

Liberal Arts Colleges

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Admission to the Liberal Arts Colleges

Rutgers–Newark encourages the admission of students who are seeking an education of the highest possible quality. The liberal arts colleges in Newark, Newark College of Arts and Sciences and University College–Newark, receive applications from a wide variety of potential students. Qualified students are admitted to the college without regard to race, color, creed, national origin, sex, sexual orientation, disability or handicap, or age.

Individual inquiries about the colleges and their programs are welcomed. Tours of the campus and personal interviews may be arranged by contacting the admissions office.

HOW TO APPLY

The Rutgers–Newark admissions office is located in Blumenthal Hall and is open Monday through Friday from 8:30 A.M. to 4:30 P.M. The mailing address is 249 University Avenue, Newark, NJ 07102-1896. The telephone number is 973/353-5205.

Applications for Newark College of Arts and Sciences and University College–Newark may be obtained from the admissions office either by visiting the office or by requesting an application by phone or mail. Applications also are available in New Jersey high school guidance offices and community college transfer counselor offices. Students also may download an application form from the undergraduate admissions web site (<http://www.rutgers.edu>) and/or apply online.

Students who wish to attend the School of Management must first apply and be accepted to either the Newark College of Arts and Sciences or University College–Newark. They also must fulfill a set of prerequisite courses and obtain a minimum grade-point average to remain in the School of Management. See the School of Management section for more information.

WHEN TO APPLY

Applicants should refer to the undergraduate application packet for specific information regarding application procedures. Students who submit a completed application by the priority application date of December 1 will receive full admission consideration. The undergraduate colleges continue to consider applications as long as space is available.

CREDENTIALS

Applicants must submit official transcripts for all work taken in grades nine through twelve and in other colleges and universities. The secondary school record should include rank in class (if available) or a grade distribution, grades for all courses taken, a listing of courses in progress, and credit granted and anticipated.

A transfer applicant for the fall term must submit a transcript that includes fall term grades from the preceding year, if enrolled in college that term.

The following documents must be submitted with the application for admission:

1. official secondary school transcript or GED diploma and scores;
2. official transcripts of work completed at other colleges;
3. a list of courses in progress at a degree-granting institution; and
4. SAT I or ACT scores if candidate is applying for admission less than two years after graduation from high school.

The College Entrance Examination Board administers the Scholastic Assessment Tests I (SAT I). Applicants should request that the results be forwarded to Rutgers, The State University of New Jersey. Use College Board code 2765 or ACT code 2592 when requesting that reports be sent. Applicants should write directly to the College Entrance Examination Board, P.O. Box 592, Princeton, NJ 08541, for information and applications. This material also is available at high school guidance offices. Applicants are encouraged to take entrance examinations by December of their senior year.

For information on the ACT, contact the Office of Admissions.

Candidates are *not* required to take the SAT I or ACT if:

1. 12 or more college-level credits have been satisfactorily completed after high school at an accredited institution of higher education; or
2. The applicant has been out of school two or more years.

High School Entrance Units

Candidates are expected to have satisfactorily completed sixteen academic units in grades nine through twelve, including four years of English, three years of college preparatory mathematics, two years of one foreign language, two years of science, and five other approved academic electives. Approved electives include social studies, natural sciences, foreign languages, and mathematics. The Faculty Admissions Committee, at its discretion, may accept other subjects. In some instances, individuals applying to University College–Newark may be permitted to meet unit requirements during the first year of college attendance.

Transfer Students

A student who has earned 12 college-level credits or more at an accredited institution of higher education by the expected date of entrance at Rutgers, The State University of New Jersey, is considered a transfer student.

In addition to a completed application form, transfer applicants must submit their secondary school record and transcripts from all previous schools of higher education, including other divisions of Rutgers, regardless of the applicant's desire to receive credit for work completed.

The priority application date for transfer students is January 15. Applicants who submit completed applications by that date will receive full admission consideration. Students who apply after the priority application date will be considered as long as space remains available.

Students currently enrolled in other institutions should submit transcripts of their work through the fall term or winter quarter. All transcripts should indicate the titles, numbers, and grades earned for courses completed and

should be mailed directly to the admissions office at Rutgers, The State University of New Jersey, by the institution(s) concerned. Transcripts submitted to Rutgers by the applicant are not considered official.

International students should refer to *Other Admission Options* below, for information about completing an application for admission.

OTHER ADMISSION OPTIONS

Admission by Examination

Candidates whose preparatory courses do not meet the formal requirement of 16 academic units, who have not completed high school, or who have a diploma from a nonaccredited high school, may qualify for admission by examination. Such candidates must submit scores from SAT II as well as the SAT I or ACT required of all candidates. The three achievement tests must include English, mathematics, and a third subject of the student's choice.

Educational Opportunity Fund Program

The Educational Opportunity Fund Program (EOF) was established by the New Jersey Legislature in 1968. Its purpose is to increase access to higher education by providing admissions, academic support services, and financial assistance to educationally and economically disadvantaged New Jersey residents attending the state's colleges and universities. Students who are admitted to this program possess the academic potential to enjoy a successful college career, but generally do not possess all the skills of traditionally admitted first-year students. To assist the students, the state provides financial support and the college offers a required summer program, specialized instruction in basic mathematics and communication skills, professional counseling, academic advising, tutoring, and career counseling, in consultation with the academic departments. The Academic Foundations Center has administered the EOF Program since its inception at the Newark College of Arts and Sciences and University College. For further information, contact the Educational Opportunity Fund director at Rutgers–Newark, 973/353-5604.

High School Scholars Program

The High School Scholars Program offers academically superior high school students a unique opportunity to study either full- or part-time at a major university center. A fully matriculated high school scholar foregoes the senior year in high school and takes a normal first-year program. Upon successful completion of a year of study, the student may apply to the former high school for a resident diploma or to the State Board of Education for a high school equivalency diploma.

A part-time high school scholar is given released time by the high school to attend classes at the college for college credit. Normally, a part-time high school scholar takes one or two 3-credit courses each term. If the student decides to matriculate, the credits earned are applied toward a baccalaureate degree awarded by the Newark College of Arts and Sciences and, generally, are accepted as transfer credits to other colleges. The college offers more than one thousand courses in nineteen academic departments. Stu-

dents accepted into the program are advised individually as to the appropriateness of particular courses. For more information, contact the admissions office at 973/353-5205.

International Students

In addition to the standard application, international students must submit the Supplementary Form for International Students (available from the admissions office) and the documentation requested on that form indicating present or proposed visa status and financial support. Official records (original or certified copies) of all previous secondary and postsecondary education, as well as official English translations of these records, are required. Students currently enrolled at a college or university in the United States also must submit a Foreign Student Adviser's report.

International students must submit the SAT I or ACT score; students whose primary language is not English must submit an official score from the Test of English as a Foreign Language (TOEFL) and/or placement information from the Rutgers Program in American Language Studies (PALS). For further information about these tests, write or call the Educational Testing Service, Princeton, NJ 08541, U.S.A.; 609/921-9000.

Applicants to the Newark campus also may sit for the Program in American Language Studies (PALS) examination in place of the TOEFL. Students must take this exam at the PALS office on the Newark campus. For further information, call or write PALS, Smith Hall, Newark, NJ 07102; 973/353-5013.

To be eligible for a student visa, a student must be enrolled on a full-time basis in Newark College of Arts and Sciences. For further information, contact the admissions office or the Office of International Student Services, 973/353-1427.

Nondegree Nonmatriculating Students

Individuals who do not wish to matriculate and work toward a degree may enroll in selected courses for two terms. However, admission is on a space-available basis and students may be admitted provided they have met one of the following criteria:

1. The applicant has completed an undergraduate degree. The goal of an applicant in this category is to complete requirements for graduate school or for professional advancement.
2. The applicant is a student in good standing at another institution that has given written permission, specifying the courses to be taken.
3. Students who meet the admission standards, but do not wish to matriculate at this time, will be allowed to attend for two terms only and to enroll in no more than 12 credits each term if they remain in good academic standing.

Nondegree students should complete a special application for nonmatriculated students. Details concerning application procedures and policies pertaining to nonmatriculated students may be obtained from the admissions office. If the undergraduate degree is from NCAS or UC, students may go to the Dean of Student Affairs Office, Hill Hall 312, for a reentry form at least thirty days prior to the term.

Rutgers, The State University of New Jersey, also encourages senior citizens to audit courses on a noncredit, space-available basis. New Jersey residents, aged sixty-two

and older, may attend classes free of charge under this program. Those interested in attending should contact the Office of the Dean of Faculty, 973/353-5213.

ACADEMIC CREDIT

Admission with Associate Degree

Students admitted to Newark College of Arts and Sciences or University College–Newark with an associate in arts degree from an accredited New Jersey two-year college transfer program receive up to 65 credits earned for that degree toward the number of credits required for the bachelor's degree at Newark College of Arts and Sciences or University College–Newark. Students so admitted are subject to all general college requirements for the bachelor's degree outlined in this catalog and the major requirements stipulated by the faculty of the major department. Applicable courses transferred with the minimal passing grade of *C* may be used to satisfy the general college requirements. No more than 65 credits will be accepted from two-year colleges.

Advanced Placement

High school seniors who have taken advanced courses may take the College Board Advanced Placement Examinations administered by the College Entrance Examination Board. Advanced placement and/or degree credit is awarded for scores of *4* or *5*; the colleges ask the appropriate academic department to evaluate scores of *3*. No advanced placement or degree credit is given for grades of *1* and *2*.

College Level Examination Program

The colleges participate in the College Level Examination Program (CLEP), which is administered by the College Entrance Examination Board. Candidates for admission who have been out of school five years or more and who have not attended college may receive degree credit based on the CLEP General Examination *before* their admission to the university. Students may earn a maximum of 24 credits for the General Examination, providing they score at or above the fiftieth percentile. Candidates for admission are granted degree credit for CLEP Subject Examinations approved by the colleges, providing they achieve a score at or above the fiftieth percentile.

Credit for Prior Learning

University College–Newark accepts up to 45 credits for prior learning. To earn such credit, a student must demonstrate college-level knowledge comparable to that required in a Rutgers course.

There are three methods whereby the student may obtain credit for prior learning.

1. College Level Examination Program (CLEP). Credit may be granted for the two types of CLEP tests—the CLEP General Examination and the CLEP Subject Examination.
2. Thomas Edison College Examination Program (TECEP) standardized tests.
3. Portfolio assessment, which is administered through Thomas Edison State College.

For more specific information about credit for prior learning and for information on fees, eligibility, and the level of achievement required, students should consult the Office of the Dean of Student Affairs, 312 Hill Hall.

Transfer Credits

Transfer credit for work done at another institution is evaluated after an applicant has been admitted to the college of his or her choice. Except in certain specific instances, credit is generally granted for courses taken at an accredited institution of higher learning, provided the student earns grades of *C* or better. Credits will transfer but grades do not transfer into the Rutgers GPA. It should be noted, however, that both Newark College of Arts and Sciences and University College–Newark accept a maximum of 12 credits in professional electives. Each college transfers courses differently. The maximum number of credits accepted from a two-year college is the number of credits required to earn the A.A. degree, not to exceed 65 credits. Transfer students should note that, generally, credit will not be accepted for courses in military or aviation science, physical education activities, secretarial/office science, cooperative education, and developmental or remedial courses.

For accounting, finance, management, and marketing transfer students, upper-level courses in these subjects generally are not accepted for credit toward the major. The maximum number of credits transferred may not exceed 94 credits from a four-year institution, 65 of which may be from a two-year college.

New Jersey County College Partnerships

Rutgers University has implemented a new articulation system, known as ARTSYS, with New Jersey's community colleges. ARTSYS is a computerized data information system designed to ease the transition from these institutions to Rutgers. Students attending one of New Jersey's two-year colleges can access the ARTSYS web site (<http://artsys.rutgers.edu>) to obtain detailed information about transferring to Rutgers. Students can determine course requirements for the first two years of each major program of study offered by Rutgers' undergraduate colleges and assess the transferability of the courses they are completing at their community college.

Newark College of Arts and Sciences

ABOUT THE COLLEGE

The Newark College of Arts and Sciences was founded in 1930 as a four-year liberal arts institution affiliated with the New Jersey Law School. Dana College—as it was first called—began with a faculty of fifteen and fewer than three hundred students. Six years later and almost twice as large, Dana was renamed the Newark College of Arts and Sciences when it became the undergraduate division of the newly formed University of Newark. In 1946, the University of Newark and Rutgers University were merged to form Rutgers, The State University of New Jersey.

Modern Urban Campus

In the late 1960s, the college moved to a new campus. Located in the downtown business district of Newark, the college is part of an active urban community that offers great cultural and career advantages. The college shares its campus with various other divisions of Rutgers, including the School of Management, the College of Nursing, Graduate School–Newark, Graduate School of Management, the School of Law–Newark, and the School of Criminal Justice. The college also is in close proximity to the University of Medicine and Dentistry of New Jersey and New Jersey Institute of Technology, with the resources of both institutions available to qualified students through an exchange registration program.

Liberal Arts Tradition

From its inception, the Newark College of Arts and Sciences has prided itself on combining the best of the liberal arts tradition with excellence in professional and preprofessional training. As an undergraduate unit within Rutgers, the college draws upon the vast educational resources of one of the country's finest universities. At the same time, with a student body numbering about 3,700, the college is able to offer students the option of small classes in many fields of study, as well as the opportunity to work with faculty members on an individual basis. An honors college, a study abroad program, various internship programs, service learning opportunities, and the possibility of enrolling in graduate courses during senior year are among special advantages the college offers.

DEGREE REQUIREMENTS

The Newark College of Arts and Sciences seeks to foster the broad intellectual and personal development of its students. The spirit of this philosophy is reflected in the liberal arts curriculum, which requires that all candidates for the baccalaureate degree complete courses in a variety of fields of learning. In addition, each student must select a field of knowledge for intensive study in order to gain some mastery

of a particular discipline. This combination of broad-ranging inquiry and concentrated investigation of a specific area of learning prepares the student for effective and intelligent participation in the modern world.

The college offers courses in liberal arts and sciences leading to either the Bachelor of Arts or the Bachelor of Science degree. The curricula of the college are as follows: liberal arts and sciences leading to the degree of Bachelor of Arts; combined liberal arts and business administration (graduate) leading to the degrees of Bachelor of Arts and Master of Business Administration; combined liberal arts and criminal justice (graduate) leading to the degrees of Bachelor of Arts and Master of Arts; combined liberal arts and engineering leading to the degrees of Bachelor of Arts and Bachelor of Science; and clinical laboratory sciences leading to the degree of Bachelor of Science, conferred jointly by Rutgers and the School of Health Related Professions of the University of Medicine and Dentistry of New Jersey in Newark.

To be certified for graduation, candidates for the Bachelor of Arts or Bachelor of Science degrees must satisfy college requirements. Students are subject to the curriculum requirements in effect when they entered Newark College of Arts and Sciences or, in the case of absence for two or more terms, those requirements in effect when they return.

Placement Examinations for Entering Students

Students with fewer than 12 college credits at the time of admission must take the Rutgers Placement Test in Math and English. If the student has completed 12 or more college credits at the time of admission, writing and mathematics placement tests may be required. Based on the results of these tests, students are placed in the appropriate English and mathematics courses.

General Curriculum Requirements

A student must successfully complete at least 124 academic credits to graduate from the Newark College of Arts and Sciences. Credits earned more than seven years before the date of graduation are not necessarily accepted in fulfillment of the requirements for graduation. Students must complete all requirements for graduation in order to participate in graduation ceremonies.

To ensure that every graduate has the opportunity to acquire a broad liberal arts education, the faculty has prescribed the following general curriculum requirements for all students, regardless of major field.

English Composition. Every student must successfully complete 21&62:350:101-102 English Composition I, II or 21&62:350:121-122 Expository Writing I, II (for transfer students) with grades of *C* or better; this one-year course must be taken as soon as the student is eligible according to established placement standards at the college. Students who do not fulfill this requirement may be compelled to carry a reduced credit load and to defer their probable date of graduation.

Students who perform exceptionally well in a placement examination may be permitted to take an honors course in English composition (21&62:350:103-104) in lieu of the regular composition sequence.

It should be understood that students are expected to write proper English in all courses. A student who consistently writes in an unsatisfactory manner, even though English composition has been passed, may be required to complete appropriate remedial work.

Writing across the Curriculum

Beginning in fall 2001, every student must successfully complete a two-term writing requirement beyond English 101 and 102 (or 121 and 122). Students may satisfy this requirement by taking any two courses designated "W" in the *Schedule of Classes*. Students must take at least one of these courses within the department of their major, and may choose to take the other as a course that satisfies general requirements, or as an elective.

Mathematics Proficiency. All candidates for the Bachelor of Arts or Bachelor of Science degrees are required to demonstrate minimum proficiency in mathematics by satisfying one of the following criteria:

1. Successful completion, with a grade of *C* or better, of 21&62:640:103 (Math for Liberal Arts), 112, or 113 College Algebra or any more advanced course in mathematics offered by the Department of Mathematics and Computer Science.
2. Satisfactory performance on a proficiency examination administered by the Department of Mathematics and Computer Science.
3. Successful completion, with a grade of *C* or better, of a college level, first-term calculus course equivalent to 21&62:640:135 Calculus I, at another institution, or a grade of *B* or better in a precalculus course equivalent to 21&62:640:114 or 119.

Every student must attempt the mathematics proficiency requirement within one term after becoming eligible according to established placement standards at the college. This requirement must be completed satisfactorily before the student achieves senior standing. Students not meeting the deadline may be required to carry a reduced credit load and to defer their probable date of graduation.

Foreign Language. Students are expected to have completed two years of high school study of a foreign language prior to entering college. Students who have not fulfilled this expectation will be required to complete a one-year, elementary, sequential course (6 credits) in a foreign language offered by the Department of Classical and Modern Languages and Literatures. The department offers such courses in French, German, Greek, Hebrew, Italian, Latin, Russian, and Spanish. A placement exam, administered by the department, must be taken before registering for a foreign language. Students must take 6 credits to receive any credit.

History and Literature. Every student must successfully complete 6 credits in history offered by the Department of History and 6 credits in literature offered by the Department of English, the Department of Classical and Modern Languages and Literatures, or the Department of Afro-American and African Studies. The literature course may be taken in the original language or in translation. Successful completion of English composition is a prerequisite for enrolling in the history and literature courses. Students who choose a literature course in an original language must fulfill language prerequisites for that course as well. For information on specific courses that fulfill this requirement, consult the Office of Student Affairs.

Natural Sciences. Every student must successfully complete a one-year course with a laboratory in a natural science (8 credits), and 3 additional credits in either the natural sciences or mathematics. A mathematics

course taken to fulfill this requirement must be at a higher level than the course taken to meet the mathematics proficiency requirement.

The laboratory science requirement is satisfied by taking one of the one-year introductory courses, with laboratory, offered in the natural sciences area. Students with specific career or major interests in scientific fields should seek academic guidance in choosing laboratory courses.

The following courses fulfill the laboratory science requirement:

- 21&62:120:101-102 General Biology
- 21&62:120:109,110 Basic Plant Science and Basic Plant Science Laboratory 21&62:120:206,207 General Horticulture and Horticulture Laboratory
- 21&62:160:101,102 World of Chemistry *and* 21&62:160:109,110 World of Chemistry Laboratory
- 21&62:160:115-116 General Chemistry *and* 21&62:160:113-114 General Chemistry Laboratory
- 21&62:460:103,104 Planet Earth and Planet Earth Laboratory *and* 21&62:460:114,115 Earth and Life History and Earth and Life History Laboratory
- 21&62:750:203,204 General Physics I,II *and* 21&62:750:205,206 Introductory Physics Laboratory
- 21&62:750:213,214 Elements of Physics *and* 21&62:750:205,206 Introductory Physics Laboratory

The following courses fulfill the natural science requirement:

- 21:120:109 Basic Plant Science
- 21:120:204 Economic Botany
- 21:120:205 Environmental Issues
- 21&62:120:206 General Horticulture
- 21&62:120:208 Human Sexuality
- 21:160:101 World of Chemistry
- 21&62:198:101 Computers and Programming I
- 21:460:101 Introduction to the Earth (not for students who take Planet Earth)
- 21:460:102 Africa: A Virtual Field Trip to the Continent
- 21:460:103 Planet Earth
- 21:750:109 Astronomy and Cosmology

For updated information about courses that fulfill this requirement, consult the Office of the Dean of Student Affairs.

Social Sciences. Every student must successfully complete a one-year sequential course (6 credits) in African-American studies, anthropology, economics, political science, psychology, or sociology. The following courses fulfill the social sciences requirement:

- 21&62:014:111,112 Introduction to the Black Experience in Western Culture
- 21&62:070:203 Introduction to Physical Anthropology and Archaeology *and* 21&62:070:204 Introduction to Cultural Anthropology
- 21&62:220:101 Introduction to Economics, Micro *and* 21&62:220:102 Introduction to Economics, Macro

- 21&62:790:201 American National Government *and* 21&62:790:202 America and the World *or* 21&62:790:201 American National Government *and* 21&62:790:203 Introduction to Comparative Politics *or* 21&62:790:371 Early Political Theory (prerequisite junior standing or permission of instructor) *and* 21&62:790:372 Modern Political Theory (prerequisite junior standing or permission of instructor)
- 21&62:830:101,102 Principles of Psychology
- 21&62:920:201,202 Sociology I *and* Sociology II *or* 21&62:920:201 Sociology I *and* 62:202:303 Criminology *or* 21&62:920:202 Sociology II *and* 62:202:303 Criminology

For updated information about courses that fulfill this requirement, contact the Office of Student Affairs.

The Fine Arts. Every student must successfully complete one course (3 credits) that focuses on an aspect of the fine arts. The course may be a selected performance offering, or it may be one that reflects a historical/critical perspective on an area of the fine arts.

The following courses fulfill the fine arts requirement:

- 21&62:080:102 Design Fundamentals
- 21&62:080:103 3-D Design Fundamentals
- 21&62:080:121 Introduction to Drawing
- 21&62:080:251 Introduction to Painting (prerequisites: 21&62:080:102,121)
- 21&62:080:261 Introduction to Photography
- 21&62:082:101 Introduction to Art History I
- 21&62:082:102 Introduction to Art History II
- 21&62:082:201 History of Non-Western Art
- 21&62:700:101 Introduction to Music
- 21&62:700:111 Fundamentals of Music I
- 21&62:700:135 Music and Film
- 21&62:700:219 Women in Music
- 21&62:700:229 American Music
- 21&62:700:237,238 Survey of Western Music
- 21&62:700:265 Jazz
- 21&62:700:280 World Music—An Introduction
- 21&62:950:289 Principles of Oral Interpretation
- 21&62:965:208 Movement for the Theater
- 21&62:965:209,210 Voice and Speech for the Theater I, II
- 21&62:965:211 Living Theater—Introduction to Theater
- 21&62:965:256 The Art and History of the Film
- 21&62:965:263 Modern Film
- 21&62:965:271 Acting Fundamentals
- 21&62:965:351,352 Topics in American Film
- 21&62:965:353 Traditional Theaters of Asia

For updated information about courses that fulfill this requirement, contact the Office of Student Affairs.

