigation in some branch of electrical and computer engineering of particular interest to the student. Topic selected for study must be approved and directed by a faculty member.
***Prerequisite: Permission of department.***

**14:332:493,494** ***Topics in Electrical and Computer Engineering (3,3)***
Topics of current interest and importance in electrical and computer engineering. Typically one topic per semester is studied intensively.

**14:332:495** ***Internship in Electrical and Computer Engineering (3)***
Intended to provide a practical experience to the student's undergraduate studies by integrating prior coursework into a working electrical and computer engineering professional environment. Credits granted only for a three-month assignment totaling approximately 180 hours.
***Prerequisite: Permission of department. Graded pass/no credit.***

**14:332:496,497** ***Co-Op Internship in Electrical and Computer Engineering (3,3)***
Intended to provide a practical experience to the student's undergraduate studies by integrating prior coursework into a working electrical and computer engineering professional environment. Credits granted only for a continuous, six-month, full-time assignment.
***Prerequisite: Permission of department. Graded pass/no credit.***

# Environmental Engineering 366 (ENG)

## ENVIRONMENTAL ENGINEERING 366

The courses in Environmental Engineering (366) are currently listed under the subject code 117.

**11:117:100** ***Introduction to Bioenvironmental Engineering (1)***
Overview of specializations within bioenvironmental engineering. Expanding role of biological and environmental sciences in engineering. Analysis of selected problems. Review of professional opportunities.

**11:117:323** ***Environmental Fate and Transport for Engineers (3)***
Fundamental principles of physical and chemical processes including mass and energy balance approaches, phase partitioning, reaction kinetics, mass transfer, advection and dispersion. Topics include: (1) toxicity and risk assessment; (2) systems and processes characterization; (3) chemical thermodynamics and kinetics; (4) diffusion and mass transfer; (5) continuity equations; (6) transport in surface water and groundwater systems. It emphasizes how to simplify extremely complex systems so that solutions and conceptual design can be obtained.
***Prerequisites: 01:640:251; 01:750:227; 11:375:202; or permission by instructor.***

**11:117:333** ***Environmental Engineering Analysis Tools (3)***
This course applies state-of-the-art environmental engineering tools in analyzing problems and creating solutions and designs. Tools include, as examples, measurement tools and techniques, programming languages and software for graphics, statistical analysis, and modeling. Tools may vary with current engineering practice.
***Prerequisites: 14:440:127 or 14:440:102 and 14:180:215 or 14:180:216.***

**11:117:413** ***Unit Processes in Environmental Engineering I (3)***
Physical and chemical processes and operations commonly applied for water and wastewater treatment, including coagulation, flocculation, sedimentation, filtration, adsorption, ion exchange, membrane separation, precipitation, oxidation, and disinfection; principles of chemical reaction kinetics; modeling of ideal and non-ideal batch and flow-through reactors.
***Prerequisites: 01:640:244; 11:117:323 (or 11:375:203).***

**11:117:414** ***Unit Processes in Environmental Engineering II (3)***
Biological principles and operations for wastewater treatment, bioremediation, and energy production including: microbial ecology; energetics, stoichiometry, and kinetics of microbial growth; kinetics of pollution degradation; modeling of ideal bioreactors; design criteria for specific wastewater treatment processes; and new developments in use of microorganisms in environmental engineering.
***Prerequisite: 11:375:201 and 11:117:413 (or permission by instructor).***

**11:117:423** ***Environmental Engineering Unit Processes Laboratory I (1)***
Demonstration of physicochemical operations used in drinking water and wastewater treatment, including reactor design and residence time distribution, coagulation, flocculation, sedimentation, filtration, carbon adsorption, chemical oxidation, and oxygen transfer.
***Prerequisite: 11:117:323 Corequisite: 11:117:413.***

**11:117:424** ***Unit Processes in Environmental Engineering Laboratory II (1)***
Demonstration and investigation of biological processes used in the treatment of wastewater, including: natural biological processes in biotreatment ponds; biodegradability and biodegradation kinetics; activated sludge reactors; anaerobic digestion for bioenergy production; use of laboratory methods and analytical equipment to assess biological processes; and introduction to activated sludge simulation software.
***Prerequisites: 01:117:423 and 01:160:211. Corequisite: 11:117:414.***

**11:117:450** ***Applied Instrumentation and Control (4)***
This class will develop an understanding of how to conduct experiments involving the collection of field data and the various tools and techniques required to do so.
***Prerequisite: 11:375:203.***

**11:117:462** *Design of Solid Waste Treatment Systems (3)*
Analysis and design of integrated solid waste management systems, including waste minimization, quantity estimates, waste characteristics, life-cycle thinking in waste management, collection, composting and anaerobic digestion, materials recovery, recycling, waste-to-energy, and landfilling.
***Prerequisites: 11:375:201 and 01:640:152 and 14:180:215.***

**11:117:468** *Hazardous Waste Treatment Engineering (3)*
Engineering and process design aspects of hazardous waste management. Waste reduction and recovery, waste treatment, and site remediation. Case studies and engineering solutions to model hazardous waste problems.
***Prerequisite: 11:117:413 or permission by instructor.***

**11:117:474** *Air Pollution Engineering (3)*
Engineering design techniques for air quality control. Control of particulate and gas emissions from stationary sources. Control of mobile source emissions. Design for indoor air quality and regional air quality control.
***Prerequisite: 14:180:387 or 14:650:312.***

**11:117:488** *Environmental Engineering Capstone Design I (2)*
Design morphology. Case studies and special design problems. Solutions developed using creative design processes that include analysis, synthesis, and iterative decision making. Safety and professional ethics.
***Open only to seniors in environmental engineering. Prerequisite: 11:117:423.***

**11:117:489** *Environmental Engineering Capstone Design II (2)*
Completion of bioenvironmental engineering senior design project. Evaluation. Presentation of final report.
***Prerequisite: 11:117:488. Only open to seniors in Environmental engineering.***

**11:117:494** *Contaminant Hydrogeology Engineering (3)*
Principles of groundwater hydrology and pollution. Development of mathematical formulations for describing pollutant movement in groundwater systems. Examination of control measures. Discussion of case studies. Introduction to and application of MODFLOW.
***Prerequisite: 11:375:423.***

**11:117:495** *Surface Water Quality Modeling (3)*
Formulation and solution of mathematical models as applied to surface water quality systems. Techniques of simulation and validation using case studies.
***Prerequisite: 11:375:423.***

**11:117:496** *Planning and Design of Land Treatment Systems (3)*
Engineering design of land treatment systems for municipal and industrial wastewater, including spray irrigation, overland flow, infiltration/percolation, and subsurface soil absorption systems. Facilities planning.
***Prerequisite: 14:180:387 or 14:650:312.***

**11:117:497,498** *Special Problems in Environmental Engineering (BA,BA)*
Studies of special interest in some selected area of environmental engineering.
***Prerequisite: Permission of department.***

# General Engineering 440 (ENG)

## GENERAL ENGINEERING 440

**14:440:100** ***Introduction to Engineering (1)***
Brief overview of each of the specific fields of engineering offered as degree programs at the school. Describes the major fields of study, as well as the engineering profession in general.
***Graded Pass/No Credit.***

**14:440:107** ***Methods of Inquiry for Engineers (E3)***
Study skills. A system of thinking strategies and critical and analytical thinking skills applicable across the engineering curriculum.

**14:440:115** ***Reilly DELLC Introduction to Engineering (3)***
Reilly DELLC Introduction to Engineering introduces different engineering majors to students consist of in-class activities including panels, guest lectures, and group projects. It gives students a chance to connect with the engineering community and orients them to information, programs, and resources that may be helpful as they embark on their journey in engineering. The class is open to engineering students who are members of the Reilly Douglass Engineering Living Learning Community (DELLC).

**14:440:127** ***Introduction to Computers for Engineers (3)***
Introduction to MATLAB, a powerful programming package for engineers and scientists. Students will learn the fundamentals of MATLAB, how to write programs in MATLAB, and how to solve engineering problems using MATLAB. Emphasis on problem-solving skills and mathematical tools of importance in engineering.
***Prerequisite: Some prior programming experience is preferred.***

**14:440:191** ***Honors Introduction to Engineering I (3)***
This course introduces students to the profession of engineering in all of its creative, professional, social, and at times controversial aspects. Students will learn about engineering as a curriculum of study, the different fields, careers, and job functions. They will learn the aspects of engineers as creators and designers as they create solutions, keeping in mind both ethics and professionalism. Students will also learn some of the key tools needed for engineers as they develop their paths toward professional/personal growth and success. The course culminates in final projects where students create, document, and present a human-based design.
***Open only to first-year students in the Engineering Honors Academy.***

**14:440:221** ***Engineering Mechanics: Statics (3)***
Classification of systems of forces and their resultants; geometrical and analytical conditions for the equilibrium of force systems; frames and trusses; friction; parabolic and catenary cables; centers of gravity.
***Prerequisites: 01:640:151 and 01:750:123.***

**14:440:222** ***Engineering Mechanics: Dynamics (3)***
Kinematics of particles and rigid bodies; rectangular, path, and polar descriptions. Relative motion. Kinetics of particles, particle systems, and rigid bodies; equations of motion, principles of work and energy, linear and angular impulse and momentum. Impact.
***Prerequisites: 01:640:152 and (14:440:221 or 14:440:291).***

**14:440:291** ***Honors Engineering Mechanics: Statics (3)***
Covers the same material as 14:440:221 but in a more thorough and demanding fashion.
***Open only to honors program participants.***

**14:440:292** ***Honors Engineering Mechanics: Dynamics (3)***
Covers the same material as 14:440:222 but in a more thorough and demanding fashion.
***Open only to honors program participants.***

**14:440:294** ***Honors Engineering Design and Development I (1)***
This course is offered in the spring semester of the Engineering Honors Academy second year. The class is made to enhance professional and technical skills by practicing human-centered design and continuing the growth of leadership and presentation abilities while fostering community between the sophomores and juniors in the Honors Academy. The course will culminate in an oral presentation and poster session. The learning objectives are to continue to develop engineering, technical, and public speaking skills from Honors Introduction to Engineering (14:440:191); to continue to build a sense of community between the different classes that compose the Honors Academy students; to assist in preparing students for industry, research, and senior design; to develop group skills while immersing students in multidisciplinary engineering; and to build creative problem-solving skills in realistic scenarios.
***Prerequisite: 14:440:191. Open only to sophomore students in the Engineering Honors Academy.***

**14:440:298** ***Professional Skills to Succeed in Engineering (1)***
This course consists of a series of seminars that provide students with exposure to some of the professional skills and competencies associated with the practice of engineering. Topics include professional ethics and conduct, contemporary issues, written and oral communication, evaluation of career options, interviewing skills, and other career-related topics. Material and activities include guest lectures, case studies, and interactive small-group discussions.

**14:440:391-392** ***Undergraduate Research in Engineering***
Interdisciplinary undergraduate research under the guidance of a faculty member in the areas of math, science, and engineering.
***Permission by the Instructor.***

**14:440:396** ***Honors Engineering Design and Development II (1)***
This course is offered in the spring semester of the Engineering Honors Academy third year. The class is made to enhance professional and technical skills by practicing human-centered design and continuing the growth of leadership and presentation abilities while fostering community between the sophomores and juniors in the Honors Academy. The course will culminate in an oral presentation and poster session. The learning objectives are to continue to develop engineering, technical, and public speaking skills from Honors Introduction to Engineering (14:440:191) and the Honors Design and Development I (14:440:294); to continue to build a sense of community between the different classes that compose the Honors Academy students; to assist in preparing students for industry, research, and senior design; to develop group skills while immersing students in multidisciplinary engineering; and to build creative problem-solving skills in realistic scenarios.
***Prerequisites: 14:440:294. Open only to junior students in the Engineering Honors Academy.***

**14:440:496-497** ***Co-op Internship in Engineering (3,3)***
Provides students with the opportunity to practice and/or apply knowledge and skills in various industrial settings in the engineering fields. Credits earned for the educational benefits of the experience and granted only for a continuous, six-month, full-time assignment.
***Permission by the Instructor. Graded pass/no credit.***

# Industrial Engineering 540 (ENG)

## INDUSTRIAL ENGINEERING 540

**14:540:201** ***Work Design and Ergonomics (3)***
Man-machine analysis, motion economy, time study, predetermined time systems, work sampling; introduction to robotics, facilities layout, material handling; introduction to ergonomics and anthropometric, biomechanical, and human-machine interface models.
***Prerequisite: 01:640:151 or 21:640:135 or 50:640:121 or 01:640:191. Corequisite: 14:540:202.***

**14:540:202** ***Work Design and Ergonomics Laboratory (1)***
Experiments in robotics, time study, work measurement, workplace design and the human-machine interface, facilities layout.
***Prerequisite: 01:640:151 or 21:640:135 or 50:640:121 or 01:640:191. Corequisite: 14:540:201.***

**14:540:210** ***Engineering Probability (3)***
Probability problems in engineering, conditional probability, discrete and continuous distributions, functions of random variables, interval estimates.
***Prerequisite: 01:640:144 or 151 or 152 or 154 or 191 or 192 or 21:640:135 or 136 or 50:640:121 or 122. Open to School 14 (School of Engineering) ONLY.***

**14:540:213** ***Industrial Engineering Laboratory (2)***
Introduction to programming, fundamental data types, flow control, and functions; arrays, pointers, and do loops; algorithms and flow charts; GUI concepts.
***Prerequisite: 01:640:151 or 21:640:135 or 50:640:121 or 01:640:191.***

**14:540:303** ***Manufacturing Processes (3)***
Properties of engineering materials; metals, polymers, ceramics and composites, bulk and sheet forming, traditional and nontraditional material removal processes, polymer processing, laser and energy-beam processes, additive layered manufacturing processes, and micro- and nanofabrication processes. Basic and computerized machine tools. Process chains, planning and process optimization. Engineering metrology and product quality.
***Prerequisites: 14:440:221, 14:635:407. Corequisite: 14:540:304.***

**14:540:304** ***Manufacturing Processes Laboratory (1)***
Experiments on machine tools: lathes, drilling machines, milling machines, and CNC milling machines; robot workplace design and computer control of machine tools.
***Corequisite: 14:540:303.***

**14:540:305, 306** *Honors Candidacy Problems (0,0)*
Extensive reading and study in a particular problem area of industrial engineering under the guidance of a faculty member.
*Prerequisite: Permission of department chair. Prerequisite for industrial engineering students who wish to be James J. Slade Scholars.*

**14:540:311** *Deterministic Models in Operations Research (3)*
Elements of modeling and problem solving. Use of a software package like LINDO or EXCEL to solve real-life industrial engineering problems. Linear programming, duality, sensitivity analysis, integer programming, transportation, and assignment problems.
*Prerequisite: 01:640:244 or 21:640:314 or 50:640:314.*

**14:540:320** *Statistics for Engineers (3)*
Statistical estimation; confidence interval; testing hypothesis; engineering applications throughout the course.
*Prerequisite: 14:540:210*

**14:540:338** *Probability Models in Operations Research (3)*
Modeling and decision making under uncertainty, Markov chains, poisson processes, inventory models, and queuing systems.
*Prerequisites: 14:540:210*

**14:540:343** *Engineering Economics (3)*
Economic decisions involving engineering alternatives; annual cost, present worth, rate of return, and benefit-to-cost; before- and after-tax replacement economy; organizational financing; break-even charts; unit and minimum-cost public sector studies.
*Prerequisite: Any Course EQUAL or GREATER Than: (01:640:026 INTERMEDIATE ALGEBRA)*

**14:540:382** *Automation and Systems Design(3)*
Programmable automation applied to manufacturing. Computer architecture, sensors and automatic data acquisition, computer control of actuators, continuous and discrete control of processes, computer integration, and local area networks.
*Prerequisite: 01:750:227 Corequisite: 14:540:383.*

**14:540:383** *Automation and Systems Design Laboratory (1)*
Use of microcomputers and industrial controllers in controlling machines and processes. Assembly language programming, ladder logic programming, and interfacing controllers to sensors and actuators. Experiments in manufacturing applications.
*Corequisite: 14:540:382.*

**14:540:384** *Simulation Models in Industrial Engineering (3)*
Modeling and analysis of industrial and service systems using ARENA, simulation modeling perspectives, discrete event and continuous simulation, simulation languages, and statistical aspects of simulation.
*Prerequisites: 14:540:338.*

**14:540:399** ***Design of Engineering Systems I (3)***
Design principles, material selection, design for assembly, design for manufacturing, and effect of environmental issues on product design.
***Prerequisites: 14:540:338, 382. Open to industrial and systems engineering students only. Corequisite: 14:540:303, 384***

**14:540:400** ***Design of Engineering Systems II (3)***
A team approach to the redesign of a real-life product. Alternative engineering plans for improved designs will be developed and implemented. Both written and oral reports will be completed.
***Prerequisites: 14:540:384, 399. Open to industrial and systems engineering students only.***

**14:540:433** ***Quality Engineering (3)***
Statistical methods for monitoring and improving product quality and decreasing variation. Factorial experiments, variables and attribute control charts, acceptance sampling, on- and off-line process controls.
***Prerequisite: 14:540:320. Corequisite: 14:540:434.***

**14:540:434** ***Quality Engineering Laboratory (1)***
Practical application of quality engineering methodologies, statistical software, gage studies, online process control, design of experiments to improve product design, industrial manufacturing processes, and system design.
***Corequisite: 14:540:433.***

**14:540:453** ***Production Planning and Control (3)***
Coordination of activities of both manufacturing and service systems. Systems design; input and output; planning and scheduling. Decision-making problems employing mathematical techniques of linear programming. Sequencing jobs on machines and line-balancing techniques.
***Prerequisites: 14:540:311, 338.***

**14:540:461** ***Engineering Law (3)***
Legal and ethical aspects of engineering; bids, awards, and negotiated contracts. Liabilities to the public and to employees, contract labor law. Contracts, patents, copyrights, trademarks, and engineering specifications.
***Prerequisite: Permission of department. Open only to seniors and graduate students in engineering.***

**14:540:462** ***Facilities Layout and Materials Handling (3)***
Fundamentals of the design, layout, and location of industrial and nonmanufacturing facilities. Selection of machines and material handling equipment and their efficient arrangement. Emphasis on quantitative methods. Warehouse layout. Facility location theory.
***Prerequisites: 14:540:201, 303.***

**14:540:485** ***Industrial Information Systems (3)***
The course focuses on acquiring hands-on experience in the organization, modeling, and analysis of raw data to extract pertinent information and actionable insights for industrial and engineering systems. Covered topics include database management using structured query language programming software, as well as the design and implementation of data science solutions and forecasting methods through project-based learning and case studies from manufacturing, materials engineering, and energy systems.
***Prerequisite: 14:540:320***

**14:540:487** *Energy Systems Modeling and Optimization (3)*
Addresses the design, analysis, modeling, and optimization of selected energy systems (including conventional fossil fuels and renewable wind and solar). This course will provide the basis for applying mathematical modeling and optimization techniques in energy systems. A set of projects and case studies focused on modeling and optimization of a variety of energy systems will be assigned to students and discussed in detail. The course will have hands-on experience with data collection, experimentation, simulation, and optimization tools as they apply to energy systems.
***Prerequisites: 14:540:311***

**14:540:491,492** *Special Problems (3,3)*
Studies in phases of industrial and systems engineering of special interest.

**14:540:496,497** *Co-op Internship in Industrial and Systems Engineering (3,3)*
Intended to provide a capstone experience to the student's undergraduate studies by integrating prior coursework into a working industrial engineering professional environment. Credits earned for the educational benefits of the experience and granted only for a continuous, six-month, full-time assignment.
***Prerequisite: Permission of department. Graded pass/no credit.***

# Materials Science and Engineering 635 (ENG)

## MATERIALS SCIENCE AND ENGINEERING 635

**14:635:203** *Introduction to Materials Science and Engineering (3)*
General field of materials, including its development and present scope, the classification of the industry by major divisions, and discussion of the technology of these industries. The broad principles of materials based on an approach from crystal physics and unit processes.
***Prerequisite: 01:160:160 or 162.***

**14:635:204** *Materials Processing (3)*
Investigation of the methods and techniques of producing materials from all categories, ranging from polymers and metals to semiconductors and advanced ceramics. The course will provide an introduction to synthesis, properties, and processing of technologically important materials.
***Prerequisite: 14:635:203.***

**14:635:205** *Crystal Chemistry and Structure of Materials (3)*
Introduction of concepts of crystal chemistry applied to ceramics, oxides, and nonoxides. Theories of bonding, the unit cell, crystallography, and symmetry as a basis for structure-property relationships.
***Prerequisite: 01:160:160 or 162.***

**14:635:206** *Thermodynamics of Materials (4)*
The laws of thermodynamics, chemical potentials and activities, condensed phase equilibria, phase diagrams and microstructure, the reactions between solids and gases, and gas-gas reactions.
***Prerequisites: 01:160:160 or 162; 01:640:244.***

**14:635:212** ***Physics of Materials (3)***
This course extends the coverage of structure-processing-property relationships and emphasizes properties. It includes an introduction to thermal processes, thermal properties, and optical properties.
***Prerequisites: 01:640:244, 14:635:203.***

**14:635:252** ***Laboratory I (2)***
Develops skills for planning, execution, and reporting of formal experimental results relating to processing of materials. Fabrication methods, powder processing, and melt forming.
***Lec. 55 min., lab. 3 hrs.***

**14:635:305** ***Materials Microprocessing (3)***
Emphasizes batch preparation and organic additives. Provides understanding of processing steps that precede forming. Fundamentals of powder processing, organic chemistry, rheology, and colloid science, with examples in various casting technologies.
***Prerequisite: 14:635:204.***

**14:635:307** ***Kinetics of Materials Processes (3)***
Phenomenological approach to the solid-state reactions involved in materials processing, including phase transformations, phase separation, mechanisms, and transport phenomena.
***Prerequisites: 14:635:205, 206; 01:640:244.***

**14:635:309** ***Characterization of Materials (3)***
Interactions of electromagnetic radiation, electrons, and ions with matter and their application in X-ray diffraction and X-ray, IR, UV, electron, and ion spectroscopies in the analysis of materials. Nonspectroscopic analytical techniques also are covered.
***Prerequisite: 14:635:205.***

**14:635:312** ***Glass Engineering (3)***
Basic physical and chemical properties of glass, chemical durability, stress release, annealing and tempering, mechanical strength, raw materials and melting, and methods of manufacture. Design of composition for desired engineered properties.
***Prerequisites: 14:635:204, 303.***

**14:635:314** ***Strength of Materials (3)***
The mechanical behavior of materials is discussed with emphasis on brittle behavior at room temperature and the transition to a limited plasticity regime at high temperatures. The interplay of basic deformation mechanisms with microstructural features and the implication for design and processing of materials are considered.
***Prerequisite: 01:640:244.***

**14:635:316** ***Electronic, Optical, and Magnetic Properties of Materials (3)***
Theoretical and practical consideration of dielectric loss, ferroelectricity, ferromagnetism, and semiconductivity in materials systems (glass, crystal, glass-crystal composites). Variation of properties with composition, structure, temperature, and frequency.
***Prerequisites: 14:635:205 and 354.***

**14:635:320** ***Introduction to Nanomaterials (3)***
Nanotechnology involves behavior and control of materials and processes at the atomic and molecular levels. This interdisciplinary course introduces the student to the theoretical basis, synthetic processes, and experimental techniques for nanomaterials. This course is the introduction to three advanced courses in (1) Structural, Mechanical, and Chemical Applications of Nanostructures and Nanomaterials (321); (2) Photonic, Electronic, and Magnetic Applications of Nanostructures and Nanomaterials (322); and (3) Biological Applications for Nanomaterials (410).
***Prerequisite: Open to all science and engineering students who have completed 60 credits.***

**14:635:321** ***Structural, Mechanical, and Chemical Applications of Nanostructures and Nanomaterials (3)***
Fundamentals of grain boundaries and surfaces; application of nanomaterials to batteries, fuel cells, and catalysts; mechanical applications such as hardness, yield strength, superplasticity, tribology, and wear; and microelectric-electromechanical systems (MEMS).

**14:635:322** ***Photonic, Electronic, and Magnetic Applications of Nanostructures and Nanomaterials (3)***
Electronic applications of nanomaterials such as quantum dots, nanowires, field effect transistors, and nanoelectromechanical systems. Magnetic applications include information storage, giant and colossal magnetoresistance, and superparamagnetism. Photonic applications include nanolasers, photonic band gap devices, and dense wavelength multiplexers.

**14:635:353** ***Laboratory II (2)***
Develops skills for planning, execution, and reporting of formal experimental results relating to the characterization of materials, particle size measurement, phase identification, and dilatometry.
***Lec. 55 min., lab. 3 hrs.***

**14:635:354** ***Laboratory III (2)***
Focuses on helping the student develop skills for the planning, execution, and reporting of formal experimental results relating to the measurement of materials properties. Properties investigated are optical, electrical, and mechanical in nature. The measurement method as well as the structure-property relationship found in materials will be stressed. Principles of electrical engineering relevant to the property measurements will also be emphasized.
***Lec. 55 min., lab. 3 hrs.***

**14:635:360** ***Materials Science and Engineering of Ceramics (3)***
Focuses on the principal materials fields that are satisfied by ceramic materials. These topics include traditional areas as well as a wide range of advanced materials topics, such as electronic, magnetic, optic, biomedical, catalyst, and structural materials are covered. An emphasis will be placed on understanding the interrelationship among chemistry, structure, properties, and performance.

**14:635:361** ***Materials Science and Engineering of Polymers (3)***
Focuses on the principal materials fields that are satisfied by organic polymers. Topics covered include polymerization, structure, characterization methods, stress/strain behavior, processing methods, and structure-property relationships with an emphasis on mechanical, optical, and transport properties.

**14:635:362** ***Physical Metallurgy (3)***
Focuses on the principal materials fields that are satisfied by metals and alloys. These topics include crystallography, phase equilibria, alloy crystal chemistry, and traditional and advanced metal and alloy processing. The relationship among structure, properties, and performance will be discussed in detail. These relationships will be used to

understand the criteria for process selection, which includes risk assessment, product liability, failure analysis and prevention, and environmental impact.
*Prerequisite: 14:635:203.*

**14:635:401-402** *Senior Materials Science and Engineering Laboratory I,II (3,3)*
Training in methods of independent research. Students, after consultation, are assigned a problem connected with some phase of materials science and engineering in their elected field of specialization.
*Conf. 1 hr., lab. 6 hrs. Prerequisites: 14:635:307, 309.*

**14:635:403,404** *Materials Science and Engineering Seminar (1,1)*
Current trends and topics of special interest in materials discussed by faculty, students, and representatives from the materials industry.

**14:635:405** *Solar Cell Design and Processing (3)*
This course will cover principles of photovoltaic solar cell operation and build from that foundation to discuss how these principles guide solar cell design. Lecture format with significant design content to emphasize current/voltage trade-offs encountered in solar cell optimization and the role that processing choices can play in improving system efficiency.
*Prerequisites: 01:750:227, 229. This course is offered in alternate years.*

**14:635:407** *Mechanical Properties of Materials (3)*
Fundamentals of materials science and engineering. Investigation of properties including elasticity, plasticity, strength, hardness, ductility, fracture, time-dependent deformation, and the impact of environmental effects.
*Prerequisites: 14:440:221 and 01:160:160 or 162. For other engineering majors.*

**14:635:410** *Biological Applications for Nanomaterials (3)*
Begins with the fundamentals of nanoscience in biology and medicine, and progresses to the current state of research in nanomaterials and nanotechnology as applied to biological applications. Key topics include nanoparticles and phagocytosis, nanoscale drug delivery systems, nanopatterning, scanning probe microscopy, and nanomachines in medicine. Due to the rapidly evolving nature of nanomaterials research, the course contents may change considerably from year to year to reflect the latest advances.

**14:635:411,412** *Materials Science and Engineering Design I,II (3,3)*
Fundamentals of equipment and plant design, construction, installation, maintenance, and cost for manufacture of materials products. Assignment of a problem in elected field of specialization.
*Prerequisites: 14:635:204 and 305.*

**14:635:413** *Materials Science and Engineering Venture Analysis (3)*
Product innovation and development techniques for materials technology commercialization based on traditional venture-analysis techniques. Aspects of marketing, engineering design, framework structuring, and decision and risk analysis.
*Prerequisite: 01:220:200.*

**14:635:416** *Physical and Chemical Properties of Glass (3)*
Provides an atomistic understanding of the role of composition on the structure and properties of glasses.
*Two 80-min. lectures. Prerequisites: 14:635:312 and 01:160:160 or 162. Offered even years only.*

**14:635:433** *Optical Materials (3)*
Fundamentals of optical materials (crystals, glasses, polymers). Relation of structure with optical properties and applications. Spectral characteristics of thin films as well as bulk materials.

**14:635:440** *Electrochemical Materials and Devices (3)*
Introduction to basic electrochemistry, principles of electrochemical devices, electroactive materials used in such devices, and case studies of batteries, fuel cells, and sensors. Emphasis on electrochemical principles and materials science for application in modern electrochemical devices.

**14:635:491,492** *Special Problems in Materials Science and Engineering (BA,BA)*
Individual or group study or study projects, under the guidance of a faculty member, on special areas of interest in materials science and engineering.