Interdisciplinary Study. Every student must successfully complete one course (3 credits) that explicitly takes an interdisciplinary approach to its subject matter. The following courses fulfill the interdisciplinary requirement:

- 21&62:014:305 Black Women in the United States
- 21&62:014:306 Comparative Race Relations: South Africa and the United States
- 21&62:014:389 Psychology and Values of the African American
- 21&62:014:396 The African-American Community
- 21&62:050:306 The Vietnam War and America

- 21&62:070:346 The Cultural History of the New York Police
- 21&62:070:390 Culture, Political Violence, and Genocide
- 21&62:070:475 Culture and Globalization
- 21&62:120:208 Human Sexuality
- 21&62:190:310 Ancient Technology
- 21:190:325 Women in Antiquity
- 21:190:335,336 Ancient Law
- 21&62:190:361,362 Greek Civilization
- 21&62:190:363,364 Roman Civilization
- 21&62:350:254 Literature and Politics in the Third World
- 21&62:350:302 Writing with Computers
- 21&62:350:361,362 Women in Literature
- 21&62:350:377 Science Fiction, Technology, and Society
- 21&62:350:379 Computers and Literature
- 21&62:350:395 Nuclear War and Literature
- 21&62:352:350 The Vietnam War and American Literature
- 21&62:352:351 Crime and Punishment in American Literature
- 21&62:420:260 Contemporary France
- 21&62:460:203 Natural Disasters
- 21&62:470:327 Germanic Mythology and Folklore
- 21&62:500:235,236 The World of the Bible
- 21&62:500:341,342 Jewish Civilization
- 21&62:510:394 The Peoples and Cultures of Central Asia
- 21&62:730:105 Current Moral and Social Issues
- 21&62:730:112 Introduction to Ethics
- 21&62:730:201 Introduction to Logic
- 21&62:730:225 Philosophy of Science
- 21&62:730:251 Business and Professional Ethics
- 21&62:730:327 Philosophical Issues of Feminism
- 21&62:730:328 Social and Political Philosophy
- 21&62:730:350 Decision Theory and Ethics
- 21&62:750:202 Physics as a Liberal Art
- 21&62:810:321 Oral History of Newark's Ironbound Neighborhood
- 21&62:840:204 Seminar on Religion and Culture
- 21&62:880:331,332 Topics in Science, Technology, and Society
- 21&62:940:341,342 Hispanic Civilization
- 21&62:940:383 Ibero-American Thought in English Translation
- 21:965:253 TV and Society: Image and Impact
- 21&62:988:201,202 Introduction to Women's Studies
- 21:988:325 Politics of Sexuality
- CIS 350 (NJIT) Computers and Society

For updated information about specific courses that fulfill this requirement, contact the Office of Student Affairs.

Restricted Electives. Every student must successfully complete 15 credits of electives outside his or her major. (Current and prospective students in the School of Management may not take courses offered by the School of Management to fulfill this requirement.)

Courses taken for graduation credit in education may be used as electives for purposes of this requirement.

With elective credits, students may choose to complete a minor in an approved subject offered at the college.

Major Programs

In addition to fulfilling the general curriculum requirements, every degree candidate must select a special field of knowledge for intensive study. Students may declare a major beginning with the first term of their sophomore

year; they must do so by the end of their sophomore year. The general advisers, the deans, and the staff members in the Career Development Center all can provide assistance to students who are undecided about an appropriate program to pursue. Specific information about the requirements for the various majors offered at the college is found in the chapter on program requirements.

As a general rule, a major consists of 30 to 70 credits of course work in a discipline, but specific requirements are set by each academic department. No course in which a grade of *D* or *F* has been earned may be counted toward completion of a major. Most majors require a minimum cumulative grade-point average of 2.0; some, such as accounting, finance, management, and marketing, require a minimum 2.5 cumulative grade-point average. Transfer students must complete at least one-half of the credits required for their major at the college.

Students interested in a particular major should consult with the appropriate department chairperson or program director concerning current requirements for the major, necessary prerequisites, and the acceptability of any transfer credits. Once a decision has been made to pursue a major, it is the student's responsibility to file a Declaration of Major form in the department that offers that major.

The following majors are offered at Newark College of Arts and Sciences. Requirements in each major are described in the Academic Programs and Courses chapters of this catalog. A Bachelor of Arts degree is conferred for all majors except accounting, allied health technologies, clinical laboratory sciences, criminal justice, environmental science, finance, geoscience engineering, management, and marketing, for which a Bachelor of Science degree is awarded. Either a Bachelor of Arts degree or a Bachelor of Science degree is available in the following subjects: biology and geology. The Federated Department of Biological Sciences confers both a Bachelor of Arts degree and a Bachelor of Science degree. A B.F.A. in Visual Arts is available for students interested in pursuing a professional degree in the arts. This degree program requires students to submit a portfolio.

- 010 Accounting
- 014 African-American and African Studies
- 045 Allied Health Technologies
- 050 American Studies
- 060 Ancient Mediterranean Civilizations
- 070 Anthropology
- 080 Art*
- 081 Visual Arts*
- 120 Biology*
- 130 Botany
- 149 Central and Eastern European Studies
- 160 Chemistry*
- 191 Clinical Laboratory Sciences
- 198 Computer Science
- 202 Criminal Justice
- 220 Economics*
- 350 English*
- 375 Environmental Science
- 390 Finance
- 420 French*
- 460 Geology*
- 465 Geoscience Engineering
- 470 German*

- 510 History*
- 531 Human Computer Interaction (pending)
- 548 Information Systems
- 558 Interdisciplinary
- 570 Journalism
- 620 Management
- 630 Marketing
- 640 Mathematics*
- 642 Mathematics, Applied
- 700 Music*
- 730 Philosophy
- 750 Physics*
- 755 Physics, Applied
- 790 Political Science*
- 830 Psychology
- 836 Puerto Rican Studies
- 880 Science, Technology, and Society
- 910 Social Work
- 920 Sociology
- 940 Spanish*
- 965 Theater Arts and Television
- 988 Women's Studies
- 990 Zoology

Interdisciplinary Majors

Qualified students may have the option of pursuing an interdisciplinary major, which includes specified course work in more than one academic department. A student who wishes to pursue an interdisciplinary major must develop a complete program of study in consultation with the department chairpersons involved. A written copy of that program signed by the chairpersons must be filed with the Office of Student Affairs. Unless it is subsequently amended with the written permission of the chairpersons, it constitutes the major program the student must complete for graduation.

Double Majors

OTHER PROGRAMS

075	Archaeology
080	Art
098	Asian Studies
120	Biology
130	Botany
135	Business Administration
149	Central and Eastern European Studies
160	Chemistry
198	Computer Science
202	Criminal Justice
220	Economics
350	English-Literature
420	French
460	Geology
470	German
510	History
525	Honors College
551	International Affairs (Classical and Modern Languages and Literatures, and Political Science)
560	Italian
570	English-Journalism
600	Legal Studies (History and Political Science)
640	Mathematics
700	Music
730	Philosophy
750	Physics
755	Physics, Applied
790	Political Science
810	Portuguese
830	Psychology
836	Puerto Rican Studies
860	Russian
861	Slavic
880	Science, Technology, and Society
910	Social Work
920	Sociology
940	Spanish
965	Television
965	Theater Arts
988	Women's Studies
990	Zoology

Courses of Study

The program of study a student follows varies considerably depending upon specific interests and abilities. The information below is of a general nature; many alternative programs are possible and should be discussed with the student's adviser or an academic dean.

Students should frequently consult with an adviser regarding the progress of work, the completion of all requirements, and plans for graduate study or professional work. Before graduation, the chairperson of the major department must certify to the faculty and the dean that the student has satisfactorily met the requirements for the major.

First and Sophomore Years

In the first and sophomore years, the student should explore areas of major interest and should try to complete many of the general curriculum requirements. Students whose major requires additional knowledge of mathematics or science normally take appropriate courses in the field beginning in the first year.

Typical programs for the first and sophomore years might look as follows:

First Year

Fall Term	Spring Term
English composition (3)	English composition (3)
Mathematics (3)	Fine arts (3)
Laboratory science (4)	Laboratory science (4)
Social science (3)	Social science (3)
Major or elective (3)	Major or elective (3)

Sophomore Year

Fall Term	Spring Term
History (3)	History (3)
Literature (3)	Literature (3)
Natural science/mathematics (3)	Interdisciplinary (3)
Major or elective (3)	Major or elective (3)
Elective (3)	Elective (3)

HONORS COLLEGE

The Honors College at Rutgers–Newark is a four-year undergraduate “college within a college,” drawing the top students admitted to the Newark College of Arts and Sciences. The Honors College helps students develop a highly sophisticated research ability; the skill to analyze the question; the ability to see and discover information about the question; the wisdom to evaluate information; and the practiced skill of applying information to solve problems. The Honors College draws on faculty in all disciplines to present colloquia or to serve as mentors for honors projects. Honors College students are given full consideration for all available merit scholarships, and enjoy close interaction with faculty, small classes and seminars, independent and cross-disciplinary study, and off-campus internships and service opportunities.

Students are invited to join the Honors College based on their academic record. In some instances, an interview with a member of the staff may be required. Incoming first-year students, as well as continuing and transfer students, are all considered for Honors College invitation.

Participants in the four-year program are required to enroll in 21:350:103-104 Honors English Composition during the first year. In addition, 21:640:155,156 Honors Calculus is available for students with the appropriate mathematics background. During sophomore and junior years, students may take additional honors credits (see course listing). The Senior Honors project is the capstone of the Honors College program. These projects are often of either publishable or exhibition quality, thus giving graduates the credentials ordinarily characteristic of advanced graduate students.

For more information, contact Dr. Elizabeth Mitchell, Director of the Honors College, Hill Hall, Rutgers–Newark, Newark, NJ 07102; 973/353-5860 or 5866, email: lizmit@andromeda.rutgers.edu.

OTHER PROGRAMS**Architecture**

A five-year Bachelor of Architecture degree is offered by the School of Architecture at the New Jersey Institute of Technology. Qualified students with an interest in the field should apply directly to NJIT for admission. Students

admitted to the Newark College of Arts and Sciences may, through the exchange registration system, take courses in the School of Architecture as space permits. Those who decide to continue studies in architecture should plan to transfer to NJIT preferably no later than the beginning of the sophomore year. Admission as a transfer student is not guaranteed, and is solely at the discretion of the New Jersey Institute of Technology. For those interested in the architecture program, the following course of study is recommended:

Rutgers

21&62:080:121 Introduction to Drawing (3)
21&62:350:101-102 English Composition (3,3)
21&62:640:135 Calculus I (3)

New Jersey Institute of Technology

Arch 155 Architectural Graphics (3)
Arch 163 Introduction to Design I (5)
Arch 164 Introduction to Design II (5)
CIS 104 Computer Programming and Graphics Problems (2)
HSS 211 The Premodern World (3) *or* HSS 212 The World and the West (3) *or* HSS 213 The Twentieth-Century World (3) *
Math 114 Finite Mathematics and Calculus II (4)

For more information, students may contact the Office of Admissions, or the assistant to the dean at New Jersey Institute of Technology School of Architecture at 973/596-3075.

Criminal Justice: Joint B.A. or B.S./M.A.

This five-year program makes it possible for qualified students to earn a baccalaureate degree from the Newark College of Arts and Sciences and a masters degree from the School of Criminal Justice. The program is designed for the highly motivated student who, at an early stage, has decided to pursue a career in the criminal justice field. Program requirements are:

1. Ninety-four undergraduate credits in liberal arts subjects, including satisfactory completion of the general curriculum requirements of the Newark College of Arts and Sciences;
2. Completion of an undergraduate major at the Newark College of Arts and Sciences;
3. A cumulative grade-point average of 3.2 or better at the Newark College of Arts and Sciences *and* a Graduate Record Examination test score (junior year) acceptable to the School of Criminal Justice.

Careful planning is necessary to complete the undergraduate requirements specified within a 94-credit framework. Accordingly, the program is ordinarily open only to students who matriculate as first-year students at the Newark College of Arts and Sciences or to those who transfer with no more than 30 credits.

Students interested in this program should contact the Office of Student Affairs during their first year; an official declaration of intent must be filed during the sophomore year. Application for early admission to the School of Criminal Justice is then made at the beginning of the second term of the junior year. (Applications, catalogs, and additional information about the School of Criminal Justice may be obtained at the Rutgers Center for Law

and Justice, 123 Washington Street.) Students who meet at least the minimum qualifications specified above must secure a recommendation from the Office of the Dean of Student Affairs, which should be forwarded to the School of Criminal Justice with their application for admission. In all cases, the School of Criminal Justice reserves the right to deny admission to applicants it deems unqualified. Students who do not qualify for admission to the graduate program at the end of the junior year may apply or reapply upon graduation from the Newark College of Arts and Sciences, but admission to the School of Criminal Justice is not guaranteed.

Those students accepted by the School of Criminal Justice receive their B.A. or B.S. degree from the Newark College of Arts and Sciences upon satisfactory completion of 24 credits in the graduate program. Upon satisfactory completion of the remaining requirements of the School of Criminal Justice, a Master of Arts degree is awarded. Upon admission to the School of Criminal Justice, students are bound by the academic regulations and degree requirements of that school.

Dual Major with NJIT

To enhance the scope of education and the opportunities available to undergraduate students, the New Jersey Institute of Technology (NJIT) and the Newark campus of Rutgers, The State University of New Jersey (Rutgers–Newark), offer their students the option of pursuing a dual major in select fields at the two institutions.

Students at either Rutgers–Newark or NJIT may elect to pursue a dual (or second) major at the corresponding institution. Acceptance into a program will be determined entirely by the host institution program, but will be consistent and uniform with practices in place for home institution students. General education requirements are completed at the host institution.

Dentistry

Most dental schools now urge students to prepare for admission with the broadest possible curriculum. The entrance requirements for dental schools, as recommended by the American Dental Association, are identical to those listed for medical schools. The Dental Admission Test (DAT) is normally taken in the spring term of the junior year and application to dental schools made in the summer between the junior and senior years. Early in their undergraduate careers, interested students should ascertain specific admission requirements of schools to which they may apply. Students interested in dentistry are urged to consult with the adviser for the prehealth program at 973/353-5705.

Education

Students can obtain certification to teach at the elementary or secondary level by combining an approved major with courses in education. See the entry on education in the Academic Programs and Courses chapter in this section of the catalog.

Engineering: Four-Year Program

The first two years of the four-year program are offered by the Newark College of Arts and Sciences. The last two years are taken at the School of Engineering at New Brunswick. To transfer to the School of Engineering, the student must satisfactorily complete all courses specified for the first

* For course descriptions, students should consult the 1997–2000 NJIT Undergraduate Catalog.

two years and also must satisfactorily meet the standards established by the School of Engineering. Students should contact the engineering adviser in the Department of Physics, or the Office of Student Affairs at the earliest opportunity. As is the case of other preprofessional programs, competition is intense and admission to the School of Engineering is not guaranteed.

By combining science and liberal arts courses at the Newark College of Arts and Sciences with appropriate engineering courses at the New Jersey Institute of Technology, the four-year program enables the student to complete the first two years of a regular engineering curriculum at the Newark College of Arts and Sciences. The last two years are completed at the School of Engineering at New Brunswick. The Bachelor of Science degree is conferred by the School of Engineering at the end of the fourth year.

First Year

Fall Term (16 credits)

- 21&62:160:113,115 General Chemistry and Laboratory (4)
- 21&62:350:101 English Composition I (3)
- 21&62:640:135 Calculus I (4)
- 21&62:750:205 Introductory Physics Laboratory (1)
- 21&62:750:213 Elements of Physics (3)
- CIS 101 (NJIT) Computer Programming and Program Solving (2)

Spring Term (17 credits)

- 21&62:160:114,116 General Chemistry and Laboratory (4)
- 21&62:640:136 Calculus II (4)
- 21&62:750:206 Introductory Physics Laboratory (1)
- 21&62:750:214 Elements of Physics (3)
- SS 201 (NJIT) Economics (3)
- humanities/social sciences elective (3)

Sophomore Year

Fall Term (15–17 credits)

- 21&62:640:236 Calculus III (4)
- 21&62:750:316 Introduction to Modern Physics (3)
- 21&62:750:407 Advanced Physics Laboratory I (1)
- Mech 235 (NJIT) Statics * (3)
- engineering major (NJIT)* (2–4)
- humanities/social sciences elective (3)

Spring Term (15–17 credits)

- 21&62:640:314 Elementary Differential Equations (3)
- engineering major (NJIT) * (6–8)
- humanities/social sciences elective (3)

Law

Law schools do not ordinarily require students seeking admission to have completed any specific major field or group of courses. There is, therefore, no rigid prelaw curriculum at the college. Most prelaw students major in one of the social sciences. In addition to acquiring a broad social science background and a high level of competence in using the English language, students should enroll in a number of courses that deal with the history and structure of the American courts and government, the complexities of the American society and economy, and the broad cultural background of our times.

* Courses that may be taken at New Jersey Institute of Technology or during the Summer Session at the School of Engineering. Students should contact the engineering adviser, Department of Physics, or the Office of the Dean of Student Affairs for information regarding the proper choice of engineering courses before transfer to New Brunswick.

Admission to law school is highly competitive; students whose college grades are mediocre and whose Law School Admission Test scores are low have very little chance of admission. Students interested in going to law school are strongly advised to make early contact with the prelaw adviser, Dr. Jonathan Lurie (973/353-5410).

Law: Dual Admission

Up to five students each year will be guaranteed admission to the School of Law–Newark when they begin their undergraduate degrees at the Newark College of Arts and Sciences (NCAS). To qualify, high school students must rank in the eighty-fifth percentile or above on both the verbal and the mathematical Scholastic Assessment Test. Applications are available at the Rutgers–Newark admissions office.

As an undergraduate, a student admitted to this program must maintain a 3.5 undergraduate cumulative grade-point average and score in the eightieth percentile on the Law School Admission Test. (Graduates who do not meet these criteria will be considered along with other applicants.)

Liberal Arts Coordinated B.A. or B.S./M.B.A. in Professional Accounting

To encourage students to acquire a broad foundation in the liberal arts before they enroll in professional education, the Newark College of Arts and Sciences and the Graduate School of Management of Rutgers University have established a coordinated program leading to the B.A. or B.S. degree at the Newark College of Arts and Sciences and an M.B.A. degree in professional accounting from the Graduate School of Management. The program is designed for liberal arts students who seek to pursue full-time professional studies in accounting at the graduate level. Students who accrue more than 9 credits in accounting at the undergraduate level, or who earn an undergraduate degree jointly through the School of Management–Newark, may not enroll in this program.

Further information and applications may be obtained from the Office of Student Services, Room 115, Engelhard Hall, or at the Graduate School of Management, 92 New Street, Newark, NJ 07102-1895.

Management: Joint B.A./M.B.A.

This five-year program makes it possible for students to earn a baccalaureate degree from the Newark College of Arts and Sciences and a Master of Business Administration degree from the Graduate School of Management. The program is designed for the highly motivated student who, at an early stage, has decided to pursue a career in management. Program requirements are:

1. Ninety undergraduate credits in liberal arts subjects, including satisfactory completion of the general requirements of the Newark College of Arts and Sciences;
2. Satisfactory completion of an undergraduate major at the Newark College of Arts and Sciences *other than business or accounting*;
3. A cumulative grade-point average of 3.2 or better at the Newark College of Arts and Sciences and a Graduate Management Admissions Test score in the top quartile.

Careful planning is necessary to complete the undergraduate requirements specified within a 90-credit framework. Accordingly, the program is ordinarily open only to students who matriculate as first-year students at Newark College of Arts and Sciences or to those who transfer with no more than 30 credits.

Students interested in this program should contact the Office of Student Affairs during their first year; an official declaration of intent must be filed during the sophomore year at the School of Management. Application for admission to the Graduate School of Management is then made during the junior year according to the procedures outlined in the school's catalog. (Applications, catalogs, and additional information about the Graduate School of Management are available at the Office of Student Services, Room 115, Engelhard Hall.) Students who meet at least the minimum qualifications specified above will be admitted to the Graduate School of Management, providing a timely application for admission is filed and space is available in the class to which entry is sought.

Medicine: Dual Admission

The Newark College of Arts and Sciences (NCAS) and the New Jersey Medical School (NJMS) offer a seven-year B.A./M.D. degree for outstanding high school graduates. Admission requirements include SAT scores of 1400 or above, a strong record of high school academic achievement, recommendations, and a final admissions interview. In order to matriculate at NJMS, students are required to maintain a minimum grade-point average of 3.4 during each term at NCAS.

The NCAS and the NJMS also offer outstanding high school graduates a joint eight-year B.A./M.D. program. This program seeks to recruit to the medical profession minority students who are underrepresented in the medical sciences. Admission requirements include SAT scores of 1150-1200 or above, a strong record of high school achievement, recommendations, and a final admissions interview. To matriculate at NJMS, students are required to maintain a minimum grade-point average of 3.4 during each term at NCAS.

Further information and applications are available at the Rutgers-Newark admissions office.

Prehealth Professions (allopathic medicine, osteopathic medicine, dentistry, podiatry, optometry, and veterinary medicine)

There is no official "premed" major. While the majority of prehealth students major in the biological sciences or chemistry, individuals can major in any subject, including nonscience, with the provision that the core courses listed below are fulfilled.

Core Curriculum

Health professional schools require the successful completion of specific science courses in addition to basic undergraduate course work. Schools generally require, at minimum, the following subjects:

21&62:120:101-102	General Biology (4,4)
21&62:160:113-114	General Chemistry Laboratory (1,1)
21&62:160:115-116	General Chemistry (3,3)
21&62:160:331	Organic Chemistry Laboratory (2)

21&62:160:335-336	Organic Chemistry (3,3)
21&62:750:203-204	General Physics (3,3) <i>or</i> 21&62:750:213-214 Elements of Physics (3,3)
21&62:750:205-206	Introductory Physics Laboratory (1,1) mathematics (3-6 credits), typically through 21&62:640:114 Precalculus (3), but some schools may require 21&62:640:135 Calculus 1 (4)

Since professional school requirements are subject to change, students should consult individual schools for information. Psychology, ethics, logic, or other specific courses are sometimes required, and upper-level courses in the sciences are strongly encouraged.