**14:635:496,497** *Co-op Internship in Materials Science and Engineering (3,3)*
Provides the student with the opportunity to practice and apply knowledge and skills in various materials science and engineering professional environments. Intended to provide a capstone experience to the student's undergraduate studies by integrating prior coursework into a working engineering environment. Credits earned for the educational benefits of the experience and granted only for a continuous, six-month, full-time assignment.
***Prerequisite: Permission of department. Graded pass/no credit.***

# Mechanical and Aerospace Engineering 650 (ENG)

## MECHANICAL AND AEROSPACE ENGINEERING 650

**14:650:210** *Introduction to Aerospace Engineering (3)*
Basic concepts in aerospace engineering; pressure, density, temperature, atmosphere, NACA and NASA, equation of state, airfoils, streamlines, standard atmosphere, interpolation and use of data; basic aerodynamics, continuity equation, Bernoulli's equation, streamlines, lift and drag, Reynolds number, flow separation, boundary layer, drag coefficient; airfoil nomenclature, quarter chord point NACA charts, finite wingspan, aspect ratio, drag polar, summary of drag effects; aircraft performance, required thrust and power, rate of climb, gliding, take-off and landing performance, turning; aircraft equations and stability, effects of wings and tail; astronautics, Newton's law of gravitation, polar coordinates, orbital motion, momentum and energy, types of orbits, escape velocity, Kepler's laws, earth satellites, launch window, reentry dynamics; ballooning.
***Prerequisites: 01:640:152 and 14:440:221 (or 14:440:291).***

**14:650:289** *Professional and Leadership Development in Mechanical Engineering (1)*
This course is intended to cover a variety of topics that are important and relevant to students graduating from the Department of Mechanical and Aerospace Engineering and preparing to enter the workforce. Topics are intended to provide a glimpse of various facets of the professional work environment regardless of the role or the field you enter. Each topic is intended to broaden student's knowledge of professional protocols that exists in the industry and give them real life examples, case studies, and tips that will help them succeed in choosing the right direction. Focus on "soft skills" for engineers such as effective communication, presentation and team work as well as career path, interviewing, and networking topics are discussed.

**14:650:291** *Mechanics of Materials (3)*
The course introduces principles from the mechanics and materials disciplines to train students in analyzing and solving stress and strain problems in elastic solids such as shafts and beams, combined stresses, and statically indeterminate beams. Lectures are intended to provide the students with fundamental concepts in mechanics and materials, cultivate mathematical formulation of engineering problems, and practice problem solving.
***Prerequisites: 01:640:152 and 14:440:221 (or 14:440:291).***

**14:650:298,299** *Undergraduate Research for Sophomores (BA,BA)*
This course seeks to expand student participation in research projects with mechanical and aerospace engineering faculty. It features high-quality interaction of students with faculty and access to appropriate facilities and other professional development opportunities.
***Prerequisite: Permission of department.***

**14:650:312** *Fluid Mechanics (3)*
Control volume concepts of mass, momentum, and energy transport. Hydrostatics, Euler's equations, potential flow, Navier Stokes equations, turbulence, and boundary layer theory.
***Prerequisites: 01:640:244 and 14:440:222 (or 14:440:292).***

**14:650:342** *Design of Mechanical Components (3)*
Design philosophy; stress and deflection analysis; energy methods; theories of failure; fatigue; bearings; design of such mechanical elements as springs, weldments, and gears.
***Prerequisites: 01:640:251, 14:650:291, 14:650:388, and 14:440:222.***

**14:650:350** *MAE Measurements with Lab (4)*
Theory of instrumentation, selection, calibration, use of instruments. Error analysis. Sensors, signal conditioners, data acquisition, and processing systems. Design project.
***Prerequisites: 01:640:251, 14:650:291, and 14:650:361.***

**14:650:351** *Thermodynamics (3)*
Fundamental concepts, First Law, reversibility, Second Law, entropy, properties of fluids and perfect gases, processes, cycles, general equations, and mixtures.
***Prerequisites: 01:640:244, 01:750:227, and 14:440:222.***

**14:650:361** *Introduction to Mechatronics (4)*
Emphasizes integration of analog electronics, digital electronics, sensors and transducers, actuators, and microprocessors for mechanical and aerospace systems. Lectures provide students with foundation concepts in mechatronics and practical familiarity with common elements that make up mechatronic systems. Mathematical modeling of electromechanical systems and basic PID controller design are discussed. Laboratory experiments give the students hands-on experience with components and measurement equipment used in the design of mechatronic systems.
***Prerequisites: 01:640:152 and 14:440:221.***

**14:650:388** *Computer-Aided Design in MAE (3)*
Computer-aided design (CAD) applications of analysis, synthesis, and design. Automated drafting and higher-order programming languages. Development of general-purpose functions, components, and command files. Hands-on experience on CAD stations.
***Prerequisites: 01:640:152 and 14:440:221.***

**14:650:398,399** ***Undergraduate Research for Juniors (BA,BA)***
This course seeks to expand student participation in research projects with mechanical and aerospace engineering faculty. It features high-quality interaction of students with faculty and access to appropriate facilities and other professional development opportunities.
***Prerequisite: Permission of department.***

**14:650:401** ***Dynamic Systems and Controls (3)***
Dynamic analysis of mechanical, electromechanical, thermal, hydraulic, and pneumatic feedback control systems. Fundamentals of vibrational systems, including the single- and multi-degree-of-freedom vibrations of mechanical systems.
***Prerequisites: 14:440:222 and 01:640:244.***

**14:650:431** ***Mechanical and Aerospace Engineering Laboratory I (2)***
Comprehensive experiments in fluid dynamics, acoustics, heat transfer, power systems, and dynamic mechanical and aerospace systems. Preparation of test procedure, data analysis, and presentation of results and conclusions.
***Lab. 3 hrs. Prerequisites: 14:650:291, 312, 350, and 351.***

**14:650:432** ***Mechanical Engineering Lab II (2)***
Comprehensive experiments in fluid dynamics, acoustics, heat transfer, power systems, and dynamic mechanical systems. Preparation of test procedure, data analysis, and presentation of results and conclusions.
***Lab. 3 hrs. Prerequisites: 14:650:291, 312, 350, and 351.***

**14:650:433** ***Aerospace Engineering Laboratory (2)***
Comprehensive experiments in fluid dynamics, heat transfer, acoustics, power systems, and dynamic aerospace systems. Preparation of test procedure, data analysis, and presentation of reports and conclusion.
***Lab. 3 hrs. Prerequisites: 14:650:291, 312, 350, and 351.***

**14:650:435** ***Energy Systems Lab (2)***
In this lab, the students will have hands-on experience and knowledge to start up and troubleshoot solar and wind energy systems. The students will learn basics of alternate energy systems in theory and practice, and will be able to evaluate the system's characteristics and performance. Designing, analyzing, and evaluating components will also be included in the lab.
***Lab. 3 hrs. Prerequisites: 14:650:291, 312, 350, and 351.***

**14:650:439** ***Multiphysics Simulations (3)***
Survey of the major techniques engineers use for simulating physical systems, specifically particle/molecular dynamics, finite difference time domain, and finite element method, focusing on multiphysical simulations that include multiple driving forces and phases. Case studies of active areas of research are introduced by guest lecturers to cover topics including: electrospray deposition, smart actuators, and phononics. Students will produce a final project that will be relevant to their research or design projects.
***Prerequisites: 14:650:312, 342, and 351.***

**14:650:443** ***Vibrations (3)***
Mechanical vibration, vibration isolation, and critical speeds. Balancing of rotating and reciprocating machinery.
***Prerequisites: 14:440:222, 14:650:291, and 01:640:421.***

**14:650:447** ***Probabilistic Models in Mechanical and Aerospace Systems (3)***
Probabilistic concepts and modeling in mechanical design and analysis. Reliability of mechanical systems. Introduction to turbulence modeling. Introduction to computational aspects. Design project.
***Prerequisite: 01:640:421.***

**14:650:449** ***Aerospace Materials (3)***
Particle and fiber-reinforced composites, stress-strain relations of anisotropic materials, tensor transformation, derivation of effective moduli of composites from those of the constituents, cross-ply/angle-ply laminates, symmetric/antisymmetric laminates, and engineering applications. Lightweight materials and foams description, constitutive behavior, and applications.
***Prerequisites: 14:650:291 and 01:640:244.***

**14:650:451** ***Vehicle Dynamics (3)***
Performance, handling, and ride of ground vehicles. Tires, slip and traction, braking, aerodynamic effects, and steering.
***Prerequisite: 14:440:222.***

**14:650:455** ***Design of Mechanisms (3)***
Motion analysis. Centrodes, analytical representation of plane motion, Euler-Savary equation, Bobillier's theorem. Linkages and cams. Two- and three-position syntheses, Freudenstein's method, and optimal methods. Design project.
***Prerequisite: 14:650:342.***

**14:650:457** ***Spacecraft and Mission Design (3)***
Provides an introduction and overview of spacecraft and mission design. Topics covered are mission design, spacecraft environment, astrodynamics, propulsion, atmospheric entry, attitude determination and control, configuration and structural design, thermal control, power systems, telecommunications, and reliability analysis.
***Prerequisite: 14:650:342.***

**14:650:458** ***Aerospace Structures (3)***
Load factors, stresses and deformations in thin-walled members, shear center, torsion of single-cell and multicell structures, and analysis of aircraft and spacecraft components.
***Prerequisites: 14:650:291 and 01:640:251.***

**14:650:459** ***Aerospace Propulsion (3)***
Theory of air-breathing and rocket engines. Propulsion performance parameters and mission requirements. Operation of diffusers, combustors, rockets, and jet engines. Design project.
***Prerequisites: 14:650:312 and 351.***

**14:650:460** ***Aerodynamics (3)***
Circulation and lift, Kutta-Joukowski theorem, thin airfoil theory, finite wing theory, induced drag, static and dynamic longitudinal and lateral stability and control, aircraft performance.
***Prerequisites: 14:650:312 and 351.***

**14:650:461** ***Internal Combustion Engines (3)***
Thorough analysis of reciprocating engines and gas turbines. Fuel characteristics. Pollutant formation and control. Combustion and lubrication.
***Prerequisite: 14:650:351.***

**14:650:462** ***Power Plants (3)***
Current theory and practice of cycles and design of equipment for the generation of power in central stations and industrial power plants. Design projects.
***Prerequisite: 14:650:351.***

**14:650:463** ***Compressible Fluid Dynamics (3)***
Integral form of conservation laws. One-dimensional compressible flow with friction and heat. Normal and oblique shock waves. Prandtl-Meyer expansion. Differential form of conservation laws. Unsteady wave motion. 2-D subsonic, supersonic, and hypersonic flow.
***Prerequisites: 14:650:312 and 351.***

**14:650:465** ***Orbital Mechanics (3)***
Rocket principle and performance; staging; trajectories in central force field; orbit transfer; reentry dynamics and heating.
***Prerequisites: 14:650:312 and 351.***

**14:650:467** ***Design and Manufacturing I (2)***
First semester of the senior design project to be completed in the fall semester of the final year. Group project under the direction of a faculty adviser.
***Prerequisites: 14:650:312, 342, 350, and 351.***

**14:650:468** ***Design and Manufacturing II (2)***
Second semester of the senior design project to be completed in the spring of the final year. Group project under the direction of a faculty adviser.
***Prerequisite: 14:650:467.***

**14:650:471** ***Aircraft Flight Dynamics (3)***
The goal of this course is to develop an understanding of the fundamentals of the dynamics and control of aircraft with an emphasis on conventional airplane performance and stability, both static and dynamic.
***Prerequisites: 01:640:421 and 14:440:222.***

**14:650:474** ***Alternative Energy Systems I (3)***
Critical analysis of use of wasted energy; design parameters that influence the performance of wind, geothermal, solar, fuel cell, and biomass alternative energy systems; and the challenges associated with incorporation of these systems into the United States' current infrastructure.
***Prerequisite: 14:650:351.***

**14:650:477** ***Alternative Energy Systems II (3)***
The fundamentals of energy and power, and available alternatives to power derived from consumption of fossil fuels will be covered. Course content is divided into several components: 1) fundamentals of energy and power, available resources, and historical perspectives (national and international); 2) solar energy fundamentals; 3) active

solar thermal applications; 4) passive solar energy; 5) photovoltaic systems; 6) biomass; and 7) ocean energy. Depth of course content may vary depending on student feedback and instructor discretion.
***Prerequisite: 14:650:351.***

**14:650:481** ***Heat Transfer (3)***
Theory of heat transfer by steady and transient conduction. Heat transfer by radiation. Convection of heat by fluid motion in external and internal flow. Combined heat transfer calculations.
***Prerequisites: 14:650:312, 14:650:351, and 01:640:421.***

**14:650:485** ***Computing Environment (3)***
Course topics include introduction to Linux operating system management and practical exercises with applications. Topic examples: system installation and configuration, shell scripting, networking, file sharing via NFS and SAMBA, centralized authentication with LDAP, virtualization, security, computational Linux clusters.
***Prerequisites: 14:440:127 and 14:650:342.***

**14:650:487** ***Aerospace Engineering Design I (2)***
First semester of senior design project to be completed in fall of the final year. Group project under the direction of a faculty adviser.
***Prerequisites: 14:650:210, 312, 342, 350, and 351.***

**14:650:488** ***Aerospace Engineering Design II (2)***
Second semester senior design project to be completed in spring of the final year. Group project under the direction of a faculty adviser.
***Prerequisite: 14:650:487.***

**14:650:495** ***Internship in Mechanical and Aerospace Engineering (3)***
Provides students with the opportunity to practice and/or apply knowledge and skills in various industrial settings in mechanical, aerospace, or related engineering fields. Credits earned for the educational benefits of the experience and granted only for a continuous, three-month, full-time assignment.
***Prerequisites: Permission of department; open to mechanical and aerospace engineering students only. Graded pass/no credit.***

**14:650:496** ***Co-op Internship in Mechanical and Aerospace Engineering (3)***
Provides students with the opportunity to practice and/or apply knowledge and skills in various industrial settings in mechanical, aerospace, or related engineering fields. Credits earned for the educational benefits of the experience and granted only for a continuous, six-month, full-time assignment.
***Prerequisite: Permission of department. Graded pass/no credit.***

**14:650:497** ***Co-op Internship in Mechanical and Aerospace Engineering (3)***
Provides students with the opportunity to practice and/or apply knowledge and skills in various industrial settings in mechanical, aerospace, or related engineering fields. Credits earned for the educational benefits of the experience and granted only for a continuous, six-month, full-time assignment.
***Prerequisite: Permission of department. Graded pass/no credit.***

**14:650:498,499** ***Undergraduate Research for Seniors (BA,BA)***
This course seeks to expand student participation in research projects with mechanical and aerospace engineering faculty. It features high-quality interaction of students with faculty and access to appropriate facilities and other professional development opportunities.

# General Information (EJB-U)

## GENERAL INFORMATION

General Information (EJB-U)

## History and Purpose of the School

## HISTORY AND PURPOSE OF THE SCHOOL

The mission of the Bloustein School is to create just, socially inclusive, environmentally sustainable, and healthy local, national, and global communities.

At the Bloustein School, the disciplines and professions of urban planning, public policy, public health, health administration, and public informatics are strongly situated in an educational context that stresses social science education and public service.

The school's research and scholarship touch on a wide array of issues that affect public welfare including designing healthy communities, better understanding the social determinants of health, researching ways to effectively and economically combat and adapt to climate change, and much more.

Our students are being trained to think about what can be done to make society better.

Edward J. Bloustein--Rutgers president, constitutional scholar, active citizen, philosopher, and teacher--lived a life of civic engagement that the school's ethic seeks to perpetuate. The Bloustein ethic strives to improve the quality of public discourse by producing ideas and measures that have impact, engaging those who do their jobs not just honorably, but with a passion for their work that alters their surroundings. The Bloustein School seeks to foster new research and thinking that achieve both scholarly recognition and public acceptance.

For more information about the school, visit here.

General Information (EJB-U)

## Admission

## ADMISSION

The Bloustein School welcomes current Rutgers-New Brunswick students as well as prospective students to consider our major and minor programs of study. We offer five undergraduate majors and nine minors.

Students seeking the planning and public policy, urban planning and design, public policy, public health, or health administration major must apply for admission to the Bloustein School.

Students declare their minor with their matriculating school. They need not apply for minor status with the Bloustein School.

Students already enrolled in the School of Arts and Sciences (SAS) or the School of Environmental and Biological Sciences (SEBS) at Rutgers University-New Brunswick should obtain information about Bloustein School admission and an application from the school's website, here.

Transfer students admitted to Rutgers by the Bloustein School of Planning and Public Policy should attend a Students in Transition Advising and Registration (STAR) session before the start of classes in order to learn more about their academic program and schedule their courses for their first semester at Rutgers. **Please visit here to learn more.**

Students who:

- successfully meet all of the eligibility requirements (see the Programs of Study section),
- who have completed their area distribution requirements for English and mathematics,
- who hold at least a 2.5 cumulative grade-point average, and
- who have achieved grades of C or better in each of the prerequisite courses for the respective majors

are encouraged to apply for direct admission to the Bloustein School. Acceptance of applications and decisions about admission are made on a cyclical basis.

Students applying to a Bloustein School major who are interested in applied research and who hold a cumulative grade-point average of 3.4 or better are encouraged to apply to the Bloustein Honors Research Program.

Questions about any of the programs, majors, minors, or certificates offered can be directed to the Bloustein School's Office of Student and Academic Services by emailing undergrad@ejb.rutgers.edu. Undergraduate advisers answer all emails.

**Note: Given that there are several different options available in admissions, please see the program's homepage to determine which path is yours.*

# Programs of Study (EJB-U)

## PROGRAMS OF STUDY

The Edward J. Bloustein School of Planning and Public Policy offers five major programs of study and nine minors:

- Planning and Public Policy major (762, 762D) -- Bachelor of arts (B.A.) degree
- Health Administration major (501, 501D) -- Bachelor of Science (B.S.) degree
- Public Health major (832, 832D) -- Bachelor of Science (B.S.) degree
- Public Policy major (833, 833D) -- Bachelor of Science (B.S.) degree
- Urban Planning and Design major (971, 971D) -- Bachelor of Science (B.S.) degree
- Minors in:
    - Planning and Public Policy
    - Health Administration

- Public Health
- Public Policy
- Urban Planning & Design
- Public Administration & Management
- Urban Studies
- Medical Ethics & Health Policy
- Disability Studies

All of the majors are available to students who directly transfer into the Bloustein School, as well as to students in the School of Arts and Sciences. Students in the School of Environmental and Biological Sciences are eligible to pursue the public health major.

- Bloustein School direct-admit students are permitted to double major or major/minor across programs except as noted below.
- Students in SAS are allowed to declare a Bloustein School major/minor combination except as noted below.
- Students in SEBS are allowed to declare the Public Health major with a Bloustein School minor.
- Students in a Rutgers-New Brunswick professional school need permission from their dean's office to declare more than one Bloustein School program.
- Students in the Ernest Mario School of Pharmacy may not declare a Bloustein School major.

**Restrictions of major and minor combinations:**

- Planning and Public Policy majors may NOT declare the Urban Studies (975), Public Policy (833), and Urban Planning and Design (971) minors. Also, PPP majors may NOT double major in Public Policy or Urban Planning and Design.
- Public Policy majors may NOT declare the Planning and Public Policy major or minor programs.
- Urban Planning and Design majors may NOT declare the Planning and Public Policy major or minor or the Urban Studies minor.

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Exceptional, well-prepared students who are admitted to the Bloustein School may be invited by the faculty to pursue dual-degree programs in the following areas:

- B.A. or B.S./M.P.H. for public health
- B.A. or B.S./ M.P.P. for public policy
- B.A. or B.S./M.C.R.P. for city and regional planning

- Health Administration Major (501, 501D) and Minor
- Planning and Public Policy Major (762, 762D) and Minor
- Public Health Major (832, 832D) and Minor
- Public Policy Major (833, 833D) and Minor
- Urban Planning and Design Major (971, 971D) and Minor
- Disability Studies (304) Minor
- Medical Ethics and Health Policy Minor
- Public Administration and Management Minor
- Urban Studies Minor

# Health Administration Major (501, 501D) and Minor (EJB-U)

## HEALTH ADMINISTRATION MAJOR (501, 501D) AND MINOR

This program is designed to accommodate the needs of traditional, nontraditional, and transfer students.

The health administration (501, 501D) major prepares students for entry-level positions leading to an administrative career path in the healthcare sector. Students learn to address administrative and managerial problems in health systems, hospitals, ambulatory care facilities, long-term care facilities, and other healthcare delivery settings. Students learn about the financial, quality, and patient satisfaction issues in healthcare today as well as the policies, laws, and regulations regarding institutional management and human resources. They also learn about the ethical context in which administrative decisions are made in the healthcare field.

Upon completing all degree requirements, the student will receive the bachelor of science (B.S.) degree.

### Rutgers School of Arts and Sciences and School of Environmental and Biological Sciences Students

This program is designed to accommodate the needs of traditional students at Rutgers University-New Brunswick.

Students in the School of Arts and Sciences (SAS) and students in the School of Environmental and Biological Sciences (SEBS) who wish to remain in their primary unit must apply for admission prior to declaring the major.
SAS students may pursue Health Administration as their first major and remain within SAS. SEBS students may pursue Health Administration as a second major to remain within SEBS.

Students are advised to declare the Health Administration major no later than their first semester of junior year to ensure completion of the major by their anticipated graduation date. Applicants must have achieved a minimum grade of 'C' or better in each of the prerequisite courses and obtained at least a 2.00 cumulative grade point average.

Students can apply for the Health Administration major during one of our application cycles listed here. The application may be found on the school's website.

Only courses with 'C' or better may be counted towards the health administration major, and students must complete the core curriculum requirements of their primary school.

Health Administration is a credit-intensive major so the minor requirement is waived. However, students are encouraged to complete a minor, even though they are not required to do so.

## Transfer Students

This program is designed to accommodate the needs of transfer, adult, and nontraditional students.

Students seeking the Health Administration major must have at least 30 credits before applying to the Bloustein School. Successful applicants will have completed the prerequisite courses with a grade of 'C' or better, and have achieved an overall GPA of at least 2.5.

Current Rutgers students seeking a school-to-school transfer from another Rutgers unit, or students transferring to Rutgers from another college or university, must apply via the Rutgers Office of Undergraduate Admissions. Contact ugadmissions@ejb.rutgers.edu for more information.

Transfer students from New Jersey community colleges are encouraged to complete lower-division prerequisite courses and the associate's degree to benefit from the NJ Statewide Transfer Agreement.

Only courses with a 'C' or better may be counted towards the major.

For more information about transferring, please see the school's website.

## HEALTH ADMINISTRATION MAJOR REQUIREMENTS (501, 501D)

(51 credits)

*Prerequisite Courses (6-7credits)*

- 355:101 Expository Writing (3) or equivalent
- 775:205 Basic Statistical Methods (4) or 200-level of higher equivalent (3-4) (see approved equivalent statistics courses in Degree Navigator)

***Recommended Lower-Division Core Courses (3 credits)***
It is recommended students complete Intro to Financial Accounting or equivalent at the community college or four-year college/university from which they are transferring. The course is not required for admission to the program. Completion of accounting prior to admission will provide transfer students more flexibility in scheduling once at the Bloustein School.

*Major Requirements (501, 501D) (51 credits)*

- 10:501:203 Introduction to Health Administration (3)
- 10:501:207 Accounting for Supervisors/Managers *(open to declared 501 majors and 843 minors only)*
  **or** Intro to Financial Accounting (33:010:272) (3)
- 10:501:260 Health Care Systems (3)
- One of the following:
  - 10:775:300 Writing for Professionals (3)
  - 01:355:302 Scientific and Technical Writing (3)

    - 01:355:303 Writing for Business and the Professions (3)
- 01:355:315 Writing Grant Proposals (3)
- One of the following:
    - 10:501:310 Administrative Issues for Health Care Managers (3) *Prerequisite 10:501:260*
    - 10:501:420 Human Resource Management in Health Administration (3)
- 10:501:332 Health Care Economics (3) - *Prerequisites: 10:501:203, 207*
- 10:501:333 Financial Aspects of Health Administration (3) *Prerequisites: 10:501:203, 207*
- 10:501:335 Population Health (3) - *Prerequisite: 10:501:203*
- 10:501:354 Marketing for Health Care Organizations (3) - *Prerequisites: 10:501:203, 207*
- 10:501:356 Health Care Ethics and Law (3) - *Prerequisite: 10:501:203*
- 10:501:363 Health Systems Operations (3) - *Prerequisites: 10:501:203, 207, 260*
- 10:501:395 Data Management for Healthcare (3) - *Open to majors only; 10:775:205* ***or*** *equivalent*
- 10:501:410 Information Systems for Health Care (3) - *Prerequisites: 10:501:203, 333*
- 10:501:425 Financial Management (3) - *Prerequisite 10:501:333*
- 10:775:450 Leadership Seminar (3) - *Prerequisites: Open to majors only; min. 85 credits; Pre- or Corequisite Data Management for Healthcare 10:501:395*
- 10:775:499 Professional Practice Internship (6) - *Open to majors only; Prerequisites: 10:775:300* ***or*** *01:355:303, 10:501:395, 10:775:450* ***and*** *min. 100 credits*

## Health Administration Minor (18 credits)

The Bloustein School welcomes current and prospective Rutgers-New Brunswick students to consider the Health Administration minor. Students should declare a minor with their matriculating school. They need not apply for minor status with the Bloustein School. Only courses with a grade of 'C' or better can be counted toward the minor program of study.

The Health Administration minor is well-matched to majors in business; economics; human resource management; information technology & informatics; labor studies & employment relations; nursing; psychology; public health; social work; as well as clinical health tracks such as pre-medicine/dental.

Students seeking the Health Administration minor must complete three core courses and three 300-level or higher 501 course code electives, excluding 775:395, 775:450 and 775:499, which are open to majors only.

Information about the Health Administration minor at the Bloustein School may be found here.

- 10:501:203 Introduction to Health Administration (3)
- 10:501:207 Accounting for Supervisors & Managers (3)
  **or** 33:010:272 Intro to Financial Accounting (3)
- 10:501:260 Health Care Systems (3)
- Three upper-level electives with course code 501 (9)

*Prerequisite Courses (6-7 cr)*

- 01:355:101 Expository Writing (3) or equivalent
- 10:775:205 Basic Statistical Methods (4) or 200-level of higher equivalent (3-4)

# Planning and Public Policy Major (762, 762D) and Minor (EJB-U)

## PLANNING AND PUBLIC POLICY MAJOR (762, 762D) AND MINOR

### Planning and Public Policy Major (37 credits)

The Planning and Public Policy major (762, 762D) provides students with a foundation in areas such as city dynamics, environmental aspects of cities, community health, urban poverty, public policy, housing issues, social concerns, fiscal matters, and land use planning. Students are prepared for entry-level professional management and planning positions focused on overseeing and improving public programs, such as transportation, housing, planning, the environment, finance, economic development, and urban renewal. These career paths can be found in business, government, education, banking, and nonprofit settings. This program also prepares students for graduate education in public administration, public policy, and urban planning.

Upon completing all degree requirements, the student will receive the bachelor of arts (B.A.) degree.

### Rutgers School of Arts and Sciences and School of Environmental and Biological Sciences Students

This program is designed to accommodate the needs of traditional students at Rutgers University-New Brunswick.

Students in the School of Arts and Sciences (SAS) and students in the School of Environmental and Biological Sciences (SEBS) who wish to remain in their primary unit must apply for admission prior to declaring the major.

SAS students may pursue Planning and Public Policy as their first major and remain within SAS. SEBS students may pursue Planning and Public Policy as a second major to remain within SEBS.

Students can apply for the Planning and Public Policy major during one of our application cycles listed here. Applicants must have a minimum grade of 'C' or better in each of the prerequisite courses and be in good academic standing. The application may be found on the school's website.

Students are advised to declare the Planning and Public Policy major no later than their first semester of junior year to ensure completion of the major by their anticipated graduation date. **A minor program is required for this major.**

Only courses with a 'C' or better may be counted towards the major, and students must complete the core curriculum requirements of their primary school.

The most current information for the Planning and Public Policy major may be found on the Bloustein School website here.

## Transfer Students

This program is designed to accommodate the needs of transfer, adult, and nontraditional students.

Students seeking the Planning and Public Policy major must have at least 30 credits before applying to the Bloustein School. Successful applicants will have completed the prerequisite courses with a grade of 'C' or better, and have achieved an overall GPA of at least 2.5.

Current Rutgers students seeking a school-to-school transfer from another Rutgers unit, or students transferring to Rutgers from another college or university, must apply via the Rutgers Office of Undergraduate Admissions. Contact ugadmissions@ejb.rutgers.edu for more information.

Transfer students from New Jersey community colleges are encouraged to complete lower-division prerequisite courses and the associate's degree to benefit from the NJ Statewide Transfer Agreement.

Only courses with a 'C' or better may be counted towards the major. **A minor program is required for this major.**

For more information about transferring, please see the school's website.

## PLANNING AND PUBLIC POLICY MAJOR REQUIREMENTS (762, 762D)

(37 credits)

*Prerequisite Courses (9-10 credits)*

- 01:355:101 College Writing (3)
- 10:775:205 Basic Statistical Methods (4) or equivalent (3-4)
- 01:220:102 Introduction to Microeconomics (3)

*Major Requirements (762, 762D) (37 credits)*
*Core Courses (16 credits)*

- One of the following (3):
    - 01:220:103 Introduction to Macroeconomics (3)
    - 01:790:104 American Government (3)
    - 10:833:210 Principles of Public Policy (3)
    - 10:971:201 Intro to Urban Planning and Design (3)

- One of the following intensive writing courses (3):
    - 10:775:300 Writing for Professionals (3)
    - 01:355:302 Scientific and Technical Writing (3)
    - 01:355:303 Writing for Business and the Professions (3)
    - 01:355:315 Writing Grant Proposals (3)
- 10:775:395 Research Methods (4) *Open to majors only*
- 10:762:400 Internship with Seminar* (3) *Open to majors only*
- 10:762:499 Senior Seminar* (3) Open to majors only with at least 100 credits **and** no outstanding core requirements

** Students qualifying for departmental honors may replace 10:762:400 and 10:762:499 with 10:762:497, 498 Bloustein Honors Research.*

***Required Electives (21 credits)***

- 21 credits of electives from Bloustein School undergraduate courses, 15 credits of which must be at the 300-level or higher

Students interested in specific career paths should consider clustering their electives and seek advising early in their program of study.

## Joint BA/MCRP or BS/MCRP Program

Exceptional, well-prepared students from any Rutgers University-New Brunswick matriculating unit with a GPA of 3.5 or higher, exceptional GRE scores, a dedication to public service and outstanding recommendations who wish to study urban planning are encouraged to seek advising about the 3-1-1 master of city and regional planning (M.C.R.P.) program. Contact ugadmissions@ejb.rutgers.edu for more information.

## Planning and Public Policy Minor (18 credits)

The Bloustein School welcomes current and prospective Rutgers-New Brunswick students to consider the Planning and Public Policy minor. Students should declare a minor with their matriculating school. They need not apply for minor status with the Bloustein School. Only courses with a grade of 'C' or better can be counted toward the minor program of study.