Typical Science Programs

The core curriculum should be completed by the end of the third year, with at least a 3.0 cumulative grade-point average, and in advance of the nationwide standardized examinations for the health professions (see below), which should be taken prior to the senior year.

A typical program for a student entering with a solid science background, excluding other credits required for graduation, might look as follows:

First Year

General Biology (4)
General Chemistry (8)
Mathematics (3 to 6)

Sophomore Year

Organic Chemistry (8)
Upper-level Biology (3 to 4)

Junior Year

Physics (8)

Senior Year

Completion of college credits for graduation

For students with an average science background, a typical program might look as follows:

First Year

General Biology (8)
Mathematics (3 to 6)

Sophomore Year

General Chemistry (8)
Upper-level Biology (3 to 4)

Junior Year

Organic Chemistry (8)
Physics (8)

Senior Year

Completion of college credits for graduation

Professional schools typically expect applicants to have superior scholastic records. Competition for admission is intense. Schools weigh not only grades, but also scores on the standardized entrance examination, the college letter of recommendation, and extracurricular activities, as well as seriousness of intentions. Students lacking at least a 3.0 cumulative grade-point average by the conclusion of the first year should seriously consider changing their career goals.

OTHER PROGRAMS

The following are the standardized admission tests for the health professions:

- for allopathic, osteopathic and podiatric schools: Medical College Admission Test (MCAT);
- for dental schools: Dental Admission Test (DAT);
- for optometry schools: Optometry Admission Test (OAT); and
- for veterinary schools: Veterinary College Admission Test (VCAT), Graduate Record Examination (GRE), or Medical College Admission Test (MCAT).

Interested students should consult in their first year with Michael Feder (973/353-5800). Qualified upper-level students should contact Dr. John Maiello, chairperson, Prehealth Advisory Committee (973/353-5705), as should students seeking specific information or meetings.

Pharmacy

Two Plus Four Program

Students directly admitted to the College of Pharmacy may spend the first two years of the six-year Pharmacy Doctorate program at the Newark College of Arts and Sciences. The last four years are taken at the College of Pharmacy, located on the Busch Campus in Piscataway. A dean to dean transfer to the College of Pharmacy is possible if the student satisfactorily meets the standards established by the college.

Pharmacy students in the Two Plus Four program must consult the pre-pharmacy adviser for advisement and preparation for a dean to dean transfer to the College of Pharmacy at the end of their second year in Newark.

Pre-Pharmacy Transfers

Students admitted to the Newark College of Arts and Sciences may apply to transfer to the College of Pharmacy through the admissions office at the end of their sophomore year, but such admissions are extremely limited. Only students with outstanding academic credentials should apply to the College of Pharmacy.

Students seeking admission to the College of Pharmacy must obtain application materials from the admissions office and submit supporting documents to the admissions office in New Brunswick prior to March 15.

For further information on either program, students may contact the Office of Student Affairs, 312 Hill Hall, Newark campus.

Pharmacy students at Newark or those planning to attempt to transfer to the College of Pharmacy should have completed approximately 65 credits by the end of their sophomore year.

Required courses include:

First Year

First Term

21:120:101	General Biology I	4
21:120:101LC	General Biology Lecture	0
21:160:113	General Chemistry Laboratory	1
21:160:115	General Chemistry I	3
21:350:101	English Composition I	3
21:640:135 or 136	Calculus I or II*	4
<i>Total Credits</i>		<u>15</u>

Second Term

21:120:102	General Biology II	4
21:120:102LC	General Biology Lecture	0
21:160:114	General Chemistry Laboratory	1
21:160:116	General Chemistry II	3
21:350:102	English Composition II	3
21:__:__	Humanities/Social Science Elective	3
21:__:__	Humanities/Social Science Elective	3
<i>Total Credits</i>		<u>17</u>

Second Year

First Term

21:160:335	Organic Chemistry I	3
21:220:101	Introduction to Microeconomics	3
21:750:203	General Physics I	3
21:750:205	General Physics Laboratory	1
21:830:101	Introduction to Psychology	3
21:__:__	Humanities/Social Science Elective	3
<i>Total Credits</i>		<u>16</u>

Second Term

21:160:336	Organic Chemistry II	3
21:160:331	Organic Chemistry Laboratory	2
21:120:340	Mammalian Physiology	3
21:220:231	Statistical Methods	3
21:__:__	Humanities/Social Science Elective	3
21:__:__	Humanities/Social Science Elective	3
<i>Total Credits</i>		<u>17</u>

Rutgers Study Abroad Program

Rutgers, The State University of New Jersey, offers a program of junior year studies in twelve foreign countries: Australia, Britain, France, Germany, India, Ireland, Israel, Italy, Mexico, Poland, South Africa, and Spain. Although the program is intended primarily for students majoring in foreign languages and literatures, admission is open to majors in all disciplines within the humanities and the social sciences. Participants are selected from the various divisions of the university, as well as from other colleges and universities throughout the United States. Competence in the target language—both oral and written—is of paramount importance, and is therefore required; before departure, participants must have completed at least two years of college-level study (or its equivalent) in that language. An introductory course in the literature of the target language is highly recommended as preparation for the usually advanced-level offerings abroad.

The program is designed for 30 credit hours. Examinations, written work, hours of contact, and level of instruction meet in full the standards maintained at Rutgers. However, to ensure that students meet graduation requirements, participants should carefully plan their academic programs in consultation with their department advisers and academic deans. In the foreign country, a member of the university faculty is in residence to serve as director of the program and as an academic counselor to the students. Opportunities to study abroad for a summer or one term only also are available.

For more information, students should contact the Department of Classical and Modern Languages and Literatures on the Newark campus or write to the director of the Rutgers Study Abroad Program, Rutgers, The State University of New Jersey, 102 College Avenue, New Brunswick, NJ

* Every student is expected to take one calculus course at the University. If an AP calculus course has been taken in high school and the student accepts the credit offered, then the next level of calculus must be taken.

08901-8543. Plans to study abroad also should be discussed and approved by the associate dean of student affairs in Hill Hall, Room 312.

Reserve Officer Training Corps (ROTC)

An air force officers training program is available to students through exchange registration at the New Jersey Institute of Technology in Newark. The mission of the AFROTC is to commission as second lieutenants those students who successfully complete the AFROTC education and training program while concurrently registered in a college degree program. Participation is voluntary, and the program is open to both male and female students.

A two-year and a four-year program are available. Scholarships, pay, field training, and aviation training are offered. A maximum of 6 degree credits is awarded by Newark College of Arts and Sciences. For additional information, students should contact the Department of Aerospace Studies, New Jersey Institute of Technology (973/596-3629).

An army officers training program is offered through the Department of Military Education (Army) on the Rutgers campus at New Brunswick. Army ROTC is open to qualified Rutgers male and female students of all academic majors. Completion of the program results in the award of an army commission as lieutenant in the regular army, army reserves, or army national guard. Tangible aspects of participation include scholarship opportunities, pay during the advanced phase of the program (300- and 400-level courses), improved potential in seeking civilian employment, and access to military careers.

The Newark College of Arts and Sciences does not award degree credit for courses in military science, but a maximum of 6 credits toward the B.A. or B.S. degree is granted to individuals who are commissioned through this program.

ACADEMIC POLICIES AND PROCEDURES

Policies and procedures applicable to all Newark undergraduate colleges may be found in the General Information section of this catalog. The descriptions below are specific for NCAS students and take precedence.

Academic Advising

The college endeavors to ensure that all students receive sound academic advice and guidance during their undergraduate years. First-year students and other students who have not decided upon a particular course of study are advised by a special group of general advisers working through the Office of Student Affairs. Students who have declared a major are advised by a faculty member in the department of their major. It is recommended that students declare a major by junior standing.

The academic deans also are available for guidance on academic matters, and students should consult with them regarding college requirements, the various academic regulations, or their program of study. The Career Development Center is another useful resource for students seeking information or guidance in selecting a major.

Credit Load

To be considered a full-time student, an individual must carry a minimum of 12 credit hours per term. Students may carry between 1 and 19 credit hours, but not more than 19 credit hours per term without written permission from the dean of student affairs office. For a credit overload, a student must meet all of the following standards:

- English 101 and 102 or 121 and 122 completed
- Math proficiency completed
- Major declared with an academic department
- Successful completion of 24 Rutgers–Newark credit hours
- Cumulative grade-point average of 3.0 or higher

Class Standing

A student's progress is recorded in terms of credit hours, and each course carries a stated number of credits. Class standing is updated via the computer, June through October of each year. This classification attempts to predict the year in which the degree requirements will be completed, based on the number of credit hours earned.

Classification	Credits
First-year	0–24
Sophomore	25–55
Junior	56–85
Senior	more than 85

HONORS AND AWARDS

Dean's List

At the end of each academic year, the Office of the Dean of Student Affairs compiles an honors list of students whose work in either or both terms was outstanding. The Dean's List specifically includes those students who complete 12 or more credits toward graduation in a given term and whose term average was 3.5 or better. *N* credit courses do not count toward graduation. The student transcript will note Dean's List.

Graduation with Honors

The diplomas of students whose cumulative grade-point average is between 3.5 and 3.699 at graduation are inscribed "With Honors." For the student whose cumulative grade-point average lies between 3.7 and 3.849 inclusive, the phrase reads "With High Honors." Students earning a cumulative grade-point average of 3.850 or better are designated as graduating "With Highest Honors." Only grades received for courses completed at the university can be counted in these calculations; a minimum of 60 credits earned at Rutgers is necessary to qualify.

Honor Societies

Phi Beta Kappa. The Phi Beta Kappa Society elects to membership the outstanding scholars of the senior and junior years from a list of eligible students whose undergraduate programs have been substantially composed of liberal arts courses.

Other Honor Societies. Other honorary societies include:

- Beta Beta Beta*—Botany and Zoology
- Beta Gamma Sigma*—Business
- Phi Lambda Epsilon*—Chemistry

Omicron Delta Epsilon–Economics
Pi Delta Phi–French
Phi Alpha Theta Iota Kappa–History
Pi Sigma Alpha–Political Science
Psi Chi–Psychology
Alpha Kappa Delta–Sociology
Sigma Delta Pi–Spanish
Alpha Epsilon Rho–Theater Arts
Alpha Psi Omega–Theater Arts
Golden Key

Scholarships

Scholarships specifically for first-year and new transfer students are awarded by the Office of University Undergraduate Admissions and the Office of Financial Aid in consultation with the dean of the college and specific committees, as appropriate. Application for admission also serves as an application for these scholarships. Contact the Office of Undergraduate Admissions–Newark (973/353-5205) for more information.

During the spring term, Newark College of Arts and Sciences students apply for the dean of student affairs and other scholarships. A 3.5 GPA is required. Those selected receive need- and merit-based awards from the scholarships listed below. Contact the dean of student affairs office (973/353-5800) in March for an application.

The following list constitutes scholarships limited to students enrolled in Newark College of Arts and Sciences, in addition to those described in the chapter on financial aid in this catalog. Very brief eligibility criteria are provided.

Amelior Foundation Scholarship. Awarded to full-time students enrolled in the Honors College, based on academic merit and financial need. Preference to minority students from urban areas of New Jersey.

Robert M. Birnbaum Scholarship. Awarded on the basis of academic merit and financial need to a full-time student who has completed at least 24 credits and intends to major in business or accounting.

Henry Blumenthal Scholarship. Awarded by a committee of the NCAS Alumni Association on the basis of good academic performance, promise of responsible citizenship, and financial need.

Joseph and Joyce Bonanno Scholarship. Award based on academic merit and financial need.

Catherine Bond Memorial Fund. Award based on academic merit and financial need.

John and Aljean Brown Scholarship. Award based on academic merit and financial need.

Chai Family Scholarship. Award based on academic promise and financial need.

Derrick Family Award. Awarded to a full-time student as a scholarship or to be used for an internship stipend or to provide financial support for undergraduate research activity, based on academic promise and financial need.

Christian and Theresa Dingler Foundation Scholarship. Awarded to full-time students who graduated from Essex County College or who are residents of Newark, Essex County, or neighboring counties, based on academic merit and financial need.

Dudas-O'Brien Scholarship. Awarded to a full-time student, preferably a female accounting major, based on academic merit and financial need.

Stuart and Pamela Faber Memorial Scholarship. Renewable award to a full-time student, preferably from Newark and the surrounding area, who demonstrates academic promise and financial need.

Roberta Nobes Finch Memorial Scholarship. Awarded to full-time students graduated from Woodbridge High School, Colonia High School, or John F. Kennedy High School in Iselin, New Jersey, based on academic merit.

Dean Inge Gambe NCAS Memorial Scholarship. Awarded to a member of the junior class on the basis of service to the NCAS student body, unmet financial need, and academic merit.

Julius Gerson Memorial Scholarship. Award based on financial need.

Debra and Marvin Greenberg Scholarship. Awarded to a Hudson County Community College graduate based on academic achievement and campus citizenship, with preference given to those with financial need.

Sydney S. Greenfield Botany Fellowship Fund. Awarded to a graduating senior admitted to Graduate School–Newark, based on academic merit and demonstrated desire to pursue a career in the plant sciences.

Daniel Grover Memorial Scholarship. Awarded to full-time students majoring in social work or psychology, based on academic merit and financial need.

Rachel Hadas Scholarship. Awarded to full-time students studying poetry or the classics, based on academic merit and financial need.

Healthcare Foundation of New Jersey Service Scholarship. Awarded to full-time students who anticipate going into a health care profession, based on academic promise and financial need. Intended to promote and improve access to health care for the vulnerable population of Newark/Essex County and to provide health care-related educational opportunities to students from these communities.

Cynthia Kastner Scholarship. Awarded to a full-time student, preferably from a single parent household at time of application, based on academic merit and financial need.

Kimler Scholarship. Awarded to a full-time student who is pursuing a career in music through the Department of Visual and Performing Arts, based on academic merit and financial need.

Lipkin Scholarship. Award based on academic merit and financial need.

Maimone Family Scholarship. Renewable award based on academic merit and financial need.

Jerome and Lea P. Mandelman Memorial Scholarship. Award based first on financial need and then on academic achievement. Preference to qualified Newark residents studying social sciences or natural sciences.

Marvin David Miller Scholarship. Awarded on the basis of academic excellence, economic need, evidence of leadership, and good health.

Joseph J. Navatta Memorial Scholarship. Awarded to students enrolled in the honors college, based on academic merit and financial need.

NCAS Alumni Scholarship. Renewable scholarship awarded to first-year students by the NCAS Alumni Association on the basis of scholastic achievement, leadership, or public service and evidence of potential academic excellence and contribution to the life of the college.

Newark College of Arts and Sciences Scholarship Fund. Awarded annually to full-time students, based on academic merit and financial need.

Samuel I. Newhouse—Newark Star-Ledger Scholarship. Award based on academic promise and financial need.

Julia O'Hara Scholarship. Renewable scholarship awarded to a student from St. Benedict's Preparatory School, based on financial need.

Anna and Harry Phillipson Undergraduate Scholarship for Music and the Fine Arts. Awarded to New Jersey residents in the top 10 percent of their high school class. To promote an uninterrupted quality education in specific areas of music and the fine arts, based on academic merit as determined by the Department of Visual and Performing Arts and financial need.

Alex J. and Rose Marie Plinio Fund. Awarded to disadvantaged full-time students to provide emergency or supplemental scholarship support.

Juan B. Rodriguez Memorial Scholarship. Awarded to full-time students with preference given to students of Hispanic descent, based on academic merit and financial need.

Henry Rogers Newark College Scholarship. Award based on academic merit and financial need.

Schaefer Family Scholarship. Awarded to a full-time undergraduate student who has at minimum completed the first year, based on financial need and the student's commitment to achieving an undergraduate education.

Anna and Bernard Z. Senkowski Scholarship. Awarded annually to a chemistry major, based on financial need.

Servicemen's Center Association Scholarship. Awarded to needy and worthy students who are Newark residents, preferably who have at least one parent who has served or is serving on active duty in the Armed Forces, or to otherwise qualified students.

Strauss Equal Opportunity Fund. Awarded to a student majoring in social work.

Betty Thompson Memorial Scholarship. Awarded to a full-time undergraduate student majoring in physics, based on academic merit, financial need, and other criteria as determined by the Department of Physics.

John P. Thompson Trust Scholarship. Awarded to full-time students, based on academic merit.

Associated Students War Memorial Grant Fund. Awarded to full-time students who have completed at least one year at the college.

Walter F. Weiker Scholarship. Awarded on the basis of merit to a senior majoring in political science or sociology who is continuing graduate education in political science, sociology, or international affairs.

John A. Williams Scholarship. Awarded to full-time students studying journalism or creative writing, based on academic merit and financial need.

Awards and Prizes

In addition to being eligible for the scholarships described in this chapter and the chapter on financial aid, students in the Newark College of Arts and Sciences may compete for the following awards:

John Faulstich Alumni Association Award. The Alumni Association of Newark College of Arts and Sciences annually awards an outstanding senior a plaque for scholastic and extracurricular achievement. A plaque bearing the student's name is presented to the student's high school.

Kenneth Alvord Award. Awarded to an outstanding graduating senior whose major or minor is in broadcasting journalism.

American Institute of Chemists Award. Upon recommendation of the chemistry faculty of the college, an outstanding senior chemistry major is awarded a special scroll by the American Institute of Chemists at a formal banquet.

Madison C. Bates Award. Colleagues, former students, and members of the family of the late Madison C. Bates, professor of English at the college, established a fund that provides an annual award to the senior student majoring in English who, at the middle of senior year, has attained the highest scholastic average in the department.

Charles I. Biederman Award. Awarded annually to a student demonstrating scholastic excellence in the field of philosophy. The recipient is selected by the faculty of the Department of Philosophy.

Biological Society Award. Awarded annually to a senior demonstrating scholastic excellence in the biological sciences and service to the society.

Lourdes Casal Memorial Award. In honor of the memory of the late Dr. Lourdes Casal, the Department of Psychology awards a prize each year to the graduating senior selected by the faculty who best combines intellectual excellence with social commitment.

Peter Christian Award. Awarded to a graduating senior in journalism who has a high cumulative grade-point average but who did not necessarily start out with a distinguished record.

Class of 1954 Scholarship Award. Presented annually to the graduating student with the highest cumulative grade-point average who is not otherwise an award recipient.

Dean of Students Award. Awarded annually by the dean of students to a senior for outstanding leadership and service.

Delta Sigma Pi Scholarship Key. Awarded annually by the faculty to that student pursuing the economics-business curriculum who ranks highest in scholarship among the seniors.

David Diorio Award. Established in memory of David Diorio, a student in NCAS, by his family, this award is given annually to a nontraditional student majoring in English.

Bessie Dolgan Memorial Award. This award, honoring the late Bessie Dolgan, a medical technologist, is presented annually to a premedical student who has been accepted for admission to a medical school. The grant is to be devoted to the purchase of books needed for medical studies. The biology faculty names the student on the basis of scholarship and financial need.

Nancy Higginson Dorr Awards. The awards, supported by the income from a fund given by the John Van Nostrand Dorr Trust, amount to not less than \$100 each. They are given annually to the outstanding senior(s) showing the greatest promise of teaching in secondary schools. The Teacher Education Committee of the Newark College of Arts and Sciences is responsible for selecting the winner(s) in accordance with criteria developed by that committee.

Economics Department Prize. Awarded each year to a senior majoring in economics who is selected by the members of the department for outstanding scholarship.

May Edel Memorial Award. A fund has been established by the friends and colleagues of the late Dr. May Edel, assistant professor of anthropology in Newark College of Arts and Sciences until her death in 1964. The interest from this fund, in the form of an annual cash prize, is awarded to the anthropology student who, in the opinion of the senior members of the Department of Sociology and Anthropology, shows the most promise of distinction in anthropology.

Harold A. Fales Memorial Award. Established by Mrs. Fales and the many friends of the late Professor Fales, who was visiting professor of chemistry at Newark College of Arts and Sciences from 1948 through 1953, the cash award of interest from the fund is presented to a senior student chemistry major at the Newark College of Arts and Sciences selected by the chemistry faculty of the college.

FAS-N Dean's Award. Awarded annually by the dean of the Faculty of Arts and Sciences-Newark to an outstanding senior for academic excellence.

Herbert and Edith Feldman Award. Plaque and cash awarded annually to a graduating senior from either NCAS or UC-N who has shown, through work in the community or on campus, a commitment to fostering sensitivity to ethnic differences and leadership in the encouragement of diversity, tolerance, and cooperation.

David Robert Friedlander Memorial Award. Interest from a fund established in memory of David Friedlander, a graduate of Newark College of Arts and Sciences, is awarded annually to an outstanding senior graduating from the college and majoring in history or prelaw.

Inge Gambe Award. A plaque is presented annually to the most outstanding international student in the graduating class. The award honors the late associate dean of students, who served as adviser to international students.

Joel Girgus Book Award. In honor of the memory of the late Dr. Joel Girgus, the Department of Psychology awards a prize each year to the graduating senior majoring in psychology with the highest cumulative grade-point average.

Sydney S. Greenfield Award. The Department of Biological Sciences presents the award annually to its outstanding graduating senior. The selection is made by the botany faculty.

Samuel Greitzer Award. Established by the mathematics department faculty in honor of their colleague, Samuel Greitzer, this prize is awarded to an outstanding graduating mathematics major in Newark College of Arts and Sciences or University College-Newark.

Paul Mahlon Hamlin Award. Established in 1958 by Madge Sills Hamlin to perpetuate the lifelong interest in scholarship of her husband, Paul Mahlon Hamlin, professor emeritus of political science. The award consists of a certificate and cash and is made in May to the graduating senior of Newark College of Arts and Sciences who has attained the highest scholastic rank as shown by Phi Beta Kappa standing.

Morton Hellman Award. Established by Mrs. Morton Hellman in honor of the late Morton Hellman, this award is given to an outstanding graduating mathematics major in Newark College of Arts and Sciences or University College-Newark who plans to continue mathematical studies at the graduate level.

Joannie L. Huberman Award. Given annually in memory of Joannie Huberman, a 1979 graduate of Newark College of Arts and Sciences, to a junior or senior anthropology major who demonstrates the particular qualities she exemplified: commitment to anthropology; academic excellence; original insight; and concern for humanistic values.

John Keosian Award. Annual book award to a senior undergraduate of the Department of Biological Sciences who demonstrates continuing interest in basic biological problems, such as the origin and evolution of biological systems.

Joshua K. Kohn Award. The trustees of the Joshua K. Kohn Memorial Fund have endowed a prize for essays concerning some phase of Jewish culture. The contest is open to any student.

Beth Niemi Award. Awarded to a student for outstanding work in women's studies.