This minor is well-matched to majors in economics; labor studies & employment relations; political science; geography; sociology; urban planning and design; as well as the pre-law track.

Students seeking the Planning and Public Policy minor must complete three core courses and five elective courses in course code 762, excluding those designated for 'majors only'.

- 10:775:101 Introduction to Planning, Policy and Health (3)

- Five electives selected from all the undergraduate Bloustein courses that are open to non-majors. At least four of the five must be 300 or 400-level.

For the most current configuration of courses for the Planning and Public Policy minor, please see the school's website here.

## Planning and Public Policy Certificate Programs

The Bloustein School currently offers four Planning and Public Policy certificates open to all Rutgers-New Brunswick undergraduates. Certificate programs are open to students in any major and are awarded with, or subsequent to, a bachelor's degree. Only courses with a C or better may be applied toward a certificate program.

*Certificates do not qualify as a minor.* **Students must declare their intention to pursue a certificate program with the Bloustein School before their last semester of study in order to qualify to receive a certificate.** Awarded certificates appear on the student's final transcript.

For the most current configuration of courses for each certificate, please see the school's website here.

- Community Development Certificate (24 credits)
- Community Sustainability Certificate (18 credits)
- Urban Planning Certificate (24 credits)
- Historic Preservation Certificate (15 credits)

# Public Health Major (832, 832D) and Minor (EJB-U)

# PUBLIC HEALTH MAJOR (832, 832D) AND MINOR

## Public Health Major (46 credits)

The major in Public Health (832, 832D) prepares students for entry-level careers in population health and disease prevention. Public health professionals work in a wide range of services including infectious disease control; health problems of children, older adults, and the medically underserved; chronic disease management; health monitoring and surveillance; environmental/occupational health and safety; and emergency preparedness. Our students learn about the upstream factors that influence community health, particularly poverty, housing, work and unemployment, social exclusion, food security, transportation, access to health and social services, and evidence-based, data-driven decision-making.

Upon completing all degree requirements, the student will receive the bachelor of science (B.S.) degree.

## Rutgers School of Arts and Sciences or School of Environmental and Biological Sciences Students

This program is designed to accommodate the needs of traditional students at Rutgers University-New Brunswick.

Students in the School of Arts and Sciences (SAS) or the School of Environmental and Biological Sciences (SEBS) who wish to pursue the public health major must apply for admission to the major.

To ensure degree completion by their anticipated graduation date, students are advised to declare the public health major no later than the first semester of their junior year. Applicants must have achieved a minimum grade of C or better in each of the prerequisite courses, and obtain at least a 2.0 cumulative grade point average.

Students can apply for the Public Health major during one of our application cycles listed here. The application may be found on the school's website here.

Only courses with 'C' or better may be counted towards the public health major, and students must complete the core curriculum requirements of their primary school.

Public Health is a credit-intensive major so the minor requirement is waived. However, students are encouraged to complete a minor, even though they are not required to do so.

The most current information for the Public Health major may be found on the Bloustein School website.

## Transfer Students

This program is designed to accommodate the needs of transfer, adult, and nontraditional students.

Students seeking the Public Health major must have at least 30 credits before applying to the Bloustein School. Successful applicants will have completed the prerequisite courses with a grade of 'C' or better, and have achieved an overall GPA of at least 2.5.

Current Rutgers students seeking a school-to-school transfer from another Rutgers unit, or students transferring to Rutgers from another college or university, must apply via the Rutgers Office of Undergraduate Admissions. Contact ugadmissions@ejb.rutgers.edu for more information.

Transfer students from New Jersey community colleges are encouraged to complete lower-division prerequisite courses and the associate's degree to benefit from the NJ Statewide Transfer Agreement.

For more information about transferring, please see the school's website here.

## PUBLIC HEALTH MAJOR REQUIREMENTS (832, 832D)

(46 credits)

For the most current competencies required to earn the Bachelor of Science in Public Health, please see the school's website here.

*Prerequisite Courses (12-15 credits)*

- 355:101 Expository Writing (3) or equivalent
- 775:205 Basic Statistical Methods (4) or equivalent (3-4)
- One human biology course (3-4)*
- One chemistry course (3)
    - 160:127 Impact of Chemistry (3)
    - 160:128 Chemistry of Life (3)
    - 160:161 or General Chemistry Ior II

***Major Requirements (832, 832D) (46 credits)***

*Core Courses (31 credits)*

- 10:832:201 Principles of Public Health (3)
- 10:832:212 Introduction to Health Disparities (3) *Open to majors only*
- 10:832:240 Global Health Perspectives (3)
- One of the following intensive writing courses (3):
    - 10:775:300 Writing for Professionals (3)
    - 10:832:339 Public Health Literature (3) *Prerequisites 10:832:201 and¿ 01:355:101*
    - 01:335:302 Scientific and Technical Writing (3)
    - 01:335:315 Writing Grant Proposals (3)
    - 01:355:303 Writing for Business and the Professions (3)
- 10:832:335 Epidemiology (3) *Prerequisites: Statistics or Pre-calculus and 10:832:201*
- 10:832:356 Public Health Law and Ethics (3)
- 10:775:395 Research Methods (4) *Prerequisites 775:205 or equivalent statistics. Open to majors only*
- 10:775:450 Leadership Seminar (3) *Pre-or Co-requisite 10:775:395. Open to majors only. Minimum 85 credit.*
- *10:775:499 Professional Practice Internship (6) *Prerequisites 10:775:395, 10:775:450,* ***and*** *100 credits. Open to majors only.*

**Students seeking to replace 775:499 with 832:497, 498 Bloustein Honors Research (3, 3) should contact their advisor.*

*Required Electives (15 credits)*

- 15 credits of 832 electives, 9 credits of which must be at the 300 level or higher; can apply up to 6 credits from other Bloustein undergraduate disciplines

Students interested in select career paths should consider clustering their electives, pursuing a certificate, and seek advising early in their program of study.

## Joint BA/MPH or BS/MPH Program

Exceptional, well-prepared students from any major with at least 60 credits and a GPA of 3.2, and who wish to pursue graduate studies at the Rutgers School of Public Health are encouraged to seek advising about the Accelerated BA/MPH or BS/MPH program. Contact ugadmissions@ejb.rutgers.edu for more information.

## Public Health Minor (24 credits)

The Bloustein School welcomes current and prospective Rutgers-New Brunswick students to consider the Public Health minor. Students should declare a minor with their matriculating school. They need not apply for minor status with the Bloustein School. Only courses with a grade of 'C' or better can be counted toward the minor program of study.

The Public Health minor is well-matched to majors in environmental policy, institutions and behavior; exercise science; food science; health administration; biological sciences; kinesiology and health; nursing; nutrition; psychology; social work; as well as clinical health tracks such as pre-medicine/dental.

Students seeking the Public Health minor complete three core courses and five elective courses in 832, three of which must be at the 300-level or higher, excluding those designated for 'majors only'.

- 832:201 Principles of Public Health (3)
- 832:212 Introduction to Health Disparities (3)
  **or** 832:240 Global Health Perspectives (3)
- 832:335 Epidemiology (3)
- Required Elective Courses  15 credits of 832 electives, 9 credits of which must be at the 300 level or higher; can apply up to 6 credits from other Bloustein undergraduate disciplines

For the most current configuration of courses for the Public Health minor, please see the school's website here.

## Public Health Certificate Programs

The Bloustein School offers several Public Health certificates open to all Rutgers-New Brunswick undergraduates. Certificate programs are open to students in any major and are awarded with, or subsequent to, a bachelor's degree. *Certificates do not qualify as a minor.* **Students must declare their intention to pursue a certificate program with the Bloustein School before their last semester of study in order to qualify to receive a certificate.** Awarded certificates appear on the student's final transcript.

- Cancer Surveillance and Epidemiology Certificate (18 credits)
- Global Health and Health Policy Certificate (18 credits)
- Health Disparities Certificate (18 credits)

- Health Policy Certificate (18 credits)
- Public Health Education and Advocacy Certificate (18 credits)
- Public Health Preparedness Certificate (18 credits)

For the most current configuration of courses for each certificate, please see the school's website here.

# Public Policy Major (833, 833D) and Minor (EJB-U)

## PUBLIC POLICY MAJOR (833, 833D) AND MINOR

### Public Policy Major (53 credits)

The public policy major prepares students for jobs in government, politics, and public affairs within public, nonprofit, or for-profit sectors or for graduate education in law, public administration, public affairs, and public policy.

The major introduces students to the use of analytical techniques to better understand public problems and evaluate alternative solutions to those problems. Examples include income inequality, health care reform, climate change, and immigration policy.

Upon completing all degree requirements, the student will receive the bachelor of science (B.S.) degree.

### Rutgers School of Arts and Sciences and School of Environmental and Biological Sciences Students

This program is designed to accommodate the needs of traditional students at Rutgers University-New Brunswick.

Students in the School of Arts and Sciences (SAS) and students in the School of Environmental and Biological Sciences (SEBS) who wish to remain in their primary unit must apply for admission prior to declaring the major.

SAS students may pursue Public Policy as their first major and remain within SAS. SEBS students may pursue Public Policy as a second major to remain within SEBS.

Students are advised to declare the Public Policy major no later than their first semester of junior year to ensure completion of the major by their anticipated graduation date. Applicants must have a minimum grade of 'C' or better in each of the prerequisite courses and be in good academic standing.

Students can apply for the Public Policy major during one of our application cycles listed here. The application may be found on the school's website here.

Only courses with a 'C' or better may be counted towards the major, and students must complete the core curriculum requirements of their primary school.

The most current information for the Public Policy major may be found on the Bloustein School website.

## Transfer Students

This program is designed to accommodate the needs of transfer, adult, and nontraditional students.

Students seeking the Public Policy major must have at least 30 credits before applying to the Bloustein School. Successful applicants will have completed the prerequisite courses with a grade of 'C' or better, and have achieved an overall GPA of at least 2.5.

Current Rutgers students seeking a school-to-school transfer from another Rutgers unit, or students transferring to Rutgers from another college or university, must apply via the Rutgers Office of Undergraduate Admissions. Contact ugadmissions@ejb.rutgers.edu for more information.

Transfer students from New Jersey community colleges are encouraged to complete lower-division prerequisite courses and the associate's degree to benefit from the NJ Statewide Transfer Agreement.

Only courses with a 'C' or better may be counted towards the major.

For more information about transferring, please see the school's website here.

## PUBLIC POLICY MAJOR REQUIREMENTS (833, 833D)

(53 credits)

**Effective Spring 2024**

The Public Policy major and minor were updated during the spring 2023 term. **The curriculum below is effective as of spring 2024**. Students who declared at the end of spring 2024 and onward will follow the new requirements. Students who completed the previous prerequisites (American Government, microeconomics, and statistics) may count those courses towards the major electives.

*Prerequisite Courses (3 credits)*

- 01:355:101 Expository Writing (3) or equivalent

*Major Requirements (833, 833D) (53 credits)*

*Core Courses (29 credits)*

- 10:775:205 Basic Statistics or equivalent (3-4)
- 10:833:210 Principles of Public Policy (3)
- 10:833:215 Writing, Reasoning and Public Policy (3)
- 10:833:220 Public Economic Policy (3)
- One of the following (3):
    - 10:843:360 Managing Public Sector Organizations (3)

    - 10:833:361 Managing People and Organizations (3)
    - 10:833:362 Non-Profit Management (3)
- 10:775:395 Research Methods (4) *Prerequisite: 10:775:205 or equivalent statistics. Open to majors only.*
- 10:775:450 Leadership Seminar (3) *Pre or Corequisite 10:775:395 Research Methods. Open to majors only; min. 85 credits.*
- 10:775:499 Professional Practice Internship* (6) *Prerequisites: 10:775:395 Research Methods and 10:775:450 Leadership Seminar; open to majors only*

**Students with a minimum 3.4 cumulative GPA may replace 10:775:499 with 10:833:495, 496 Public Policy Honors Thesis I and II (3, 3). Students seeking to replace 10:775:499 with Bloustein Honors Research (3, 3) should contact their advisor.*

*Electives (24 credits)*

- At least 12 credits (4 electives) must be in 833. Up to two courses (6 credits) may be taken from other Bloustein School departments. Up to two courses (6 credits) may be taken outside the Bloustein School.

## Public Policy Minor (18 credits)

The Bloustein School welcomes current and prospective Rutgers-New Brunswick students to consider the Public Policy minor. Students should declare a minor with their matriculating school. They need not apply for minor status with the Bloustein School. Only courses with a grade of 'C' or better can be counted toward the minor program of study.

This minor is well-matched to majors in criminal justice; economics; labor studies & employment relations; political science; sociology; women's & gender studies; as well as the pre-law track.

Students seeking the public policy minor must complete one core course and five elective courses.

*Effective Summer 2023*

- 10:833:102 Introduction to Public Policy (3)
  **or** 10:833:210 Principles of Public Policy (3)
- Five electives selected from all the undergraduate Bloustein courses that are open to non-majors. At least four of the five must be 300 or 400-level.

For the most current configuration of courses for the Public Policy minor, please see the school's website here.

# Urban Planning and Design Major (971, 971D) and Minor (EJB-U)

## URBAN PLANNING AND DESIGN MAJOR (971, 971D) AND MINOR

### Urban Planning and Design Major (51 credits)

The major in Urban Planning and Design (971, 971D) combines the processes of urban design and urban planning to provide students with a sharper focus on city design, community development, GIS and graphic communication, as well as planning practice.

It prepares students for entry-level positions in the planning sector and graduate studies in city and regional planning. Students learn graphic communications, video software, geographic information systems, and web communication. They help design, promote, and administer plans to address issues involving land use, zoning, transportation, infrastructure, housing, community facilities, and more. Studios allow students to conduct field and observational studies and surveys, and analyze data that evaluate community demands for land uses and services.

Upon completing all degree requirements, the student will receive the bachelor of science (B.S.) degree.

### Rutgers School of Arts and Sciences and School of Environmental and Biological Sciences Students

This program is designed to accommodate the needs of traditional students at Rutgers University-New Brunswick.

Students in the School of Arts and Sciences (SAS) must apply for admission prior to declaring the major. SAS students may pursue UPD as their first major and remain within SAS. Students in the School of Environmental and Biological Sciences (SEBS) wishing to declare Urban Planning & Design (UPD) as their second major should contact the Bloustein School's Office of Student and Academic Services at ugadmissions@ejb.rutgers.edu.

To ensure degree completion by their anticipated graduation date, students are advised to declare the UPD major no later than the first semester of their junior year. **However, students must start planning their scheduled set of courses with a Bloustein advisor during the first semester of sophomore year.**

Students can apply for the UPD major during one of our application cycles listed here. Applicants must have a minimum grade of 'C' or better in each of the prerequisite courses and be in good academic standing. The application may be found on the school's website.

The UPD major is *sequence-dependent*. To prepare students for two capstone design studios during their final undergraduate year, the curriculum builds knowledge and skills in urban planning and design over the preceding two semesters. The required sequence of courses is listed below. Please note that the capstone courses, Planning

and Design Studio I and II are only offered consecutively in the fall and spring semester. **Because all required courses are sequenced, it is important that a student develop an academic plan with their Bloustein advisor when they declare the UPD major.**

As a credit intensive major, UPD does not require declared students to complete a minor. However, students may benefit from completing a minor and this option should be discussed with the Bloustein School advisor while developing their academic plan. In addition, if choosing a minor, students are encouraged to meet with the UPD Program Coordinator for career advice.

Only courses with 'C' or better may be counted towards the health administration major, and students must complete the core curriculum requirements of their primary school.

The most current information for the Planning and Public Policy major may be found on the Bloustein School website here.

## Transfer Students

This program is designed to accommodate the needs of transfer, adult, and nontraditional students.

Students seeking the Urban Planning and Design major must have at least 30 credits before applying to the Bloustein School. Successful applicants will have completed the prerequisite courses with a grade of 'C' or better, and have achieved an overall GPA of at least 2.5.

Current Rutgers students seeking a school-to-school transfer from another Rutgers unit, or students transferring to Rutgers from another college or university, must apply via the Rutgers Office of Undergraduate Admissions. Contact ugadmissions@ejb.rutgers.edu for more information.

Transfer students from New Jersey community colleges are encouraged to complete lower-division prerequisite courses and the associate's degree to benefit from the NJ Statewide Transfer Agreement.

Only courses with a 'C' or better may be counted towards the major.

For more information about transferring, please see the school's website.

## URBAN PLANNING AND DESIGN MAJOR REQUIREMENTS

(51 credits)

*Effective Spring 2024*

*Prerequisite Courses (3 credits)*

- 01:355:101 College Writing (3) or equivalent

*Major Requirements (971, 971D) (51 credits)*

*Core Courses (36 credits)*

- 10:775:205 Basic Statistical Methods or equivalent (3-4)
- 10:971:201 Introduction to Urban Planning and Design (3)
  **or** Environmental Design Analysis (3)
- 10:971:202 Designing Healthy Cities (3)
- 10:971:250 Introduction to GIS (3)
- 10:971:314 Graphic Communication for Planning (3)
- 10:971:315 Fundamentals of Urban Planning & Design (3)
- 10:971:316 Introduction to Site Planning and Urban Design (3)
- 10:971:318 History and Theory of Urban Planning & Design (3)
- 10:971:395 Methods of Planning Analysis (3)
- 10:971:403 Advanced Graphic Communication (3)
- 10:971:404 Planning and Design Studio I (3)
- 10:971:405 Planning and Design Studio II (3)
- 10:971:463 Environmental Law and Policy (3)

*Required Electives (15 credits)*

- Five, 3-credit courses see approved list in Degree Navigator.

## Joint BA/MCRP or BS/MCRP Program

Exceptional, well-prepared students from any Rutgers University-New Brunswick matriculating unit with a GPA of 3.5 or higher, exceptional GRE scores, a dedication to public service and outstanding recommendations who wish to study urban planning are encouraged to seek advising about the 3-1-1 master of city and regional planning (M.C.R.P.) program. Contact ugadmissions@ejb.rutgers.edu for more information.

## Urban Planning & Design Minor (18 credits)

The Bloustein School welcomes current and prospective Rutgers-New Brunswick students to consider the Planning and Public Policy minor. Students should declare a minor with their matriculating school. They need not apply for minor status with the Bloustein School. Only courses with a grade of 'C' or better can be counted toward the minor program of study.

This minor is well-matched to majors in art history; civil engineering; environmental science; public health; geography; landscape architecture; sociology; and more.

Students seeking the urban planning and design minor must complete three core courses and three 300-level or higher 971 electives, excluding those designated for 'majors only'.

- 10:971:201 Introduction to Urban Planning and Design (3)

- 10:971:202 Designing Healthy Cities (3)
- 10:971:314 Graphic communication for Planners (3)
- 10:971:315 Fundamentals of Urban Planning and Design (3)
- Three upper-level 971 (or substituted upper-level 762) electives, as above (9)

For the most current configuration of courses for the Urban Planning and Design minor, please see the school's website here.

# Disability Studies (304) Minor (EJB-U)

## DISABILITY STUDIES (304) MINOR

The 18-credit Disability Studies (652) minor examines the meaning, nature, and consequences of disability as a social, cultural, and political construct. It provides students the opportunity to challenge normative ableist paradigms that reinforce rigid ideas about the body and personhood for people with disabilities.

This minor is well-matched to majors in public health, public policy, urban planning and design, planning and public policy, kinesiology and health, labor and employment relations, visual and performing arts, health administration, sociology, psychology, and more.

Students seeking the Disability Studies minor must complete three core courses and three electives from an approved list.

- 37:575:265 Introduction to Disability Studies (3)
- 10:833:353 Disability Policy & Law (3)
- 01:377:327 Field Experience for Special Populations* (3)
- Three electives (9)

*May substitute other relevant fieldwork experience with undergraduate advisor approval.

For the most current configuration of courses for the Disability Studies minor, please see the school's website here.

# Medical Ethics and Health Policy Minor (EJB-U)

## MEDICAL ETHICS AND HEALTH POLICY MINOR

The 21-credit Medical Ethics and Health Policy (652) minor teaches undergraduate students to explore the conceptual foundations of medical ethics as well as develop an appreciation of how they inform contemporary health policy in an era of major scientific innovation, technological advances, and resource constraints.

- 10:652:201 or 01:730:248 Foundations of Medical Ethics & Policy (3)
- 10:652:400 or 01:730:348 Research Ethics (3)  Prerequisite 10:652:201 or 01:730:248
- Six credits of Ethics courses *see Bloustein website for approved courses*

- Six credits of Health Policy courses *see Bloustein website for approved courses*
- One additional three-credit course from either the Ethics or Health Policy lists *see Bloustein website for approved courses*

Courses taken in fulfillment of the Medical Ethics and Health Policy minor (21 credits) cannot be double-counted to fulfill the requirements of a major **EXCEPT** Public Health Law and Ethics (10:832:356) for Public Health majors. Credit issued only once for cross-listed courses. Not all courses are offered every semester.

For the most current configuration of courses for the Medical Ethics and Health Policy minor, please see the school's website here.

# Public Administration and Management Minor (EJB-U)

## PUBLIC ADMINISTRATION AND MANAGEMENT (843) MINOR

The 18-credit Public Administration and Management (843) minor is well matched to majors in public policy; criminal justice; economics; human resource management; labor studies and employment relations; political science; social work; as well as the pre-law track.

Students seeking the public administration and management minor (18 credits) must complete four core courses and two elective courses, one of which must be at the 300-level or higher

- 10:843:209 Introduction to Public Administration (3)
- 10:833:210 Principles of Public Policy (3)
- 10:843:313 Public & Nonprofit Sector Finance Management (3)
- 10:843:360 Managing Public Sector Organizations (3)
- Two electives, selected from all undergraduate Bloustein courses that are open to non-majors. At least one of the two courses must be 300-level or higher.

For the most current configuration of courses for the Public Administration and Management minor, please see the school's website here.

# Urban Studies Minor (EJB-U)

## URBAN STUDIES MINOR

The 18-credit Urban Studies (975) minor is well matched to majors in sociology, economics, labor studies and employment relations, political science, social justice, geography, psychology, ethnic studies, public health, and urban planning and design, as well as the pre-law track

Students seeking the Urban Studies minor must complete one core course and five elective courses, four of which must be 300-level or higher, excluding those designated for 'majors only'.

- 10:975:101 Introduction to Urban Studies (3)

- Five electives

For the most current configuration of courses for the Urban Studies minor, please see the school's website here.

# Fellowships and Scholarships (EJB-U)

## FELLOWSHIPS AND SCHOLARSHIPS

### FUNDING AND SUPPORT FOR UNDERGRADUATES

The Bloustein School has a limited number of scholarship and fellowship opportunities for undergraduate students in specific major areas. Please see the Bloustein School website here for more information, eligibility requirements, and application materials.

PLEASE LIST THE FELLOWSHIPS AND SCHOLARSHIPS INSET UNDER THIS SECTION

### MARY ANN AND STEVEN J. ALLARD FELLOWSHIP PROGRAM IN PUBLIC HEALTH

The Mary Ann & Steven J. Allard Fellowship is for outstanding non-traditional students, including veterans making the transition from military service to the classroom, returning adults whose formal education has been interrupted and post-baccalaureate students pursuing a public health undergraduate degree or major, who have demonstrated a personal commitment and/or outstanding academic potential in pursuit of studies in public health at the Bloustein School.

Two (2) undergraduate students in the public health major are selected to receive the Allard Fellowships.

### RALPH W. VOORHEES PUBLIC SERVICE FELLOWSHIP

The Ralph W. Voorhees Public Service Fellowship Program honors Ralph W. Voorhees's long commitment to community public service.

Up to five (5) undergraduate students from Rutgers University-New Brunswick, who are dedicated to community service, are selected to receive Ralph Voorhees Public Service Fellowships. Fellows receive a stipend so they may participate in a credit-bearing community research project.

Students interested in the fellowship apply in the spring semester here. Questions about the program may be directed to voorheesfellowship@ejb.rutgers.edu.

## DESIGN MAKES A DIFFERENCE ENDOWED SCHOLARSHIP

This scholarship supports undergraduate students at the Edward J. Bloustein School of Planning and Public Policy. Preference will be given to students majoring in Urban Planning and Design.

## E. MAE MCCARROLL SCHOLARSHIP

Recipients are selected among full-time undergraduate students at the Edward J. Bloustein School of Planning and Public Policy based on financial need. Preference will be given to students studying Public Health and Health Disparities and whose educational objectives are similar to or likely to further the legacy of E. Mae McCarroll, who was active in various civic and community affairs.

## ROBIN AND ROBERT J. NARDI ENDOWED SCHOLARSHIP

Recipients are to be selected among full-time undergraduate students at the Edward J. Bloustein School of Planning and Public Policy based on academic merit and financial need.

# Course Listing (EJB-U)

## COURSE LISTING

Course Listing (EJB-U)

## Explanation of Three-Part Course Numbers

## Explanation of Three-Part Course Numbers

The number preceding each course title is divided into three parts. The first two digits are the administrative code (standing for a faculty or a school), the next three digits are the subject code, and the final three digits are the course code.

*Administrative Codes*

The code for the Bloustein School is 10. For a complete list of administrative codes used in this catalog, see the beginning of the Programs of Study and Courses for Liberal Arts and Sciences Students section.

*Subject Codes*

A subject code comprises the third through fifth digits in all course numbers and indicates the subject matter of the course. Courses with the following subject codes are listed in this chapter:

501 Health Administration

652 Medical Ethics and Policy

762 Planning and Public Policy

775 Policy, Health, and Administration

832 Public Health

833 Public Policy

843 Public Administration and Management

971 Urban Planning and Design

975 Urban Studies

*Note: At this time, there are no specific courses for Disability Studies (304).*

*Course Codes*

The course code comprises the sixth, seventh, and eighth digits in all course numbers. Course codes from 100 to 299 indicate introductory and intermediate undergraduate courses. Codes from 300 to 499 indicate advanced undergraduate courses.

Two course codes separated by a comma indicate that each semester may be taken independently of the other (example: 10:832:491,492). Two course codes separated by a hyphen indicate that satisfactory completion of the first semester is a prerequisite to the second semester; the first semester may be taken for credit without taking the second, except where a statement is added to indicate that both semester courses must be completed in order to receive credit.

Credits awarded for the successful completion of each course are indicated in parentheses following the course title. The notation BA indicates that the number of credits is determined by arrangement with the department offering the course.

Course Listing (EJB-U)

# Health Administration 501

# Health Administration 501 Course Listing

This list includes the required core courses and electives for the undergraduate health administration (501) major and minor offered at the Bloustein School as of September 1, 2024. Courses are taught by multiple instructors and may not be offered every semester.

Undergraduate health administration major requirements, and the complete list of undergraduate health administration core courses and electives offered, may be found at the Bloustein School website here.

Students should refer to WebReg for information about special topics courses.

**10:501:203** ***Introduction to Health Administration (3)***
***CORE COURSE***

Introduction of administrative theory to health care delivery, policy, and planning. Focus on managerial structures and functions and their application in the health care workplace.

**10:501:207** ***Accounting for Supervisors and Managers (3)***
***CORE COURSE***

An introductory course that gives a basic understanding of accounting, including the basic corporate operation, preparation of financial statements, basic accounting principles, etc.

**10:501:260** ***Health Care Systems (3)***
***CORE COURSE***

Introduction to the elements of the American health care system including provider roles, the basic structure of health systems, financial aspects, and the legal and regulatory framework.
***Credit not given for this course and 10:832:260.***

**10:501:296,297** ***Special Topics (3,3)***
***ELECTIVE***

See WebReg for current offerings. This course is designed to address current issues in health administration.

**10:501:298,299** ***Independent Study (BA,BA)***
***ELECTIVE***

***Prerequisites: Students must contract with a faculty sponsor and be granted permission by the program director.***

**10:501:310** ***Administrative Issues for Health Care Managers (3)***
***CORE COURSE***

Exploration of how managers work with staff in health care delivery to develop job descriptions, provide incentives, perform evaluations, support promotions, and recommend training.

**10:501:332** ***Health Care Economics (3)***
***CORE COURSE***

Examination of microeconomics within the context of the supply and demand for health care services. Focus on health insurance and the behaviors of health care consumers and providers.

**10:501:333** ***Financial Aspects of Health Administration (3)***
***CORE COURSE***

Review of financial management tools for various health care delivery settings. Interpret financial information and understand the processes performed by financial departments of an institution.

**10:501:335** ***Population Health (3)***
***CORE COURSE***

Study of the principles and methods of epidemiology; the application of epidemiologic methods to the heath care setting including outcomes measures, decision-making, and infection control concepts.

**10:501:342** *Long-Term Care Management (3)*
*ELECTIVE*

Review of management techniques and practices for those seeking a career in long-term care management. Emphasis on skilled nursing home care, assisted living, adult day care, home health care hospice, and senior retirement communities.

**10:501:354** *Marketing for Health Organizations (3)*
*CORE COURSE*

Overview of the marketing process, strategic planning, consumerism, the competitive environment, and the marketing mix as they relate to modern health organizations.
***Credit not given for this course and 10:832:354.***

**10:501:356** *Health Care Ethics and Law (3)*
*CORE COURSE*

Introduction to ethics and law in the health care delivery and clinical settings including an examination of the rights of the patient and their decision makers.

**10:501:360** *Managing Public Sector Organizations (3)*
*ELECTIVE*

Fundamental tasks and responsibilities of management in the public sector, with an emphasis on the external and internal environments in which managers implement public policy.
***Credit not given for both this course and 10:833:360 or 10:762:360 or 10:843:360.***

**10:501:362** *Nonprofit Management (3)*
*ELECTIVE*

Applies management concepts to nonprofit organizations, emphasizing the challenges faced by managers under resource scarcity and uncertain boundaries among public, for-profit, and nonprofit sectors.
***Credit not given for both this course and 10:833:362.***

**10:501:363** *Health Systems Operations (3)*
*CORE COURSE*

Study of an integrated and strategic approach to operations management that transforms complex health policy into efficient operations that improve care, clinical operations, and financial outcomes.

**10:501:395** *Data Management in Health Care (3)*
*CORE COURSE*

Students will gain an introductory understanding of health care data and how analytical programs such as Excel can be utilized to leverage data for decision-making opportunities within an organization. This course will cover the basics of excel and data quality to identify trends and summarize analysis of various scenarios that may occur within the health care industry.