Samual Pesin Memorial Award. This is a \$100 supplementary award made to a New Jersey State Scholarship recipient at Newark College of Arts and Sciences; the individual is designated a Samual Pesin Scholar. It is made annually to a first-year student who is a resident of Hudson County and who best exemplifies the ideals of the man whose name the award bears.

Phi Beta Kappa Alumni Association of Essex County Award. Awarded each spring to an outstanding junior at Newark College of Arts and Sciences. The winner is selected by the Newark section of the Alpha Chapter of Phi Beta Kappa of New Jersey.

Charles Pine Award. Awarded to an NCAS graduating senior who is going on to graduate studies and has demonstrated outstanding scholastic excellence in the areas of physical science and mathematics.

Political Science Department Prize. A book prize awarded each year to the senior majoring in political science at Newark College of Arts and Sciences who, in the opinion of the members of the department, has made the most meritorious record in that subject.

Richard C. Robey Memorial Award. Awarded to a graduating senior for excellence in an area of study that reflects the scholarly interests of the late Richard C. Robey, dean of the college and professor of American studies.

Yolande Rubianes Award. A plaque is awarded annually to the graduating senior who, in overcoming adversity, has achieved distinction as a student.

Jay Rumney Memorial Award. A fund has been established by Rebecca Rumney as a memorial to her husband Jay Rumney, formerly professor of sociology in the University of Newark and Newark College of Arts and Sciences until his death in 1957. The interest from this fund is used for an annual book prize to the sociology student who, in the opinion of the senior members of the Department of Sociology and Anthropology, has made the best record in the field of sociology.

Charles Sabat Awards in Chemistry. Two cash prizes of \$250 each are awarded to two senior chemistry majors who are judged by the Faculty of Arts and Sciences–Newark chemistry faculty to show great promise in the fields of organic chemistry and/or biochemistry, and in the field of physical chemistry.

Scholar-Athlete Award. Awarded annually to the graduating varsity athlete (male or female) with the most outstanding record of academic achievement.

Heinz Seelbach Award. Awarded to a graduating senior with the highest grade-point average in political science.

Keshav C. Sondhi Memorial Award. An annual book prize in memory of Professor Sondhi, awarded by his colleagues in the Department of Biological Sciences to an advanced graduating student of the department selected for promise as an investigator in a branch of the biological sciences.

Israel S. Stamm Memorial Prize Fund. Two prizes awarded each spring to outstanding senior students who have majored in one or more modern or classical languages at Rutgers–Newark.

Betty Skuze Thompson Prize. Awarded to students who have shown an outstanding record of achievement in the study of undergraduate physics at Rutgers–Newark. Made in memory of Betty Thompson, a graduate of the FAS–N Department of Physics and a dedicated teacher of physics, by her husband, George Thompson.

Rebecca S. Villers Award. Established in memory of Rebecca S. Villers, this award is based on academic merit and is given to an EOF student with a major in psychology, who is completing his or her junior year. The award is to be used to purchase all required and recommended books directly related to courses during the first term of the recipient's senior year.

Wall Street Journal Award. A silver medal and a year's subscription to the *Wall Street Journal* are awarded to a senior majoring in economics or a field of business who, in the opinion of the members of the respective departments, shows promise of distinction in economics or business.

Benjamin M. Weissman Award for Excellence in Writing on Politics. Awarded to the graduating political science major who is judged to have written the best essay on politics. Essays written for class assignments, individual study, or the Honors College program are eligible for consideration.

William W. Wiles Memorial Fund. Awarded annually in memory of Dr. William W. Wiles to assist undergraduate students at Newark College of Arts and Sciences in the earth and life sciences to carry out fieldwork or attend conferences related to field studies.

Herbert P. Woodward Memorial Fund. This fund was established in 1969 through contributions from friends and associates of the late Dr. Woodward, who served as professor of geology for thirty-seven years and as dean of the college for twenty years. Interest from this fund is used to present a book prize to the outstanding senior majoring in geology.

Edward H. Zabriskie Memorial Award. Interest from a fund established in memory of the late Professor Zabriskie is awarded annually to a student majoring in history at Newark College of Arts and Sciences. The recipient is chosen by the faculty in history.

Sidney Zebel Award. Awarded to an NCAS graduate majoring in history.

Louis R. Zocca Award. Established in 1976 by friends and associates of Dr. Louis R. Zocca, professor emeritus of English, who served for thirty years; the interest on the fund is used to present an award to the outstanding senior for excellence in the study of literature.

University College– Newark

ABOUT THE COLLEGE

In 1934, Rutgers, The State University of New Jersey, established University College as an evening college offering programs of study leading to the bachelor's degree. Major branches of University College were established in Camden, Newark, and New Brunswick. In 1981, each of these branches became a separate college within the university.

Today, University College–Newark (UC–N) is a college designed for the adult student who has work and family obligations during the day, and who attends class in the evening or on Saturday. The college is served by the distinguished Faculty of Arts and Sciences–Newark, augmented by coadjutant faculty who bring to the classroom special expertise in professional studies and the world of business and government.

A Diversified Student Body

About two-thirds of the college's 1,700 students are young adults between the ages of twenty-four and thirty-four. However, a significant number are both younger and older than this age group.

Approximately 50 percent of the students are members of minority groups; about half are women. Most are candidates for the baccalaureate degree, but some are college graduates who are pursuing a second bachelor's degree or who plan to go on to graduate school in a different area of study. Others enroll in selected courses in areas of professional or personal interest without establishing degree candidacy.

DEGREE REQUIREMENTS

In preparing students for careers in the professions, business, and government and for graduate studies, UC–N builds on a broad foundation in the liberal arts. To earn a degree, all students must complete a general core of courses known as the general or liberal arts and science requirements. Students also must fulfill the requirements of a major; i.e., a concentration of courses in a particular field of study.

Academic Advising

University College students may see an adviser each term before registering for classes. Declared majors should see a faculty adviser in their major or a general adviser in the School of Management, 109 Engelhard Hall. Undeclared majors may see a general adviser in the dean of student affairs office, 312 Hill Hall (973/353-5800). At that time, the student's academic record is reviewed and students are informed of any outstanding requirements. Advisers also are available during the regularly scheduled registration dates. Students who fail to register during these dates are charged a fee for late registration.

Placement Examinations for Entering Students

Students with fewer than 12 college credits at the time of admission must take the Rutgers Placement Test in Math and English. If the student has completed 12 or more college credits at the time of admission, writing and mathematics placement tests may be required. Based on the results of these tests, students are placed in the appropriate English and mathematics courses.

General Curriculum Requirements

A student must successfully complete a minimum of 124 credits, including satisfaction of the college requirements, in order to graduate from University College–Newark. Students are subject to the curriculum requirements in effect when they entered University College–Newark. Students who leave college for two or more consecutive terms are expected to meet the requirements in effect at the time they return. Students must complete all requirements for graduation in order to participate in graduation ceremonies.

Proficiencies in Basic Skills

Students must demonstrate competence in the following areas, regardless of major field:

English. Minimum writing proficiency is satisfied by successful completion of 21&62:350:101-102 English Composition or 21&62:350:121-122 Expository Writing (for transfer students), with grades of *C* or better. A student must continue registration in either a communication skills course or English 101-102, 121-122, until the minimum writing proficiency is satisfied. Students are expected to write proper English in all courses. A student who consistently writes in an unsatisfactory manner, even though English composition has been passed, may be required to complete appropriate remedial work.

Writing across the Curriculum. Beginning in fall term 2001, every student must successfully complete a two-term writing requirement beyond English 101 and 102 (or 121 and 122). Students may satisfy this requirement by taking any two courses designated "W" in the *Schedule of Classes*. Students must take at least one of these courses within the department of their major, and may choose to take the other as a course that satisfies general requirements, or as an elective.

Mathematics. Minimum proficiency in mathematics is met by satisfying one of the following criteria:

1. Successful completion, with a grade of *C* or better, of 21&62:640:103 Math for Liberal Arts, 112 or 113 College Algebra or any more advanced course in mathematics offered by the Department of Mathematics and Computer Science.
2. Satisfactory performance on a proficiency examination administered by the Department of Mathematics and Computer Science.
3. Successful completion, with a grade of *C* or better, of a college-level, first-term, calculus course equivalent to 21&62:640:135 Calculus I, at another institution, or a grade of *B* or better in a precalculus course equivalent to 21&62:640:114 or 119.

Every student must successfully complete the mathematics proficiency requirement within one term after becoming eligible, according to established placement standards at the college. This requirement must be completed satisfactorily

before the student achieves senior standing. Students not meeting the deadline may be required to carry a reduced credit load and to defer their probable date of graduation.

Critical Thinking. First-year students with less than 12 credits may be required to complete 62:730:107 Critical Thinking.

Foreign Language. Students are expected to complete two years of a foreign language prior to entering college.

History and Literature. Students must successfully complete two courses (6 credits) in history offered by the Department of History and two courses (6 credits) in literature offered by the Department of English, the Department of Classical and Modern Languages and Literatures, or the Department of African-American and African Studies. The literature courses may be taken in the original language or in translation. Successful completion of English composition is a prerequisite for literature and history courses. Students who choose a literature course in an original language must fulfill language prerequisites for that course as well. For information about specific courses that fulfill this requirement, consult the Office of Student Affairs.

Natural Science/Mathematics. Students must complete one of the following options:

1. A one-year, 8-credit science course with laboratory and one 3-credit nonlaboratory course, or
2. three courses in nonlaboratory science, mathematics, or computer science. At least two of the three courses in the second option must be science courses offered by the departments of Biological Sciences, Geological Sciences, Chemistry, and Physics.

The nonlaboratory course may be selected from the sciences or from courses offered by the Department of Mathematics and Computer Science. If a mathematics course is chosen, it must be at a higher level than the one taken to fulfill the mathematics proficiency requirement.

Social Sciences. Students must successfully complete 6 credits in African-American studies, anthropology, criminal justice, economics, political science, psychology, social work, or sociology.

Humanities and Fine Arts. Students must successfully complete 6 credits in any of the following disciplines: art, music, philosophy, theater arts, and speech. For information about specific courses that fulfill this requirement, consult the Office of Student Affairs.

Restricted Electives. Every student must successfully complete 15 credits of electives outside their major. (Current and prospective students in the School of Management may not take courses offered by the School of Management to fulfill this requirement.)

Courses taken for graduation credit in education may be used as electives for this requirement.

Major Programs

Students must complete a major in one of the disciplines shown below:

- 010 Accounting
- 198 Computer Science
- 202 Criminal Justice
- 220 Economics

- 350 English
- 390 Finance
- 510 History
- 548 Information Systems
- 620 Management
- 630 Marketing
- 642 Mathematics, Applied
- 730 Philosophy
- 790 Political Science
- 830 Psychology
- 910 Social Work
- 920 Sociology

The general advisers, the deans, and staff members of the Career Development Center can provide assistance to students who are undecided about an appropriate program to pursue.

The requirements for each major are established by the appropriate academic department and are subject to modification. The number of credits needed to complete a major varies. Some programs of study may require more than the minimum 124 credits necessary for graduation. For details about specific majors, see the Academic Programs and Courses chapters.

Students must satisfy the requirements specified by the department of their major at the time they officially declare that major. Students leaving the college for two terms or more must meet the requirements in place at the time they return.

No course in which a grade of *D* or *F* has been earned may be counted toward the completion of a major or minor; in some disciplines the required cumulative grade-point average for the major is higher than the minimum specified by the college for graduation. Transfer students must complete at least one-half of the credits required for their major at the college.

Interdisciplinary Majors

With approval of the concerned departments, a UC–N student may elect an interdisciplinary major for either the B.A. or the B.S. degree. An interdisciplinary major includes courses selected from at least two disciplines, chosen by the student to satisfy a particular educational objective. Recent interdisciplinary majors designed by students, with faculty assistance, have included psychology/management, mathematics/accounting, political science/criminal justice, and history/philosophy.

A form for submission of a proposed interdisciplinary major program is available in the Office of Student Affairs.

Double Majors

If a student elects to enroll in a double major, the requirements stipulated for each major program must be satisfied. Courses for the second major may not be used for general education requirements, other than restricted electives.

Minor Programs

Most of the major programs listed above also offer minor programs. A minor generally consists of 18–21 credits of course work in a discipline, but more specific requirements may be imposed by the sponsoring department. Half of the requirements for the minor program must be completed at UC–N. A minor is *not* required for graduation.

Other Programs

Joint Undergraduate/Graduate Degree Programs in Business Administration and in Criminal Justice

University College–Newark has two combined bachelor's/master's degree programs. The first is between the college and the Graduate School of Management and permits students studying in a bachelor of arts curriculum at University College–Newark to obtain both the Bachelor of Arts degree and a Master of Business Administration degree in an accelerated period of time. The second program is between the college and the School of Criminal Justice and permits students in either a Bachelor of Arts or Bachelor of Science curriculum at University College–Newark to obtain a bachelor's degree along with a master's degree in criminal justice in an accelerated period of time.

Students in either program complete their junior year at University College–Newark. The student then enrolls in the graduate program. Credits earned in the graduate program are counted toward completion of the University College–Newark degree. These programs are highly competitive, and students who wish to apply must demonstrate strong academic performance. See individual program descriptions in the Newark College of Arts and Sciences section of this catalog.

HONORS COLLEGE: UC–N

Students with outstanding academic records may be eligible to participate in the UC–N Honors College, which offers an enriched and challenging educational experience. The Honors College is open to all students who have demonstrated excellence in their studies at UC–N, by invitation or by faculty recommendation.

Students in the program complete at least two special honors courses (6 credits). These might include a 101 section of English, where the instructor would give additional readings, and special writing projects to students identified as honors-eligible by the Honors office. The same arrangement would be possible for calculus students and students in the natural sciences courses.

During the UC–N honors junior year, students are required to take two honors seminars, one each term, on special topics and each worth 3 credits. These courses might resemble the day college honors seminars in special topics, and they are taught by full-time faculty members.

The senior year includes an inquiry methods course, 3 credits each term. The first term of the course is theme-based and includes several speakers' presentations on the theme. The students then work collaboratively. This first term includes work in research methods, citation and reference requirements, and use of all that Dana Library has to offer. The second term of the course requires students to work independently on research projects. These efforts will give students experience in traditional research methods, as well as multimedia techniques, and will reinforce the research methods they have learned earlier in special topics seminars.

For further details about the Honors College, contact the Director of the Honors College, Hill Hall; 973/353-5866.

ACADEMIC POLICIES AND PROCEDURES

Policies and procedures applicable to all Newark undergraduate colleges may be found in the General Information section of this catalog. The descriptions below are specific for UC–N students and take precedence.

Declaration of a Major

To declare or change a major, a student must complete a form, which is available in the academic department. A student may declare a major after he or she has earned 24 credits, satisfied the English proficiency sequence and the math proficiency, and earned a minimum cumulative grade-point average of 2.0. For students wishing to major in accounting, finance, management, or marketing, declaration must be made directly to the School of Management (SOM). Students should declare a major at SOM after they have completed 56 credits. A minimum cumulative grade-point average of 2.5 is necessary to remain in the School of Management. At the latest, a student must declare a major before the completion of 56 credits.

UC Credit Load

University College is designed for adult learners as a part-time college for students carrying 1 to 11 credit hours. To be considered a full-time student, an individual must carry a minimum of 12 credit hours per term. Students may not carry more than 12 credit hours per term without written permission from the dean of student affairs office. For a credit overload, a student must meet all of the following standards:

- English 101 and 102 *or* 121 and 122 completed
- Math proficiency completed
- Major declared with an academic department
- Successful completion of 24 Rutgers–Newark credit hours
- Cumulative grade-point average of 3.0 or higher

HONORS AND AWARDS

Dean's List

The Dean's List recognizes current academic achievement. Students are eligible if they are matriculated and have completed 6 or more credits toward graduation during an academic term, with a cumulative grade-point average of 3.5 or better. *N* credit courses do not count toward graduation. The student transcript will note Dean's List.

Graduation with Honors

A University College–Newark student may graduate with honors upon meeting the following requirements at the end of the final term for the baccalaureate degree:

1. Completion of a minimum of 45 credits at Rutgers, The State University of New Jersey, of which at least 30 credits have been completed at UC–N.
2. Achievement of cumulative grade-point average as follows:

Highest honors	3.850 or better
High honors	3.700 to 3.849
Honors	3.500 to 3.699

Honor Societies

Alpha Sigma Lambda. Alpha Sigma Lambda nationally acknowledges the UC part-time, evening adult student for high academic achievement.

Beta Gamma Sigma. Beta Gamma Sigma is the national scholastic honor society in the field of administrative studies recognized by the American Assembly of Collegiate Schools of Business. To be eligible for Beta Gamma Sigma, a student must rank in the top 5 percent of the junior class or in the top 10 percent of the senior class. Information may be obtained by contacting the program advisers in accounting, finance, management, or marketing.

Golden Key. Golden Key is a nonprofit international academic honors organization that recognizes the top 15 percent of juniors and seniors in all undergraduate fields.

Phi Beta Kappa. The Phi Beta Kappa Society elects to membership the outstanding scholars of the senior and junior years from a list of eligible students whose undergraduate programs have been substantially composed of liberal arts courses.

Scholarships

Scholarships specifically for new first-year and transfer students are awarded by the Office of University Undergraduate Admissions and the Office of Financial Aid in consultation with the dean of the college and specific committees, as appropriate. Application for admission also serves as an application for these scholarships. For more information, contact the Office of Undergraduate Admissions–Newark; 973/353-5205.

During the spring term, University College–Newark students apply for the dean of student affairs and other scholarships. Those selected receive need- and merit-based awards from the scholarships listed below. Contact the dean of student affairs (973/353-5800) for more information.

The following list constitutes scholarships limited to students enrolled in University College–Newark, in addition to those described in the chapter on financial aid in this catalog. Very brief eligibility criteria are provided.

Stuart and Pamela Faber Memorial Scholarship. Renewable award to a full-time student who demonstrates academic promise and financial need, preferably from Newark or the surrounding area.

Albert R. Gamper, Jr., Scholarship. Awarded to either a part-time or full-time student of senior standing.

Rueberta E. Rodgers Scholarship. Awarded to a young woman who is working during the day and trying to obtain an education at night.

Schaefer Family Scholarship. Awarded to a full-time undergraduate student who has at minimum completed the first year, based on the student's commitment to achieving an undergraduate education and financial need.

University College–Newark Scholarship Fund. Funded by the annual contributions of alumni and friends. Awarded on the basis of academic merit and financial need.

Awards and Prizes

University College–Newark students who demonstrate outstanding academic achievement are eligible for awards and prizes, which are presented annually at Senior Awards Night. In addition to special recognition given to seniors who have demonstrated academic excellence in major programs, the following awards are presented:

Alumni Association Award. Presented by the University College–Newark Alumni Association to the member of the graduating class who has demonstrated the highest degree of academic excellence and student leadership among candidates for degrees in the year under review.

Marcus Bean Award. Presented to the graduating senior who has majored in accounting and who has demonstrated scholastic excellence and proficiency in that field. The award was established by Mr. James Turner in honor of Professor Marcus Bean.

Edward McNall Burns Memorial Award. Presented annually to the history major who graduates with the best academic record in this field. The cash award is sponsored by Mrs. Edward McNall Burns in memory of her husband, who was professor of history and professor of political science at Rutgers.

Delta Sigma Pi Key. Presented by the Beta Rho chapter and bestowed upon that member of the graduating class whose academic record in business administration is the highest among degree candidates in the year under review.

Nancy Higginson Dorr Award. A memorial award sponsored by her children in memory of Mrs. Dorr's dedication to the teaching profession. The cash award is presented to the graduating senior who has demonstrated academic excellence and who shows promise of success as a teacher in secondary education.

Herbert and Edith Feldman Award. Plaque and cash awarded annually to a graduating senior from either NCAS or UC–N who has shown through work in the community or on campus a commitment to fostering sensitivity to ethnic differences and leadership in the encouragement of diversity, tolerance, and cooperation.

Ruth Fryer Memorial Award. Presented to the student who, in the opinion of student and faculty judges, submits the best work to *Untitled*, the University College–Newark literary magazine. The cash award and plaque commemorate the memory of Ruth Fryer, who graduated from, and subsequently taught at, University College.

Honor Society Scholarship. Presented to that member of the graduating class who also is a member of the Honor Society and who has demonstrated academic excellence and outstanding service to the college.

Rita J. Immerman Award. Presented annually to a political science major who is a candidate for degree and who has been accepted into a graduate or professional program. The award was established by Mr. John Crowley, a University College–Newark graduate, in appreciation of the contributions Dr. Immerman and the college made to his personal advancement.

Charles Kaden Memorial Award. Presented to the University College senior whose progress as an undergraduate in the field of psychology warrants special recognition.

Jack A. Mark Memorial Award. Established to honor the memory of Jack A. Mark, department chairperson of criminal justice. The award is presented to the graduating senior who has demonstrated the highest scholastic excellence and proficiency in that field.

Cassie Miller Award. Named to honor the former dean of students for University College–Newark. The award recognizes outstanding community service by a nontraditional student.

Norman C. Miller Award. Named to honor the founding dean of University College, the award is presented to that member of the graduating class who has the highest academic record among degree candidates.

James Plummer Award. Plaque and monetary prize awarded to a University College student who exhibits the best attributes of the profession of social work through class participation, life experience, and academic achievement.

Academic Programs and Courses

AVAILABILITY OF COURSES, MAJORS, AND MINOR PROGRAMS

A large proportion of majors and minors described in this section are offered at both Newark College of Arts and Sciences and University College–Newark. However, some are offered only at NCAS; others are offered only at UC–N. Further, in some instances UC–N and NCAS major and minor requirements differ. It is therefore important to consult the chapters on UC–N and NCAS in this catalog for lists of majors and minors available to students at each of the schools, and also to consult the descriptions of program requirements in this chapter.

Students enrolled at one of the Rutgers undergraduate colleges in Newark who wish to take a course or program at another college must consult with their adviser or the Office of Student Affairs for permission prior to registration.

In some instances NCAS and UC–N courses have different numbers and/or titles, but may be essentially the same in terms of subject matter. It is the student's responsibility to read course descriptions carefully and, when in doubt, to check with an adviser or the appropriate department to avoid registering for a course that the student may have already taken. Credit will not be given twice for the same course, despite a different number and/or title.

The university reserves the right to augment, modify, or cancel the courses listed in this catalog, or to change degree requirements. Except for certain types of advanced courses, a course will be canceled if fewer than ten students register.

COURSE NOTATION INFORMATION

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 following administrative codes are used in this catalog.

- 21 Newark College of Arts and Sciences
(Course normally offered only in the day.)
- 62 University College–Newark
(Course normally offered only in the evening and on weekends.)
- 21&62 Course offered at both NCAS and UC–N
- 25 College of Nursing
- 28 New Jersey Institute of Technology
- 29 School of Management

Subject Codes

The subject code indicates the subject matter of the course.
(This list does not constitute a list of majors.)