**10:501:410** ***Information Systems for Health Care (3)***
***CORE COURSE***

Exploration of the types and uses of information systems; their management and strategic application; related privacy policies; and their transformative role in health care delivery.
***Open to majors only. Prerequisites: 10:501:203 or 10:832:334 and 10:501:333 or 10:832:333.***

**10:501:412** ***Introduction to LEAN for Health Care (3)***
***ELECTIVE***

Understand and apply the LEAN management system that eliminates waste, improves employees' satisfaction, and assures better patient care.

**10:501:420** ***Human Resource Management in Health Administration (3)***
***ELECTIVE***

Utilizes psychology, management and economics to explores the management of staff in the nation's largest and fastest growing industry.

**10:501:425** ***Financial Management (3)***
***CORE COURSE***

In-depth application of financial theory to health care systems, including financial analysis and forecasting, strategic formulation, and economic application.
***Open to 501 and 832 majors only. Prerequisite: 10:501:333.***

**10:501:483,484** ***Special Topics (3,3)***
***ELECTIVES*** .

These courses are designed to address current issues in health administration. See WebReg for current offerings

**10:501:485,486** ***Independent Study (BA,BA)***
***ELECTIVES.***
***Prerequisite: Students must contract with a faculty sponsor and be granted permission by the program director.***

**10:501:497,498** ***Bloustein Honors Research (3,3)***
***ELECTIVES.***

Participation of advanced undergraduates as research assistants at one of the institutes or centers at the Bloustein School. Students contract with and are supervised by the principal investigator of the project.

# Medical Ethics and Policy 652

# Medical Ethics and Policy 652 Course Listing

This list includes the required core courses and electives for the undergraduate medical ethics and policy (652) minor offered at the Bloustein School as of September 1, 2024. Courses are taught by multiple instructors and may not be offered every semester.

Medical ethics and health policy minor requirements, and the complete list of undergraduate medical ethics and policy courses offered, may be found at the Bloustein School website here.

Students should refer to WebReg for information about special topics courses.

**10:652:201** *Foundations of Medical Ethics and Policy (3)*
*CORE COURSE*

Students explore the conceptual foundations of medical ethics that challenge the practice of medicine and health research in different world settings.
***Credit cannot be given for both this course and 01:730:248.***

**10:652:210** *Literature of Medical Ethics (2)*
*ELECTIVE*

The classic literature of medical ethics forms the basis of class discussion. Students analyze the impact of these works on society's morals and traditions.

**10:652:296,297** *Special Topics (3,3)*
*ELECTIVE*

Topics vary. See WebReg for current offerings. This course is designed to address current issues in planning and public policy.

**10:652:298,299** *Independent Study (BA,BA)*
*ELECTIVE*
***Prerequisites: A contract with a faculty sponsor and permission of the program director.***

**10:652:301** *Topics in Medical Ethics (3)*
*ELECTIVE*

Explore the latest "hot topics" in medical ethics, from gene-editing, big data, and performance enhancement to enduring social problems with equity and social justice.
***Prerequisite: 10:652:201 or 01:730:248. Credit cannot be given for both this course and 01:730:348.***

**10:652:309** *Ethical Challenges in America: Poverty, Stress, and Health (3)*
*ELECTIVE*

Explore the compelling evidence for the lasting effects of stress, particularly for the poor, and efforts by the health care industry to mediate these effects.

**10:652:319** ***Medical Narratives (3)***
***ELECTIVE***

Experience stories that acknowledge and interpret the experience of individuals with health decisions often made for them by others. Reflective writing illuminates these interactive experiences.

**10:652:399** ***Research Ethics (3)***
***ELECTIVE***

Examines the origins of contemporary research ethics. Particular attention is given to ethical issues arising in research involving vulnerable populations and research in international setting.

**10:652:400** ***Research Ethics (3)***
***CORE COURSE***

Examines the origins of contemporary research ethics and paradigm studies that contributed to modern day rules and regulations. Particular attention is given to ethical issues arising in research involving vulnerable populations and research in international settings.

Course Listing (EJB-U)

# Planning and Public Policy 762

# Planning and Public Policy 762 Course Listing

This list includes the core and elective courses offered by the planning and public policy (762) major and minor at the Bloustein School as of September 1, 2024. Courses are taught by multiple instructors and may not be offered every semester.

Planning and public policy major requirements, and the complete list of undergraduate planning and public policy courses may be found at the Bloustein School website here.

Students should refer to WebReg for information about special topics courses.

**10:762:103** ***Introduction to Urban Studies (3)***
A general introduction to urban studies leading into the history of cities, suburbs, and the urban system, politics and economics of cities and metropolitan areas, and the peopling of urban areas.
***Credit not given for this course and 971:101 and 975:101.***

**10:762:201** ***Introduction to Urban Planning and City Design (3)***
Introduction to the purpose of plans and planning including domains such as housing, land use, and transportation with an emphasis on solutions to local problems.
***Credit not given for both this course and 10:971:201.***

**10:762:202** ***Designing Healthy Cities (3)***
A review of the nature of America's cities and suburbs from their original planning to their ultimate reality and their effects on human health and well-being.
***Credit not given for both this course and 10:832:202, 10:971:202, and 10:975:202.***

**10:762:230** *Global Poverty (3)*
Introduction to the causes and governmental responses to urban poverty in developing nations: economic, historical, and cultural factors.
*Credit not given for both this course and 10:833:230 and 10:975:230.*

**10:762:231** *Poverty in the United States (3)*
Assessment of causes and consequences of poverty in the United States: economic, historical, and cultural factors, plus governmental solutions.
*Credit not given for both this course and 10:833:231 and 10:975:231.*

**10:762:233** *The Urban World (3)*
Interdisciplinary perspectives on the study of cities, historical and contemporary, and urban processes and problems.
*Credit not given for both this course and 10:975:233.*

**10:762:250** *Introduction to GIS (3)*
Study of computing concepts and methods applicable to planning and health, including database management, introduction to geographic information systems (GIS), and graphics.
*Credit not given for both this course and 10:971:250.*

**10:762:295** *Internship in Public Service (BA)*
Completion of between 40 and 125 hours in the field (1 to 3 credits) doing a preapproved public service internship under the direction of a faculty member.

**10:762:296,297** *Special Topics in Planning and Public Policy (3,3)*
Topics vary. See WebReg for current offerings. This course is designed to address current issues in planning and public policy

**10:762:298,299** *Independent Study (BA,BA)*
*Prerequisite: A contract with a faculty sponsor and permission of the program director.*

**10:762:307** *Community Development (3)*
Analysis of neighborhood-based community development efforts to address housing, economic, and social issues affecting low-income communities. Resources for community building.
*Credit not given for this both course and 10:975:307.*

**10:762:310** *U.S. Housing Policy (3)*
Exploration of major issues in housing: historical, economic, and social factors. Political and regulatory dimensions of housing decision-making: housing codes and the landlord-tenant relationship.
*Credit not given for both this course and 10:833:310 and 10:975:310.*

**10:762:313** *Public and Non Profit Finance (3)*
An introduction to the ways that the public and nonprofit sectors determine which goods and services they will provide and how they will finance the production of those goods.
*Credit not given for this course 833:313 and 10:843:313*

**10:762:317** ***Urban Municipal Management (3)***
Introduction to management issues for service delivery (e.g., police and fire, health, housing, transportation, and welfare). Focus on internal organizational structure and leadership.
***Credit not given for both this course and 10:975:317 and 10:843:317.***

**10:762:320** ***Protecting Public Health and the Environment (3)***
Assessment of the policies and realities facing places trying to protect community health in the face of economic feasibility and political forces.
***Credit not given for both this course and 10:832:320.***

**10:762:324** ***Social Movements (3)***
Exploration of how social movements translate changing social values into political forces. Issues include democracy, environment, health, human rights, labor, peace, and women.
***Credit not given for both this course and 10:833:324.***

**10:762:326** ***Food, Housing, & Energy Policy (3)***
Examines through an interdisciplinary lens the interconnectedness of sustainability-focused policy across diverse sectors such as food and agriculture, urban planning, energy, and housing and their collective impact on health outcomes.
***Credit not given for this course and 10:833:326.***

**10:762:329** ***Managing Crisis & Chaos (3)***
Focuses on the key aspects of managing crises and disasters including strategic planning, crisis communications, organizational learning, recognizing internal and external threats, leadership, and prevention/preparedness.
***Credit not given for this course and 10:833:329.***

**10:762:331** ***U.S. Social Policy (3)***
Examination of the historical emergence of social policy in the United States with a focus on housing, welfare, race relations, education, intergovernmental, and environmental issues.
***Credit not given for both this course and 10:833:331.***

**10:762:335** ***Women, Inequality, and Public Policy (3)***
Exploration of women's evolving role in both family and the labor market, and addresses contemporary public policy debates around these changes.
***Credit not given for both this course and 10:833:335. Cross-listed with 34:833:591.***

**10:762:337** ***Population Health and Urbanization (3)***
This course introduces students to the health impacts of industrialization and urbanization from the mid-18th century through the early 21st century.

**10:762:340** ***Aging and Public Policy (3)***
Examination of aging and public policy including ageism, cultural and racial-ethnic diversity as it pertains to aging, and the impact of longevity on national health and social service diversity.
***Credit not given for both this course and 10:833:323 or 10:832:323.***

**10:762:352** ***Technology in the City (3)***
Exploration of the social and economic implications of new communications technologies for urban life. Includes consideration of ecommerce, online education, egovernment, and infrastructure needs.
***Credit not given for both this course and 10:775:352 and 10:975:352.***

**10:762:360** ***Managing Public Sector Organizations (3)***
Fundamental tasks and responsibilities of management in the public sector, with an emphasis on the external and internal environments in which managers implement public policy.
***Credit not given for both this course and 10:833:360 or 10:843:360 or 10:501:360.***

**10:762:361** ***Managing People and Organizations (3)***
Introduction to organizational theory and concepts of management. Explores approaches that promote and hinder effective management.
***Credit not given for both this course and 10:833:361 or 10:843:361.***

**10:762:362** ***Nonprofit Management (3)***
Applies management concepts to nonprofit organizations, emphasizing the challenges faced by managers under resource scarcity and uncertain boundaries among public, for-profit, and nonprofit sectors.
***Credit not given for both this course and 10:501:362 or 10:833:362***

**10:762:371** ***Globalization, Sustainability, and Justice (3)***
Examines the core issues of the social, economic, environmental, and political dimensions of developing sustainable, just societies.

**10:762:413** ***Urban Revitalization (3)***
Assessment of the causes of urban decline and subsequent renewal efforts. Emphasis on contemporary programs such as neighborhood renovation, gentrification, historic preservation, and economic development.

**10:762:440** ***Principles of Real Estate (3)***
Analysis of real estate in the marketplace, the organization and services of the real estate industry, and the tools of real estate practitioners.
***Cross-listed with 34:970:604.***

**10:762:448** ***Historic Preservation (3)***
Overview of historical evolution of the preservation movement in the United States, examining important public preservation regulations and programs and the economics of historic preservation.
***Credit not given for both this course and 10:082:431. Cross-listed with 34:970:521.***

**10:762:461** ***Voorhees Research Seminar (3)***
The Ralph W. Voorhees Public Service Fellows will work with Middlesex County Food Organization and Outreach Distribution Services to research innovative 1) models of emergency food delivery and 2) regional/local emergency food coalitions.

**10:762:463** ***Environmental Land-Use Law (3)***
Understanding of the legal principles behind environmental constraints on land use, including critical areas, farmland preservation, water and sewer facilities, storm water and erosion management, and more.
***Credit not given for both this course and 10:971:463.***

**10:762:472** ***Transportation Planning (3)***
Study of planning for transit, pedestrian, and bicycle priority networks and land uses at various scales.
***Credit not given for both this course and 10:971:472.***

**10:762:483,484** ***Special Topics (3,3)***
Topics vary. See WebReg for current offerings. These courses are designed to address current issues in planning and policy.

**10:762:485,486** ***Independent Study (BA,BA)***
***Open to 762 majors only. Prerequisities: A contract with a faculty sponsor and permission of the program director.***

**10:762:497,498** ***Bloustein Honors Research (3,3)***
Participation of advanced undergraduates as research assistants at one of the institutes or centers at the Bloustein School. Students contract with and are supervised by the principal investigator of the project.

Course Listing (EJB-U)

# Policy, Health, and Administration 775

# Policy, Health, and Administration 775 Course Listing

**Policy, Health, and Administration**

The Policy, Health, and Administration sequence of courses represent a series of skills and competences that extend among and between the major program and discipline areas including:

- 501 Health Administration
- 652 Medical Ethics and Policy
- 762 Planning and Public Policy
- 832 Public Health
- 833 Public Policy
- 843 Public Administration and Management
- 971 Urban Planning and Design
- 975 Urban Studies

This list includes the policy, health, and administration (775) courses offered at the Bloustein School as of September 1, 2024. **Many of these courses are also requirements in other major sequences.**

Please see the curriculum specified for each major by visiting the Bloustein School website here.

**10:775:101** ***Introduction to Planning, Policy, and Health (3)***
Overview of public health, public policy, and urban planning with an emphasis on how these fields intersect in a U.S. context.

**10:775:205** ***Basic Statistical Methods (4)***
Introduction to descriptive and inferential statistics, data presentation, and analysis: sampling methods, probability, estimation, hypothesis testing, and chi-square.

**10:775:297** ***Exploratory Internship (BA)***
Working with a health care professional, students learn about the roles and functions within the field.

**10:775:300** ***Writing for Professionals (3)***
Formulate ideas, use critical thinking, and analyze information to produce the types of appropriate, clear, and effective writing used by professionals.

**10:775:395** ***Research Methods (4)***
Research concepts and skills applied to public health, public policy, and planning. Includes development of original and online data sources, coding, appropriate selection of statistical methods for analysis, and professional presentation of results.

**10:775:396** ***Data Visualization for Health, Administration, and Policy (3)***
Learn how to design and create ways to communicate numeric information to public health, policy, planning, and administrative audiences using Excel and other common software. Formats include infographics, fact sheets, and slides for budget and other presentations.

**10:775:450** ***Leadership Seminar (3)***
Application and synthesis of skills to analyze options, set priorities, communicate goals, and demonstrate emotional intelligence. Focus on leadership, collaboration, professionalism, and project management.
***Open to majors only.***

**10:775:493,494** ***Bloustein Honors Research I,II (3,3)***
Bloustein Honors Research I,II is a two-semester, six-credit course sequence for students enrolled in the Bloustein Honors Research Program. The program is a formal, supervised yearlong project that involves both a peer classroom learning environment under the guidance of the course instructor and research with an individual faculty mentor.

**10:775:499** ***Professional Practice Internship (6)***
Completion of a 225-hour professional experience requiring completion of an outcomes-driven project under the supervision of a field preceptor and a faculty supervisor. Projects are presented in a public forum.
***Prerequisites: 10:775:395, 10:775:450, and 100 credits toward graduation.***

Course Listing (EJB-U)

# Public Health 832

# Public Health 832 Course Listing

This list includes the required core courses and electives for the undergraduate public health (832) major and minor offered at the Bloustein School as of September 1, 2024. Courses are taught by multiple instructors and may not be offered every semester.

Public health major requirements, and the complete list of undergraduate public health courses and electives offered, may be found at the Bloustein School website here.

Students should refer to WebReg for information about special topics courses.

**10:832:201** ***Principles of Public Health (3)***
***CORE COURSE***

Dimensions of personal and environmental health and their relationship to social, economic, cultural, psychological, and political factors. Measurements of community health status.

**10:832:202** ***Designing Healthy Cities (3)***
***ELECTIVE***

A review of America's cities and suburbs from their original planning stage to their ultimate reality and how it affects human health and well-being.
***Credit not given for both this course and 10:762:202, 10:971:202, and 10:975:202.***

**10:832:212** ***Health Disparities (3)***
***CORE COURSE***

Overview of health disparities in the United States with an emphasis on inequality, race/ethnicity, socioeconomic position (SEP), and gender.

**10:832:235** ***Urban Health (3)***
***ELECTIVE***

Exploration of patterns of disease and disability associated with global urban populations: understanding the factors contributing to them and evaluating policies intended to reduce the burden of disease.
***Credit not given for both this course and 10:762:235.***

**10:832:240** ***Global Health Perspectives (3)***
***CORE COURSE***

Examination of how sociocultural, economic, environmental, and political forces contribute to vulnerability and inequality in developing countries, and their impact on health and well-being.
***Credit not given for both this course and 09:910:240.***

**10:832:241** ***Principles of Health Education (3)***
***ELECTIVE***

Introduction to the health education learning theory/models aimed at health promotion, disease prevention, and behavioral change at the individual, family, and community level.

**10:832:242** ***Principles of Health and Wellness (3)***
***ELECTIVE***

Examination of health promotion and behaviors, human growth and wellness, disease prevention, nutrition, and the ramifications of lifestyle choices from a personal, community, and societal perspective.

**10:832:243,244** ***Wellness Learning Community I,II (1.5,1.5)***
***ELECTIVES***

In a shared learning experience, students examine wellness at personal, institutional, and community levels.

**10:832:252** *Health and Social Justice (3)*
*ELECTIVE*

Introduction to social justice issues, health equity and policy, determinants of health, and health disparities, with a focus on individual and community health.
***Credit not given for both this course and 01:377:252.***

**10:832:253** *Lesbian, Gay, Bisexual, Transgender and Queer Public Health (3)*
*ELECTIVE*

Evaluate the disparities and health care needs of LGBTQ populations; review current policy issues, initiatives, and affirming strategies related to LGBTQ health.

**10:832:254** *Health and Cancer Terminology (3)*
*ELECTIVE*

This course provides a fluent understanding of health and cancer terminology for future health and public health professionals seeking to understand the complex language related to cancer.

**10:832:255** *Bullying, Violence, and Society (3)*
*ELECTIVE*

Explore the relationship between mass media and violence; consider the epidemiology, risk factors, and treatments for aggressive and violent behavior and their impact on victims, perpetrators, and society.

**10:832:260** *Health Care Systems (3)*
*ELECTIVE*

Review of elements of the American health care system, including provider components, financing of health care, and basic structure of public policymaking and public health systems.
***Credit not given for both this course and 10:501:260.***

**10:832:262** *Peer Education Advocacy (3)*
*ELECTIVE*

Training in health outreach, promotion, advocacy, and education in order to serve as peer-educators on topics such as mental health and alcohol and/or other drug use.
***Prerequisite: Permission of instructor. Course not open to seniors.***

**10:832:291 (1 Credit), 295 (4 Credits); 292, 293, 294, 296, 297 (All 3 Credits)** *Special Topics (as shown)*
*ELECTIVE*

Topics vary. See WebReg for current offerings. This course is designed to address current issues in public health.

**10:832:298,299** *Independent Study (BA,BA)*
*ELECTIVE*
***Prerequisites: A contract with a faculty sponsor and permission of the program director.***

**10:832:301** *Sexual Health Advocacy (3)*
*ELECTIVE*

Opportunities for learning new information about sexual health and community development, strengthening critical thinking skills, and broadening empathy for others.
***Prerequisite: Permission of instructor. Course not open to seniors.***

**10:832:302** ***Sexual and Reproductive Health Policy (3)***
***ELECTIVE***

Examination of the health, political, and moral influences that impact current sexual and reproductive health policies. Focus on the origins of reproductive health policies and the ramification of their implementation.
***Credit not given for both this course and 10:833:302.***

**10832:309** ***Ethical Challenges in America: Poverty, Stress, and Health (3)***
***ELECTIVE***

Explore the compelling evidence for the lasting effects of stress, particularly for the poor, and efforts by the health care industry to mediate these effects.
***Credit not given for both this course and 10:652:309***

**10:832:320** ***Protecting Public Health and the Environment (3)***
***ELECTIVE***

Overview of the policies and realities facing communities trying to protect community health in the face of economic feasibility and political forces.
***Credit not given for both this course and 10:762:320.***

**10:832:321** ***Environmental and Occupational Health (3)***
***ELECTIVE***

Examination of contemporary topics in environmental and occupational health, including workers' compensation, ergonomics, hazardous waste, and air and water pollution.

**10:832:323** ***Demography and Population Studies (3)***
***ELECTIVE***

Review of demographic concepts, methods, and applications from an interdisciplinary perspective. Global population studies, with a historical focus on distributions of wealth and power.
***Credit not given for both this course and 10:762:323, 10:775:323, or 10:833:323.***

**10:832:332** ***Public Health Economics (3)***
***ELECTIVE***

Examination of microeconomics within the context of the demand for health and the allocation of public resources to improve the public's health. A case study approach is used.

**10:832:333** ***Financial Aspects of Public Health (3)***
***ELECTIVES***

Introduction to financial management tools used in public health settings. Develop analytical skills to interpret financial information and processes used in government and nonprofit agencies.

**10:832:334** ***Public Health Management (3)***
***ELECTIVE***

Overview of fundamental management practices in public health settings including leadership, team building, credentialing and standards, regulatory oversight, budgeting, and professionalism.
***Credit not given for both this course and 11:375:406.***

**10:832:335** ***Epidemiology (3)***
***CORE COURSE***

Study of the principles and methods of epidemiology: the study of the distribution (patterns of occurrence) and determinants (causes) of disease and injury in human populations.
***Pre- or corequisite: Statistics or Precalculus and 10:832:201***

**10:832:336** ***Information Systems for Public Health (3)***
***ELECTIVE***

Connects the role of information systems in the well-established domains of public health to highlight the impact of technology in social determinants of health, government regulations, health information exchange, and dynamic trends across public health.

**10:832:337** ***Population Health and Urbanization (3)***
***ELECTIVE***

The health impacts of industrialization and urbanization from the last 100 years, with examples from the literature and former industrial clusters located within 20 miles of our campus, as well as from Asia and other areas of the world.

**10:832:338** ***Health and Public Policy (3)***
***ELECTIVE***

Investigation of the basic machinery of policymaking and the legal processes that underpin the U.S. health care and public health systems with an emphasis on recent health care reform.
***Credit not given for both this course and 10:833:338.***

**10:832:339** ***Public Health Literature (3)***
***CORE COURSE***

Review of the historic and current public health literature, intensive writing, and various forms of communication emphasized, including summaries of resources, preparing public presentations, and a public service announcement.

**10:832:340** ***Aging and Public Policy (3)***
***ELECTIVE***

Overview of aging and public policy including ageism, cultural and racial-ethnic diversity as it pertains to aging, and the impact of longevity on national health and social service delivery.
***Credit not given for both this course and 10:762:340 or 10:833:340.***

**10:832:341** *Public Health and Aging (3)*
*ELECTIVE*

Overview of the physical, mental, and social aspects of aging. Focus is placed on the implications of aging for families and communities, wellness models, long-term care, reimbursement, and health care delivery issues.

**10:832:345** *Health Program Development (3)*
*ELECTIVE*

Understanding of planning process for the promotion and improvement of the public's health through individual, group, institution, and community-level interventions.

**10:832:346** *Health Program Evaluation (3)*
*ELECTIVE*

Study of evaluation tools that ensure public health actions are effective after their implementation. Focus on the framework, key concepts, and standards of effective evaluation.

**10:832:350** *Drugs, Culture, and Society (3)*
*ELECTIVE*

Overview of the history, physical/psychological effects, current trends, and legal/social consequences of drugs. Discussion of prevention, intervention, and treatment approaches.

**10:832:351** *Addictions Policy (3)*
*ELECTIVE*

Review of basic pharmacology and scientific nature of addiction as public health issue. Exposure to treatment facilities, mutual aid meetings, and discussions of substance abuse policies.
*Credit not given for both this course and 10:833:351.*

**10:832:352** *Community Health Promotion (3)*
*ELECTIVE*

Dimensions of health education concepts and theory as applied to the community level. Focus on community assessment, capacity building, and evaluation.
*Prerequisite: 10:832:241.*

**10:832:353** *Science of Prevention (3)*
*ELECTIVE*

Introduction to the theory and methods of prevention in alcohol, drug, and tobacco addiction at the individual, family, and community level.
*Prerequisite: 10:832:350.*

**10:832:356** *Public Health Law and Ethics (3)*
*CORE COURSE*

Introduction to public health law, ethics, and advocacy. A key theme is the health and well-being of the community versus the rights of the individual.

**10:832:371** ***Special Topics (1)***
***ELECTIVE***

This 1-credit course is designed to address current issues in public health. Topics vary. See WebReg for current offerings.

**10:832:372, 373, 374** ***Special Topics (3, 3, 3)***
***ELECTIVE***

This 3-credit course is designed to address current issues in public health. Topics vary. See WebReg for current offerings

**10:832:375** ***Special Topics (4)***
***ELECTIVE***

This 4-credit course is designed to address current issues in public health. Topics vary. See WebReg for current offerings.

**10:832:401** ***Public Health Preparedness I (3)***
***ELECTIVE***

Dimensions of biological, chemical, and radiological agents that have the potential to cause widespread harm to public health. Scenarios for various exposures and public health responses are presented.

**10:832:402** ***Public Health Preparedness II (3)***
***ELECTIVE***

Review of emergency management concepts as they apply to public health including enhancing emergency response and minimizing the impact of disasters. Case studies and interactive exercises will be conducted.

**10:832:404** ***Emerging Infectious Diseases (3)***
***ELECTIVE***

Consideration of the public health impacts of new and emerging infectious diseases in global populations.
***Prerequisite: 10:832:335 or permission of instructor.***

**10:832:405** ***Cancer and Society (3)***
***ELECTIVE***

Exploration of the epidemiology of cancer, including the cultural and political history of the disease, global burden, causal mechanisms, disparities, cancer survivorship, and prevention.
***Prerequisite: 10:832:335 or permission of instructor.***

**10:832:406** ***Cancer Surveillance I (3)***
***ELECTIVE***

Covers the fundamentals of cancer registration and surveillance, including history of cancer registries, cancer as a disease, the different types and functions of cancer registries, statutory laws, privacy and confidentiality, data collection, standards and coding, quality assurance and education, cancer surveillance systems, data utilization and research.

**10:832:413** *Advanced Topics in Health Disparities (3)*
*ELECTIVE*

Explore major ways in which race-based health inequities are created and sustained, with focus on structural factors such as public policy, racial discrimination, neighborhoods, and the health care system.
*Prerequisite: 10:832:212.*

**10:832:414** *Culture and Health (3)*
*ELECTIVE*

Analysis of belief and value systems rooted in families, along with perceptions and experiences of health/wellness and disease/illness. Discussion of traditional practitioners and alternative healers.

**10:832:415** *Women and Health (3)*
*ELECTIVE*

Assessment of issues raised by women's health care needs and by women's participation in the health labor force in the context of contemporary feminist thought.

**10:832:416** *Mental Health and Society (3)*
*ELECTIVE*

Exploration of historical and contemporary policies regarding mental health care in the United States. Deinstitutionalization, public versus private care facilities, patient and consumer empowerment.
*Credit not given for both this course and 10:833:416.*

**10:832:438** *Environmental and Public Health Practice (6)*
*ELECTIVE*

Preparation to sit for the Registered Environmental Health Specialist (REHS) examination including an intensive review program and a 200-hour internship at a local health department.
*Prerequisites: 32 credits of science and math and permission of the department. Offered during Summer Session only.*

**10:832:440** *Global Public Health (3)*
*ELECTIVE*

Assessment of the wide range of global health issues and the various policies and programs nations adopt to deal with them.
*Prerequisite: 10:832:240.*

**10:832:483** *Cancer Surveillance II (3)*
*ELECTIVE*

Covers the fundamentals of cancer registration and surveillance, including history of cancer registries, cancer as a disease, the different types and functions of cancer registries, statutory laws, privacy and confidentiality, data collection, standards, and coding, quality assurance and education, and cancer surveillance systems, data utilization and research.

**10:832:484** ***Special Topics (3)***
***ELECTIVES***

Topics vary. See WebReg for current offerings. These courses are designed to address current issues in public health.

**10:832:485,486** ***Independent Study (BA,BA)***
***ELECTIVE***
***Open to 832 majors only. Prerequisites: Students must contract with a faculty sponsor and be granted permission by the program director.***

**10:832:497,498** ***Bloustein Honors Research (3,3)***
***ELECTIVE***

Advanced undergraduates conduct applied research in public health under the supervision of a faculty member.

Course Listing (EJB-U)

# Public Policy 833

# Public Policy 833 Course Listing

This list includes the required core courses and electives for the undergraduate public policy (833) major and minor offered at the Bloustein School as of September 1, 2024. Courses are taught by multiple instructors and may not be offered every semester.

Undergraduate public policy major requirements, and the complete list of public policy courses and electives offered, may be found at the Bloustein School website here.

Students should refer to WebReg for information about special topics courses.

**10:833:102** ***Introduction to Public Policy (3)***
***ELECTIVE***

Introduction to policy analysis by applying concepts from political science, economics, sociology, statistics, and science to current policy issues affecting the country and the world.
***Credit not given for both this course and 10:762:102 and 10:843:102.***

**10:833:210** ***Principles of Public Policy (3)***
***CORE COURSE***

Implementation of public policy including federal, state, and intergovernmental decision-making. Policy areas examined include environment, health care, development, labor, and others.
***Credit not given for both this course and 10:762:210 and 10:843:210.***

**10:833:215** ***Writing, Reasoning, and Public Policy (3)***
***CORE COURSE***

Understanding how to use words accurately, think and write logically, and formulate valid and true arguments for the creation of evaluation of public policy.
***Credit not given for both this course and 10:762:215.***

**10:833:220** ***Public Economic Policy (3)***
***CORE COURSE***

Evaluation of government decision-making and its effects on economic markets large and small from cars to textbooks.
***Credit not given for both this course and 10:762:220 and 10:843:220.***

**10:833:230** ***Global Poverty (3)***
***ELECTIVE***

Introduction to the causes and governmental responses to urban poverty in developing nations: economic, historical, and cultural factors
***Credit not given for both this course and 10:762:230.***

**10:833:231** ***Poverty in the United States (3)***
***ELECTIVE***

Assessment of causes and consequences of poverty in the United States: economic, historical, and cultural factors, plus governmental solutions.
***Credit not given for both this course and 10:762:231.***

**10:833:296, 297** ***Special Topics (3,3)***
***ELECTIVE***

Topics vary. See WebReg for current offerings. These courses are designed to address current issues in public policy

**10:833:298,299** ***Independent Study (BA,BA)***
***ELECTIVE***
***Prerequisites: A contract with a faculty sponsor and permission of the program director.***

**10:833:302** ***Sexual and Reproductive Health Policy (3)***
***ELECTIVE***

Assessment of the health, political, and moral influences that impact current sexual and reproductive health policies including their origins and the ramification of their implementation.
***Credit not given for both this course and 10:832:302.***

**10:833:310** ***U.S. Housing Policy (3)***
***ELECTIVE***

Exploration of major issues in housing: historical, economic, and social factors. Political and regulatory dimensions of housing decision-making: housing codes and the landlord-tenant relationship.
***Credit not given for both this course and 10:762:310 and 10:975:310.***

**10:833:313** *Public and NonProfit Finance (3)*
*ELECTIVE*

An introduction to the ways that the public and nonprofit sectors determine which goods and services they will provide and how they will finance the production of those goods.
*Credit not given for this course 762:313 and 10:843:313*

**10:833:323** *Demography and Population Studies (3)*
Review of demographic concepts, history, methods, and applications, from an interdisciplinary perspective. Global population studies, with a historical focus on distributions of wealth and power.
*Credit not given for both this course and 10:762:323 and 10:832:323.*

**10:833:326** *Food, Housing, and Energy (3)*
*ELECTIVE*

Examines, through an interdisciplinary lens, the interconnectedness of sustainability-focused policy across diverse sectors, such as food and agriculture, urban planning, energy, and housing, and their collective impact on health outcomes.
*Credit not given for this course and 10:762:326.*

**10:833:327** *The Racial Wealth Gap and Why It Persists(3)*
*ELECTIVE*

Explores policies and practices that worsen the racial wealth gap; identifies the barriers that prevent stakeholders from changing those policies; and introduces experts and advocates currently working to tackle those barriers.

**10:833:328** *Legislative Policy Making (3)*
*ELECTIVE*

Examines policy making in the states with a special focus on governors and state legislatures, and the processes by which policies are determined (including legislative representation, lobbying, agenda setting, issue campaigning, etc.)

**10:833:329** *Managing Crisis and Chaos (3)*
*ELECTIVE*

Focuses on the key aspects of managing crises and disasters including strategic planning, crisis communications, organizational learning, recognizing internal and external threats, leadership, and prevention/preparedness.
*Credit not given for this course and 10:762:329.*

**10:833:331** *U.S. Social Policy (3)*
*ELECTIVE*

Examination of the historical emergence of social policy in the United States with a focus on housing, welfare, race relations, education, intergovernmental, and environmental issues.
*Credit not given for both this course and 10:762:331.*

**10:833:335** *Women, Inequality, and Public Policy (3)*
*ELECTIVE*

Exploration of women's evolving role in both the family and the labor market, including contemporary public policy debates around these changes.
*Credit not given for both this course and 10:762:335.*

**10:832:338** *Health and Public Policy (3)*
*ELECTIVE*

Investigation of the basic machinery of policymaking and the legal processes that underpin the U.S. health care and public health systems with an emphasis on recent health care reform.
*Credit not given for both this course and 10:832:338.*

**10:833:340** *Aging and Public Policy (3)*
*ELECTIVE*

Assessment of aging for society. Topics include ageism, cultural and racial-ethnic diversity as it pertains to aging, and the impact of longevity on national health and social service policy.
*Credit not given for both this course and 10:762:340.*

**10:833:351** *Addictions Policy (3)*
*ELECTIVE*

Review of basic pharmacology and scientific nature of addiction as public health issue. Exposure to treatment facilities, mutual aid meetings, and discussions of substance abuse policies.
*Credit not given for both this course and 10:832:351.*

**10:833:353** *Disability Policy & Law (3)*
*ELECTIVE*

Examines laws that most substantively impact individuals with disabilities (e.g., Vocational Rehabilitation Act, Individuals with Disabilities Education Act, Americans with Disabilities Act, Social Security and Medicare/ Medicaid), including their implementation, court interpretations, and individuals' lived experiences.

**10:833:354** *Immigration Policy (3)*
*ELECTIVE*

Explores the roots of today's modern immigration policy, including border and citizenship policy as well as how states and localities have responded to changes in federal immigration policy.

**10:833:360** *Managing Public Sector Organizations*
*CORE COURSE*

Fundamental tasks and responsibilities of management in the public sector, with an emphasis on the external and internal environments in which managers implement public policy.
*Credit not given for both this course and 10:762:360 or 10:843:360 or 10:501:360.*

**10:833:361** *Managing People and Organizations (3)*
*CORE COURSE*

Designed to enhance understanding of one's own motivation and behavior as well as that of others, to increase effectiveness in present and future positions and career satisfaction.
***Credit not given for both this course and 10:762:361 and 10:843:361.***

**10:833:362** ***Nonprofit Management (3)***
***CORE COURSE***

Applies management concepts to nonprofit organizations, emphasizing the challenges faced by managers under resource scarcity and uncertain boundaries among public, for-profit, and nonprofit sectors.
***Credit not given for both this course and 10:501:362 or 10:762:362.***

**10:833:363** ***LGBTQIA+ Policy (3)***
***ELECTIVE***

Explores the history of LGBTQIA+ political movements, their impact on public policy, how intersecting identities correlate to public strategy, and how the media has affected the movement.

**10:833:364** ***Children, Law and Public Policy (3)***
***ELECTIVE***

Explores two key tensions in public policy about children: Parental rights to raise their children vs. state duties to protect children and mold future generations; and children as small adults with a full range of adult autonomy vs. children as a uniquely vulnerable class of people requiring special protection.

**10:833:365** ***Higher Education Policy (3)***
***ELECTIVE***

Examines the historic and contemporary policy debates in higher education and the tradeoffs between affordability, access, quality, academic freedom, and accountability. Covers federal, state, and local roles in policymaking and addresses a key challenge in applying policy theory to higher education policy because of the limited role of the federal government.

**10:833:366** ***Criminal Justice Policy (3)***
***ELECTIVE***

Explores the criminal legal system's far-reaching impact on housing, employment, education, child rearing, and healthcare, particularly for lower-income and otherwise marginalized groups. Students formulate comprehensive policy proposals aimed at rectifying disparities and promoting social justice.

**10:833:367** ***Media, Demography and Public Policy (3)***
ELECTIVE

Examines how our democracy is influenced by the media and the impact that has on our politics, our elected officials, and public policy.

**10:833:368** ***Equity State Policy (3)***
ELECTIVE

Evaluating public policies adopted in the 50 states known as the ¿laboratories of democracy¿ with a focus on identifying, measuring, and comparing policies of equality, equity, and fairness that at times extend and limit the rights of American citizens.

**10:833:381** ***Special Topics (1)***
This 1-credit course is designed to address current issues in public policy. Topics vary. See WebReg for current offerings.

**10:833:382** ***Special Topics (4)***
This 4-credit course is designed to address current issues in public policy. Topics vary. See WebReg for current offerings.

**10:833:383,384,385,386, 387 (3)** ***Special Topics (3)***
These 3-credit courses are designed to address current issues in public policy. Topics vary. See WebReg for current offerings.

**10:833:417** ***Impacted Folks Leading Policy Change (3)***
***ELECTIVE***

Focuses on the realities faced by impacted folks that advocate for policies at all levels of government. Particular attention paid to the role of power, politics, poverty, and educational access and attainment.

**10:833:418** ***Political Communications for Public Policy (3)***
Explores how to translate often complex policy ideas into readily understandable language. Focuses on framing policies, testing messaging through focus groups and polling, and winning public approval through public statements and social media.

**10:833:483,484** ***Special Topics (3,3)***
**ELECTIVES**

Topics vary. See WebReg for current offerings. These courses are designed to address current issues in public policy.

**10:833:485,486** ***Independent Study (BA,BA)***
ELECTIVES
***Open to public policy (833) majors only. Prerequisites: Students must contract with a faculty sponsor and be granted permission by the program director.***

**10:833:495,496** ***Public Policy Thesis I,II (3,3)***
***ELECTIVES***

Develop, complete, and defend a thesis topic under the supervision of a faculty mentor.
***Open to students with GPAs over 3.4 and a faculty supervisor.***

**10:775:493,494** ***Bloustein Honors Research I,II (3,3)***
**ELECTIVE**

Bloustein Honors Research I,II is a two-semester, six-credit course sequence for students enrolled in the Bloustein Honors Research Program. The program is a formal, supervised yearlong project that involves both a peer classroom learning environment under the guidance of the course instructor and research with an individual faculty mentor.

**10:833:497,498** ***Bloustein Honors Research (3,3)***
**ELECTIVES**

Participation of advanced undergraduates as research assistants at one of the institutes or centers at the Bloustein School. Students contract with and are supervised by the principal investigator of the project.
***Open to students enrolled in the Bloustein School only.***

Course Listing (EJB-U)

# Public Administration and Management 843

# Public Administration and Management 843 Course Listing

This list includes the required core courses for the undergraduate public administration and management (843) minor offered at the Bloustein School as of September 1, 2024. Courses are taught by multiple instructors and may not be offered every semester.

Public administration and management minor requirements, and the complete list of public administration and management courses and electives offered, may be found at the Bloustein School website here.

Students should refer to WebReg for information about special topics courses.

**10:843:209** ***Introduction to Public Administration***
***CORE COURSE***

Introduction to the foundational elements of government and public administration. Overview of the essential characteristics of government, such as revenue collection, expenditure, and government workforce.

**10:843:210** ***Principles of Public Policy (3)***
***CORE COURSE***

Implementation of public policy including federal, state, and intergovernmental decision-making. Policy areas examined include environment, health care, development, labor, and others.
***Credit not given for both this course and 10:762:210 or 10:833:210.***

**10:843:313** ***Public and Non Profit Finance (3)***
***CORE COURSE***

An introduction to the ways that the public and nonprofit sectors determine which goods and services they will provide and how they will finance the production of those goods.
***Credit not given for both this course and 10:833:313 or 10:762:313.***

**10:843:360** *Managing Public Sector Organizations*
*CORE COURSE*

Fundamental tasks and responsibilities of management in the public sector, with an emphasis on the external and internal environments in which managers implement public policy.
***Credit not given for both this course and 10:501:360 or 10:833:360 or 10:762:360.***

Course Listing (EJB-U)

# Urban Planning and Design 971

# Urban Planning and Design 971 Course Listing

This list includes the required core courses and electives for the undergraduate urban planning and design (971) major and minor offered at the Bloustein School as of September 1, 2024. Courses are taught by multiple instructors and may not be offered every semester.

Urban planning and design major requirements, and the complete list of urban planning and design courses offered, may be found at the Bloustein School website here.

Students should refer to WebReg for information about special topics courses.

**10:971:101** *Introduction to Urban Studies (3)*
*ELECTIVE*

A general introduction to urban studies leading into the history of cities, suburbs, and the urban system, politics and economics of cities and metropolitan areas, and the peopling of urban areas.
***Credit not given for this course and 762:103 and 975:101.***

**10:971:201** *Introduction to Urban Planning and Design (3)*
*CORE COURSE*

Introduction to the purpose of plans and planning including planning domains such as housing, land use, and transportation with an emphasis on solutions to local problems.
***Credit not given for both this course and 10:762:201.***

**10:971:202** *Designing Healthy Cities (3)*
*CORE COURSE*

A review of the nature of America's cities and suburbs from their original planning stage to their ultimate reality and how it affects human health and well-being.
***Credit not given for both this course and 10:762:202, 10:832:202, and 10:975:202***

**10:971:233** *The Urban World (3)*
*ELECTIVE*

Interdisciplinary perspectives on the study of cities, historical and contemporary, and urban processes and problems.
*Credit not given for both this course and 10:762:233 or 10:975:233*

**10:971:250** *Introduction to GIS (3)*
*CORE COURSE*

Review of computing concepts and methods applicable to planning and health, including database management, introduction to GIS, and graphics.
*Credit not given for both this course and 10:762:250.*

**10:971:296,297** *Special Topics (3,3)*
*ELECTIVES*

Topics vary. See WebReg for current offerings. This course is designed to address current issues in planning and public policy.

**10:971:298,299** *Independent Study (BA,BA)*
*ELECTIVES*
*Prerequisites: A contract with a faculty sponsor and permission of the program director.*

**10:971:313** *Public & Nonprofit Sector Finance (3)*
*ELECTIVE*

An introduction to the ways that the public and nonprofit sectors determine which goods and services they will provide and how they will finance the production of those goods.
*Credit not given for this course 833:313 and 10:843:313*

**10:971:314** *Graphic Communication for Planners (3)*
*CORE COURSE*

Development of basic graphic skills necessary to communicate the visual and spatial characteristics of streets, buildings, and neighborhoods using Autocad, Sketchup, and Photosimulations.

**10:971:315** *Fundamentals of Urban Design (3)*
*CORE COURSE*

This course is an open lecture class that will focus on discussions about design within the context of urban planning systems.
*Credit not given for both this course and 10:762:315.*

**10:971:316** *Introduction to Site Planning and Urban Design (3)*
*CORE COURSE*

Understanding the impact of physical design on quality of life with a focus on analytic processes for the basic elements of human environments. Fieldwork is required.
*Prerequisite: 10:971:201. Credit not given for both this course and 10:762:316.*

**10:971:317** *Urban Municipal Management (3)*
*ELECTIVE*

Introduction to management issues for service delivery (e.g., police and fire, health, housing, transportation, and welfare). Focus on internal organizational structure and leadership.
*Credit not given for both this course and 10:975:317.*

**10:971:318** *History and Theory of Urban Planning and Design (3)*
*CORE COURSE*

Assessment of major ideas in city and regional planning since the early 19th century. Origin, growth, and impact of these ideas on the evolution of planning in the context of intellectual, social, and technological change.
*Credit not given for both this course and 10:762:318.*

**10:971:319** *Bridging Public Health & Urban Planning (3)*
*ELECTIVE*

Uses an interdisciplinary perspective to study the intersection of public health and urban planning. Will examine the prevention, assessment, and communication or management of an issue that connects public health outcomes to planning decisions and activities.

**10:971:395** *Methods of Planning Analysis (3)*
*CORE COURSE*

Review of research concepts and skills applied to planning. Includes development of original online data sources, coding, appropriate selection of statistical methods for analysis, and the professional presentation of results.
*Open to 971 majors only.*

**10:971:396, 397, 398** *Special Topics (3,3,3)*
*ELECTIVE*

Topics vary. See WebReg for current offerings. This course is designed to address current issues in planning and public policy.

**10:971:400** *Internship (3)*
*ELECTIVE*

Completion of a 125-hour field experience in a planning agency.
*Prerequisites: 10:971:395, senior status, and a faculty sponsor.*

**10:971:403** *Advanced Graphic Communication (3)*
*CORE COURSE*

Develop advanced graphics skills and learn to communicate complex visual and spatial plans to clients.
*Prerequisites: 10:971:201 and 10:971:316.*

**10:971:404** *Planning and Design Studio I (3)*
*CORE COURSE*

Application and synthesis of planning theory under the supervision of a professional planner to develop site plans, graphics, and form-based codes for a small town.
*Pre- or corequisite: 10:971:403.*

**10:971:405** *Planning and Design Studio II (3)*
*CORE COURSE*

Development of a comprehensive plan for a sustainable small town, including a professional quality report and group presentation of the deliverable.
*Prerequisite: 10:971:404.*

**10:971:413** *Urban Revitalization (3)*
*ELECTIVE*

Assessment of the causes of urban decline and subsequent renewal efforts. Emphasis on contemporary programs such as neighborhood renovation, gentrification, historic preservation, and economic development.
*Credit not given for both this course and 10:975:413 or 10:762:413.*

**10:971:448** *Historic Preservation (3)*
*ELECTIVE*

Overview of historical evolution of the preservation movement in the United States, examining important public preservation regulations and programs and the economics of historic preservation.
*Credit not given for both this course and 10:762:448. Cross-listed with 34:970:521.*

**10:971:463** *Environmental and Land-Use Law (3)*
*CORE COURSE*

Understanding of the legal principles behind environmental constraints on land-use, including critical areas, farmland preservation, water and sewer facilities, storm water and erosion management, and more.
*Credit not given for both this course and 10:762:463.*

**10:971:464** *Planning & the Global Environment (3)*
*ELECTIVE*

This course examines broad environmental factors that are outside the control of a singular community, some of the issues that emerge, and challenges and opportunities to address them. Through a critical reading of scholarly and gray literature, we analyze the role of political, social, and economic institutions and organizations in shaping our understanding and approaches to the global environment.
*Cross-listed with 34:970:680.*

**10:971:465** *Environmental Activism, Justice & Change (3)*
*ELECTIVE*

This course examines how systems of power produce unjust environmental and climate conditions, how local and global activists respond to and engage with environmental injustice, and the relevance of environmental activism for urban planning and policymaking. The course examines three main questions: 1) How are certain groups systematically burdened with environmental hazards and when do activists mobilize? 2) What tactics do they

employ and why? 3) What constitutes an environmental justice planning success or failure and what can we - as citizens and planners - do to improve our community's environmental justice record?
*Cross-listed with 34:970:574.*

**10:971:472** *Transportation Planning (3)*
*ELECTIVE*

Study of planning for transit, pedestrian, and bicycle priority networks and land uses at various scales.
*Credit not given for both this course and 10:762:472.*

**10:971:483,484** *Special Topics (3,3)*
*ELECTIVES*

Topics vary. See WebReg for current offerings. These courses are designed to address current issues in planning and public policy

**10:971:485,486** *Independent Study (BA,BA)*
*ELECTIVES*
*Prerequisites: Students must contract with a faculty sponsor and be granted permission by the program director.*

**10:971:497,498** *Bloustein Honors Research (3,3)*
*ELECTIVES*

Participation of advanced undergraduates as research assistants at one of the institutes or centers at the Bloustein School. Students contract with and are supervised by the principal investigator of the project.

Course Listing (EJB-U)

# Urban Studies 975

# Urban Studies 975 Course Listing

This list includes the required core courses and electives for the undergraduate urban studies (975) minor offered at the Bloustein School as of September 1, 2024. Elective courses are taught by multiple instructors and may not be offered every semester.

Urban studies minor requirements, and the complete list of urban studies courses and electives offered, may be found at the Bloustein School website here.

Students should refer to WebReg for information about special topics courses.

**10:975:101** *Introduction to Urban Studies (3)*
*CORE COURSE*

A general introduction to urban studies leading into the history of cities, suburbs, and the urban system, politics and economics of cities and metropolitan areas, and the peopling of urban areas.
*Credit not given for both this course and 10:971:101 or 10:762:101.*

**10:975:202** *Designing Healthy Cities (3)*
*ELECTIVE*

A review of the nature of America's cities and suburbs from their original planning to their ultimate reality and their effects on human health and well-being.
*Credit not given for both this course and 10:762:202, 10:775:202, 10:832:202, and 10:971:202.*

**10:762:230** *Global Poverty (3)*
*ELECTIVE*

Introduction to the causes and governmental responses to urban poverty in developing nations: economic, historical, and cultural factors.
*Credit not given for both this course and 10:762:230 and 10:833:230.*

**10:975:231** *Poverty in the United States (3)*
Assessment of causes and consequences of poverty in the United States: economic, historical, and cultural factors, plus governmental solutions.
*Credit not given for both this course and 10:762:231 and 10:833:231.*

**10:975:233** *The Urban World (3)*
*ELECTIVE*

Interdisciplinary perspectives on the study of cities, historical and contemporary, and urban processes and problems.
*Credit not given for both this course and 10:762:233 or 10:971:233.*

**10:975:235** *Urban Health (3)*
*ELECTIVE*

Exploration of patterns of disease and disability associated with global urban populations: understanding the factors contributing to them and evaluating policies intended to reduce the burden of disease.
*Credit not given for both this course and 10:762:235 or 10:832:235.*

**10:975:296,297** *Special Topics (3,3)*
*ELECTIVE*

Topics vary. See WebReg for current offerings. This course is designed to address current issues in planning and public policy.

**10:975:298,299** *Independent Study (BA,BA)*
*ELECTIVE*
*Prerequisites: A contract with a faculty sponsor and permission of the program director.*

**10:975:307** *Community Development (3)*
*ELECTIVE*

Analysis of neighborhood-based community development efforts to address housing, economic, and social issues affecting low-income communities. Resources for community building.
*Credit not given for both this course and 10:762:307.*

**10:975:310** ***U.S. Housing Policy (3)***
***ELECTIVE***

Exploration of major issues in housing: historical, economic, and social factors. Political and regulatory dimensions of housing decision-making: housing codes and the landlord-tenant relationship.
***Credit not given for both this course and 10:762:310 and 10:833:310.***

**10:975:352** ***Technology in the City (3)***
***ELECTIVE***

Exploration of the social and economic implications of new communications technologies for urban life. Includes consideration of e-commerce, online education, e-government, and infrastructure needs.
***Credit not given for both this course and 10:762:352 and 10:775:352.***

**10:975:413** ***Urban Revitalization (3)***
***ELECTIVE***

Assessment of the causes of urban decline and subsequent renewal efforts. Emphasis on contemporary programs such as neighborhood renovation, gentrification, historic preservation, and economic development.
***Credit not given for both this course and 10:762:413 or 10:971:413.***

**10:975:483,484** ***Special Topics (3,3)***
***ELECTIVES***

These courses are designed to address current issues in urban studies. Topics vary. See WebReg for current offerings.

**10:975:485,486** ***Independent Study (BA,BA)***
ELECTIVES

***Prerequisites: Students must contract with a faculty sponsor and be granted permission by the program director.***

**10:975:498,499** ***Bloustein Honors Research (3,3)***
***ELECTIVES***

Participation of advanced undergraduates as research assistants at one of the institutes or centers at the Bloustein School. Students contract with and are supervised by the principal investigator of the project.

# Administration, Centers, and Faculty (EJB-U)

## ADMINISTRATION, CENTERS, AND FACULTY

Administration, Centers, and Faculty (EJB-U)

# Office of the Dean

# OFFICE OF THE DEAN

Stuart Shapiro, *Professor and Dean*

Katie Cung, *Assistant to the Dean*

Clinton J. Andrews, *Professor and Associate Dean for Research*

Theresa Kirby, *Associate Dean of Administration*

Robert B. Noland, *Distinguished Professor and Associate Dean of Faculty*

Julia Sass Rubin, *Associate Professor, Associate Dean of Academic Programs*

Patricia O'Brien-Richardson, *Associate Teaching Professor; Chief Diversity, Equity, and Inclusion Officer*

Samantha Brannigan, *Research Specialist for Assessment and Accreditation*

**Student and Academic Services**

***Graduate Program***

Stephen D. Weston, *Assistant Dean of Academic Administration*

Lynn Astorga, *Director of Student Recruitment and Adjunct Faculty*

Courtney Culler, *Associate Director for Graduate Student Services*

Greg Marrero, *Student Counselor for Graduate Student Services*

Cheryl Egan, *Career Management Specialist*

Andrea Garrido, *Career Management Specialist*

Marie O'Brien, *Administrative Assistant, Student Services*

***Undergraduate Program***

Christina Torian, *Assistant Dean of Undergraduate Education*

Natashia Huff, *Assistant Director of Undergraduate Student Services*

Alicia Nesser, *Student Counselor, Undergraduate Student Services*

Jessica Reyes, *Student Counselor, Undergraduate Student Services*

**Business Services**

Madelaine Corcoran, *Director, Business Services and Human Resources*

Keri Ferreira, *Department Administrator*

Stephanie Kose-Crozier, *Business Specialist & Events Manager*

Olufunke Odukoya, *Business Manager*

Katie Cung, *Business Assistant*

Iram Faisal. *Administrative Assistant*

Vivian Percoco, *Office Assistant*

**Communications and Marketing**

Karyn Olsen, *Director, Communications, Marketing & Public Relations*

Tamara Swedberg, *Communications, Social Media, and Website Specialist*

**Development**

Janet Cole, *Director of Development*

Madison Welch, *Alumni and Development Specialist*

**Facilities**

Thomas W. Calhoun, *Assistant Campus Facilities Manager, Civic Square Building*

**Information Technology**

Joseph Abraham , *Director, Information Technology Services*

Robert Urbanowicz, *Systems Administrator*

Michael Samman, *Lead Instructional Designer*

Ariel Sanchez, *Unit Computing Manager*

# Program and Center Directors

# PROGRAM AND CENTER DIRECTORS

## ACADEMIC PROGRAMS

**Undergraduate Programs**
Christina Torian, Assistant Dean of Undergraduate Education

**Doctoral Program in Planning and Public Policy**
Michael Smart, Director

**Public Policy Program**
Julia Sass Rubin, Director

**Urban Planning and Policy Development Program**
Mi Shih, Director

**Health Administration Program**
Soumitra Bhuyan, Executive Director

**Informatics Program**
Jim Samuel, Executive Director

## RESEARCH CENTERS AND INSTITUTES

**Bloustein Center for Survey Research**
Nancy Wolff, Director

**Center for Urban Policy Research**
Clinton J. Andrews, Director
David Listokin, Associate Director
Jennifer Senick, Executive Director

- **Bloustein Local**
- **Built Environment and Green Building**
- **Infrastructure Networks**
- **Environmental Analysis and Communications Group**
- **Planning Healthy Communities Initiative**
- **Sustainable Raritan River Initiative**
- **Urban Policy**
- **Rutgers Economic Advisory Service (R/ECON)**
  Will Irving, Director

**John J. Heldrich Center for Workforce Development**
Carl Van Horn, Director
Andrea Hetling, Associate Director

**New Jersey State Policy Lab**
Elizabeth Cooner, Executive Director

- Center for Negotiation and Conflict Resolution

**Rutgers Urban and Civic Informatics Lab**
Piyushimita "Vonu" Thakuriah, Director

**Alan M. Voorhees Transportation Center**
Robert B. Noland, Director

- **National Transit Institute**
  Billy Terry, Director
- **New Jersey Travel Independence Program (NJTIP @ Rutgers)**
  Andrea Lubin, Managing Director
- **New Jersey Bicycle & Pedestrian Resource Center**
- **New Jersey Safe Routes to School**

**Ralph W. Voorhees Center for Civic Engagement**
Kathe Newman, Director



# Faculty

# FACULTY

**Amy E. Abruzzi**, Associate Teaching Professor; Undergraduate Public Health Program Coordinator
*B.A., M.L.S., Rutgers; M.A., M.A., New York; Ph.D., M.P.H., UMDNJ-School of Public Health*
Teaching and research interests include the prevention of chronic illness and comorbidities; the geography of health, especially urban/rural issues in the United States as well as globally; and environmental and occupational contributions to disease disparities.

**Hooshang Amirahmadi**, Distinguished Service Professor
*B.A. Tabriz (Iran); M.S., Dallas; Ph.D., Cornell*
Teaching and research interests include national economic development policies and planning; globalization and international relations; foreign investment and trade; regional economic development; and industrial and technology policy.

**Clinton J. Andrews**, Professor and Associate Dean for Research
*Sc.B., Brown; Ph.D., Massachusetts Institute of Technology*
Teaching and research interests include the use of technical knowledge in environmental decision making; environmental management; energy policy; and social science aspects of industrial ecology.

**Juan Ayala**, Associate Professor of Practice
*B.S., Rutgers; M.Arch., NJIT*
Teaching and research interests include urban design; community participation and visioning; expansion of the semipublic realm; 3-D visualization and image sequencing; critical thinking, decision making and design; and parametric design development in planning.

**Bernadette V. Baird-Zars**, Assistant Professor
*B.A., Swarthmore; M.C.P., MIT; Ph.D., Columbia*
Teaching and research interests include land use; local government; implementation and enforcement; transition and uncertainty; environmental justice; institutional analysis; action/project-based learning; longitudinal data; and planning ethics and theory.

**Francis Barchi**, Associate Professor
*B.A., Smith; Ph.D., M.B.E., M.Sc., Pennsylvania*
Teaching and research interests include global health ethics; gender-based violence and women's health in sub-Saharan Africa; ethical issues in international research; capacity-building in research ethics in low- and middle-income countries; and ethics education.

**Marci Berger**, Associate Teaching Professor
*B.A., Cornell; M.A., Rutgers; M.P.H., UMDNJ/RWJ Medical School; Ph.D., Rutgers*
Teaching and research interests include health policy; public policy; reproductive rights; and poverty in the United States.

**Soumitra Bhuyan**, Associate Professor and Executive Director, Master of Health Administration Program
*M.P.H., Western Kentucky; Ph.D., University of Nebraska Medical Center College of Public Health*
Teaching and research interests include chronic disease management; health information systems; and population health.

**Debra Borie-Holtz**, Associate Teaching Professor
*B.A., M.P.A.P., Ph.D., Rutgers*
Teaching and research interests include policy formation and implementation; legislative leadership and governing; federal and state regulatory process; women in government; and survey research design, delivery, and data analysis.

**Joel Cantor**, Distinguished Professor; Director, Center for State Health Policy
*B.A., Wisconsin; Sc.D., Johns Hopkins*
Teaching and research interests include healthcare financing and delivery; healthcare policy; and access to health services by low-income populations.

**Raphael J. Caprio**, University Professor
*B.A., Rutgers; M.A., Cincinnati; Ph.D., Rutgers*
Teaching and research interests include government management; state and local tax policy; interest arbitration and public sector labor issues; and regional economic development.

**Yen-Tyng Chen**, Assistant Professor
*B.S., M.S., National Taiwan; Ph.D. Emory*
Teaching and research interests include HIV status-neutral care; substance use; mental health; social determinants of health; place-based epidemiology; and network epidemiology.

**Céu Cirne-Neves**, FACHE, Assistant Teaching Professor
*B.A., Rutgers; M.P.A., Fairleigh Dickinson; Lean Six Sigma Green Belt, Villanova*
Teaching and research interests include leadership development and mentorship; strategic planning & performance excellence; population health (alignment of public health, healthcare, and social services); community needs assessment, health equity and systems alignment; operations management and patient safety; employee engagement and patient experience; diversity and inclusion.

**Jocelyn Elise Crowley**, Professor
*B.A., Cornell; M.P.P., Georgetown; Ph.D., Massachusetts Institute of Technology*
Teaching and research interests include American social policy; family policy; and women and politics.