003	Academic Foundations
010	Accounting
014	African and African-American Studies
045	Allied Health Technologies
050	American Studies
060	Ancient Mediterranean Civilizations
070	Anthropology
074	Arabic
080	Art
081	Arts, Visual
082	Art History
084	Arts Management
090	Arts and Sciences
120	Biology
135	Business Administration
160	Chemistry
165	Chinese
190	Classics
191	Clinical Laboratory Sciences
195	Comparative Literature
198	Computer Science
202	Criminal Justice
220	Economics
240	Education, Elementary
250	Education, General Electives
300	Education
310	Education, Social and Philosophical Foundations
350	English
352	English, American Literature
390	Finance
420	French
460	Geology
470	German
490	Greek
500	Hebraic Studies
510	History
512	History, American
522	International Business and Business Environment
560	Italian
570	Journalism, Media, and Writing
580	Latin
620	Management
623	Management Science and Information Systems
630	Marketing
640	Mathematics
670	Meteorology
700	Music
701	Music, Applied
730	Philosophy
750	Physics
790	Political Science
810	Portuguese
830	Psychology
836	Puerto Rican Studies
840	Religion
860	Russian
880	Science, Technology, and Society
910	Social Work
920	Sociology
940	Spanish

950	Speech
960	Statistics
965	Theater Arts
967	Ukrainian
988	Women's Studies

Course Codes

Courses 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 indicates that each term course may be taken independently of the other (e.g., 21&62:350:319,320). Two course codes separated by a hyphen indicates that satisfactory completion of the first term course is a prerequisite to the second term (e.g., 21&62:920:301-302). The first term may be taken for credit without the second, unless a statement is added to indicate that both term courses must be completed in order to receive credit.

Other Course Notation

BA The number of credits is determined by arrangement with the department offering the course.

ACADEMIC FOUNDATIONS 003

*Department of Education and Academic Foundations
Conklin Hall (973/353-5434)*

Academic Foundations courses offered by the Department of Education and Academic Foundations are taken by special permission only; students may receive a maximum of 6 credits in these courses. Students must earn a grade of *C* or better to complete the writing/reading and mathematics courses offered for credit.

Courses**21:003:010,011. BIOLOGY SKILLS (0 + N3)**

Two-term course in science skills for students who need preparation for meeting the laboratory science requirement. Emphasis is on the process of science, strategies of problem solving, and scientific content. Intended for students planning to take 21&62:120:101-102 General Biology.

21&62:003:015,016. GENERAL BIOLOGY SUPPORT (0 + N1.5)

Corequisites: 21&62:120:101-102.

Under the guidance of a faculty member, students learn effective study skills in organized study groups. Following the syllabus of the course being supported, students set the agenda for each class meeting.

21&62:003:020,021. CHEMISTRY SKILLS (0 + N3)

Two-term course in science skills for students who need preparation for meeting the laboratory science requirement. Emphasis is on the process of science, strategies of problem solving, and scientific content. Intended for students planning to take 21&62:160:115-116 General Chemistry or 21:160:106-107 Introduction to Chemistry and 21&62:160:116 General Chemistry.

21&62:003:022,023. WORLD OF CHEMISTRY SKILLS (0 + N3)

Two-term course in science skills for students who need preparation for meeting the laboratory science requirement. Emphasis is on the process of science, strategies of problem solving, and scientific content. Intended for students planning to take 21&62:160:101-102 World of Chemistry.

21&62:003:025,026. GENERAL CHEMISTRY SUPPORT (0 + N1.5)

Corequisites: 21&62:160:115-116 or 21:160:106-107 and 116.

Under the guidance of a faculty member, students learn effective study skills in organized study groups. Following the syllabus of the course being supported, students set the agenda for each class meeting.

21:003:027,028. WORLD OF CHEMISTRY SUPPORT (0 + N1.5)

Corequisites: 21&62:160:101-102.

Under the guidance of a faculty member, students learn effective study skills in organized study groups. Following the syllabus of the course being supported, students set the agenda for each class meeting.

21&62:003:030,031. GEOLOGY SKILLS (0 + N3)

Two-term course in science skills for students who need preparation for meeting the laboratory science requirement. Emphasis is on the process of science, strategies of problem solving, and scientific content. Intended for students planning to take 21&62:460:103, 113 or 114 Planet Earth, Earth History, or History of Life.

21&62:003:035,036. PLANET EARTH SUPPORT (0 + N1.5)

Corequisite: 21&62:460:103 or 113, or 114.

Under the guidance of a faculty member, students learn effective study skills in organized study groups. Following the syllabus of the course being supported, students set the agenda for each class meeting.

21&62:003:045,046. GENERAL PHYSICS SUPPORT (0 + N1.5)

Corequisites: 21&62:750:203-204.

Under the guidance of a faculty member, students learn effective study skills in organized study groups. Following the syllabus of the course being supported, students set the agenda for each class meeting.

21&62:003:060. COLLEGE ALGEBRA SUPPORT (N1.5)

Organized study group under the guidance of a faculty member. Following the syllabus of the course, students set the agenda for each meeting and work collaboratively to enhance their ability to solve difficult problems.

21&62:003:064. PRECALCULUS SUPPORT (N1.5)

Organized study group under the guidance of a faculty member. Following the syllabus of the course, students set the agenda for each meeting and work collaboratively to enhance their ability to solve difficult problems.

21&62:003:065. CALCULUS SUPPORT (N1.5)

Organized study group under the guidance of a faculty member. Following the syllabus of the course, students set the agenda for each meeting and work collaboratively to enhance their ability to solve difficult problems.

21:003:101. COMPUTATION AND BEGINNING ALGEBRA (0 + N6)

Develops awareness of and facility in mathematical thinking. Processes of generalizing, specializing, conjecturing, and justifying are explored through in-depth study of the properties of numbers, powers and roots, linear equations, graphs, and applications.

62:003:101. COMPUTATION AND BEGINNING ALGEBRA (0 + N3)

Develops awareness of and facility in mathematical thinking. Processes of generalizing, specializing, conjecturing, and justifying are explored through in-depth study of the properties of numbers, powers and roots, linear equations, graphs, and applications.

21&62:003:102. ELEMENTS OF ALGEBRA AND APPLICATIONS (2 + N2.5)

Study of algebra and applications to other disciplines. Develops insight and facility in rational expressions, radicals, linear and quadratic equations, graphing, and applications.

21&62:003:142,143. COMMUNICATIONS SKILLS: WRITING AND READING-STUDY SKILLS (2 + N4, 2 + N4)

Some sections designated for English as a second language.

Two-term course in language and study skills; developmental activities to enhance the ability to perform the reading, writing, and study tasks required in college and to increase awareness of the uses of language; classroom, tutoring, and computer laboratory work included.

21&62:003:144. COMMUNICATION SKILLS: DEVELOPMENTAL ENGLISH COMPOSITION (2 + N2.5)

Students must successfully pass the English Placement Examination to receive credit for this course. Designated for English as a second language students only.

Continuation of 21&62:003:142,143 for students not ready for 21:350:101 or 62:350:121; critical reading and intensive writing practice emphasized.

AFRICAN-AMERICAN AND AFRICAN STUDIES 014

*Department of African-American and African Studies
Conklin Hall (973/353-5528)*

The African-American and African studies major and minor are offered at NCAS.

Major and Minor Requirements

The African-American and African Studies department offers an interdisciplinary major that focuses on the historical, socioeconomic, and cultural experiences of African-Americans, and African people in the worldwide diaspora. Courses also are designed to integrate scholarship on gender, race, and class.

Thirty-nine credits are required for a major in the discipline, and twenty-one for a minor.

The senior seminars (21&62:014:411,412) are required courses for the major.

The following courses are required for both majors and minors:

- 21&62:014:111,112 Introduction to the Black Experience in Western Culture
- 21&62:014:305 Black Women in the United States
- 21&62:014:306 Comparative Race Relations
- 21&62:014:358 Black Writers of Africa and the Caribbean
- 21&62:014:389 Psychology and Values of the African-American
- 21&62:014:396 The African-American Community

Fifteen additional credits in electives are required for completion of the major. The following electives are strongly recommended:

- 21&62:014:220 Contemporary Black Political Thinkers
- 21&62:014:301 African Cultural Retentions in the Americas
- 21&62:014:302 Special Topics in Black Studies
- 21&62:014:304 English Speaking African Writers

Recommended but not required: competency in reading French in order to study major works by French-speaking black writers, poets, and scholars.

Courses

21&62:014:111,112. INTRODUCTION TO THE BLACK EXPERIENCE IN WESTERN CULTURE (3,3)

A two-term course required of all Afro-American and African studies majors and minors. Designed primarily for first-year students and sophomores.

Historical experiences of blacks in Western culture; psychological and social impact of racism; particular aspects of the black experience throughout the diaspora of the Americas.

21&62:014:180. HISTORY OF AFRICAN-AMERICAN EDUCATION (3)

Educational experience of African Americans from the post-Civil War period to contemporary times; educational philosophies of DuBois, Booker T. Washington, and others.

21&62:014:220. CONTEMPORARY BLACK POLITICAL THINKERS (3)

Focuses on the writings of recent political thinkers such as Malcolm X, Dr. Martin Luther King, Jr., Fanon, Castro, Nkrumah, and Sekou Toure, in an attempt to draw forth ideas of universal political relevance; examines ways in which ideas from each of the black areas represented differ according to their own political situations.

21&62:014:278. BLACK SUBCULTURES OF THE U.S.A. (3)

Focuses on the cultural and social aspects of black ethnic groups, both indigenous and immigrant; examines historical variation within the black population of the U.S. and how it has been affected by immigration from the West Indies and Latin America. Study of southern blacks, speakers of the Gullah dialect, the Creoles of Louisiana, and various West Indian groups in the U.S.; analyzes social interaction and impact of these groups on one another.

21&62:014:301. AFRICAN CULTURAL RETENTIONS IN THE AMERICAS (3)

Reviews cultural and adaptation process made by blacks in the Americas from the era of the Atlantic slave trade to the present, using an interdisciplinary base of history, anthropology, literature, and music; introductory focus on traditional African culture; identification and importance of Africanisms which have helped to shape both the historic and contemporary identities of blacks in the U.S., Brazil, Haiti, Surinam, and the West Indies.

21&62:014:302. SPECIAL TOPICS IN BLACK STUDIES (3)

Selected topics are offered each term and chosen to represent a wide range of disciplines. Afro-American and African subject areas include economic development, women's roles, film history, literary genres, social institutions, and urbanization.

21&62:014:304. ENGLISH-SPEAKING AFRICAN WRITERS (3)

Analysis of the novels, poetry, and plays of contemporary English-speaking African writers such as Achebe, Ekwensi, Soyinka, John Pepper Clark, Mphahlele, La Guma, and others; examines the rejection of the concept of Negritude by certain writers.

21&62:014:305. BLACK WOMEN IN THE UNITED STATES (3)

Roles of black women in family life, the workplace, politics, literary and artistic achievement, education, and the struggle for women's rights; incorporates both fictional and nonfictional works to chronologically illuminate the major themes in black women's history and contemporary issues.

21&62:014:306. COMPARATIVE RACE RELATIONS: SOUTH AFRICA AND THE UNITED STATES (3)

Chronological and interdisciplinary study of the major themes in the history of race relations in South Africa and the United States; systematic comparisons of slavery, frontier expansion, and the roots of enduring racism, with assessments of their long-term effects on social relations in both countries. Examines, comparatively, black rights struggles against apartheid, Jim Crow segregation, and impediments to full democracy.

21&62:014:333. DECOLONIZATION AND CHANGE IN THE WEST INDIES (3)

Study of decolonization-by-states, particularly in West Indian commonwealth countries, through the political arrangement of associated statehood of independent and autonomous Caribbean islands; contemporary factors that have influenced social, economic, and political change, and the direction these changes have taken; the decolonization process in the Caribbean.

21&62:014:356. MINORITY POLITICS AND PUBLIC POLICY (3)

Study of political power and its impact on minorities; identification of the central theme of minority politics; analysis of the historical basis of the political situation of black Americans as a minority group; social and economic factors that affect the black minority.

21&62:014:358. BLACK WRITERS OF AFRICA AND THE CARIBBEAN (3)

Not open to first-year students. Course conducted entirely in English.
Development of the Black Consciousness Movement as reflected in the works of Césaire, Damas, Senghor, and others; controversy surrounding the concept of Negritude; influence of African civilization and art, the Harlem Renaissance, Marxism, surrealism, and other forces on the movement.

21&62:014:364. EDUCATION AND SOCIAL CHANGE AMONG AFRO-AMERICANS (3)

Education and social change in the Afro-American community; issues as they affect the content, function, and impact of education: pedagogy, pedagogical styles, busing, accountability, community control, and alternative school systems.

21&62:014:366. NATIONALISM, LEADERSHIP, AND POLITICAL DEVELOPMENT IN THIRD WORLD NATIONS (3)

Analysis of nationalistic movements in the third world nations; African leadership and political development since World War II.

21&62:014:388. SURVEY OF BLACK POLITICAL ECONOMY (3)

Not open to first-year students.
Exploration of political initiatives that impact on the economic status of the black community; responses developed by the community to economic problems. Analyses of approaches to black economic development: black capitalism, ghetto industries, and community-owned businesses.

21&62:014:389. PSYCHOLOGY AND VALUES OF THE AFRICAN AMERICAN (3)

Background information of various theories, concepts, and psychological definitions; emphasis on the black experience viewed in a historical context, with consideration given to the formation of self-concepts and sources of strength in the survival of the black psyche.

21&62:014:396. THE AFRICAN-AMERICAN COMMUNITY (3)

Patterns of development that characterize African-American communities in large urban areas of the U.S.; structure and organization of these communities in terms of their responses to the larger culture; distinctive problems affecting black communities and initiatives adopted to overcome them.

21&62:014:403. THE THIRD WORLD AND THE MEDIA (3)

Prerequisite: Junior or senior standing or permission of instructor.
Focuses on the importance of the third world and how it is covered by the media. Areas to be covered include Africa, the Middle East, the Caribbean, Latin America, and Asia. The industrial and strategic importance of these areas is explored; significance of the use of stringers instead of regular staff to provide media coverage; relationship of the U.S. business community and military to the third world reviewed in terms of impact on the news.

21&62:014:411,412. SENIOR SEMINAR (3,3)

Prerequisite: Senior status or permission of instructor. Two-term culminating experience for African-American and African Studies majors.
Interdisciplinary study highlights both the methodological and theoretical approaches supporting research in the field.

21&62:014:415. THE HISTORY OF BLACKS IN THE AMERICAN LABOR MOVEMENT (3)

Prerequisite: Junior or senior standing or permission of instructor.

Traces the itinerary of blacks in American labor organizations; contributions of black Americans to the development of the labor movement. Examines ideology of the labor movement and its relationship to social and political developments, and to the economic structures and forces of American society.

21&62:014:430. THE AFRICAN AMERICAN, THE LAW, AND THE COURTS (3)

Prerequisite: Junior or senior standing or permission of instructor.

Historical and contemporary relationship and impact of the American judicial system on the black community; review of constitutional, federal, state, and municipal legislation affecting the evolving legal status of black people, and the philosophical and political themes that precipitated their enactment. Case studies examined and systematic appraisal made of the dynamic process—the law, courts, execution, and enforcement of justice.

21&62:014:465. AFRICAN RELIGIONS AND PHILOSOPHICAL THOUGHT SYSTEMS (3)

General interweave of religion, culture, and the philosophical system of African societies, and how these elements fuse into an organic whole. Similarities and differences in ideological systems that structure and reflect the society are pinpointed; African religions and philosophy are used to depict the African's relationship to the universe.

21&62:014:495,496. INDIVIDUAL STUDY IN BLACK STUDIES (3,3)

Independent reading or research under the direction of a faculty member.

Other Related Courses**21&62:070:316. PEOPLES AND CULTURES OF AFRICA (3)**

See Anthropology 070.

21&62:082:275. BLACK ART IN AMERICA (3)

See Art History 082.

21&62:082:285. ART OF AFRICA (3)

See Art History 082.

21&62:352:395,396. AFRO-AMERICAN LITERATURE (3,3)

See American Literature 352.

21&62:510:263,264. HISTORY OF AFRICA (3,3)

See History 510.

21&62:510:385,386. A HISTORY OF SOUTHERN AFRICA (3,3)

See History 510.

21&62:512:333,334. AFRO-AMERICAN HISTORY (3,3)

See American History 512.

21&62:512:472. TOPICS IN AFRO-AMERICAN HISTORY (3)

See American History 512.

21&62:700:265. JAZZ (3)

See Music 700.

21&62:790:317,318. GOVERNMENT AND POLITICS OF AFRICA (3,3)

See Political Science 790.

21&62:920:316. RACE RELATIONS (3)

See Sociology 920.

ALLIED HEALTH TECHNOLOGIES 045

Coordinator: Douglas W. Morrison, 973/353-1268

The major is offered at NCAS. A major in Allied Health Technologies (AHT) leading to the bachelor of science degree is offered jointly with the University of Medicine and Dentistry of New Jersey—School of Health Related Professions in Newark (UMDNJ-SHRP) and the Department of Biological Sciences at Rutgers–Newark. Graduates become members of health care teams contributing to the diagnosis and treatment of disease in a variety of health care, industrial, governmental, and educational settings.

AHT majors take three years of course work at Rutgers–Newark and must apply to the senior clinical year at UMDNJ-SHRP beginning the fall term of their junior year through a separate admissions process. Admission requirements for the senior clinical year include a cumulative grade-point average of 2.75 and grades of *C* or better in all prerequisite core science courses taken at Rutgers–Newark. Students may specialize in diagnostic medical sonography, vascular technology, nuclear medicine technology, or respiratory care. For more information about the joint program, contact Clifford T. Araki, Ph.D., RVT, at UMDNJ, 973/972-4138, <http://arakict@umdnj.edu>, or the undergraduate coordinator at Rutgers–Newark.

Course requirements to be taken at NCAS and at UMDNJ-SHRP for the four options are as follows:

Core Rutgers–NCAS courses required of all AHT majors (55–56 credits)

21:120:101-102	General Biology (4,4)
21:160:115-116	General Chemistry (4,4)
21:160:113-114	General Chemistry Laboratory (1,1)
21:640:114 or 135	Precalculus (3) or Calculus I (4)
21:750:203-204	General Physics (3,3)
21:750:205-206	Introductory Physics Laboratory (1,1)
21:960:211	Statistics (3)
21:120:301	Foundations in Cell and Molecular Biology (4)
21:120:320	Comparative Anatomy of Vertebrates (4)
21:120:340	Mammalian Physiology (4)
21:120:352	Genetics (3)
21:160:331	Organic Chemistry Laboratory (2)
21:160:335-336	Organic Chemistry (3,3)

Year 4 (Professional courses at UMDNJ–School of Health Related Professions)

- Interdisciplinary Core (4 credits)
 - Summer, Fall, or Spring
 - IDST2210 Computer Applications in Health Care (1)
 - IDST3510 Principles of Scientific Inquiry (3)
- Specialization
 - Diagnostic Medical Sonography (42 credits)
 - Summer I
 - HSTC4100 Advanced Patient Care (3)
 - HSTC4151 Cross-Section Abdominal Ultrasound (2)
 - DXMS4171 Gynecology Ultrasound (2)
 - Fall
 - DXMS4111 Acoustic Physics I (2)
 - DXMS4131 Abdominal Ultrasound I (2)

DXMS4161	Obstetrical Ultrasound I (2)	Summer	
DXMS4172	Gynecology Ultrasound II (2)	IDST2210	Computer Applications in Health Care (1)
DXMS4199	Clinical Practice I (4)		
Spring		NUCM4343	Clinical Applications III (2)
DXMS4212	Acoustic Physics II (2)	NUCM4399	Clinical Practice III (4)
DXMS4232	Abdominal Ultrasound II (2)	NUCM4222	Instrumentation II (2)
DXMS4240	Neurosonography (2)	NUCM4211	Radiopharm and Chemistry (3)
DXMS4262	Obstetrical Ultrasound II (2)		
DXMS4299	Clinical Practice II (4)	Fall II	
Summer II		NUCM4499	Clinical Practice IV (6)
DXMS4350	Critique and Clinical Correlation (2)	NUCM4351	Clinical Correlations (2)
HSTC4360	Introduction to Echocardiography (1)		
HSTC4370	Introduction to Noninvasive Vascular Testing (2)	D. Respiratory Care (35 credits)	
DXMS4399	Clinical Practice III (6)	Summer	
B. Vascular Technology (43 credits)		RSTN4100	Fund Respiratory Care (4)
Summer		RSTN4150	Applied Cardiopulmonary Pathophysiology I (2)
HSTC3370	Introduction to Noninvasive Vascular Testing (2)	RSTN4189	Clinical Practice I (2)
HSTC4100	Advanced Patient Care for Imaging Sciences (3)	Fall	
VSTC4300	Vascular Laboratory Practices (2)	RSTN4151	Applied Cardiopulmonary Pathophysiology II (2)
VSTC4381	Introduction to Vascular Physics and Instrumentation (1)	RSTN4200	Principles of Vent Support (4)
Fall		RSTN4250	Cardiopulmonary Pharmacology (2)
DXMS4111	Acoustic Physics I (2)	RSTN4270	Cardiopulmonary Evaluation (2)
VSTC4111	Vascular Anatomy, Physiology, and Disease I (3)	RSTN4289	Clinical Practice II (3)
VSTC4121	Noninvasive Diagnosis of Vascular Disease I (2)	Spring	
VSTC4131	Clinical Correlation I (1)	RSTN4330	Pediatric/Neonatal Respiratory Care (2)
VSTC4149	Clinical Practice I (5)	RSTN4350	Patient Management Critical Care (3)
Spring		RSTN4389	Clinical Practice III (4)
DXMS4212	Acoustic Physics II (2)	RSTN4510	Long-Term, Home, and Rehabilitation Care (2)
VSTC4212	Vascular Pathophysiology, Diagnosis, and Therapeutics (4)	RSTN4990	Independent Study Respiratory Care (3)
VSTC4222	Noninvasive Diagnosis of Vascular Disease II (2)		
VSTC4232	Clinical Correlation II (1)		
VSTC4249	Clinical Practice II (4)		
Summer II			
HSTC4360	Introduction to Echocardiography (1)		
HSTC4151	Cross-Section Abdominal Ultrasound (2)		
VSTC4382	Vascular Physics and Instruction (1)		
VSTC4333	Clinical Applications and Vascular Techniques (2)		
VSTC4349	Clinical Practice III (3)		
C. Nuclear Medicine Technology (44 credits)			
Fall I			
RADS2550	Radiation Biology and Protection (3)		
HSTC4100	Advanced Patient Care (3)		
NUCM4111	Nuclear Physics I (2)		
NUCM4141	Clinical Applications I (3)		
NUCM4179	Clinical Practice I (2)		
Spring			
NUCM4121	Instrumentation I (2)		
NUCM4212	Nuclear Physics II (2)		
NUCM4242	Clinical Applications II (3)		
NUCM4299	Clinical Practice II (4)		

AMERICAN STUDIES 050

The major and minor in American studies are offered at NCAS.

Program Director: Heyward Ehrlich

Major Requirements

The major in American studies examines the many cultures of the United States from an interdisciplinary or multi-disciplinary point of view. The program is developed by student and adviser around relevant courses in American studies and other disciplines to combine reading, library research, and fieldwork. Independent study on special projects is encouraged. Each student should select one of the following areas of concentration:

Literature, fine arts, and history
Science and technology
Popular culture and the media
Folklore and folklife

The major requires 30 credits beyond prerequisite courses:

1. Prerequisites:
21&62:352:223,224 Survey of American Literature
21&62:512:201,202 Development of the United States
2. 6 credits to include:
21&62:050:300 Introduction to American Studies *or*
21&62:050:301 Documentation and Research in American Studies; *and*
21&62:050:488,489 Topics in American Studies

ANCIENT AND MEDIEVAL CIVILIZATIONS

3. 6 additional credits in American Studies 050
4. 6 additional credits in American Literature 352 or American History 512
5. 12 credits in other departments in related courses approved by American studies advisers. These courses are to be selected to support the area of concentration.

Students interested in a dual major—American studies and another discipline—or an American studies minor should contact an American studies adviser.

Minor Requirements

The minor consists of 9 elective credits beyond the prerequisite courses listed below:

- 21&62:352:223,224 Survey of American Literature
21&62:512:201,202 Development of the United States

Students interested in pursuing a major or minor should consult with the program director to plan for available courses.

Courses

21&62:050:300. INTRODUCTION TO AMERICAN STUDIES (3)

A survey of approaches to the interdisciplinary study of the culture of the U.S.; folk, popular, and elite culture; American myth, folklore, folk music, fine arts, architecture, science and technology, community study, and popular arts and culture.

21&62:050:301. DOCUMENTATION AND RESEARCH IN AMERICAN STUDIES (3)

Methods and techniques of research and documentation in the library and in the field pertaining to a current issue in American studies; old and new disciplines draw upon actual resources of the metropolitan area and approaches of two or more related areas.

21:050:306. THE VIETNAM WAR AND AMERICA (3)

Explores the interrelations between the U.S. war in Vietnam and American culture—before, during, and after. Attempts to challenge the student's perceptions of historical and cultural reality through a variety of mediums.

21&62:050:311,312. POPULAR CULTURE AND THE MEDIA (3,3)

Popular arts, attitudes, folklore, and myths in print, broadcast, electronic, and commercial media; relationship of popular culture to vogues, movements, censorship, audience, leisure, politics, business, and technology; content analysis of actual texts, and examples balanced with a survey of theory, history, and criticism.

21&62:050:363. AMERICAN FOLKLORE (3)

Oral tradition in America in its cultural context; folklore from regional, occupational, and ethnic groups; genres include folk songs, folktales, proverbs, folk beliefs, customs, games, and folk ceremonies; collecting folklore in the Newark area required.

21&62:050:391,392. FIELDWORK IN AMERICAN STUDIES (3,3)

Oral history, photographic surveys, historical preservation, or other practical exercises in the collection, analysis, and description of evidence of American culture. The focus each term is a team project.

21:050:395. NUCLEAR WAR AND LITERATURE (3)

Equivalent to 21&62:350:395. Credit not given for both this course and 21&62:350:395.

The development of nuclear weapons in culture and history from their first appearance as fiction in the first decade of the twentieth century. Examines the imagined futures that now form part of everyday life.

21&62:050:403,404. TECHNOLOGY AND CULTURE IN AMERICA (3,3)

These courses fulfill the technology course requirement in the teacher certification program.

Design and function of computers and technological systems in America, popular and esthetic responses to them, and the relationship between American culture and American industrialism; course materials drawn from literature, the arts, popular culture, social commentary, political writings, design, and engineering.

21&62:050:488,489. TOPICS IN AMERICAN STUDIES (3,3)

One of these courses required of majors; open to nonmajors.

Each term the course offers a different topic for intensive, interdisciplinary study in a seminar format; seminar paper required. For specific topics in any term, consult the American studies advisers.

21&62:050:498,499. INDIVIDUAL STUDY IN AMERICAN STUDIES (3,3)

Prerequisite: Permission of instructor or program director.

Supervised arrangement for readings, a research paper, fieldwork, or an internship in such institutions as the New Jersey Historical Commission, the New Jersey Historical Society, the Newark Public Library, or the Newark Museum.

ANCIENT AND MEDIEVAL CIVILIZATIONS 060 (Classics 190, Greek 490, Hebraic Studies 500, Latin 580)

Department of History

Conklin Hall (973/353-5410)

Program Director: Robert R. Stieglitz

The major and minor in Ancient and Medieval Civilizations are offered at NCAS.

Major Requirements

The interdepartmental major in ancient and medieval civilizations encourages students to study the give-and-take among the contiguous civilizations of Eurasia and North Africa, and to appreciate how this exchange facilitated material and intellectual development from the earliest times through the Middle Ages. These civilizations are approached through courses in history, language and literature, archaeology and art, anthropology, religion and myth, technology, law, and philosophy. Students may choose to concentrate either in Classical or in Near and Middle Eastern Civilizations. Complementary courses in the concentration not chosen, as well as in related subjects, should be selected with the help of an adviser. The ancient and medieval civilizations program provides an excellent general education in the humanities, as well as a foundation for graduate studies or professional training, such as law.

The major in ancient and medieval civilizations includes courses in Anthropology 070, Classics 190, Greek 490, Hebraic Studies 500, History 510, Latin 580, and Philosophy 730. The major requires the following:

1. 12 credits of history courses, selected from the following, according to the student's area of concentration:
 - 21:510:263 History of Africa (first term only)
 - 21:510:286 The Ancient Near East
 - 21:510:287 History of Islamic Civilization (first term only)
 - 21:510:297 Far Eastern History (first term only)
 - 21:510:319,320 The Classical World
 - 21:510:327,328 Civilization of the Middle Ages

- 21:510:329,330 Civilization of Medieval Eastern Europe and the Near East
- 21:510:394 Peoples and Cultures of Central Asia
2. 12 credits of courses in material and intellectual development, selected from the following, according to the student's interests and area of concentration:
- 21:070:367 Archaeology of the Old World
- 21:190:214 Greek Archaeology
- 21:190:215 Roman Archaeology
- 21:190:255,256 Ancient Myths and Religions
- 21:190:310 Ancient Technology
- 21:190:312 Ancient Warfare
- 21:190:325 Women in Antiquity
- 21:190:335,336 Ancient Law
- 21:190:343 Money in the Ancient World
- 21:190:361,362 Greek Civilization
- 21:190:363,364 Roman Civilization
- 21:500:235,236 The World of the Bible
- 21:500:315,316 Hebrew Literature in Translation
- 21:500:341,342 Jewish Civilization
- 21:510:346 Medieval Legal History
- 21:730:206 Introduction to Greek Philosophy
3. 12 credits in one or two of the following languages, selected according to the student's area of concentration: Arabic 074, Chinese 165, Greek 490, Hebrew 500, and Latin 580.
4. 3 credits of participation in an undergraduate seminar.
5. 3 credits of independent study (21:190:445,446; 21:500:499) or an internship (21:190:395,396).
6. A thesis to be written for 3 credits in the senior year under faculty supervision, on a subject approved by the program director (21:190:390).

Minor Requirements

The minor consists of 6 credits of history courses and 6 credits in material and intellectual development, as listed in 1. and 2. under major requirements. In addition, 6 credits are to be taken in one language. The credits in categories 1. and 2. should be in courses significantly related to the language chosen.

Courses (Classics 190)

21:190:214. GREEK ARCHAEOLOGY (3)

The material culture of ancient Greece and the Greek colonies in Asia Minor and Italy from the Neolithic period to the first century B.C.

21:190:215. ROMAN ARCHAEOLOGY (3)

The material culture of ancient Italy and the Roman provinces from the Neolithic period to the third century A.D.

21:190:255,256. ANCIENT MYTHS AND RELIGIONS (3,3)

Myths and religions of the ancient world, including Greece, Rome, and the Near East. Myths are studied in light of modern theories of mythology; the nature and forms of classical pagan religion, Judaism, and early Christianity are compared.

21:190:310. ANCIENT TECHNOLOGY (3)

Relationship between technological advance and cultural change in the ancient Mediterranean world; water control, metallurgy, food production, engineering, transport, and the technology of the arts.

21:190:312. ANCIENT WARFARE (3)

The study of the motives, weapons, and tactics of warfare in the ancient Mediterranean world; the relation of ancient warfare to social, economic, political, and technological development.

21:190:315,316. TOPICS IN MEDITERRANEAN CIVILIZATION (3,3)

In-depth study of selected subjects in Greek, Roman, and Near Eastern civilizations.

21:190:325. WOMEN IN ANTIQUITY (3)

The lives of women in ancient Mediterranean and Near Eastern lands are reconstructed with the aid of archaeological evidence. The relation of this evidence to portrayals of women in ancient literature is considered.

21:190:335,336. ANCIENT LAW (3,3)

Major developments in legal codes and procedures in Greece, Rome, and the Near East (circa 2000 B.C. to the sixth century A.D.).

21:190:343. MONEY IN THE ANCIENT WORLD (3)

Interaction between social and political developments and the growth of a money economy in the ancient Mediterranean and Near East. The invention and development of coinage; numismatic technology and artistry. Ancient monetary standards; banking and finance; the handling of capital; living standards as understood through documents recording prices. How the existence of coinage affected the accumulation of wealth and influenced social organization.

21:190:361,362. GREEK CIVILIZATION (3,3)

Study of the cultural heritage of ancient Greece through its literature, art, and archaeology.

21:190:363,364. ROMAN CIVILIZATION (3,3)

The literary and material culture of the Romans, emphasizing Rome's influence on the development of European civilization.

21:190:390. SENIOR THESIS (3)

An extended research paper written during the senior year with faculty guidance.

21:190:395,396. INTERNSHIP IN ANCIENT MEDITERRANEAN CIVILIZATIONS (3,3)

Prerequisite: Permission of program director.

Opportunity to explore professional activity, under department supervision; for example, in the ancient collection of an area museum.

21:190:445,446. INDIVIDUAL STUDIES (3,3)

Prerequisite: Permission of instructor.

Study in detail of a selected subject in classical civilization.

Courses (Greek 490)

21:490:101-102. ELEMENTARY ANCIENT GREEK (3,3)

Both terms must be completed to receive credit.

Fundamentals of Greek grammar and practice in reading.

21:490:131,132. INTERMEDIATE ANCIENT GREEK (3,3)

Prerequisites: 21:490:101-102 or permission of instructor.

Selected readings in prose and poetry.

21:490:311. ADVANCED ANCIENT GREEK I (3)

Selected advanced readings in prose and poetry.

21:490:312. ADVANCED ANCIENT GREEK II (3)

Selected advanced readings in prose and poetry.

21:490:353,354. INDIVIDUAL STUDIES (3,3)

Prerequisite: Permission of instructor.

Study of Greek authors selected according to need and previous preparation of students.

ANTHROPOLOGY

Courses (Hebraic Studies 500)

21:500:101-102. ELEMENTARY HEBREW (3,3)

For students with little or no previous knowledge of Hebrew. Both terms must be completed to receive credit.

A beginner's course planned to lay a broad foundation for reading, speaking, and writing the language; oral and written exercises.

21:500:131,132. INTERMEDIATE HEBREW (3,3)

For students who have completed 21:500:101-102 or equivalent as determined by placement examination.

Practice in oral and written composition; selected readings in Hebrew prose and poetry.

21:500:235,236. THE WORLD OF THE BIBLE (3,3)

Examination of the data afforded by explorations and excavations of ancient Israelite, Canaanite, Egyptian, and Mesopotamian sites, elucidating (possibly corroborating or else challenging) the details, background, context, and significance of biblical history and the scriptural pages.

21:500:311. ADVANCED HEBREW I (3)

Selections from the narrative, legal, and poetic chapters of Genesis, Exodus, Deuteronomy, the Prophets, Proverbs, Daniel, Esther, and Ecclesiastes. Taught in Hebrew.

21:500:312. ADVANCED HEBREW II (3)

Representative passages from the Mishnah (with special emphasis on Pirkei Avot) and the Midrashic literature; Aggadic extracts from the Gemara. Taught in Hebrew.

21:500:315. HEBREW LITERATURE IN ENGLISH TRANSLATION: BIBLICAL (3)

Selections from the narrative, legal, and poetic chapters of Genesis, Exodus, Deuteronomy, the Prophets, Proverbs, Daniel, Esther, and Ecclesiastes.

21:500:316. HEBREW LITERATURE IN ENGLISH TRANSLATION: POSTBIBLICAL (3)

Representative passages from the Mishnah (with special emphasis on Pirkei Avot) and the Midrashic literature; Aggadic extracts from the Gemara.

21:500:341,342. JEWISH CIVILIZATION (3,3)

History of the Jewish people from their tribal beginnings, migrations, and metamorphoses; their encounters with Egyptian, Canaanite, and Syrian civilizations; period of Judges and the Monarchy; conquests by Assyrian, Babylonian, Persian, and Greek empires; priestly and prophetic phenomena; the Maccabean revolt and the Hasmonean Kingdom; the rise of Pharisaism and early Christianity; the impact of Imperial Rome; the Hadrianic persecutions and the Bar Kochba uprising; the spread of Jews around the Mediterranean and to northwestern Europe; the consequences of triumphant Christianity and late Islam upon Jewry.

21:500:499. INDIVIDUAL STUDIES (3)

Prerequisite: Permission of instructor.

Study in detail of a selected subject in Hebraic studies.

Courses (Latin 580)

21:580:101-102. ELEMENTARY LATIN (3,3)

For students with no knowledge of Latin or less than two years of high school Latin. Both terms must be completed to receive credit.

Fundamentals of Latin grammar and practice in reading.

21:580:131,132. INTERMEDIATE LATIN (3,3)

Prerequisites: 21:580:101-102 or permission of instructor.

Selected readings in prose and poetry.

21:580:311. ADVANCED LATIN I (3)

Prerequisites: 21:580:131,132 or permission of instructor.

Selected advanced readings in prose and poetry.

21:580:312. ADVANCED LATIN II (3)

Prerequisite: 21:580:311 or permission of instructor.

Selected advanced readings in prose and poetry.

21:580:353,354,453,454. INDIVIDUAL STUDIES (3,3,3,3)

Prerequisites: 21:580:131,132 or permission of instructor.

21:580:364. LATIN PROSE COMPOSITION (3)

Prerequisites: 21:580:131,132 or permission of instructor.

Exercises in composition to strengthen understanding of syntax and grammar.

21:580:425. ADVANCED LATIN III (3)

Prerequisite: 21:580:312 or permission of instructor.

Selected advanced readings in prose and poetry.

21:580:426. ADVANCED LATIN IV (3)

Prerequisite: 21:580:425 or permission of instructor.

Selected advanced readings in prose and poetry.

ANTHROPOLOGY 070

Department of Sociology and Anthropology

Hill Hall (973/353-5255)

The anthropology major and minor are offered at NCAS and the minor is offered at UC-N. Note that the NCAS and the UC-N minor requirements differ.

Major Requirements: NCAS

The anthropology major provides students with an understanding of human society in terms of its biological and cultural aspects in the widest historical and comparative framework. This major provides a useful background for students interested in careers in education, research, government service, and other employment where a knowledge of human relations is important.

The requirements for the anthropology major are 30 credits as follows:

- 21 credits in anthropology that must include
 - 21&62:070:203 Introduction to Physical Anthropology and Archaeology
 - 21&62:070:204 Introduction to Cultural Anthropology
- 3 credits in an area course
 - 21&62:070:207 Indians of North America
 - 21&62:070:316 Peoples and Cultures of Africa
 - 21&62:070:352 Peoples and Cultures of Latin America
 - 21&62:070:353 Peoples and Cultures of Southeast Asia
 - 21&62:070:361 Selected Area Studies
 - 21&62:070:367 Archaeology of the Old World
 - 21&62:070:369 New World Archaeology
- 3 credits in a comparative course
 - 21&62:070:301 Anthropology of Development
 - 21&62:070:303 Anthropology of Postcolonialism
 - 21&62:070:305 Culture and Personality
 - 21&62:070:306 Anthropology of Power
 - 21&62:070:309 Medical Anthropology
 - 21&62:070:310 Comparative Religion
 - 21&62:070:331 Urban Anthropology
 - 21&62:070:337 Anthropology of Inequality
 - 21&62:070:340 Comparative Roles of Women
 - 21&62:070:350 Cultural Ecology
 - 21&62:070:358 Archaeological Theory and Practice
 - 21&62:070:363 Anthropology of Social Life
 - 21&62:070:420 Tribal Warfare
- 3 credits in an advanced seminar

- 21&62:070:425 Research in Anthropology
 21&62:070:492 Seminar in Anthropology *or*
 3 credits of independent study or
 other advanced course to be
 designated

- 6 credits in any two additional anthropology courses, *or*
 other advanced courses to be designated
2. 9 credits from other course listings in anthropology and sociology. With departmental approval, related courses offered in other departments may be applied toward the major.

Minor Requirements: NCAS

The minor requires 18 credits as follows:

- 15 credits in anthropology which must include
 - 21&62:070:203 Introduction to Physical Anthropology and Archaeology
 - 21&62:070:204 Introduction to Cultural Anthropology
 3 credits in an area course
 3 credits in a comparative course
- 3 credits from other course offerings in anthropology and sociology.
- With departmental approval, related courses offered in other departments may be applied toward the minor.

Minor Requirements: UC-N

A minor consists of 18 credits in anthropology, including no more than 9 credits at the 200 level. Closely related courses are considered for minor credit on an individual basis through consultation with the program adviser.

Courses

21&62:070:203. INTRODUCTION TO PHYSICAL ANTHROPOLOGY AND ARCHAEOLOGY (3)

The biological and cultural evolution of the human species is traced by examining the fossil and archaeological record, primate behavior, and the significance of human variation.

21&62:070:204. INTRODUCTION TO CULTURAL ANTHROPOLOGY (3)

A study of various ways of life—from hunting and gathering to industrial societies. Topics such as marriage, economics, politics, and religion examined; comparisons made to illustrate the principles underlying cultural similarities and differences.

21&62:070:207. INDIANS OF NORTH AMERICA (3)

A survey of Native American cultures, including the Inuit of the Arctic, the Iroquois, the buffalo hunters of the plains, and the pueblo dwellers of the Southwest, among others.

21&62:070:220. ANTHROPOLOGICAL THEORY AND METHODS (3)

General historical framework; nineteenth-century and contemporary evolutionism, functionalism, structuralism, cultural ecology, Marxism, and postmodernism; the impact of feminism; and anthropological research in libraries and museums, and in the field.

21&62:070:301. ANTHROPOLOGY OF DEVELOPMENT (3)

Theoretical approaches to the study of developing nations. Ethnographies that describe the impact of development on people's lives, cultures, and identities.

21&62:070:303. ANTHROPOLOGY OF POSTCOLONIALISM (3)

Postcolonial responses to cultural and economic domination in locations such as multinational corporations, media productions, tourist attractions, and religious sites.

21&62:070:305. CULTURE AND PERSONALITY (3)

Comparative study of the dynamics of human development and its cultural patterning; readings include autobiographies and ethnographies from several societies and theoretical approaches to understanding the cultural structuring of perception, interaction, and experience; emphasis on interpreting observed social interactions and utilizing life histories.

21&62:070:306. ANTHROPOLOGY OF POWER (3)

The body politic and the politics of bodies are ways in which anthropologists analyze the formal and informal organization of power and authority. Anthropological studies of kings and chiefs, lawmakers, and ritual leaders.

21&62:070:309. MEDICAL ANTHROPOLOGY (3)

Cross-cultural perspectives on health beliefs and practices; social organization of health care institutions; sociocultural factors in physical and mental health; relationship between human health and the social environment.

21&62:070:310. COMPARATIVE RELIGION (3)

Examines religion as an aspect of society and the human condition. This course raises questions about the origin, function, structure, and meaning of religion. It uses the broadest possible comparisons, particularly religion as practiced by "tribal" peoples, and draws on students' own ideas about religion. Topics include ritual, belief, magic, witchcraft, communicating with spirits, and religious movements.

21&62:070:314. TOPICS IN ANTHROPOLOGY (3)

Topics vary each term. Consult department for current information.

21&62:070:316. PEOPLES AND CULTURES OF AFRICA (3)

Culture areas of Africa south of the Sahara, from the Bushman and Pygmy hunters to advanced empires of Uganda and the west coast. Technology, society, art, and religion of the indigenous cultures; African cultural history; continuity and change in African cultures today.

21&62:070:319. ANTHROPOLOGY THROUGH FILM (3)

Examination and analysis of selected societies and cultures through films and complementary written texts. Study of the process of making documentary and ethnographic films and the related problems of representing "realities" through visual media.

21&62:070:331. URBAN ANTHROPOLOGY (3)

Examines the theoretical underpinnings of a variety of urban studies done by anthropologists; individual or group research project.

21&62:070:337. ANTHROPOLOGY OF INEQUALITY (3)

Class, race, and gender and how they intersect with power and domination. Study of how systems of inequality work, how they are maintained, and how they are transformed.

21&62:070:340. COMPARATIVE ROLES OF WOMEN (3)

Women's roles in societies that range from hunting and gathering bands to agricultural and pastoral chiefdoms, from ancient China to socialist Cuba. Women's experience in the family and community setting, as workers, as individuals, and as leaders. The impact of class, race, and gender on women's experience and consciousness.

21&62:070:346. THE CULTURAL HISTORY OF THE NEW YORK POLICE (3)

Explores the role of policing in modern society by examining the origins and development of the New York City Police Department, from the events leading up to the founding of a unified day and night force in 1845, to the reforms following the Knapp Commission in the early 1970s. Uses extensive readings to ask how changing social and political forces affected the organization and policies of the police, and how police actions in turn shaped the character of urban life.

ARCHAEOLOGY

21&62:070:350. CULTURAL ECOLOGY (3)

Study of anthropological works that interpret cultural phenomena from an ecological viewpoint; basic principles of ecology used to analyze communities and human populations in indigenous, colonial, and developing societies; cultural methods of adaptation and the critical role of technology and economic organization in human ecosystems.