**William Cundiff, Assistant Teaching Professor**
*B.S., MBA, Wagner; J.D., Touro College Law Center*
Teaching and research interests include marketing, artificial intelligence, finance, health administration, health policy, and U.S. health systems.

**Thomas P. Davis**, Assistant Teaching Professor
*B.A., Villanova; M.C.R.P., Rutgers; M.P.A., Columbia*
Teaching and research interests include comparative health policy; gun safety; social theory; and ethics.

**James DeFilippis**, Professor
*B.A., Vermont; M.A., Ph.D., Rutgers*
Teaching and research interests include urban political economy and political philosophy; community development theory and practice; unregulated work and the informal economy; and immigration.

**Derek DeLia**, Associate Professor
*B.A., Rutgers-Camden; M.A., Ph.D., Cornell*
Teaching and research interests include healthcare payment and delivery reform; federal and state health policy; performance measurement for accountable care organizations (ACOs); shared savings arrangements; coordination of care for complex patients; emergency medical care; healthcare access; and health insurance coverage.

**Aakanksha Deoli**, Instructor of Teaching and Undergraduate Internship Coordinator
*M.H.A., Rutgers*
Teaching interests include maternal health; population health; healthcare disparities; healthcare management; and process improvement.

**Barbara Faga**, Professor of Professional Practice in Urban Design
*B.S., Michigan State; Ph.D., Georgia Institute of Technology*
Teaching and research interests include participatory planning; landscape architecture; planning practice and theory; zoning; and urban design.

**Anita Franzione**, Associate Teaching Professor
*B.A., M.P.A., NYU; Dr.P.H., Columbia*
Teaching and research interests include U.S. health care systems; aging; long-term care; quality improvement in patient care in various settings; and public health initiatives.

**Irina Grafova**, Associate Professor
*B.S., Moscow State; M.A., New Economic School (Moscow, Russia); Ph.D., University of Michigan*
Teaching and research interests include socio-economic inequalities in health; financial strain; financial toxicity of cancer; health policy; healthcare spending; and neighborhoods.

**Alexander J. Hatala**, FACHE, Executive in Residence, Master of Health Administration Program
*B.A., Rutgers; M.B.A./H.A., Florida*
Research interests include health care management and operations; population health; and global health.

**Andrea Hetling**, Professor; Associate Director, Heldrich Center for Workforce Development
*B.A., Columbia; Ph.D., Maryland*
Teaching and research interests include anti-poverty and human services policy; Temporary Assistance for Needy Families (TANF) and the safety net; equity analysis of public policies; social policy implementation; and intimate partner violence.

**James W. Hughes**, University Professor and Dean Emeritus, Edward J. Bloustein School of Planning and Public Policy
*B.S., M.C.R.P., Ph.D., Rutgers*
Teaching and research interests include demographics and housing; regional and New Jersey economics; development patterns and transportation.

**Will Irving**, Associate Professor of Practice
*B.A., University of California Santa Cruz; M.P.P., Rutgers, Edward J. Bloustein School of Planning and Public Policy*
Teaching and research interests include economic policy; historical and current tax trends; economic forecasting; economic impact analysis; and quantitative economics.

**Radha Jagannathan**, Professor
*B.A., School of Economics, Delhi (India); M.A., Rutgers; Ph.D., Princeton*
Teaching and research interests include school-to-work transition; social capital and community development; culture and human capital development; international comparative studies on youth; poverty, public welfare, and child welfare; and evaluation of social programs.

**Jane Kaye**, Associate Professor of Teaching
*B.A., Pennsylvania; M.B.A., Boston*
Teaching and research interests include budget and finance; health economics; health policy; strategic planning; business development; and healthcare management and operations.

**Susan Krum**, Associate Professor of Teaching
*B.S., East Stroudsburg; M.A., Temple; Au.D., Salus*
Teaching and research interests include strategic planning; business development; healthcare management; healthcare operations; budget and finance; organizational strategy; and population health.

**Ellen Kurtzman**, Professor
*B.S.N., Pennsylvania School of Nursing; M.P.H., Johns Hopkins; Ph.D., George Washington*
Teaching and research interests include the impact of federal, state, and institutional policies on health care delivery; cannabis use and cannabis policy; the role of the health care workforce in achieving higher value care; team-based care; quality of care and the services delivered by nurse practitioners and physician assistants; the influence of performance-based payment programs on practitioner behavior.

**Zoe Lindenfeld**, Assistant Professor
*B.S., Cornell; Ph.D., NYU School of Global Public Health*
Teaching and research interests include health policy and services; mitigating factors that perpetuate health inequities for individuals with substance use disorders; mixed-methods research designs; operationalizing harm reduction as an approach to care within clinical settings; racial disparities in the availability of hospital-based substance use treatment; and disparities in the distribution of services for substance use disorders.

**David Listokin**, Distinguished Professor; Director, Center for Urban Policy Research
*B.A., CUNY (Brooklyn); M.C.R.P., Ph.D., Rutgers*
Teaching and research interests include housing and land development; development impact assessment; and historic preservation.

**Alexandra Lopez**, Associate Teaching Professor
*B.A., Rutgers; M.A., Kean*
Teaching and research interests include clinical supervision in addictions counseling and cultural competency; and clinical service provision within the Latino community.

**Jane Miller**, Professor and Faculty Mentoring Director
*B.A., Williams; M.A., Ph.D., Pennsylvania*
Teaching and research interests include quantitative reasoning; research communication; health services research; statistical literacy; poverty and child health; and access to health care.

**Kathe Newman**, Professor and Director, Ralph W. Voorhees Center for Civic Engagement
*B.A., Manhattan; Ph.D., CUNY*
Teaching and research interests include urban change, revitalization, and community development; community food planning; housing policy and finance; and economic development.

**Fereydoun Nikpour**, Professor of Teaching
*B.A., M.A., National University of Iran (NUI); M.C.R.P., Ph.D., Rutgers*
Teaching and research interests include statistical research methods; national spatial development planning; development of metropolitan areas in developing countries; and methods of regional analysis.

**Robert B. Noland**, Distinguished Professor; Associate Dean of Faculty; Director, Alan M. Voorhees Transportation Center
*B.A., California; M.Sc., Ph.D., Pennsylvania*
Teaching and research interests include the impacts of transport planning and policy on environmental outcomes; micro-simulation of pedestrian-vehicle interactions; non-motorized transportation; and safety analysis.

**Patricia O'Brien-Richardson**, Associate Teaching Professor and Chief Diversity, Equity and Inclusion Officer
*B.A., SUNY Old Westbury; M.S.Ed., CUNY Brooklyn; Ph.D. Rutgers*
Teaching and research interests include urban public health disparities; education policy; social justice; race, class, and gender policies.

**Emily Parker**, Assistant Professor
*B.A., American; M.A., Ph.D., Cornell*
Teaching and research interests include health and social policy; poverty and inequality; gender and family; and spatial demography.

**Mark Paul**, Assistant Professor
*B.A., Ph.D., UMass Amherst*
Teaching and research interests include political economy; environmental policy; and inequality of race, gender, and class.

**Will B. Payne**, Assistant Professor
*A.B., Harvard; Ph.D., California (Berkeley)*
Teaching and research interests include urban geography, geographic information science (GIS), urban informatics, spatial data science, critical and feminist GIS, food studies, and gentrification studies.

**Katie Pincura**, Associate Teaching Professor
*B.A., Georgia; M.A., Adler-Vacouver, B.C.; M.P.H., Armstrong State; D.P.H. Leadership, Georgia Southern*
Teaching and research interests include community health and social services management; health policy; healthcare workforce issues in underserved communities such as the uninsured, people with intellectual and developmental disabilities, people living with HIV, and those impacted by the opioid epidemic.

**Ronald Quincy**, Professor of Professional Practice
*B.A., M.A., University of Detroit; Ph.D., Michigan State*
Teaching and research interests include nonprofit sector leadership and governance; fundraising, institutional branding, and grantsmanship; organizational strategy; human capital, performance, and executive coaching; international civil society organizations; and international affairs.

**Kelcie Ralph**, Associate Professor
*B.S., Alaska (Anchorage); M.E.P., Cambridge; M.C.D.S.S., London School of Economics; Ph.D., California (Los Angeles)*
Teaching and research interests include travel behaviors of special populations; and causes and consequences of the decline in driving among young adults.

**Andrea Restrepo-Mieth**, Assistant Professor
*B.A. SUNY New Paltz; M.P.P., National University of Singapore; Ph.D., Cornell*
Teaching and research interests include planning institutions; politics of planning for water and sanitation; grassroots involvement in urban governance; cities and metropolitan areas in the Global South; progressive planning; and climate change adaptation.

**Julia Sass Rubin**, Associate Professor, Associate Dean for Academic Administration, and Director, Program in Public Policy
*A.B., Harvard (Radcliffe); M.B.A., A.M., Ph.D., Harvard*
Teaching and research interests include education policy; social justice; nonprofit advocacy; grassroots mobilization; and community economic development.

**Melinda Rushing**, Assistant Professor
*B.A., M.S. Social Work, Houston; Ph.D., Texas Health Sciences Center at Houston, School of Public Health*
Teaching and research interests include data science amd social work; inequities in health services delivery among individuals living with chronic illnesses; trends in health behavior; health disparities and their effect on health outcomes.

**Hal Salzman**, Professor and Senior Faculty Fellow, John J. Heldrich Center for Workforce Development
*B.A., California (Santa Cruz); M.A., Ph.D., Brandeis*
Research interests include workforce development and labor markets; science and engineering workforce policy; socioeconomic analysis of Arctic communities and employment; effects of technological change; and low-wage workers, internal labor markets, and corporate restructuring.

**Jim Samuel**, Associate Professor of Practice and Executive Director, Master of Public Informatics
*M.Arch, Sir J.J. College of Architecture, an affiliate of the Royal Institute of British Architects; M.B.A., Arizona State; Ph.D., Baruch*
Teaching and research interests include artificial intelligence; data science; social media analytics; AI bias and ethics; and computer simulation modeling.

**Eric Seymour**, Assistant Professor
*B.A., Florida Atlantic; M.U.R.P., Florida; Ph.D., Michigan*
Teaching and research interests include community development; housing; informatics; statistical research methods; and GIS.

**Stuart Shapiro**, Professor and Dean, Edward J. Bloustein School of Planning and Public Policy
*B.S., Case Western Reserve; M.P.P., Ph.D., Harvard*
Teaching and research interests include the regulatory process; cost-benefit analysis; federal bureaucracy; regulatory reform; and policy analysis.

**Mi Shih**, Associate Professor and Director, Program in Urban Planning and Policy Development;
*B.S., M.S., National Taiwan; Ph.D., Rutgers*
Teaching and research interests include international urbanization; land development, land politics and and property rights; displacement; social protests and community participation; ethnographic methods.

**Michael Smart**, Associate Professor and Director, Ph.D. Program in Planning and Public Policy
*B.A., Yale; M.C.R.P., Pennsylvania; Ph.D., California (Los Angeles)*
Teaching and research interests include transportation; immigrant neighborhoods; LGBT neighborhoods; urban modeling; and GIS.

**Piyushimita "Vonu" Thakuriah**, Distinguished Professor and Dean Emeritus, Edward J. Bloustein School of Planning and Public Policy; Director, Rutgers Urban and Civic Informatics Laboratory (RUCI Lab)
*B.A., M.A., Dehli (India); M.U.P.P., Ph.D., Illinois (Chicago)*

Teaching and research interests include transportation planning and operations; big data, urban informatics, smart cities, and urban mobility analytics; social and economic cyberinfrastructure; data justice, equity, and ethical aspects of information technology, AI, and automation.

**Jermaine Toney**, Assistant Professor
*B.A., St. Thomas; M.S., Ph.D., Milano - The New School*
Teaching and research interests include applied microeconomics; socioeconomic and racial inequality; wealth and health disparities; and demography and family connections.

**Carl E. Van Horn**, Distinguished Professor; Director, John J. Heldrich Center for Workforce Development
*B.A., Pittsburgh; M.A., Ph.D., Ohio State*
Teaching and research interests include employment policy; economic development; education policy; state government and federalism; and policy analysis and evaluation.

**Sharifa Z. Williams**, Assistant Professor
*B.A., Rutgers; M.P.H., Dr.PH., Columbia*
Teaching and research interests include identifying health disparities; describing longitudinal trends in psychosocial exposures across the life-course; development of Bayesian modeling approaches for improving inference about psychiatric conditions using survey data; analyzes trends in overdose and suicide attempts in large statewide datasets

**Ruth Winecoff**, Assistant Professor
*B.A., UNC Chapel Hill; M.P.A., Ph.D., Indiana-Bloomington*
Teaching and research interests include budget and finance; economics; health disparities; health policy; environmental planning and policy

**Nancy Wolff**, Distinguished Professor; Director, Bloustein Center for Survey Research
*B.A., Ph.D., Iowa State*
Teaching and research interests include health economics; public finance; and criminal justice.

**Wenwen Zhang**, Associate Professor
*B.E., Zhejiang (China); M.S., M.S., Ph.D., M.C.R.P., Georgia Institute of Technology*
Teaching and research interests include urban land use and transportation interaction; innovative/disruptive transportation technology; urban modeling/simulation; sustainable development; data analytics and visualization in planning.



# Associated Faculty

# ASSOCIATED FACULTY

**Robert Kopp,** Professor, Department of Earth and Planetary Sciences, School of Arts and Sciences; Director, Coastal Climate Risk and Resilience Initiative
*S.B., Chicago; Ph.D., California Institute of Technology*
Teaching and research interests include past states of the Earth system and modeling future global change; and assessments of the effects of policy on energy, economic, and climate systems.

**Lenna Nepomnyaschy,** Associate Professor, School of Social Work
*Ph.D., Columbia*
Teaching and research interests include child and family policy; poverty and inequality; and health disparities.

**Karen O'Neill,** Associate Professor and Undergraduate Director, Department of Human Ecology, School of Environmental and Biological Sciences
*B.A., San Francisco; M.A., Ph.D., California (Los Angeles)*
Teaching and research interests include environmental policy; U.S. history; political sociology; comparative and historical sociology; environmental justice; and environmental sociology.

**Edward Ramsamy,** Associate Professor of Africana Studies, School of Arts and Sciences
*B.A. (Hons), Durban-Westville (South Africa); M.C.R.P., Ph.D., Rutgers*
Teaching and research interests include international development planning; geographies of globalization; political economy of transition and nation-building in post-colonial/developing societies; and comparative politics of identity and race relations in South Africa and the United States.

**Mark Gregory Robson,** Vice Provost for Graduate Education; Board of Governors Distinguished Service Professor and Distinguished Professor of Plant Biology
*B.S., M.S., Ph.D., Rutgers; M.P.H., UMDNJ/School of Public Health*
Teaching and research interests include exposure science and pesticide use, primarily in developing countries and on a global scale; and risk assessment processes as they relate to public health and health policy.

**Rachael Shwom,** Assistant Professor, Department of Human Ecology, School of Environmental and Biological Sciences
*B.A., Syracuse; M.E.M., Duke; Ph.D., Michigan State*
Teaching and research interests include energy efficiency policy; reducing greenhouse gas emissions; formation of public opinions on climate change; and media's coverage of climate change.

**Hannah Younes**, Post-Doctoral Research Associate
*Ph.D., Maryland*
Teaching and research interests include sustainable transportation and promoting equity



# Fellows

# FELLOWS

**Adriana Abizadeh**, Senior Policy Fellow
*B.S. Rutgers-Camden; M.S Drexel*
Teaching and research interests include collective land ownership; community organizing; decommodification; democratic participation; governance.

**Hon. Paul W. Armstrong**, J.S.C., M.A., J.D., LL.M., Senior Policy Fellow and Judge in Residence, Master of Health Administration Program
*A.B., Oxford, Exeter ; M.A., Dayton; J.D., Notre Dame Law; L.L.M, NYU School of Law*
Teaching and research interests include healthcare law and ethics.

**David Artz**, MD, MBA, Health Administration Fellow
*B.S. Rochester; M.D., West Virginia School of Medicine; M.B.A., Northwestern*
Teaching and research interests include healthcare informatics, economics, and precision medicine payment and policy.

**Lawrence B. Burrows,** Senior Planning Fellow
*B.A., Rutgers; M.C.P., Pennsylvania; A.M.P., Wharton School*
Teaching and research interests include market analysis; financial feasibility; real estate development; and team building and development.

**Henry Coleman**, Senior Policy Fellow, Professor Emeritus
*B.A., Morehouse, M.A. and Ph.D., Princeton University*
Teaching and research interests include state and local public finance, intergovernmental relations and government structure, income (re)distribution, education finance, and urban revitalization.

**Bob Gordon**, Senior Policy Fellow
*B.A., Williams; M.P.P., Goldman School of Public Policy, Cal-Berkeley; M.B.A., Wharton Business School, Pennsylvania; London Business School, International Management Program*
Teaching and research interests include transportation policy, corporate management, and the intersection of business and government.

**Sanford M. Jaffe**, Policy Fellow
*B.A. Rutgers; L.L.B. Harvard Law School*
Teaching and research interests include decision-making in negotiations and collaborations; barriers to effective negotiations; impact of decision-making processes on the nature of, and compliance with, outcomes.

**Richard F. Keevey**, Senior Policy Fellow
*B.A., LaSalle; M.P.A., Wharton, University of Pennsylvania*
Research interests include federal, state, and local fiscal policy; financial management; and education and finance challenges.

**Brandon McKoy**, Senior Policy Fellow
*B.A., The College of New Jersey; M.C.R.P., Rutgers*
Teaching and research interests include racial equity; economic justice; public policy; and healthcare.

**Russ Molloy**, Senior Policy Fellow
*B.A., Rutgers; J. D. Seton Hall Law*
Teaching and research interests include political institutions; politics; advocacy; government relations; regulatory affairs; independent authorities.

**Roberto Muniz,** Senior Health Administration Fellow
*B.S., M.P.A., Rutgers*
Teaching and research interests include health and aging services.

**Marc Pfeiffer,** Senior Policy Fellow; Assistant Director, Bloustein Local Government Research Center
*B.S., American; M.P.A., New York*
Teaching and research interests include local and state government policy and administration; local government fiscal policy; the legislative process and regulation; use of technology in local government; and training of public administrators in matters of government transparency that intersect with technology.

**Eduardo Schur**, Senior Health Administration Fellow
*Bachelors, Post Graduate, Finance FGV -- Fundação Getulio*
Teaching and research interests include market assessments, brand and marketing strategy development, competitive assessment, analysis of patient pathways and buying process, portfolio and franchise strategy, market analytics and customer insights.

**Linda Stamato**, Policy Fellow
*B.A., Rutgers; M.A. Seton Hall; M.A., Rutgers; Ph.D. (ABD), NYU*
Teaching and research interests include decision-making in negotiations and collaborations; barriers to effective negotiations; impact of decision-making processes on the nature of, and compliance with, outcomes; theoretical (and practical) concerns having to do with intractable controversies, particularly those that emerge in public policy decision-making.

# Student Organizations (EJB-U)

## STUDENT ORGANIZATIONS

Student Organizations (EJB-U)

## Bloustein Public Service Association (BPSA)

## Bloustein Public Service Association (BPSA)

The Bloustein Public Service Association (BPSA) seeks to provide a network for students interested in public service initiatives and career networking opportunities. Although many of the students interested in this organization may be enrolled as students at the Edward J. Bloustein School of Planning and Public Policy as planning and public policy (762) and public health (832) majors, this organization is open to all Rutgers University-New Brunswick undergraduate students, and is committed to actively supporting their interests through networking opportunities, career development, and service.

The organization was established during the fall 2006 semester to honor Edward J. Bloustein, a former Rutgers University president, scholar, and active citizen during his lifetime. The group provides opportunities for networking, as well as participation in a variety of public service activities. BPSA endeavors may involve local government and community-based and nonprofit organizations in areas of interest that include community development, health, housing, and transportation. Undergraduate students benefit by participating in the BPSA and thereby gaining access to academic and career development activities, as well as mentoring and networking opportunities. Officers for the BPSA are required to be declared planning and public policy (762) majors or declared public health (832) majors at the Bloustein School.

# Bloustein Social Justice Committee

# Bloustein Social Justice Committee

The Bloustein Social Justice Committee (BSJC) provides an independent space for students to embody, integrate, and act upon principles of social justice within the Edward J. Bloustein School of Planning and Public Policy and the broader community. We provide opportunities for Bloustein students to voice their ideas and concerns, organize formal and informal social justice activities for Bloustein students, staff, and faculty, facilitate collaborative engagement between Bloustein and the surrounding community, and support the work of aligned institutional initiatives. For more information or to get involved, email the group at blousteinsjc@gmail.com.

Student Organizations (EJB-U)

# EJB|D E S I G N S

# EJB|D E S I G N S

EJB|D E S I G N S began as a group of planning students and faculty looking to improve their hand-drawing skills and digital graphic methods. A social organization based out of the Bloustein School, the group encourages networking with professionals, faculty, and students interested in learning and teaching digital and hand-drawing techniques. Through practice and social networking its members prepare for the planning and urban design profession. It is open to both undergraduate and graduate students.

Student Organizations (EJB-U)

# Epsilon Beta Chapter of Eta Sigma Gamma (National Health Education Honorary)

# Epsilon Beta Chapter of Eta Sigma Gamma (National Health Education Honorary)

Rutgers installed the Epsilon Beta Chapter of Eta Sigma Gamma, the National Health Education Honorary, in the spring of 2009. The primary purpose of Eta Sigma Gamma is to further the professional competence and dedication of individual members of the health education profession. The mission of the honorary is promotion of the discipline by elevating the standards, ideals, competence, and ethics of professionally prepared men and women in health education. Eta Sigma Gamma also provides grant opportunities, scholarships, and travel assistance as well as a wide network of professionals in health education throughout the country. Students are asked to take an active role in contributing knowledge and skills to the task of providing health promotion and health education services to those in need.

Student Organizations (EJB-U)

# New Jersey Public Health Association-Rutgers Student Chapter

# New Jersey Public Health Association-Rutgers Student Chapter

The New Jersey Public Health Association (NJPHA) - Rutgers Student Chapter seeks to advance and support the cause of public health within the Rutgers community and throughout New Jersey. We host lectures, seminars, and panel discussions to educate students and create a bridge to public health professionals, and offer mentorship, internship, and networking opportunities with the NJPHA professional network. The organization also hosts awareness events on campus and in the surrounding community and hands out contraceptives, pamphlets, and healthy food as we strive to educate the community on how to utilize resources and options.

We are actively involved in Rutgers events such as Winter Wishes and Rutgers Day and also work consistently with community partners in New Brunswick including Dina's Dwellings, Unity Square, and the Robert Wood Johnson University Hospital. Ultimately, our goal is to educate students and support future leaders in the field, functioning as an organization to benefit all future health professionals at Rutgers University.

Student Organizations (EJB-U)

# Public Informatics Student Group

# Public Informatics Student Group

The Public Informatics Student Group (PISG) is an interdisciplinary organization for students interested in topics that bridge the gaps between information technology and public service. Founded in 2019, the organization is open to undergraduate and graduate students with an interest in discovering how governments, education, health care, and social services are learning to be more agile in the age of big data, artificial intelligence, and the internet of things.

Student Organizations (EJB-U)

# Rutgers Future Healthcare Administrators

# Rutgers Future Healthcare Administrators

Rutgers Future Healthcare Administrators is a student-led organization dedicated to developing future health care leaders by promoting networking, academics, and community involvement to the students at Rutgers University.

While affiliated with the Edward J. Bloustein School of Planning and Public Policy, the group encourages all majors from nursing to premed to business to IT to join and learn about this rapidly growing field.

# Aims of the School (SMLR-U)

## AIMS OF THE SCHOOL

The School of Management and Labor Relations (SMLR) seeks to create and disseminate knowledge that fosters a better understanding of employment and work in modern society, promote harmony and cooperation between management and labor, and improve employment systems and relationships.

In pursuit of this mission, SMLR faculty members conduct research, organize credit and noncredit programs, and provide technical assistance to employers and labor organizations.

# Faculty (SMLR-U)

## FACULTY

Vikrant Advani; M.A., Rutgers
Labor and employment relations

Eric Blanc; Ph.D., New York
Sociology

Joseph R. Blasi; Ed.D., Harvard
Sociology of organizations

Dana Britton, Chair, Department of Labor Studies and Employment Relations; Ph.D., Texas (Austin)
Gender and work; gender and social control

William Brucher; Ph.D., Brown
Labor education

Nichelle Carpenter; Ph.D., Texas A&M
Industrial/organizational psychology

William Castellano; Ph.D., Rutgers
Industrial relations and human resources

Tracy F.H. Chang, Associate Dean for Diversity, Equity, and Inclusion; Ph.D., Iowa
Sociology

Rosemarie Cipparulo; J.D., Rutgers
Union-side labor law; employment law; constitutional law; and civil rights matters

Douglas Coffey; M.B.A., St. John's

Ashley Conway; M.A., American
Workplace development; communications; occupational safety and health

James M. Cooney; J.D., School of Law, Miami

Sheri Davis; Ph.D., Emory
American studies

Lindsay Yasmin Dhanani; Ph.D., Central Florida
Industrial/organizational psychology

William Dwyer; M.A., Rutgers
Management

Adrienne Eaton, Dean of Rutgers School of Management and Labor Relations; Ph.D., Wisconsin
Industrial relations

Hadi El-Farr; Director, Online Professional Master of Human Resource Management Program; Ph.D., Leeds
Knowledge management; diversity issues; labor economics

Jie (Jasmine) Feng; Ph.D., Wisconsin (Madison)

David A. Ferio, Director, Master of Human Resource Management Program; A.B.D., Stevens Institute of Technology

Janice Fine; Ph.D., Massachusetts Institute of Technology
Political science

Rebecca Kolins Givan; Ph.D., Northwestern
Health care work and the public sector

Rebecca Greenbaum, Associate Dean for Academic Affairs; Ph.D., Central Florida
Business administration

Ryan Greenbaum, Director, Undergraduate Program in Human Resource Management; M.B.A., Oklahoma State

Joo Hun Han; Ph.D., Maryland
Strategic HRM compensation

Christopher Hayes; Ph.D., Rutgers
American history

Charles Heckscher; Ph.D., Harvard
Sociology

Lawrence Houston III; Ph.D., Penn State
Industrial-organizational psychology

Hazel-Anne Johnson-Marcus; Ph.D., South Florida
Industrial-organizational psychology

William Kane; Ph.D., Fielding Graduate
Organizational development and change

Carla Katz; J.D., Seton Hall

Maria L. Kraimer; Ph.D., Illinois (Chicago)
Business administration and human resource management

Douglas Kruse; Ph.D., Harvard
Economics

Sheila Lawrence; Ph.D., Rutgers
Statistical analysis; quality management; problem-solving

Barbara A. Lee; Ph.D., Ohio State; J.D., Georgetown
Higher education administration

Tamara Lee; Ph.D., Cornell
Political economic reform in Cuba; U.S. labor and employment law

Mingwei Liu, Associate Dean for Research; Ph.D., Cornell
Industrial and labor relations

Xiangmin (Helen) Liu; Ph.D., Cornell
Human resource studies

Anne-Michelle Marsden; M.S., Florida State
Human sciences

Carmen Martino; M.A., Rutgers
Labor studies

Joseph McCune; Ph.D., Michigan State
Industrial/organizational psychology

Jessica R. Methot, Director, Ph.D. Program in Industrial Relations and Human Resources; Ph.D., Florida

Christopher Michael, Ph.D., City University of New York, political science; J.D., City University of New York School of Law

Akhila Naik; J.D., City University of New York School of Law

Julie Peters; M.A., Centenary

Danielle Phillips-Cunningham; Ph.D., Rutgers
Women's and gender studies

Yana van der Muelen Rodgers; Ph.D., Harvard

Ralph Rodriguez; Ph.D., Temple
Organizational communication; human resource management

Peter Rokkos; J.D., Boston, School of Law

Saul Rubinstein; Ph.D., Massachusetts Institute of Technology
Impact of changes in work organization on firms and unions

Francis Ryan; Director, Master of Labor and Employment Relations Program; Ph.D., Pennsylvania
Unionization in the public sector and retail industries; 20th-century working-class politics

Tobias Schulze-Cleven; Ph.D., California
Comparative/international employment relations; comparative political economy; European politics

Lisa Schur, Chair, Department of Labor Studies and Employment Relations; J.D., Northeastern; Ph.D., California (Berkeley)

Susan J. Schurman; Ph.D., Michigan
Union effectiveness; workplace safety and health

Scott Seibert; Ph.D., Cornell
Organizational behavior; careers; leadership and motivation; entrepreneurship

Marilyn Sneiderman; M.S.W., Wisconsin
Labor and organizing

Michael C. Sturman, Chair, Department of Human Resource Management; Ph.D., Cornell
Employee performance; compensation; pay-for-performance; HR analytics

Kyra Leigh Sutton; Ph.D., Ohio State
Labor and human resources

Jim Terez; M.A., Rutgers; M.B.A., New York
Accounting

Christopher To; Ph.D., New York
Management

Todd E. Vachon; Ph.D., Connecticut
Sociology

Michelle Van Noy; Ph.D., Columbia
Sociology and education

Paula B. Voos, Academic Program Director, Labor Studies and Employment Relations; Ph.D., Harvard
Economics

Naomi R Williams; Ph.D., Wisconsin (Madison)
History

# Labor Studies and Employment Relations (SMLR-U)

## LABOR STUDIES AND EMPLOYMENT RELATIONS

The department offers two undergraduate degrees: the **Bachelor of Arts in Labor Studies and Employment Relations** joint degree from the School of Management and Labor Relations and the School of Arts and Sciences

and a **Bachelor of Science in Labor and Employment Relations** granted by the School of Management and Labor Relations. The latter features flexible scheduling opportunities and a student-centered program especially suitable for part-time students or working adults. Both offer great choices for students interested in how work is managed, the problems of working people, and what workers have done as individuals and groups to address these problems. Both types of majors are eligible to apply for a five-year bachelor/master of labor and employment relations degree program.

The undergraduate labor studies and employment relations program's introductory courses offer anyone interested in the world of work (or likely to have a job) the opportunity to develop a realistic view of the dominant institutions, practices, and values of the workforce and to think about how work can be improved.