21&62:070:352. PEOPLES AND CULTURES OF LATIN AMERICA (3)

Latin-American cultures studied with emphasis on contributions and interactions of Native Americans, Iberians, and Africans. Examines the impact of colonialism and neocolonialism; structures of class, race, and gender; and ongoing efforts to implement change. Readings focus on Brazil, Guatemala, and Peru.

21&62:070:353. PEOPLES AND CULTURES OF SOUTHEAST ASIA (3)

Analysis of the societies of Vietnam, Malaysia, Indonesia, and other countries of Southeast Asia which include the tribal peoples of the jungle, the peasantry and fishing groups, the large merchants, and princes; impact of the new Western technology on rural and urban family life and other cultural changes occurring in the area.

21&62:070:358. ARCHAEOLOGICAL THEORY AND PRACTICE (3)

Examines methods and techniques of archaeological research.

21&62:070:361. SELECTED AREAS STUDIES (3)

Analysis of selected cultures and societies, such as those indigenous to North America, the Caribbean, the Middle East, and/or New Guinea and Australia.

21&62:070:363. ANTHROPOLOGY OF SOCIAL LIFE (3)

Traditional anthropological concerns of kinship, marriage, household formation, and networks. Recent focuses on the construction of sexuality and gender.

21&62:070:367. ARCHAEOLOGY OF THE OLD WORLD (3)

Examination of the evidence for the origins and development of culture in Paleolithic Europe, Asia, and Africa, and the rise of civilization in the Near East.

21&62:070:369. NEW WORLD ARCHAEOLOGY (3)

Examines the first peoples of the New World and subsequent cultural development; emphasis on the rise of the high civilizations of America.

21&62:070:390. CULTURE, POLITICAL VIOLENCE, AND GENOCIDE (3)

Explores the cultural dimensions of political violence and genocide; focuses loosely on perpetrator motivation. Includes discussion of the cultural, socioeconomic, and historical origins of political violence in countries such as Cambodia, Rwanda, Nazi Germany, Guatemala, Sri Lanka, India, and the former Yugoslavia, the conceptual meanings of terms like "violence" and "genocide," and the aftermaths of mass violence and terror.

21&62:070:420. TRIBAL WARFARE (3)

Overview of anthropological knowledge about war. Examination of various aspects of war, cross-cultural variations in its practice, and shifting analytic approaches to the subject of war. Impact of state expansionism on indigenous warfare patterns. Readings selected for ethnographic detail and theoretical significance.

21&62:070:425. RESEARCH IN ANTHROPOLOGY (3)

Prerequisites: Three anthropology courses or permission of the instructor.
Topics vary depending upon current focus of instructor.

21&62:070:475. CULTURE AND GLOBALIZATION ANTHROPOLOGY (3)

Analysis of the cultural dimensions of globalization. Examines how global flows of people, information, resources, identities, ideas, commodities, symbols, and images impact upon and are transformed in local contexts.

21&62:070:492. SEMINAR IN ANTHROPOLOGY (3)

Prerequisites: 21&62:070:204 and two 300-level anthropology courses, or permission of instructor.

Intensive study of a single topic or area of anthropological relevance conducted through the exchange of information by participating members of the seminar.

21&62:070:495. INDEPENDENT STUDY IN ANTHROPOLOGY (3)

Prerequisites: Junior or senior standing and permission of instructor.
Special, individualized study of an anthropological topic.

ARABIC 074

21&62:074:101-102. ELEMENTARY MODERN ARABIC (3,3)

For students with no knowledge of Arabic. Both terms must be completed to receive credit.

Fundamentals of writing, pronunciation, reading, and grammar.

21&62:074:131,132. INTERMEDIATE MODERN ARABIC (3,3)

Prerequisites: 21&62:074:101-102 or equivalent, as determined by a placement examination.

Continued practice in writing, reading, speaking, and grammar.

ARCHAEOLOGY

The minor in archaeology is an interdepartmental program administered through the Department of Classical and Modern Languages and Literatures and involving the Department of Sociology and Anthropology and the Department of Geological Sciences.

The minor is offered at NCAS.

Minor Requirements

The minor requires a minimum of 19 credits, selected from the offerings of the natural sciences, the social sciences, and the humanities.

Group 1 (Natural Sciences)—minimum of 4 credits

Geology

21&62:460:103 Planet Earth

21&62:460:104 Planet Earth Laboratory

Group 2 (Social Sciences)—minimum of 6 credits

Anthropology

21&62:070:203 Introduction to Physical Anthropology and Archaeology

21&62:070:358 Archaeological Theory and Practice

21&62:070:367 Archaeology of the Old World

21&62:070:369 New World Archaeology

Hebraic Studies

21&62:500:235,236 The World of the Bible

Group 3 (Humanities)—minimum of 6 credits

Classics

21:190:214 Greek Archaeology

21:190:215 Roman Archaeology

21:190:310 Ancient Technology

21:190:315,316 Topics in Mediterranean Civilization

Group 4—3 credits

3 additional credits in any one of the above groups, to be taken in the senior year, and to include the writing of a research paper, the subject of which ties together the course of study; *or*

a 3-credit individual study project in a participating department, taken with the approval of the program adviser and instructors involved.

ART (Art 080, B.F.A. Visual Arts 081, Art History 082, Arts Management 084)

Department of Visual and Performing Arts

Bradley Hall (973/353-5119)

The art major (with concentrations in art and design and in art history) and minor are offered at NCAS.

Major Requirements

Art and Design

The art and design concentration provides an understanding of art as a humanistic discipline and concepts and skills leading to careers in art and design. Students may specialize in either fine arts, graphic design, or digital arts. The program consists of sixteen courses earning 48 credits: a required group of foundation courses, an area of emphasis, and a senior thesis. The emphasis is worked out in consultation with an adviser, and is intended to provide development of ideas and skills in a particular area. During the senior year, students in art and design produce a series of works that are shown in an exhibition at the Paul Robeson Gallery and that also form a portfolio for admission to graduate school or professional job entry. Students take the following courses:

1. Foundation program (18 credits)
Note: These courses should be taken as early as possible; they are the prerequisites for other art courses.
 - 21&62:080:102 Design Fundamentals
 - 21&62:080:103 3-D Design Fundamentals
 - 21&62:080:121 Introduction to Drawing
 - 21&62:080:251 Introduction to Painting
 - 21&62:082:101 Introduction to Art History I
 - 21&62:082:102 Introduction to Art History II
2. Area of specialization (12 credits)
3. Art history (9 credits)
 - One art history course at the 200 level or above
 - 21&62:082:350 Development of Modern Art
 - 21&62:082:360 Art since 1945
4. Critical studies (3 credits)
 - 21&62:080:285 Seminar in Contemporary Art I *or*
 - 21&62:080:399 Seminar in Contemporary Design
5. Senior program (6 credits)
 - 21&62:080:497 Senior Studio Seminar I *and*
 - 21&62:080:498 Senior Studio Seminar II;
 - or* 21&62:082:497 Senior Seminar in Art History I *and* 21&62:082:498 Senior Seminar in Art History II

Courses to complete the area of specialization requirement may be selected from the following course offerings in consultation with an adviser:

- 21&62:080:231,232, 331,332 Graphic Design I,II,III,IV
- 21&62:080:245 Introduction to Computer Art
- 21&62:080:251 Introduction to Painting
- 21&62:080:252, 351,352 Painting II,III,IV
- 21&62:080:261 Introduction to Photography
- 21&62:080:262 Photography II
- 21&62:080:264 Color Photography
- 21&62:080:273 Introduction to Printmaking
- 21&62:080:276 Intaglio Printmaking
- 21&62:080:281 Introduction to Sculpture
- 21&62:080:283 Figure Sculpture
- 21&62:080:321,322 Drawing III,IV
- 21&62:080:345 Intermediate Computer Art

- 21&62:080:354 Experiments in Computer Art
- 21&62:080:355 Painting and Drawing Workshop
- 21&62:080:361 Studio Photography
- 21&62:080:362 Photography Workshop
- 21&62:080:370 Computers in Graphic Design
- 21&62:080:373 Advanced Printmaking
- 21&62:080:378 Printmaking Book Arts Workshop
- 21&62:080:445 Advanced Experiments in Computer Art
- 21&62:080:483 Advanced Sculpture Workshop

Art History

Credit requirements for a concentration in art history are the same as those for the art and design concentration, except that only 12 credits are required in the foundation program and the 18-credit specialization area is in art history courses at the 200 level and above, selected in consultation with an adviser. The 6-credit senior seminar is required during the senior year to produce a written thesis.

Minor Requirements

The requirements for a minor in art are the successful completion of 21 credits in the following:

- 21&62:080:102 Design Fundamentals
- 21&62:080:121 Introduction to Drawing
- 21&62:082:101 Introduction to Art History I
- 21&62:082:102 Introduction to Art History II

The 9 additional credits should be chosen in consultation with an adviser.

B.F.A. Visual Arts

The B.F.A. Visual Arts major (with concentrations in fine arts, graphic design, and digital arts) is offered at NCAS.

Major Requirements

The B.F.A. Visual Arts major (with concentrations in fine art, graphic design, and digital art) is offered at NCAS. It is a professional degree program that provides students with a multidisciplinary approach to the visual arts. It offers practical, experimental, and theoretical course work and the technical skills necessary for careers in art and design, and includes a large liberal arts component that adds to the development of personal expression. Students also may take advantage of special internship opportunities in the New York/New Jersey metropolitan area. Work starts with the foundation courses, then continues to advanced studio work, where students can pursue their goals and concentrate in either fine arts, graphic design, or digital arts. The program consists of 27 courses earning 81 credits, including a required group of foundation courses, art history courses, critical studies courses, advanced studio courses in the concentration, art electives, portfolio, and senior thesis. The concentration is worked out in consultation with an adviser, and is intended to develop ideas and skills in a particular area. During the senior year, students produce work that is shown in an exhibition at the Paul Robeson Gallery and that also forms the portfolio for admission to graduate school or for professional job entry. Students take the following courses:

1. Foundation program (21 credits)

Note: These courses must be taken as early as possible; they are the prerequisites for other art courses.

- 21&62:080:102 Design Fundamentals
- 21&62:080:103 3-D Design Fundamentals
- 21&62:080:121 Introduction to Drawing

- 21&62:080:223 Figure Drawing
 21&62:080:251 Introduction to Painting
 21&62:082:101 Introduction to Art History I
 21&62:082:102 Introduction to Art History II
2. Studio Concentration (21 credits)
3. Advanced Art History (9 credits)
 21&62:082:350 Development of Modern Art
 21&62:082:360 Art since 1945
One from the following:
 21&62:082:201 History of Non-Western Art
 21&62:082:202 History of Design*
 21&62:082:207 Art and Women
4. Critical studies (6 credits)
 21&62:080:285 Seminar in Contemporary Art
One from the following:
 21&62:080:399 Seminar in Contemporary Design*
 21&62:965:253 TV and Society
 21&62:965:256,257 The Art and History of the Film
5. Art electives (18 credits)
6. Senior program (6 credits)
 21&62:080:497 Senior Studio Seminar I
 21&62:080:498 Senior Studio Seminar II

Students also must complete a minimum of 47 credits of general education requirements (see Degree Requirements chapter) for a total of 128 credits required for graduation.

Teacher Certification

Students seeking teacher certification in art must complete the requirements for a major in the art and design concentration as well as satisfy other requirements for certification. For details regarding admission to the teacher education program and the requirements, students should consult both their department adviser and the chairperson of the education department.

Sequence in Arts Management

The faculty of the Department of Visual and Performing Arts, in conjunction with members of the Faculty of Management, offer a sequence of eight courses as pre-professional training for a wide spectrum of not-for-profit arts management opportunities. The sequence provides students with the opportunity to acquire specific business skills that may be applied to a profession in the arts. For practical experience, a wide variety of internships is available, some of which provide stipends. The sequence comprises the following 18 credits:

- 21&62:080:393,394 Internship in Art (3,3)
 21&62:084:395,396 Issues in Arts Management I,II (3,3)
 21&62:084:408,409,410,411 Topics in Arts Management I,II,III,IV (3,3,3,3)

Courses (Art 080, B.F.A. Visual Arts 081)

21&62:080:102. DESIGN FUNDAMENTALS (3)

Open to nonmajors. No previous art experience needed.

Basic studio course to develop visual literacy and skill; basic vocabulary of art and experience in manipulating this vocabulary through actual projects; principles of composition, color theory, and concepts of space; training in use of pencil, pen, paint, and collage techniques.

21&62:080:103. 3-D DESIGN FUNDAMENTALS (3)

Open to nonmajors. No previous art experience needed.

Basic course to develop an awareness of three-dimensional space through plane, volume, form, light, and rhythm; variety of tools and procedures used to manipulate space; analysis of a problem through materials, processes, and concepts; basic skills involved in structuring space.

21&62:080:121. INTRODUCTION TO DRAWING (3)

Open to nonmajors. No previous art experience needed.

Basic studio course to develop skills in representational drawing; trains students in the perception of real world form and space and the transfer of that perception into two-dimensional images; experience in drawing still life, land- and cityscape, and the figure; materials include pencil, conte crayon, and other drawing media.

21&62:080:211. CERAMICS I (3)

Open to nonmajors.

Covers a wide range of ceramic techniques, including hand-building and wheel techniques using clay and glazes; studio experience supplemented by demonstrations and slides.

21&62:080:212. CERAMICS II (3)

Open to nonmajors. Prerequisite: 21&62:080:211 or permission of instructor.

Advanced hand-building wheel techniques; skills acquired in the formation of functional vessels and a basic understanding of stoneware clay and glaze techniques.

21&62:080:215. CRAFTS I (3)

Open to nonmajors.

Significant projects in a variety of techniques; emphasis on the aesthetics and processes involved in fiber art—weaving, quilting, pattern design, and others.

21&62:080:216. CRAFTS II (3)

Prerequisite: 21&62:080:215 or permission of instructor.

Continuation of 21&62:080:215; advanced fiber and weaving techniques; history of crafts as art stressed through visits to museums and galleries.

21&62:080:223. FIGURE DRAWING (3)

Open to nonmajors. Prerequisite: 21&62:080:121 or permission of instructor.

Drawing from the figure using a variety of approaches ranging from the analytical and precise to the gestural and expressive; familiarity with the complexities of line, value, and texture, and with the various media approaches gained while drawing from life; materials include pencil, conte crayon, and other drawing media.

21&62:080:231. GRAPHIC DESIGN I (3)

Open to nonmajors. Prerequisites: 21&62:080:102, 121, and sophomore standing or permission of instructor.

Fundamental design problems emphasizing the use of typography while exploring problem solving in a variety of visual forms, conceptual and analytical approaches, and technical processes. The use of pictographic image-making, symbol design, semantics, visual sequencing and transformation in developing a visual language. One research paper.

21&62:080:232. GRAPHIC DESIGN II (3)

Open to nonmajors. Prerequisite: 21&62:080:231 or permission of instructor.

Further practice and exploration of typography and typographic processes. Emphasis on various historical and contemporary typographic models. The use of the grid system to explore verbal and visual relationships, typographic hierarchies, and semiotics in expressive compositions. Introduction of type specification, typesetting, copyfitting, and graphic production procedures from traditional methods to digital technology. One research paper.

21&62:080:236. ILLUSTRATION I (3)

Open to nonmajors. Prerequisites: 21&62:080:102, 121.

Basic media and techniques with emphasis placed on conceptual and analytical thinking; projects include using the concept of transformation to develop solutions derived from real-life information; the purpose and history of illustration. One research paper; field trips.

*Required for graphic design concentration.

21&62:080:245. INTRODUCTION TO COMPUTER ART (3)

Open to nonmajors. Prerequisites: 21&62:080:102, 121.

Bridges the historical traditions of art making with aesthetics of computer technology. Painting, drawing, photo-image manipulation, and computer animation using Macintosh computers.

21&62:080:251. INTRODUCTION TO PAINTING (3)

Open to nonmajors. Prerequisites: 21&62:080:102, 121.

Studio course introducing the fundamental concepts of painting; various materials and approaches, both abstract and representational, used to deal with form and image.

21&62:080:252. PAINTING II (3)

Open to nonmajors. Prerequisite: 21&62:080:251 or permission of instructor.

Studio course using a variety of materials and approaches to explore the ways of painting; work is primarily in modes arising from perceptual experience and emphasizes personal expression.

21&62:080:261. INTRODUCTION TO PHOTOGRAPHY (3)

Open to nonmajors

All aspects of black and white photography, including creative use of the camera and related darkroom work; the development and history of photographic techniques; demonstration and illustrated lectures and critiques.

21&62:080:262. PHOTOGRAPHY II (3)

Open to nonmajors. Prerequisite: 21&62:080:261 or permission of instructor.

Black and white photography beyond the introductory level. Development of technical control through the use of the zone system. Lectures on historical as well as contemporary issues in photography. Stress on the development of personal vision.

21&62:080:264. COLOR PHOTOGRAPHY (3)

Open to nonmajors. Prerequisite: 21&62:080:261 or permission of instructor.

Concepts and techniques involved in the use of color in photography; the relationship of color to ideas about reality and artifice; color as a vehicle for controlling the image, using handcoloring, slides, and full-color reproduction printing techniques.

21&62:080:273. INTRODUCTION TO PRINTMAKING (3)

Open to nonmajors. Prerequisites: 21&62:080:102, 121.

Studio introduction to printmaking, covering the techniques of screenprint, linocut, woodcut, monoprint, collograph, and digital applications. Emphasis on developing visual vocabulary and effective forms; history and contemporary roles of printmaking. Field trips.

21&62:080:276. INTAGLIO PRINTMAKING (3)

Open to nonmajors. Prerequisites: 21&62:080:102, 121.

Studio introduction to etching, including various techniques of aquatint, hard and soft grounds, color applications; personal imagery developed while learning how to print and proof a limited edition; history and contemporary roles of printmaking. Field trips.

21&62:080:281. INTRODUCTION TO SCULPTURE (3)

Open to nonmajors. Prerequisites: 21&62:080:102,103, 121.

Basic principles of sculpture introduced through slides, discussions, and projects; experience working in wood, modeling in clay, building armatures, making molds, casting, and direct plaster work; instruction in the use of power tools and safety procedures in the operation of equipment.

21&62:080:283. FIGURE SCULPTURE (3)

Open to nonmajors. Prerequisite: 21&62:080:103 or permission of instructor.

Workshop that deals with individual sculptural concerns, and the function and structure of a sculpture studio; materials and processes determined by instructor and student.

21&62:080:285. SEMINAR IN CONTEMPORARY ART I (3)

Prerequisites: 21&62:082:101,102 and sophomore standing.

Focus on the problems of the contemporary artist, architect, designer, filmmaker, and photographer in relation to modernist movements, socioeconomic institutions, and ideologies.

21&62:080:286. SEMINAR IN CONTEMPORARY ART II (3)

Prerequisite: 21&62:080:285.

Focus on the problems of the contemporary artist, architect, designer, filmmaker, and photographer in relation to modernist movements, socioeconomic institutions, and ideologies.

21&62:080:305. PROBLEMS IN ART (3)

Open to nonmajors. Prerequisite: Permission of instructor.

Seminar directed toward utilizing the mutual benefits of scholarship and studio creativity through activities such as lectures by visiting artists and scholars.

21&62:080:311. CERAMICS III (3)

Open to nonmajors. Prerequisite: 21&62:080:212 or permission of instructor.

Continued exploration of both wheel and handmade form; emphasis on special structural and design aspects of closed and covered vessels; individual approaches developed.

21&62:080:312. CERAMICS IV (3)

Open to nonmajors. Prerequisite: 21&62:080:311 or permission of instructor.

Advanced work in clay; aspects of production pottery as well as special firing techniques that combine low- and high-fire glazing.

21&62:080:315. CRAFTS III (3)

Prerequisite: 21&62:080:216 or permission of instructor.

Continuation of weaving and other crafts skills; role of crafts in the contemporary art world through study of museum collections as well as through further development of skills and aesthetics.

21&62:080:316. CRAFTS IV (3)

Prerequisite: 21&62:080:315 or permission of instructor.

Addresses individual problems in crafts; emphasis on quality of design, technique, and originality of ideas.

21&62:080:321. DRAWING III (3)

Open to nonmajors. Prerequisite: 21&62:080:121 or 223 or permission of instructor.

Studio course that continues the development of skills and of perceptual and imaginative responses in creative drawing; drawing from life and from the environment using a variety of drawing materials; emphasis on strong individual development.

21&62:080:322. DRAWING IV (3)

Open to nonmajors. Prerequisites: 21&62:080:121 and 223.

Advanced development of skills, perceptions, and approaches to drawing the figure; investigation includes experimentation, new media, and improvisation.

21&62:080:331. GRAPHIC DESIGN III (3)

Open to nonmajors. Prerequisite: 21&62:080:232 or permission of instructor. Corequisite: 21&62:080:370.

Advanced design problems emphasizing visual communication as a basis for experimental work. Further study of various typographic grid systems in single page, multiple page, and dimensional formats to include booklets, folders, posters, cover design, and packaging. Various design strategies and processes are applied in organizing complex verbal and pictorial information. One research paper.

21&62:080:332. GRAPHIC DESIGN IV (3)

Open to nonmajors. Prerequisite: 21&62:080:331 or permission of instructor.

Projects investigate the integration of design into a broad scope of communication formats and printing material and the formulation of a variety of information systems applied to environmental, institutional, and industrial communication problems. Projects include promotional and multidimensional design, public service, visual systems, corporate identity, editorial, and advertising.

21&62:080:335. ILLUSTRATION II (3)

Open to nonmajors. Prerequisite: 21&62:080:236 or permission of instructor.
Projects beyond the introductory level; develop conceptual and analytical solutions to assignments while expressing and expanding upon personal, visual vocabulary; traditional and nontraditional techniques utilized for book and magazine covers, posters, book illustrations, self-promotion, and album covers; history of illustration. One research paper; field trips.

21&62:080:336. ILLUSTRATION III (3)

Open to nonmajors. Prerequisite: 21&62:080:335 or permission of instructor.
Advanced course specializing in book illustration, including the production of a limited edition book. Students choose their own subject matter (copy), illustrate, print, design, and bind their book. Instruction in bookkeeping, letterpress printing, linocut, and wood engraving; history of book illustration. Field trips.

21&62:080:345. INTERMEDIATE COMPUTER ART (3)

Open to nonmajors. Prerequisites: 21&62:080:103, 245 or permission of instructor.
Course involves advanced digital art projects, including 3-D image creation, computer animation, and human figure manipulation and animation. Emphasis upon the development of personal vision and its expression through advanced digital imaging technology.