Intermediate courses enable students to acquire a range of specific competencies useful to employment, labor relations, and human resource specialists. They also allow students to participate in a series of cultural and disciplinary dialogues providing alternative perspectives on work and the wider society.

Advanced courses provide students majoring in labor studies and employment relations with an opportunity to consolidate what they have learned about the nature of work through more in-depth study of a particular topic or topics through either independent work or the senior seminar.


- The Programs
- Bachelor of Arts in Labor Studies and Employment Relations
- Bachelor of Science in Labor and Employment Relations
- Off-Campus Labor Studies and Employment Relations Programs
- Departmental Honors Program


# Internships and Scholarships (SMLR-U)

## Internships and Scholarships

**Internships**

Upper-level labor studies and employment relations majors are encouraged to apply for internships, which typically carry 3 credits. They may be arranged by the student, an individual faculty member, or through the department. Students must submit a description of the internship to a faculty adviser or to the director of the undergraduate program. They also participate in exchanging ideas with other students and faculty in an online segment of what is officially a hybrid course.

Approval will be contingent on the suitability of the internship and whether the student has maintained an acceptable academic record in labor studies and employment relations courses.

For complete internship guidelines, requirements, and the application form, visit here.

**Scholarships**

A limited number of named scholarships are available to undergraduate students, including the Pamela Sue Schmidt Award for Outstanding Service to the Community.

For further scholarship information and applications, visit here.

# Independent Study (SMLR-U)

## Independent Study

Credit toward a labor studies and employment relations major may be obtained by independent study. Under most circumstances, the number of independent study credits will not exceed 3 in a single semester. Additional credits would require approval from the program director.

Typically, independent studies culminate in the requirement of a final paper designed by both the student and the faculty sponsor. Students interested in pursuing an independent study are encouraged to contact faculty members with whom they would like to work. Under most circumstances, independent studies will not be granted to students who are neither labor studies and employment relations majors nor minors.

# Scholastic Honors (SMLR-U)

## Scholastic Honors

Students who achieve a GPA of 3.70 or higher in their coursework for the labor studies major will earn departmental honors. Students who achieve the following final grade-point averages across their overall program of study at Rutgers will earn scholastic honors as follows: cum laude with a grade-point average of 3.500 or better; magna cum laude with an average of 3.700 or better; and summa cum laude with an average of 3.850 or better.

# Undergraduate Students in Graduate Courses (SMLR-U)

## Undergraduate Students in Graduate Courses

Undergraduate students may receive credit toward the labor studies and employment relations major for courses taken at the graduate level. Courses offered by the graduate program in labor and employment relations and selected courses in the graduate program in human resource management can be treated as courses within the labor studies and employment relations department. In general, the student should be a senior and have a cumulative grade-point average of 3.0 or better. In some instances, the School of Management and Labor Relations will accept petitions from upper-level students who are not yet in their senior year to take and receive credit for graduate courses.

# Courses (SMLR-U)

## COURSES

**37:575:100** ***Introduction to Labor Studies and Employment Relations (3)***
Work, workers, and organizations that represent employees; class, race, gender, and work; legal, labor market, and human resource issues.

**37:575:110** ***Work, Society, and the Quality of Life (3)***
Work, social class, diversity, and economic opportunity in the context of globalization; civic engagement and collective action to promote opportunity and social justice for all people.

**37:575:191,192,193** ***Short Topics on Work (1,1,1)***
Brief examination of selected issues with regard to work at a level suitable for first-year college students, as well as those at a higher level of academic preparation. Topics to be announced.

**37:575:201** ***U.S. Labor and Work before the End of Reconstruction (3)***
History of work, economic organization, and labor in the United States. Free and slave labor. Early labor unions and movements in the American context.

**37:575:202** ***History of Labor and Work in the U.S. 1880 to 1945 (3)***
Changes in work, its organization, and the public policy context. History, philosophy, structure, activities, and impact of U.S. labor unions.

**37:575:203** ***Work and Labor History from 1940 to the Present in the U.S. (3)***
Developments in work, labor organizations, and related social movements. Relationship of labor movements to the changing economic, social, and public policy context, including increasing globalization.

**37:575:207** ***New Jersey Labor History (3)***
Workers movements in New Jersey, both local and statewide; their relationship to U.S. labor and working-class history from the earliest period to today.

**37:575:215** ***Youth and Work (3)***
Youth in the U.S. labor market; working students, internships and unpaid work; job-hopping; and other contemporary concerns. Policies and practices to improve outcomes.

**37:575:220** ***Law for Business and Nonprofit Organizations (3)***
Overview of legal essentials for organizations: contracts; torts; organizational forms; property rights; cyber-law; bankruptcy; agency; criminal law; basics of employment/labor law.

**37:575:230** ***People, Work, and Organizations (3)***
Contemporary organizational transformations forming the context for how people are managed at work: decline of bureaucracy and predictable internal careers; growth of flexible, knowledge-based systems.

**37:575:240** ***Sustainability, Jobs, and Justice (3)***
The interconnections between democracy, economy, and the environment; movements for social, economic, and environmental sustainability; the relationship between good jobs and environmental justice.

**37:575:250** ***Finance for Personal and Professional Success (3)***
Overview of core financial concepts and techniques useful both at work and in personal life; interest, credit, insurance, investments, present value, and net worth.

**37:575:265** ***Introduction to Disability Studies: History, Rights, Justice, and Inclusion (3)***
Introduces perspectives on disability and its relationship to politics, employment, law, media, arts, sports, and built environments, focusing on creating social and economic change.

***Previously listed as 37:575:365 Disability, Work, and Society.***

**37:575:294** ***Avoiding Sexual Harassment (1)***
Legal, organizational, and social dimensions of sexual harassment in the workplace; power, gender roles, homophobia, and failed romance; effective prevention or response.

**37:575:295** ***Workplace Violence (1)***
Causes, consequences, and prevention of physical violence in the American workplace. Organizational policies that preserve the rights and well-being of all employees.

**37:575:297** ***Religion in the Workplace (1)***
Contemporary workplace issues stemming from employee religious diversity. Employee rights, accommodation, and inclusion; dominate group privilege, prejudice, discrimination, and organizational responses to religious diversity.

**37:575:298** ***Social Media in the Workplace (1)***
Issues for organizations and employees stemming from the increased use of social media by individuals. Hiring discrimination, professional image, collective action, ethics, and other concerns.

**37:575:300** ***Writing in Labor Studies and Employment Relations (3)***
Construction of a well-written argument in labor studies and employment relations; application of sound writing principles to contemporary labor policy issues; intensive practice.

**37:575:301** ***Labor and Democracy (3)***
Labor as a worldwide social and political movement; comparative and historical consideration of how labor can achieve influence in market economies and a better standard of living.

**37:575:302** ***Comparative Social and Employment Policy (3)***
Overview of such policy in wealthy democracies; the relationship between state and market; varieties of capitalism and welfare states; social safety nets; family policy; labor movements' role.

**37:575:303** ***Black Workers in American Society (3)***
Examination of the historical relationships between Black workers and the American labor movement; analysis of problems facing Black workers at the workplace.

**37:575:304** ***Comparative Employment Relations in Wealthy Nations (3)***
Employment relations systems in wealthy nations; corporate governance; social welfare; global and national labor standards; union-management relations; work organization; labor policies.

**37:575:307** ***Latino Workers in the United States (3)***
Role of Latino workers in U.S. society and the U.S. economy; impact of the new migration on the U.S. labor market and social policy.

**37:575:308** ***Dynamics of Work and Work Organizations (3)***
Examination of the social dynamics of economic institutions and their corresponding work relations; corporate organization and trade union structure; selected problems of technological change; human relations in industry and industrialization; human relations in industry and the changing bases of managerial authority.

**37:575:309** ***Working Women in American Society (3)***
Focus on the contemporary experience of working women, including an exploration of current legal strategies and social policies created to address their concerns.

**37:575:310** ***Labor Relations in Professional Sports (3)***
Labor relations systems in professional sports in the United States; unique institutional aspects and common features of union-management and employee relations.

**37:575:311** ***Organizational Design and Structure (3)***
New and old methods of organizing work and organizations ranging from hierarchical bureaucracy to contemporary models emphasizing teamwork and/or flatter or networked structures.

**37:575:312** ***Conflict and Conflict Resolution in the Workplace (3)***
How people resolve work-related grievances: bargaining, grievance procedures, mediation, arbitration, demonstrations, strikes, and industrial violence. Examines union and nonunion workplaces.

**37:575:313** ***New Technology and Work (3)***
Impact of new technology on work, workers, and society. Emerging technologies like digital platforms, algorithmic hiring, artificial intelligence, and practices like gig jobs.

**37:575:314** ***Collective Bargaining (3)***
Comprehensive study of the development of collective bargaining; the nature and scope of contracts; the changing character of collective bargaining processes through negotiation, legislation, the courts, and arbitration; the substantive issues in bargaining, including the implications for public policy.

**37:575:315** ***Employment Law (3)***
Overview of employment at-will and its limitations; wages and hours; medical/family leave; privacy; drug testing; workers' compensation; and fundamental antidiscrimination law.

***Required course for the B.S. in labor and employment relations program (not a required course for the B.A. program.***

**37:575:316** ***Employment Discrimination Law (3)***
Legal, regulatory, and public policy approaches to employment discrimination of all types; Title VII, ADA, ADEA, relevant New Jersey laws, and related court decisions.

**37:575:317** ***Contingent and Nonstandard Work (3)***
Issues arising from employment and relationships that have nonstandard aspects; temporary, leased, or part-time employees; independent contractors and owner-operators.

**37:575:319** ***Leadership and Governance of Labor Unions (3)***
Leadership of all types of labor organizations. Internal management; union politics; relationships with other organizations; use of media; and other key leadership issues.
***Prerequisite: 37:575:100 or 101, or permission of instructor.***

**37:575:320** ***Immigration Public Policy (3)***
Immigration and immigrant workers in American society; history; current legal rights; related public policy issues; immigrants in unions and community organizations.

**37:575:321** ***Immigration Law and Employment Rights (3)***
Contemporary immigration law in the United States; employer compliance issues; employee rights; immigrant employee representation; and related policy debates.

**37:575:322** ***American Labor Unions in Politics (3)***
Role of the labor movement in the political process from the New Deal to the present, including an analysis of its ideology, its legislative agenda, its political action, and its impact on public policy.

**37:575:325** ***Economics of the Employment Relationship (3)***
Fundamentals of labor economics presented. Economic dimensions of public policies and human resource administration.

**37:575:326** ***Negotiation Concepts and Techniques (3)***
Negotiation strategy and tactics; interests and interest-based bargaining, rights, power, leverage, concessions, commitment; application of theory in various work-life contexts; negotiation skill development.

**37:575:330** ***Working Women and the Law (3)***
Survey of laws affecting women as employees: anti-discrimination, OSHA, and other laws. How law relates to advancement opportunities for women, the glass ceiling, and employer behavior.

**37:575:335** ***Women and Labor Movements in Global Perspective (3)***
How labor movements around the world are addressing such issues as pay equity, equal opportunity, sexual and racial harassment, work-life balance, and women's leadership.

**37:575:336** ***Employment Relations in Emerging Economies (3)***
Changing employment relations systems in nations that are rapidly industrializing; focus on labor movements; labor management relations; labor standards and public policy.

**37:575:337** ***Workers and Multinationals in Global Perspective (3)***
Impact of multinationals and global value chains on workers in developing nations. Issue of labor standards; corporate social responsibility; international labor organizations and regulatory approaches.

**37:575:338** ***Occupational Safety and Health (3)***
Federal and state regulatory laws and enforcement; the basic issues involved in safety and health at the workplace; and worker, union, and employer response to the issues.

**37:575:340** ***American Labor Law (3)***
Examination of the present legal arrangements governing the conduct of labor relations in the United States; historical development and impact of common law, legislative statutes, and court decisions on the growth of the labor movement.

**37:624:345** ***Organizational Behavior and Work (3)***
Behavior by individuals and groups in the workplace; group and intergroup dynamics; organizational culture, structure, and change; leadership, employee motivation, job performance, and feedback.

***Previously listed as 37:575:345.***

**37:624:348** ***Leadership in the Workplace (3)***
Leadership in work organizations, including unions, nonprofits, and businesses. Key leadership issues in small groups and large organizations; diversity concerns; leadership development.

***Previously listed as 37:575:318 Leadership in Work Organizations***

**37:575:350** ***Public Sector Collective Bargaining (3)***
Study of employer-employee relations in the public sector; federal executive orders and state and municipal legislation regulating public employers and employee organizations; procedures for bargaining unit certification, representation, and recognition; dispute resolution techniques.

**37:575:355** ***Current Labor Problems (3)***
Selected number of labor and employment issues that have particular relevance in contemporary society.

**37:575:357** ***Social Movements, Social Change, and Work (3)***
The theory and practice of social movements and social change, particularly those related to work; the prospects for current and future mobilization.

**37:575:359** ***Organizing for Social Change (3)***
Theory and practice of community organizing for social change for labor and community groups; membership building; leadership development; strategy development; community power analysis; campaign planning.

**37:575:360** ***Union Organizing (3)***
Introduction to and critical analysis of union organizing strategies and tactics.

**37:575:361** ***Labor and Corporate Restructuring (3)***
Study of how management efforts to decentralize organizational structures and reduce employment levels affect industrial relations, work and workers, skill levels and training needs, and productivity and the macroeconomy.

**37:575:362** ***The Work-Education Connection (3)***
What do workers need to know to be prepared for the jobs being generated by the global economy? How do the American secondary and higher education systems prepare workers for changing jobs?

**37:575:363** ***Labor Unions and the Global Economy (3)***
Changes in the global economy and their effects on the living standards and bargaining power of American workers and their unions. Alternative strategies for dealing with globalization.

**37:624:364** ***Diversity in the Workplace (3)***
Focuses on how the increasing demographic diversity of American workplaces affects social relations, cultural dynamics, and organizational effectiveness.

***Previously listed as 37:575:364***

**37:575:366** ***Asian American Workers in a Global Context (3)***
Social structures affecting Asian American workers; contemporary and historical immigration policies; stereotypes and other problems; racialized employment; inequality and achievement; differences by nation origin.

**37:575:367** ***Emotional Intelligence in the Workplace (3)***
Nature of emotional intelligence and its effects on employee performance and organizational success; research on development of emotional intelligence; self-awareness and self-development.

**37:575:368** ***Professional Development Strategies (3)***
Best practices in professional development; organizational strategies for addressing employee retention, work/life balance, wellness, communication, and other matters related to employee development.

**37:575:375** ***Benefits and Social Insurance (3)***
Overview of benefits with a focus on social insurance systems, health insurance, and pensions. Relevant issues for employers, employees, unions, and public policy.

**37:624:376** ***Corporate Governance, Power, and Control (3)***
Corporate governance and the impact of corporations on society; boards of directors; executive compensation; principal-agent/stakeholder theories; issues for labor and the public.

***Previously listed as 37:575:376***

**37:575:377** ***Democratic Workplaces (3)***
Democracy within the firm, employee ownership, and co-ops; approaches to economic democracy; political and economic theory; case studies; and related career tracks.

**37:575:385** ***Finance for Organizational Leadership (3)***
Quantitative financial and accounting techniques in organizations used for cost analysis and performance decisions. The class is for nonfinancial leaders in profit and nonprofit organizations.

**37:575:391,392,393,394** ***Issues in Work (1,1,1,1)***
Brief examination of selected issues in labor and employment relations; topics to be announced.

**37:575:395** ***Perspectives on Labor Studies (3)***
In-depth study of the classic works on the nature of labor, the relationship of work to other social functions, and the relationship between workers and management.
***Prerequisite: Open only to labor studies majors who have completed at least 15 credits of labor studies coursework.***

**37:575:396,397** ***Concerns at Work (2,2)***
Examination of contemporary issues related to work; topics to be announced.

**37:575:401** ***Research Methods in Labor Studies (3)***
Nature and sources of labor statistics; alternative research methods used in the study of labor problems.

**37:575:402** ***Research Corporations and Industries (3)***
Overview of methods used to investigate the competitive situation/prognosis of an industry's employers, profitability, sales, employment, wages, and unionization; strategic corporate research.

**37:575:403** ***Problem-Solving Tools at Work (3)***
Applied analytical and statistical tools for solving problems at work, surveying employees, and maintaining quality. Projects are individual/group and spreadsheet-intensive.

**37:575:404** ***Creating and Administering Surveys (3)***
Issues for online, mail, telephone, and in-person surveys given their intended use. Samples: item construction; scaling; measurement validity and reliability; improving response rates; ethical research.

**37:575:407** ***Workers' Movement in New Jersey (3)***
Examination of workers' movements at state and local levels in New Jersey, using library resources, interviews, participant observations, and movement archives. Research results document the development of the New Jersey labor movement.

**37:575:450** ***Senior Seminar in Labor Studies (3)***
In-depth study of a labor studies topic. Intensive reading and discussion designed to integrate student experiences in the labor studies major.
***Prerequisite: Open only to majors with senior standing.***

**37:575:480,481,491,492,493** ***Topics in Labor Studies (3,3,3,3,3)***
In-depth examination of particular topics concerning work organization, worker problems, or worker organizations.

**37:575:490** ***Internship in Labor Education (BA)***
Students work under the supervision of individual faculty members and other experienced labor educators to develop and/or teach courses and workshops.
***Prerequisite: Permission of instructor.***

**37:575:494,495** ***Independent Study and Research (BA,BA)***
Individual reading and research project under the guidance of a labor studies faculty member on a topic of interest to the student.
***Prerequisite: Permission of instructor.***

**37:575:496,497** ***Internship in Labor Studies (BA,BA)***
Students work as staff members in a labor union or labor-related organization (public or private), in an industrial relations unit in private industry, or as employees in a position that permits observation of and participation in a labor union at the grassroots level. Allows students to apply conceptual knowledge learned in the classroom to actual situations and to acquire new skills and knowledge.
***Prerequisite: Permission of instructor.***

**37:575:498,499** ***Honors in Labor Studies (BA,BA)***
Students conduct an in-depth individual research project under the guidance of a member of the LSER department and write a research paper based on that project.
***Prerequisite: Permission of department.***

# Bachelor of Arts in Labor Studies and Employment Relations (SMLR-U)

## BACHELOR OF ARTS IN LABOR STUDIES AND EMPLOYMENT RELATIONS

The bachelor of arts degree in labor studies and employment relations is embedded in the broader undergraduate curriculum of the School of Arts and Sciences. It is possible to complete the degree in the evening as well as in the daytime.

The undergraduate labor studies and employment relations program provides students with an opportunity to learn more about the nature of work, the problems of working people, and what workers have done to address those problems, both individually and collectively.

For further information, please visit the website here.



## Admission and Requirements of the Bachelor of Arts in Labor Studies and Employment Relations

## Admission and Requirements of the Bachelor of Arts in Labor Studies and Employment Relations

Students in this degree program must be admitted to the School of Arts and Sciences. There is no deadline for admission to the major, but students should apply as soon as possible. Students may take individual courses, or complete a minor offered by the School of Management and Labor Relations, without being admitted.

Admission to complete the major involves completing the application, writing a one-page application letter explaining why the applicant wishes to pursue a labor studies and employment relations major, having earned a 2.0 grade-point average or better in college work taken to date, and having demonstrated an adequate academic record in the introduction to labor studies course.

Please contact:
Amalia (Amy) Marchitto, Student Advisor
lobelo@smlr.rutgers.edu
Labor Studies and Employment Relations
50 Labor Center Way
New Brunswick, NJ 08901

# Major Requirements for the Bachelor of Arts Degree

# Major Requirements for the Bachelor of Arts Degree

The major consists of 36 credits in labor studies and employment relations. Students must maintain a grade of C or better. In place of 6 of these credits, students may substitute related courses from other programs. (A list of these courses is available from the department.)

The following three courses are required in the bachelor of arts program: either 37:575:100 Introduction to Labor Studies and Employment Relations or 37:575:110 Work, Society, and the Quality of Life; 37:575:395 Perspectives on Labor Studies; and one advanced course taken in the senior year, chosen from 37:575:401, 402, 403, 404, 450, 490, 494, 495, 496, 497, 498, or 499.

Concentrations in the major are available but not required. These include:

- Law and the Workplace
- Diversity in the Workplace
- Work Organization and Management
- Labor Unions and Social Movements
- Work, Globalization, and Migration

For more information and courses for each concentration, visit here.

Bachelor of Arts in Labor Studies and Employment Relations (SMLR-U)

# Minor in Labor Studies and Employment Relations

# Minor in Labor Studies and Employment Relations

The minor in labor studies and employment relations consists of six courses offered by the department, for a total of 18 credits. The department also offers minors focused on one of the five areas of the field including: law and the workplace; diversity in the workplace; work organization and management; labor unions and social movements; and work, globalization, and immigration. All minors must include Introduction to Labor Studies and Employment Relations (37:575:100) or Work, Society, and the Quality of Life (37:575:110). Students must earn a C or better in a course for it to count toward the minor.

# Bachelor of Science in Labor and Employment Relations (SMLR-U)

## BACHELOR OF SCIENCE IN LABOR AND EMPLOYMENT RELATIONS

Bachelor of Science in Labor and Employment Relations (SMLR-U)

# Admission and Requirements of the Bachelor of Science in Labor and Employment Relations

# Admission and Requirements of the Bachelor of Science in Labor and Employment Relations

This program is designed to accommodate the needs of transfer and nontraditional students. Applicants should have successfully completed a minimum of 24 credits of college-level courses, but most students who are admitted will have twice that many credits and a GPA of 2.75 or above.

Please apply to the School of Management and Labor Relations via Rutgers Undergraduate Admissions.

Please note that the academic and other regulations established by the faculty and administration of the School of Management and Labor Relations and the Board of Governors of Rutgers University are subject to amendment at any time. Questions related to general student rules that fall under the jurisdiction of the School of Management and Labor Relations may be directed to the appropriate program.

Please contact:
Amalia (Amy) Marchitto, Student Advisor
lobelo@smlr.rutgers.edu
Labor Studies and Employment Relations
50 Labor Center Way
New Brunswick, NJ 08901

Bachelor of Science in Labor and Employment Relations (SMLR-U)

# Major Requirements for the Bachelor of Science Degree

# Major Requirements for the Bachelor of Science Degree

The major consists of 36 credits in labor and employment relations. Students must attain a grade of C or better for a class to count toward the major. In place of 6 of these credits, students may substitute related courses from other social science programs; departmental approval is required for courses from other universities; a list of Rutgers University-New Brunswick courses is available from the department.

The following five courses are required in the bachelor of science program:

- 37:575:100 Introduction to Labor Studies or 37:575:110 Work, Society, and the Quality of Life
- 37:575:315 Employment Law
- 37:575:401 Research Methods in Labor Studies or an alternative research methods/statistics course from other programs; 01:920:311; 01:830:200; 01:790:300; 10:762:205; 01:220:322; 01:450:319; 01:960:212; 01:960:285;
- 37:575:395 Perspectives on Labor Studies; and
- 37:575:490, 496, or 497 an internship; this course will be waived for students with work experience.

Bachelor of Science in Labor and Employment Relations (SMLR-U)

# General Education Requirements for the Bachelor of Science Degree

# General Education Requirements for the Bachelor of Science Degree

The School of Management and Labor Relations is fully compliant with the Lampitt Law requiring that all individuals who have earned an associate in arts (A.A.) or associate in science (A.S.) degree from a New Jersey county college will have fulfilled its general education requirements. For others, the requirements are:

Writing: 6 credits. Expository writing (01:355:101) and one second-level writing course. See Degree Navigator for a list of approved second-level writing courses.

Quantitative Reasoning: 6 credits. Two courses in mathematics or applied quantitative reasoning. See Degree Navigator for lists of courses in each area.

Natural Sciences: 6 credits. See Degree Navigator for lists of courses in each area.

Arts and Humanities: 3 credits. See Degree Navigator for lists of courses in each area.

History: 3 credits. See Degree Navigator for lists of courses in each area.

Diversity:  3 credits.  See Degree Navigator for lists of courses in each area.

Bachelor of Science in Labor and Employment Relations (SMLR-U)

# Minors and Dual Majors in the Bachelor of Science Program

# Minors and Dual Majors in the Bachelor of Science Program

A minor or second major is not required for graduation. However, students may complete any minor or second major offered by Rutgers University-New Brunswick as long as they meet its requirements. The School of Arts and Sciences has agreed that its minors and majors are open to bachelor of science program students without a separate application to that school; other schools at Rutgers may require admission.

Bachelor of Science in Labor and Employment Relations (SMLR-U)

# Online Bachelor of Science Program

# Online Bachelor of Science Program

The School of Management and Labor Relations' (SMLR) online program for the bachelor of science (B.S.) degree in labor and employment relations (LER) is perfectly suited for highly motivated, independent students who are seeking the convenience of distance learning. A typical online learner is self-directed, self-motivated, and organized in his or her approach to studying. This program is ideal for adult learners.

All 36 credits needed for the B.S. degree in LER can be completed exclusively online or through a combination of online and live courses. In order to complete the degree solely online, students must be sure they have completed SMLR's general education requirements since some requirements may not be available from Rutgers online, particularly 01:355:101 (Expository Writing). An A.A. or A.S. degree will suffice and many A.A.S. degrees will require only a few additional general education courses.

Students must ensure that they have the appropriate computer requirements needed to fulfill their work. Academic requirements for individual courses in LER are identical for both the online and in-person versions. Online learners will not be segregated into a separate cohort.

Please note that not all online courses are the same. Classes and experiences will vary, as it does with in-person class sessions. Students' course responsibilities using this learning venue require the same, if not more, commitment than traditional courses. In turn, students will learn as much or more than what they would learn in a traditional class.

For more information on the online program for the B.S. degree in LER, visit here.

# Off-Campus Labor Studies and Employment Relations Programs (SMLR-U)

## OFF-CAMPUS LABOR STUDIES AND EMPLOYMENT RELATIONS PROGRAMS

In-person courses for the bachelor of science in labor and employment relations are offered at two off-campus locations. This is a degree completion program for students who have completed close to 60 credits at a New Jersey community college or other colleges. The online-only option of the program is offered at a limited number of other off-campus Rutgers locations operated by the Division of Continuing Studies (DOCS).

1. The Rutgers-Brookdale partnership in Lincroft, NJ is one location for in-person courses.
2. Mercer County Community College in West Windsor is the second site for in-person courses.
3. The online-only option of the program is offered via DOCs at Atlantic Cape Community College and Camden Community College.

# Departmental Honors Program (SMLR-U)

## DEPARTMENTAL HONORS PROGRAM

To qualify for the departmental honors program, the student must have completed at least 18 credits in labor studies. The student must also have attained a cumulative grade-point average of 3.4 or better in the major at the end of the junior year. At that time the student should formally apply to the program director. Candidates who are accepted are required to complete a research project under the direction of a faculty member, culminating in a written honors paper, and are examined orally on their project by a faculty honors committee.

For the honors program guidelines and requirements, please visit here.

# About Our Programs (SMLR-U)

## ABOUT OUR PROGRAMS

The Department of Human Resource Management of the School of Management and Labor Relations in conjunction with the School of Arts and Sciences offers a bachelor of arts (B.A.) degree in human resource management (HRM) and a minor in human resource management. Human resource management is one path to understanding business that does not require a traditional business degree. Students wishing to pursue the B.A. in HRM do so through admission to the School of Arts and Sciences.

The HRM programs help prepare students for successful corporate, consulting, or governmental careers. The HRM major and minor provide a business perspective that is particularly useful to students who major in psychology, economics, communication, or other social science programs. The B.A. in HRM and the HRM minor also prepare students interested in pursuing the master of business administration (M.B.A.) degree.

Students who successfully complete either the major or the minor program can combine some credits earned with graduate work to earn a master's in human resource management (M.H.R.M.) degree at the School of Management and Labor Relations through a five-year plan. Students may transfer up to 18 credits of human resource management (37:533) classes with a grade of B or better, enabling them to complete a master's degree in approximately one additional academic year. This is provided the courses are from the published list of transferable courses and is contingent upon acceptance into the M.H.R.M. program.

With the support of one of the nation's largest and most frequently published and cited human resource management faculty, our HRM programs could be the entry to a successful and rewarding career. Rutgers human resources management graduates are currently working in leadership positions in some of the largest companies around the world.

For more information regarding the School of Management and Labor Relations HRM programs, please see our website here.

# Declaration

# Declaration

Students enter the human resource management (HRM) major or minor programs via declaration from their respective school. Typically, HRM students reside in the School of Arts and Sciences (SAS). Full-time students normally declare their major in the second semester of their second year, although some students may declare earlier in order to facilitate the planning needed for an appropriate sequence of the courses required to complete the major within four years.

Part-time students normally declare their major by the time they have completed 60 credits.

Students within the School of Arts and Sciences may utilize the SAS online declaration system to declare either their major or their minor: here. Some academic departments may have prerequisites and/or require approval by an adviser. For more information regarding the declaration of either a major or a minor, please see the SAS website here.

Students who attend a school within Rutgers outside of SAS should consult with their adviser for information on the declaration process.



# Degree and Course Credits: Additional Information

# Degree and Course Credits: Additional Information

For both the human resource management (HRM) major and minor, students can count HRM courses taken toward either the major or minor. The HRM minor requires 18 credits, including Introduction to HRM and 4 required core HRM courses (37:533). The HRM major requires 42-46 credits, including Introduction to HRM, 7 required core HRM courses, and 4 HRM elective courses (37:533). If a student is within the HRM Honors Program (37:533H), 8 HRM courses (37:533) are required. While some labor studies courses are incorporated into the HRM major and minor programs, there is a limit to the number that can be applied to each program. Information regarding all requirements can be found on the website.

The Department of Human Resource Management at the School of Management and Labor Relations will determine whether students have sufficiently completed the requirements necessary to receive the HRM minor or major at graduation. To facilitate this verification process, the School of Arts and Sciences (SAS) provides a list of students who have applied for graduation and declared the HRM minor or major. Certification for students from schools outside of SAS (i.e., Rutgers Business School: Undergraduate-New Brunswick, School of Management and Labor Relations, School of Environmental and Biological Sciences, School of Engineering, Edward J. Bloustein School of Planning and Public Policy, Mason Gross School of the Arts, and Ernest Mario School of Pharmacy) is done separately.

# Contact Information

# Contact Information

*Director of Undergraduate Human Resource Management Programs*

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# Bachelor of Arts in Human Resource Management (SMLR-U)

## BACHELOR OF ARTS IN HUMAN RESOURCE MANAGEMENT

The bachelor of arts (B.A.) in human resource management is a joint degree from the School of Management and Labor Relations (SMLR) and the School of Arts and Sciences (SAS).

**Major Requirements**

Students who are in good academic standing are eligible to declare the human resource management (HRM) major through the School of Arts and Sciences at Rutgers University-New Brunswick. The major consists of a total of 45+ credits (15 courses):

a. a minimum of 36 credits are to be taken from within the human resource management curriculum (seven HRM core courses [37:533] are required; eight HRM core courses for the HRM Honors Program; plus a minimum of four HRM electives)

b. a minimum of 9 credits from a list of related courses from other programs

Introduction to Human Resource Management (37:533:301) is a prerequisite for the human resource management B.A. program. Students must achieve a grade of C or better in this course before the major is declared. Grades of C or better must be earned in all courses used to fulfill the requirements of the human resource management major.

Detailed information about requirements for the major can be found on the SMLR website here.



# Learning Goals

# Learning Goals

The curriculum in the programs within the School of Management and Labor Relations' Department of Human Resource Management focuses on different levels of study (i.e., undergraduate, master's, Ph.D.). Across these programs, we strive to advance students' cognitive skills and processes, their knowledge of theory and application, and develop their professional skills.

The three core areas for success in HRM are:

1. Cognitive Skills and Processes
2. Knowledge of Theory, Practice, and Application
3. Professional Development

For more detailed information on each of these areas, please see the undergraduate HRM learning objectives on our website.

Bachelor of Arts in Human Resource Management (SMLR-U)

# Admission and Requirements

# Admission and Requirements

Students in this degree program must first be admitted to the School of Arts and Sciences (SAS). Students declare their major via the SAS online major/minor system. Typically, students declare their major at the end of their sophomore year. However, it is important that interested students consult with their SAS advisers during their first and sophomore years for the purpose of selecting courses that will fulfill the prerequisites of the individual courses selected for the human resource management major from related programs.

Bachelor of Arts in Human Resource Management (SMLR-U)

# Departmental Honors

# Departmental Honors

The Department of Human Resource Management (HRM) offers a departmental honors program for those students who excel in the HRM major core courses. The HRM departmental honors program is a separate curriculum from the general HRM major program. Students who wish to apply to the HRM departmental honors program (37-533H) must do so toward the end of their junior year and must first have declared the general HRM major. Other criteria for acceptance can be found on the Departmental Honors 37-533H curriculum webpage.

During the senior year, HRM honors students conduct an original research project under the supervision of a faculty adviser and senior thesis committee. The distinction of highest honors, high honors, and honors are awarded at graduation.

Students who successfully complete the HRM departmental honors curriculum and wish to enter into the master's in human resource management program (M.H.R.M) will have the GRE/GMAT requirement waived. Application to the M.H.R.M. must take place within five years after completion of the undergraduate degree.

More information regarding the eligibility criteria, requirements, and general overview of the HRM departmental honors program is found here.

Bachelor of Arts in Human Resource Management (SMLR-U)

# Internships and Independent Study

# Internships and Independent Study

**Internships**

Upper-level human resource management (HRM) majors can apply for academic credit for a paid or unpaid HRM sponsored internship provided they have completed five human resource management core classes (15 credits) with a grade-point average within the HRM core of 3.5 or better. Students can receive up to 3 academic credits from

the Department of Human Resource Management toward one HRM internship. All applications for academic credit for internships will go through a rigorous process and require approval from the HRM undergraduate program director. More information regarding academic credit for HRM internships can be found here.

**Independent Study**

Upper-level HRM majors can apply for independent study credits provided they have completed five human resource management core classes (15 credits) with a grade-point average of 3.5 or better. Independent study projects typically carry 3 credits. Additional credits would require approval from the HRM undergraduate program credit director, Hazel-Anne Johnson. Interested students must first obtain joint approval from the HRM program credit director and a full-time faculty adviser from the Department of Human Resource Management. Students approved for independent study will be required to submit a 15-20 page final paper to be graded by the supervising faculty adviser.

Bachelor of Arts in Human Resource Management (SMLR-U)

# Undergraduate Students in Graduate Courses and Transfer Credits

# Undergraduate Students in Graduate Courses and Transfer Credits

**Undergraduate Students in Graduate Courses**

Given the opportunity that human resource management (HRM) students have to incorporate certain undergraduate HRM courses into their graduate studies, the Department of Human Resource Management does not allow students to take any of the master's of human resource management (M.H.R.M.) graduate courses toward their undergraduate degree.

**Transfer Credits**

Students wishing to transfer credits from a previously attended institution can submit a waiver application for up to three noncore courses (9 credits), thereby reducing the required credits for the bachelor's in human resource management to 33 credits. Quantitative requirements may be filled by courses accepted for transfer by the School of Arts and Sciences.

Bachelor of Arts in Human Resource Management (SMLR-U)

# Master's of Human Resource Management

# Master's of Human Resource Management

Students have the ability to utilize 18 credits from the undergraduate human resource management courses (37:533) toward the master's of human resource management (M.H.R.M.) degree provided the student receives a grade of B or better in each applicable course and provided the student applies to and is accepted into the M.H.R.M. within five years after receiving their undergraduate degree. Students who are not a declared HRM major or minor

may also apply up to 18 credits from any of the human resource management courses to the M.H.R.M. program provided they have met the stipulations stated above. Students can only substitute core graduate courses with approved electives, for comparable classes taken toward their B.A. degree in which they received a grade of B or better. More information regarding this program can be found here.

# Minor in Human Resource Management (SMLR-U)

## MINOR IN HUMAN RESOURCE MANAGEMENT

Students who are in good academic standing are eligible to declare the human resource management (HRM) minor through either the School of Arts and Sciences at Rutgers University-New Brunswick or through the school they have been matriculated into. The minor consists of 18 credits in human resource management and must include 37:533:301 Introduction to Human Resource Management, four courses from the concentration, and one elective course from the potential electives offered by the School of Management and Labor Relations. Substitution of courses is not allowed.

Students will be required to complete six undergraduate HR courses, offered by the School of Management and Labor Relations, with a grade of C or better.

For information on the human resource management minor, visit the website.

# Courses (SMLR-U)

## Courses

**37:533:301** ***Introduction to Human Resource Management (3)***
While many of the tasks associated with human resource management are centered in the HR department, all managers have HR responsibilities. This course covers the broad range of topics associated with HR management from the perspective of the HR professional, the manager, and the employee. It serves as the base course in both the undergraduate HRM major and minor. It will also serve to familiarize students who hope to become managers or team leaders during their careers with some of the issues they will have to deal with, such as staffing, motivating, and developing team members.

**37:533:311** ***Talent Acquisition (3)***
This course focuses on the effective management of the flow of talent into and through organizations. It covers human resource planning, recruiting and selection, career transitions, and other workforce movement. An important goal of the class will be to provide opportunities to develop hands-on skills that are relevant to effectively managing talent flow.
***Prerequisite: 37:533:301.***

**37:533:312** ***Developing Talent (3)***
This interactive, theoretically anchored, and applied course is aimed at understanding the processes and practices of developing human capital. It covers how organizations train and develop their employees, performance

management as an evaluative and developmental tool, and the strategic development of talent framed within the context of talent.
*Prerequisite: 37:533:301.*

**37:533:313** *Compensation & Total Rewards (3)*
Helps students understand the theoretical basis for compensation and other rewards systems and provides a practical understanding of how compensation and rewards systems work. The economic, psychological, and strategic aspects of rewards systems are covered. A series of exercises provide hands-on experience with major compensation and rewards practices.
*Prerequisite: 37:533:301.*

**37:533:315** *Global Human Resource Management (3)*
Explores the importance of international business management in the context of international human resource management, including topics on culture, compensation and benefits, international organizations and their structures, international assignment management, and the legal and regulatory considerations that global organizations face.

**37:575:315** *Employment Law-Labor Studies Offering (3)*
Overview of employment at-will and its limitations; wages and hours; medical/family leave; privacy; drug testing; workers' compensation; and fundamental antidiscrimination law.

**37:533:317** *Career Management (3)*
Provides students with the knowledge and skills to help others manage their careers while learning how to manage their own. Topics will include self-assessments, motivation theory, professional skill-development, career ladders, labor market/occupational trends, market research, personal branding, job search techniques, résumé writing, interviewing skills, negotiating, networking, and creating work-life balance.

**37:533:318** *HRM and Benefits (3)*
Employee benefits are complex, expensive, very personal, and many times misunderstood. This course seeks to acquaint students with the type of employee benefits offered in the workplace, the history behind them, and the challenges that benefits present to an organization. Students gain an understanding of benefits strategy, the legal requirements covering benefits, and explore how workforce demographics provide a context for the organization's employee benefits decisions. The course relies on a base knowledge of employment law, tax law, psychology, management, organizational dynamics, and economics.

Note: This course was previously offered under Special Topic numbers 533:322 and 533:324. Students who take this course may not also utilize 37:575:375 Benefits and Social Insurance toward the HRM major.

**37:533:321-329** *Special Topics in Human Resource Management (3)*
Topics offered may include: Ethics, People Analytics, Social Media, Human Resource Management in the Public Sector, and Equity Compensation & Employee Ownership.

**37:624:345** *Organizational Behavior and Work (3)*
Covers behavior by individuals and groups in the workplace; group and intergroup dynamics; organizational culture, structure, and change; leadership, employee motivation, job performance, and feedback.

Note: Previously listed under 37:575:345.

**37:624:348** ***Leadership in the Workplace (3)***
Leadership in work organizations, including unions, nonprofits, and businesses. Key leadership issues in small groups and large organizations; diversity concerns; leadership development.

Note: Previously listed under 37:575:318 Leadership in Work Organizations

**37:533:360** ***HRM Financial Decisions (3)***
Successful HR strategies are those that align with and support the firm's business strategy. Successful business strategies are those that create value for the firm and its stakeholders. To be effective in their strategic partner role HR professionals must understand how firms create value and measure value creation. This course will introduce students to the interpretation of financial statements and use of discounted cash flow techniques for planning and evaluating HR and strategic investments. Particular attention will be paid to topics such as selecting the financial measures used to determine incentive pay, paying in stock versus paying in stock options, alternative models for valuing stock options, the financial and HR aspects of pension plans, and the modeling of merger and acquisition opportunities.

Note: This course is designed for students without prior training in accounting or finance.
***Prerequisite: 37:533:301.***

**37:624:364** ***Diversity in the Workplace (3)***
Focuses on how the increasing demographic diversity of American workplaces affects social relations, cultural dynamics, and organizational effectiveness.

Note: Previously listed under 37:575:364

**37:624:376** ***Corporate Governance, Power, and Control (3)***
Explores the relationship between corporate governance and the economic, social, and political impact of corporations. Topics include: history of the corporation and stock ownership; boards of directors; principal-agent/ stakeholder theories; executive compensation; profit sharing; employee ownership; stock options; shareholder rights; takeovers and mergers; labor issues; pension funds; international corporate governance; the relationship between governance, corporate performance, and financial collapses; social and environmental sustainability; corporate social responsibility; and the role of public policy and government regulation.

**37:533:440** ***Statistics for HRM (3)***
Addresses basic statistics, covering frequency distributions through regression analysis. Enables students to compile and analyze data used in developing, implementing, and measuring HR outcomes. It will also enable students to interpret HR and government reports.
***Prerequisite: 37:533:301***

**37:533:494,495** ***Independent Study and Research (BA)***
Individual reading and research project under the guidance of a human resource management faculty member on a topic of interest to the student. For HRM majors only.
***Prerequisites: Completion of five human resource management courses from the list of core requirements including 37:533:301, with a GPA of 3.5 or better. Permission of faculty member and program director required***

**37:533:496,497** ***Internship in Human Resource Management (BA)***
Students work as staff members in an approved public or private organization's human resource management department. The opportunity will allow students to apply conceptual knowledge learned in the classroom to actual

situations and to acquire new skills. For HRM majors only.
***Prerequisites: Completion of four human resource management courses from the list of core requirements including 37:533:301, with a GPA of 3.2 or better. Permission of program director required.***

**37:533:498,499** ***Honors in Human Resource Management (BA,BA)***
An in-depth individual research project under the guidance of a member of the HRM department. Student will produce a thesis-quality research paper.
***Prerequisite: Students must be enrolled in the HRM Departmental Honors Curriculum***

**37:533:351** ***Human Resource Management in Health Administration (3)***
Human resource management in the healthcare setting shares common features with HRM in any organization. However, healthcare organizations have a unique history of approaches to HRM. Healthcare organizations are closely regulated entities.

**37:533:352** ***Human Resource Management in the Public Sector (3)***
Human Resources Management in the Public Sector will introduce you to human resources policies and processes in government entities.

**37:533:353** ***Equity Compensation & Employee Ownership (3)***
This survey course explores the variety of ways that businesses can compensate employees with shares of equity and profits, and the human resource management, employment relations, organizational and individual motivational issues that such practices raise.

**37:533:354** ***People Analytics in HRM (3)***
People analytics is a data-driven approach to improving people-related decisions for the purpose of advancing both individual and organizational success. While people have always been critical to the success of organizations, many business leaders still make key decisions about their workforce based on intuition, experience, advice, and guesswork.

**37:533:355** ***HRM & Social Media (3)***
Social Media has altered our lives in ways we didn't know are possible. The consequences of Social Media, and how these tools can be in Human Resources. Topics covered will include social networking, the how/why the business world leverages them, sharing corporate culture on Social Media and technologies, and skills in designing and implementing social media for Human Resources.

**Applicable Labor Studies Courses**

In addition to 37:575:315, there are certain courses from the Department of Labor Studies and Employment Relations that are applicable to both the HRM undergraduate minor and major. For the complete list, please consult the HRM undergraduate website here.

**Applicable Courses from Other Disciplines**

The HRM undergraduate major includes a requirement of three courses from psychology, sociology, and economics as well as two courses from a list of quantitative requirements. Applicable courses from these areas of study can be found on the human resource management website here.

# Bachelor/Master of Labor and Employment Relations (SMLR-U)

## BACHELOR/MASTER OF LABOR AND EMPLOYMENT RELATIONS

This program allows qualified students to complete both a bachelor of arts (B.A.) degree in labor studies and employment relations, or a bachelor of science (B.S.) degree in labor and employment relations, and a master of labor and employment relations (M.L.E.R.) degree in approximately five years of full-time study. Graduates have been successful in obtaining responsible positions in labor/nonprofit organizations, the public sector, and in corporations in labor relations, human resources, health and safety, training, diversity/equal employment opportunity, and related fields.



## Program

## Program

Students who are labor studies and employment relations majors and are accepted into the program:

- may waive up to 9 credits of graduate work;
- can start their graduate work as undergraduate students by taking up to two graduate-level courses;
- can complete the master's program in one calendar year of full-time study or can expedite completion on a part-time basis.

Students who are interested in this option should speak to the graduate program director as early as possible in their undergraduate studies. The sooner students indicate that they wish to pursue the five-year program, the sooner they can receive advice on how to plan their schedules. Without careful planning, students may have difficulty completing the program in five years.



## Application

## Application

- Admission requirements and standards are similar to those for other graduate students.
- Two letters of reference, preferably from faculty, a personal statement, and academic transcripts demonstrating likely success in the program are required.
- Acceptance is contingent upon completion of the bachelor's degree, but provisional admission can be made as soon as the completed application is received.

**When to Apply:**
Apply as early in your senior year as possible. Talk to the academic program director or a student adviser.

# Master's Advantage Plan (M.A.P.) (SMLR-U)

## MASTER'S ADVANTAGE PLAN (M.A.P.)

The Master's Advantage Plan is not a five-year program per se. Rather it allows human resource management (HRM) undergraduate students the ability to complete a bachelor's degree and the master of human resource management (M.H.R.M.) degree within five years provided all program requirements are satisfied. Qualified students can utilize up to 18 select credits earned from their bachelor of arts in human resource management toward the master's in human resource management. Use of these credits is contingent upon application and acceptance into the M.H.R.M. program. Further, students must have received a grade of B or better in the applicable courses.

All HRM students are included in the M.A.P. but, in order to be able to utilize the specific credits earned during their years of undergraduate study, **students must apply separately to the M.H.R.M. program** and must do so within five years after receipt of their bachelor's degree. Please see here.

For a concise explanation of the program and the list of applicable courses, please see the HRM undergraduate website.

Master's Advantage Plan (M.A.P.) (SMLR-U)

# Application

# Application

Students who wish to utilize course credits from their undergraduate degree toward a master of human resource management (M.H.R.M.) degree **must apply separately to the M.H.R.M. program**. Students may apply for fall, spring, or summer semester admission.

Although acceptance is contingent upon successful completion of the bachelor's degree, the program can grant conditional admission upon receipt of a completed application and official transcripts.

Additional information regarding the application process for the M.H.R.M. may be found here.

# About the Honors College (HC-NB)

## ABOUT THE HONORS COLLEGE

About the Honors College (HC-NB)

# History and Mission

# History and Mission

In the fall of 2015, the Honors College at Rutgers University-New Brunswick opened its doors and welcomed its inaugural class. Overlooking the Raritan River and located at the north end of Voorhees Mall, the Honors College became a new landmark on Rutgers' historic College Avenue campus. The Honors College curriculum offers an unparalleled educational experience focused on interdisciplinary and experiential learning in the context of an innovative and comprehensive living-learning community, complete with seminar rooms, on-site advising and administrative offices, study lounges, and faculty apartments. The Honors College provides a fully integrated, 24/7 academic and social experience.

Addressing the need to provide more honors opportunities to the highest-achieving students from New Jersey and across the country, the Honors College in New Brunswick was conceived as a powerful academic initiative to support the needs of honors students and build on the strength of existing honors programs at Rutgers by offering an innovative learning environment and close interaction with faculty from the beginning of students' undergraduate careers. In parallel with the national visibility gained from Rutgers-New Brunswick joining the Big Ten and its related Big Ten Academic Alliance, the founding of the Honors College doubled the number of high-achieving students at New Brunswick with access to honors education, underscoring the role of Rutgers-New Brunswick as the public flagship university of New Jersey. The Honors College works alongside the existing school-based honors programs--which continue to fulfill their missions of supporting high-achieving students in New Brunswick--integrating exceptional talent from all of the schools into its unique residential program and allowing for even greater interdisciplinary curricular and extracurricular experiences.

Ground was broken on the Honors College facility as part of the Seminary Place Redevelopment Project in September 2013, flanking the new academic building next door completed in September 2016, and the Voorhees Mall opposite the historic Old Queens campus. As the new facility took shape, a broadly representative faculty committee was convened by then-New Brunswick Chancellor Richard Edwards, and charged with developing an innovative curriculum designed to guide students from their introduction to scholarly inquiry, through the development of critical thinking skills, to applied research and the formation of new knowledge. Along with the consortium of six participating undergraduate schools, the New Brunswick Honors College works in tandem with a student's major course of study in their school of enrollment, exposing students to interdisciplinary inquiry, providing opportunities for research and engagement with Rutgers' world-class faculty, and challenging them to engage with 21st-century issues from their first days on campus. With the Honors College motto of "Curiosity. Knowledge. Purpose.", students are asked to think about how they can serve the world with their creativity and knowledge so that they may ultimately have a life and a career with purpose.



# Participating Schools

# Participating Schools

The Honors College draws its students from six undergraduate schools at Rutgers University-New Brunswick. Every student is admitted into their degree-granting school and then invited to join the Honors College community.

The schools that comprise the Honors College are as follows: the School of Arts and Sciences (SAS), the School of Environmental and Biological Sciences (SEBS), the School of Engineering (SoE), the Rutgers Business School: Undergraduate-New Brunswick (RBS), the Ernest Mario School of Pharmacy (EMSP), and the Mason Gross School of the Arts (MGSA). More information about each school and their individual major/minor offerings and requirements can be found on their websites or in this catalog. The Honors College has an administrative staff, including our dean. All faculty who work with the Honors College are based within our partner schools.

# Academic Requirements (HC-NB)

## ACADEMIC REQUIREMENTS

Academic Requirements (HC-NB)

## School and Major Requirements

## School and Major Requirements

Honors College students must complete all core requirements for their academic school of enrollment along with the requirements of their chosen major(s)/minor(s). For more information about school- and major-specific requirements, please refer to the relevant sections of this catalog or the individual school and departmental websites. Credit granted for previous education and training lies within the purview of our partner schools, which grant degrees.

Academic Requirements (HC-NB)

## Honors College Coursework

## Honors College Coursework

The Honors College curriculum is integrated into a student's course of study so as not to conflict with or add additional credits to their school/major requirements. In order to graduate as an Honors College Scholar, all of the courses below must be completed with a grade of B or C or better, depending on a student's school of enrollment.

**Honors College Forum**
The Honors College Forum is the mission course of the college, providing first-year Honors College students with a common academic experience. Bringing all Honors College Scholars together to utilize project-based learning leading to a social impact idea that tackles one or more United Nations' Sustainable Development Goals (UN-SDGs), the course introduces students to the importance and challenges of global problem-solving in local contexts. The students investigate some of the essential questions defining human existence in the 21st century in the process of developing their own teams' social impact solutions to address global challenges. The Forum brings in distinguished guest speakers and also features small breakout sections that emphasize interdisciplinary collaboration among the entire Honors College cohort, as students representing the breadth of schools and disciplines work together on finding solutions to 21st-century challenges. The Forum is thus designed to lead to convergence, which is the integration of knowledge, techniques, and expertise from multiple fields to address moral, social, and cultural questions and scientific and economic challenges. Through this course, our primary task is to engage all our first-

year Honors College students to develop traits and noncognitive skills--such as critical thinking skills, problem-solving skills, social skills, persistence, creativity, and introspection--that allow them to contribute meaningfully to society and to succeed in their public lives, workplaces, homes, and other societal contexts. All Honors College students are required to take the Honors College Forum in either their first or second semester.

**Cross Cultural Competency**
Cross-Cultural Competency (CCC) teaches students to unpack issues such as racism and inequality, evaluate their role in knocking down barriers to belonging, and engage with peers collaboratively to create a final project reflecting on ways that could advance the principles of diversity, inclusion, and equity. CCC embodies three units: Identity, Interaction, and Interdependence, or, simply put Me, You, and We.

**Interdisciplinary Honors Seminar**
Interdisciplinary Honors Seminars are offered as joint initiatives between the School of Arts and Sciences (SAS) Honors Program and the Honors College, and the School of Environmental and Biological Sciences (SEBS) Honors Program and the Honors College. All Honors College students, regardless of their school of enrollment, must take at least one Interdisciplinary Honors Seminar within their first six semesters. In some cases, additional Interdisciplinary Seminars can be taken to fulfill honors credit requirements. These seminars provide students an opportunity to work closely with a faculty member and think about complex problems and issues across disciplinary boundaries or outside of traditional disciplinary trajectories. Interdisciplinary Seminars have an enrollment of no more than 18 students. All seminars involve extensive written work, readings, discussion, and independent work, and they often include research as well as fieldwork opportunities. Most Interdisciplinary Seminars offered through SAS can be used to meet the SAS, SEBS, and Rutgers Business School: Undergraduate-New Brunswick Core requirement for Writing and Communication (code WCd).

**Capstone Project**
All Honors College students must complete an independent capstone project during their senior year. Because of the wide range of majors in the Honors College--from the humanities, social sciences, and arts to business, engineering, and the life and physical sciences--a variety of different kinds of projects can fulfill the capstone requirement. Working with an Honors College adviser and with support from a departmental faculty capstone supervisor, students propose and gain approval for their capstone project by the end of their junior year. Work on the project can begin, in some cases, during the junior year and will comprise at least 6 academic credits.

Academic Requirements (HC-NB)

# Service

# Service

As a part of the Honors College's mission to develop service-minded citizens, a minimum of 30 hours of approved service work are required in their first three years. Students can choose from preapproved service projects or gain approval for independent service work. The service requirement can be credit- or noncredit-bearing; paid internships do not fulfill the service requirement.

Academic Requirements (HC-NB)

# Honors Sections and Honors Contract Courses

# Honors Sections and Honors Contract Courses

Honors College students have the opportunity to take honors sections of traditional courses during their time at Rutgers. These include general courses that often meet core school or major requirements, such as Honors Calculus and Honors Microeconomics, and provide a smaller, more intensive experience than the traditional, nonhonors sections of these courses. Honors College students also have access to special departmental honors seminars that can fulfill major requirements and offer greater opportunities for high-achieving students to go in-depth into a faculty member's area of interest. Finally, Honors College students can take Honors contract courses. With the prior approval of the course instructor and the Honors College dean, students can take sections of traditional courses with an honors contract to perform additional assignments: research, independent study, and more. Graduate courses can also potentially be taken as contract courses.

Academic Requirements (HC-NB)

# Academic Standing

# Academic Standing

In order to remain in good standing in the Honors College, students must earn at least a B or C in all honors courses taken, depending on a student's school of enrollment. Overall, students must maintain the minimum grade-point average (GPA) determined by their school of enrollment for honors status. Students who fall below this GPA will be placed on academic probation, during which time they will have the opportunity to raise their GPA back to Honors College standards. Failure to return to honors standing after a probationary period will result in dismissal from the Honors College (but not necessarily the student's academic school of enrollment). The Honors GPA for the participating schools can be found on the Honors College website. In addition, all Honors College students must adhere to the university's academic integrity policy and the student code of conduct.

Academic Requirements (HC-NB)

# Graduation Requirements

# Graduation Requirements

Students who graduate from the Honors College will have the distinction noted on both their transcripts and their diploma. To graduate as an Honors College Scholar, students must complete the following:

- Core requirements in their academic school of enrollment
- All requirements for their major(s)
- All requirements for their minor(s), if applicable
- Honors College core requirements (Honors College Forum, Cross-Cultural Competency, Interdisciplinary Seminar, Capstone Project, and Service Learning) with a grade of B or C or better, depending on a student's school of enrollment

- Completion of additional honors credits--through honors sections, contract courses, and/or additional Interdisciplinary Seminars--to meet the total honors credit requirement of their school of enrollment
- Good academic standing in their school of enrollment and the Honors College

# Student Life and Extracurricular Opportunities (HC-NB)

## STUDENT LIFE AND EXTRACURRICULAR OPPORTUNITIES

Numerous academic and social opportunities are available to students throughout their four-year membership at the Honors College.

Student Life and Extracurricular Opportunities (HC-NB)

## Housing

## Housing

For their first year, all Honors College students must live in the Honors College community with dedicated resident assistants (RAs) and mentors in residence. First-year residence is required in the Honors College community regardless of a student's school of enrollment or field of study.

Following their first year, Honors College students have the opportunity to move into special honors cohort housing on the five campuses in New Brunswick and Piscataway: College Avenue, Busch, Livingston, Douglass, and G.H. Cook. This arrangement allows students to remain with a cohort of honors students drawn from the Honors College for the remainder of their time on campus. Typically, students choose to move to the campus where the majority of their major coursework is based, but they can also live in any campus honors community of their choosing.

Honors College students may also move into traditional nonhonors housing or off-campus housing after their first year.

Student Life and Extracurricular Opportunities (HC-NB)

## Academic Advising

## Academic Advising

When students join the Honors College, they have access to the Honors College advising team. Based in the first-floor administrative offices of the college, the Honors College advisors are students' primary resource for discussing their Honors College requirements and how they integrate with their course of study. They also guide students to other resources and opportunities within the Honors College and across Rutgers, including professional development, scholarships, research, study abroad, distinguished fellowships, graduate school, and more.

Student Life and Extracurricular Opportunities (HC-NB)

# Professional Development

# Professional Development

Honors College students also have access to the assistant dean of professional development for more in-depth support in pursuing professional and research opportunities in their field of study. Students receive support through résumé writing, interview preparation, networking events, internship opportunities, and mentoring programs.

Student Life and Extracurricular Opportunities (HC-NB)

# Mentoring Program

# Mentoring Program

The Honors College's mentoring program connects students with a range of mentors from their first days on campus. The Honors College mentoring program draws on many different mentoring resources: Rutgers' distinguished faculty; graduate students from programs across the New Brunswick and Piscataway campuses; undergraduate Honors College students from upper classes; the dean of the Honors College; and Rutgers alumni working in business, law, medicine, and other professions as mentioned above.

Student Life and Extracurricular Opportunities (HC-NB)

# Student Life

# Student Life

In addition to academics and professional development, the Honors College community offers students many engaging opportunities in the areas of service and fun. Students can meet their required service hours through several HC Serves planned events throughout the year, including food insecurity projects, cleanup days, participation in the Rutgers Dance Marathon, school supply packaging for elementary school children, among many other projects. Students also enjoy activities such as the coffeehouse performances, semi-formals, and barbecues, as well as events that are both educational and fun such as the annual Geek Week event--with past themes such as Star Wars and Harry Potter--where speakers give lectures in their areas of expertise (e.g., potions chemistry, religion in Harry Potter, etc.) as related to the event's theme.

# Administration (HC-NB)

## ADMINISTRATION

**Honors College Dean**

- J.D. Bowers

**Academic Affairs and Advising**

- Andrea Rydel, Assistant Dean for Professional Development and Alumni & Corporate Engagement
- Mukesh Patel, Director of Innovation
- Talia Robbins, Assistant Teaching Professor and Lead Instructor of the Forum
- Sabrina Gat, Academic Advisor
- Ariel Chun, Academic Advisor

**Student Affairs**

- Krista Klein, Assistant Dean and Director for Student Outreach & First-Year Transition
- Domenic Nalbandian, Assistant Director for Student Support & Inclusive Communities
- Shan Reeves, Community Based Counselor
- Shawn Lawson Jr., Residence Life Coordinator

**Marketing and Communications**

- Donel Young, Director for Marketing and Communications
- Anna Witek, Web Designer and Digital & Visual Strategist

**Business and Administrative Staff**

- Joan Melillo, Business Manager
- Lisa Wittmaack, Department Administrator
- Kamini Chopra, Administrative Coordinator