21&62:080:351. PAINTING III (3)

Open to nonmajors. Prerequisite: 21&62:080:252 or permission of instructor.
Further development of painting as a means of visual expression; conceptual approaches to painting; synthesizing visual ideas to form an individual style. Viewing exhibitions at museums and galleries included.

21&62:080:352. PAINTING IV (3)

Open to nonmajors. Prerequisite: 21&62:080:351 or permission of instructor.
Advanced problems in painting while integrating preceding disciplines and experiences with formal, directed approaches; emphasis on individual development and excellence of execution. Viewing exhibitions at museums and galleries included.

21&62:080:354. EXPERIMENTS IN COMPUTER ART (3)

Open only to majors. Prerequisites: 21&62:080:245, 345, or permission of instructor.
Covers 2-D/3-D imaging formats within multiple platforms. Emphasis upon multimedia digital applications, including image, text, sound, motion graphics, and time-base media. Planning and initiating of digital projects for various uses, including Internet delivery and the web. Examines history, theory, and understanding of digital media; concepts of interactivity and digital cultures.

21&62:080:355. PAINTING AND DRAWING WORKSHOP (3)

Prerequisites: 21&62:080:223, 252, or permission of instructor.
Studio course using wet and dry media. Introduction to the watercolor medium, collage techniques, and mixed media methods. These processes, as well as traditional oil painting and drawing techniques, are used to explore themes and concepts in the work.

21&62:080:361. STUDIO PHOTOGRAPHY (3)

Open to nonmajors. Prerequisite: 21&62:080:261 or permission of instructor.
Concepts and processes involved in photography as manipulated in a studio setting; traditional and innovative approaches to artificial lighting, still life, and portraiture; experience with view camera and advanced light metering techniques.

21&62:080:362. PHOTOGRAPHY WORKSHOP (3)

Open to nonmajors. Prerequisite: 21&62:080:261 or permission of instructor.
Advanced work in all areas of photography based on projects designed to fit individual needs; emphasis on development of aesthetic and critical dimensions in photography. Students carry out ideas and techniques independently.

21&62:080:370. COMPUTERS IN GRAPHIC DESIGN (3)

Open to nonmajors. Prerequisite: 21&62:080:232 or permission of instructor. Corequisite: 21&62:080:331.
Advanced typographic workshop using Macintosh computers. Stresses design and typographic principles while exploring the language of signs in compositional exercises. Typesetting, image-making, scanning software, electronic page makeup, prepress, and printing production procedures.

21&62:080:373. ADVANCED PRINTMAKING (3)

Open to nonmajors. Prerequisite: 21&62:080:273 or 276. Corequisite: 21&62:080:331.
Advanced studio in printmaking; emphasis on exploration of previously learned printmaking techniques to develop personal imagery. Proof and print a minimum of five prints; research paper on the history of printmaking; field trips.

21&62:080:378. PRINTMAKING BOOK ARTS WORKSHOP (3)

Prerequisite: Permission of instructor.
Studio course in book arts. Emphasis upon traditional bookbinding, as well as innovative forms and printing techniques. Printmaking techniques including letterpress are explored within the context of book arts. Research on book design, artists' books. Field trips.

21&62:080:391,392. INDIVIDUAL STUDY IN STUDIO (3,3)

Prerequisites: Permission of department chairperson and instructor.
Special problems in original creative work. Independent studio work in any of the disciplines offered.

21&62:080:393,394. INTERNSHIP IN ART (3,3)

Prerequisite: Permission of department chairperson or adviser.
Opportunity to explore career experience in art and design; limited to students with highly developed skills. Placements, designed to ensure maximum benefit to the student, may be in graphic design studios, as apprentices to artists, or in arts management positions. Under department supervision.

21&62:080:399. SEMINAR IN CONTEMPORARY DESIGN (3)

Prerequisites: 21&62:080:232; 21&62:082:101,102, 202.
Focus on contemporary topics and issues in design theory, history, criticism, and practice.

21&62:080:405. PROBLEMS IN CONTEMPORARY ART (3)

Open to nonmajors. Prerequisite: Permission of instructor.
Examination of significant ideas and problems in contemporary painting, sculpture, and multimedia; emphasis on the current scene.

21&62:080:445. ADVANCED EXPERIMENTS IN COMPUTER ART (3)

Open only to majors. Prerequisites: 21&62:080:245, 354 or permission of instructor.
Continuation of experiments in computer art; covers advanced work in integrating multimedia digital applications including animation, audio/video, and time-based media. Covers html and web design. Emphasis on the aesthetic and critical understanding of digital technology. Students initiate and complete a final project.

21&62:080:483. ADVANCED SCULPTURE WORKSHOP (3)

Open to nonmajors. Prerequisite: 21&62:080:283 or permission of instructor.
Continues the development of individual expression in sculpture; production of a body of aesthetically consistent work by each student.

21&62:080:497. SENIOR STUDIO SEMINAR I (3)

Open only to majors. Prerequisite: Completed course work in area of specialization.
Focuses on advanced studio work and the completion of a portfolio in area of graphic design specialization. Conducted under the direction of individual advisers.

21&62:080:498. SENIOR STUDIO SEMINAR II (3)

Open only to majors.
Under the supervision of advisers, students produce, for an exhibition, a body of work in their individual areas of specialization. One research paper and slide documentation of work required.

Courses (Art History 082)

21&62:082:101. INTRODUCTION TO ART HISTORY I (3)

Recommended for nonmajors.

Emphasizes the significance and meaning of art in our civilization; selective overview of Western and some non-Western art from prehistoric times to the Renaissance; the important arts of major cultures and periods addressed through illustrated lectures, readings, and museum visits.

21&62:082:102. INTRODUCTION TO ART HISTORY II (3)

Recommended for nonmajors.

Survey of art of the past few centuries; emphasis on tendencies leading to modern developments; develop the ability to respond to and to feel at ease with contemporary art forms, and to gain familiarity with major works of art and important artists. Illustrated lectures and readings, museum and gallery visits.

21&62:082:201. HISTORY OF NON-WESTERN ART (3)

Recommended for nonmajors.

Examines the form, function, content, and style of art in several cultures and civilizations around the world from past to present—Asian, Pacific, African, Islamic, and Native American. Slide lectures, museum visits, and research paper.

21&62:082:202. HISTORY OF DESIGN (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

Focuses on graphic design from nineteenth century to present. Includes analysis of the arts and crafts movement, art nouveau, art deco, de Stijl, and later developments such as the international style, modernism, postmodernism, and beyond. Slide lectures, research papers, and museum and gallery visits.

21&62:082:207. ART AND WOMEN (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

First half of the course examines the manner in which women have been represented in art, primarily by male artists. The second half concentrates on the twentieth century, with a focus on the art of women. Feminists' theory considered. Slide lectures.

21&62:082:233. NEWARK: A HISTORY OF ART, ARCHITECTURE, AND CULTURAL INSTITUTIONS (3)

Open to nonmajors.

Weekly seminar meets primarily off campus to examine and analyze various sites and institutions throughout the city. Each class period spent exploring a different aspect of Newark's cultural legacy, often in lectures and discussions led by leading local specialists from the city's most influential cultural institutions.

21&62:082:270. AMERICAN ART (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

Focuses on American painting, sculpture, and photography within the context of the developing society and its tastes; emphasis on art and artists in the nineteenth century through the early twentieth century. Slide lectures and museum visits.

21&62:082:275. BLACK ART IN AMERICA (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

Examines both the high art and folk art aspects of black American art from a historical and contemporary point of view; emphasis on the aesthetics of the works and their relation to social and intellectual history. Field trips to New York and within the Newark area to see folk art and to visit artists.

21&62:082:280. ART OF THE FAR EAST (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

History of art in Japan, India, and China from the earliest periods to modern times; emphasis on understanding the aesthetics of Asian art. Slide lectures and museum trips to outstanding Asian collections at the Newark Museum and in New York.

21&62:082:285. ART OF AFRICA (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

The classical traditions of sculpture and related arts of the black people of Africa; impact of African forms on modern Western art and on cultural traditions of the new nations of Africa. Slide lectures and museum trips to the Newark Museum and New York collections.

21&62:082:305. PROBLEMS IN ART (3)

Open to nonmajors. Prerequisite: Permission of instructor.

Addresses specific topics in the history of art.

21&62:082:310. ANCIENT ART (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

Arts of the civilizations of Mesopotamia, Egypt, Greece, and Rome as reflections of the ideas and ideals of these cultures; study of architecture, sculpture, painting, ceramics, and other arts; the contributions of these great cultures of antiquity to the later Western world. Slide lectures and museum trips.

21&62:082:320. MEDIEVAL ART (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

History of art from the fall of Rome to the Renaissance: early Christian and Byzantine; Romanesque and Gothic; sculptural and architectural monuments, as well as objects created by migratory cultures of the period. Slide lectures and museum trips.

21&62:082:330. RENAISSANCE ART (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

Examines European painting, sculpture, and architecture from about 1400 to 1580; emphasis on the major masters of the period—Jan van Eyck, Donatello, Leonardo da Vinci, Dürer, Michelangelo, El Greco, and others—whose artistic legacy provides a visual record of this important period in Western civilization. Slide lectures and museum trips.

21&62:082:340. BAROQUE AND ROCOCO ART (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

European art and architecture from 1580 to 1800; emphasis on the great masters of the period—Rembrandt, Rubens, Caravaggio, Bernini, Velazquez, and others; survey of the transformation of the Baroque style into the Rococo. Slide lectures and museum visits.

21&62:082:350. DEVELOPMENT OF MODERN ART (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

Traces the development of modern art from 1770 to 1945, focusing on major trends from neoclassicism to surrealism. Slide lectures and museum visits.

21&62:082:360. ART SINCE 1945 (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

Explores art since 1945. Emphasizes styles such as abstract expressionism, minimalism, pop, neorealism, and neo-expressionism as new and developing trends in art. Slide lectures, and museum and gallery visits.

21&62:082:382. HISTORY OF PHOTOGRAPHY (3)

Open to nonmajors. Prerequisites: 21&62:082:101,102, or permission of instructor.

Surveys technical and aesthetic development of photography from prephotography optical inventions to contemporary photographic art.

21&62:082:391,392. INDIVIDUAL STUDY IN ART HISTORY (3,3)

Prerequisites: Permission of department chairperson and instructor.

Special work in art history research. Directed by faculty member; designed to meet specific interests.

21&62:082:393,394. INTERNSHIP IN ART HISTORY (3,3)

Prerequisite: Permission of department chairperson or adviser.

Opportunity to explore career possibilities. Limited to students interested in developing curatorial and exhibition skills through museum or gallery work; intern in the Paul Robeson Gallery on the Newark campus or in other locations, under department supervision.

21&62:082:405. PROBLEMS IN CONTEMPORARY ART (3)

Open to nonmajors. Prerequisite: Permission of instructor.

Examination of significant ideas and problems in contemporary painting, sculpture, and multimedia; emphasis on the current scene.

21&62:082:497,498. SENIOR SEMINAR IN ART HISTORY (3,3)

Open to majors only. Prerequisite: Completed course work in area of specialization.

Culminating courses for the major concentrating in art history. Thesis topic selected in consultation with the adviser. Demonstration of a general knowledge of art history required.

Courses (Arts Management 084)

21&62:084:395. ISSUES IN ARTS MANAGEMENT I (3)

Prerequisites: 29:620:201; 202 or 318; or 328; and 21&62:080:102; or 21&62:082:101,102; or 21&62:965:211; or 21&62:700:101.

Introduction to not-for-profit arts management with emphasis on organizational structure, personnel and staffing, U.S. policies, and financial and legal issues.

21&62:084:396. ISSUES IN ARTS MANAGEMENT II (3)

Prerequisite: 21&62:084:395.

Second part of the introduction to not-for-profit arts management with emphasis on resource development, marketing, facilities management, accounting, and computer applications.

21&62:084:408,409,410,411. TOPICS IN ARTS MANAGEMENT I,II,III,IV (3,3,3,3)

Prerequisites: 21&62:084:395,396.

Focuses on one of the following topics each term: marketing the arts, fund-raising and resource development for arts organizations, financial management for arts not-for-profits, and organizational management in the arts.

BIOCHEMISTRY (See Biological Sciences)

BIOLOGICAL SCIENCES

Department of Biological Sciences

Smith Hall, 135 (973/353-5437)

Web site: <http://biology-newark.rutgers.edu>

Email: biosci@newark.rutgers.edu

Majors and minors in biology, botany, and zoology are offered at NCAS. The biology major is offered jointly by Rutgers and NJIT. Bachelor of Arts and Bachelor of Science degrees are both conferred.

Biology

The biology major introduces students to the fundamental concepts, principles, and procedures characteristic of several major conceptual approaches to organisms. The major provides a solid foundation in biology and also permits students to specialize in any of the major branches of biology.

The biology major is useful for students whose career plans lie in pure or applied biology; agriculture; biochemistry; biotechnology; botany; conservation, environmental quality, and natural resources; dentistry; ecology; food science and nutrition; forestry; genetics; horticulture; human medicine; limnology, marine biology, and biological oceanography; microbiology; natural history and nature study; pharmacy; plant pathology; public health; teaching of biology; toxicology; veterinary medicine; wildlife management; and zoology. Students considering admission to medical, dental, or veterinary schools should meet with the prehealth adviser, Dr. John Maiello, in 301 Hill Hall; 973/353-5705.

In the sophomore year, each biology major is assigned one member of the faculty to serve as a permanent academic counselor; consultation with this person on a regular basis is urged. An informative brochure is available in the departmental office.

Major Requirements for Bachelor of Arts in Biology

The biology major consists of 35 credits in biological sciences plus cognate courses in chemistry, physics, and mathematics. The following requirements define the major in biology. All courses required for the major in biology, including cognate courses, must be completed with a grade of C or better. Students are urged to meet with their advisers regularly.

1. 21&62:120:101-102 General Biology (4,4)
2. 21&62:120:301 Foundations of Biology: Cell and Molecular Biology (4)
3. Students must complete one course from each of the four categories listed below under major conceptual approaches to organisms (13–14 credits).
 - a. *Organismal Approach.* Biology and systematics of organismal groups from a phylogenetic perspective.
 - 21&62:120:211 Plant Kingdom (4)
 - 21&62:120:311 Taxonomy of Vascular Plants (4)
 - 21&62:120:320 Comparative Anatomy of Vertebrates (4)
 - 21&62:120:322 Evolution (3)
 - 21&62:120:327 Biology of Invertebrates (4)
 - b. *Functional Approach.* Functional mechanisms of living organisms.
 - 21&62:120:230 Biology of Seed Plants (4)
 - 21&62:120:330 Plant Physiology (4)
 - 21&62:120:335 General Microbiology (4)
 - 21&62:120:340 Mammalian Physiology (4)
 - c. *Molecular and Cellular Approach.* Structure and function of living systems at the molecular and cellular levels.
 - 21&62:120:355 Cell Biology (3)
 - 21&62:120:356 Molecular Biology (3)
 - 21&62:120:360 Elementary Biochemistry (3)
 - d. *Ecological Approach.* Organism environment interactions; the structure and function of populations, communities, and ecosystems.
 - 21&62:120:370 Plant Ecology (3)
 - 21&62:120:380 Animal Ecology (3)
 - 21&62:120:481 Marine Biology (4)
4. Students are required to have at least one laboratory course dealing with animal systems and one laboratory course dealing with plant systems. Please note that some of these courses also may be used to fulfill the requirements of number 3 above. However, the same course may not be used to satisfy both laboratory and field requirements.

Animal laboratory courses

- 21&62:120:320 Comparative Anatomy of Vertebrates (4)
- 21&62:120:327 Biology of Invertebrates (4)
- 21&62:120:340 Mammalian Physiology (4)
- 21&62:120:342 Developmental Biology (4)
- 21&62:120:358 Microanatomy of Cells and Tissues (4)

Plant laboratory courses

- 21&62:120:211 Plant Kingdom (4)
 - 21&62:120:230 Biology of Seed Plants (4)
 - 21&62:120:311 Taxonomy of Vascular Plants (4)
 - 21&62:120:330 Plant Physiology (4)
 - 21&62:120:414 Phycology (4)
 - 21&62:120:415 Paleobotany (4)
 - 21&62:120:430 Plant Growth and Development (4)
5. Students are required to have at least one course with a field component, as listed below. Please note that some of these courses also may be used to fulfill requirements in number 3 above. However, the same course may not be used to satisfy both field and laboratory requirements.
- 21&62:120:311 Taxonomy of Vascular Plants (4)
 - 21&62:120:327 Biology of Invertebrates (4)
 - 21&62:120:328 Ornithology (3)
 - 21&62:120:371 Field Studies in Plant Ecology (3)
 - 21&62:120:381 Field Studies in Animal Ecology (3)
 - 21&62:120:415 Paleobotany (4)
 - 21&62:120:470 Field Ecology (3)
 - 21&62:120:481 Marine Biology (4)
 - 21&62:120:486 Tropical Field Biology (2)
6. In addition to the above, the following courses may be used to complete the 35 credits for the biology major:
- 21&62:120:325 Animal Parasites (3)
 - 21&62:120:326 Laboratory Exercises in Parasitology (1)
 - 21&62:120:352 Genetics (3)
 - 21&62:120:382 Animal Behavior (3)
 - 21&62:120:403 Biological Ultrastructure (3)
 - 21&62:120:404 Light and Electron Microscopy (4)
 - 21&62:120:413 Mycology (4)
 - 21&62:120:443 Immunology (3)
 - 21&62:120:445 Endocrinology (3)
 - 21&62:120:451 Cellular Biophysics (4)
 - 21&62:120:452 Molecular Biotechniques (4)
 - 21&62:120:455 Molecular Cell Biology (3)
 - 21&62:120:456 Virology (3)
 - 21&62:120:471 Ecological Physiology (3)
 - 21&62:120:472 Environmental Assessment (3)
 - 21&62:120:487 Systems Ecology (3)
 - 21&62:120:491-492 Problems in Biology (BA,BA)
 - 21&62:120:493-494 Seminar in Biology (1,1)
7. In addition to the requirements in the biological sciences, the following cognate courses are required:
- a. 21&62:160:115-116 General Chemistry (4,4) *and*
21&62:160:113-114 General Chemistry Laboratory (1,1)
 - b. 21&62:160:335-336 Organic Chemistry (3,3) *and*
21&62:160:331 Organic Chemistry Laboratory (2)
 - c. 21&62:750:203,204 General Physics I (3,3) *and*
21&62:750:205,206 Introductory Physics Laboratory (1,1)
 - d. 21&62:640:135 Calculus I (4)

Questions concerning the applicability of individual courses to the major may be directed to the undergraduate coordinator of the Department of Biological Sciences, Room 139, Smith Hall, 973/353-1268. With written permission of the undergraduate coordinator, qualified majors may use certain graduate courses selected from the offerings of the Graduate Program in Biology and the Graduate Program in Behavioral and Neural Sciences at the Graduate School–Newark to fulfill the credit requirement for the biology major.

The following courses are recommended for the biology major:

- 21&62:198:100 Introduction to Computers and Information Processing *or* 21&62:198:101 Computer and Programming *or* (NJIT) CIS 098 Fundamentals of Computers and Programming
- 21:640:327 Probability and Statistics *or* 21:830:301 Statistical Methods for the Cognitive and Behavioral Sciences *or* 21:960:211 Statistics *or* (NJIT) 28:640:105 Probability and Statistics.

Major Requirements for the Bachelor of Science in Biology

The B.S. in biology major consists of 35 credits in biological sciences plus cognate courses in chemistry, physics, mathematics, and computer science. The following requirements define the major in biology. All courses required for the major in biology, including cognate courses, must be completed with a grade of *C* or better. Students are urged to meet with their advisers regularly.

1. 21&62:120:101-102 General Biology (4,4)
2. 21&62:120:301 Foundations of Biology: Cell and Molecular Biology (4)
3. Students must complete one course from each of the categories listed below:
 - a. *Organismal Approach.* Biology and systematics of organismal groups from a phylogenetic perspective.
 - 21&62:120:211 Plant Kingdom (4 credits)
 - 21&62:120:311 Taxonomy of Vascular Plants (4)
 - 21&62:120:320 Comparative Anatomy of Vertebrates (4)
 - 21&62:120:322 Evolution (3)
 - 21&62:120:327 Biology of Invertebrates (4)
 - b. *Functional Approach.* Functional mechanisms of living organisms.
 - 21&62:120:230 Biology of Seed Plants (4)
 - 21&62:120:330 Plant Physiology (4)
 - 21&62:120:335 General Microbiology (4)
 - 21&62:120:340 Mammalian Physiology (4) *or* BME 469 Introduction to Human Physiology (3)
 - c. *Molecular and Cellular Approach.* Structure and function of living systems at the molecular and cellular levels.
 - 21&62:120:335 Cell Biology (3)
 - 21&62:120:356 Molecular Biology (3)
 - 21&62:120:360 Elementary Biochemistry (3) *or* Chem 473 Biochemistry (3)
 - d. *Ecological Approach.* Organism environment interactions; the structure and function of populations, communities, and ecosystems.
 - 21&62:120:370 Plant Ecology (3)
 - 21&62:120:380 Animal Ecology (3)
 - 21&62:120:481 Marine Biology (4)
 - e. *Computational Approach.*
 - Math 371 Physiology and Medicine (3)
 - Math 372 Population Biology (3)
 - Math 430 Computational Neuroscience I (3)
 - Math 431 Computational Neuroscience II (3)
 - 21&62:120:451 Laboratory in Cellular and Molecular Biology I: Cellular Biophysics (4)

4. In addition to the above courses, the following courses may be used to complete the 35 credits for a biology major:

21&62:120:325	Animal Parasites (3)
21&62:120:326	Lab Exercise in Parasitology (1)
21&62:120:342	Developmental Biology (4)
21&62:120:352	Genetics (3)
21&62:120:358	Microanatomy of Cells and Tissues (4)
21&62:120:371	Field Studies in Plant Ecology (3)
21&62:120:381	Field Studies in Animal Ecology (3)
21&62:120:382	Animal Behavior (3)
21&62:120:403	Biological Ultrastructure (3)
21&62:120:404	Light and Electron Microscopy (4)
21&62:120:413	Mycology (4)
21&62:120:414	Phycology (4)
21&62:120:415	Paleobotany (4)
21&62:120:430	Plant Growth and Development (4)
21&62:120:443	Immunology (3)
21&62:120:445	Endocrinology (3)
21&62:120:452	Molecular Biotechnology (4)
21&62:120:455	Molecular Cell Biology (3)
21&62:120:456	Virology (3)
21&62:120:470	Field Ecology (3)
21&62:120:472	Environmental Assessment (3)
21&62:120:473	Ecology of Microorganisms (3)
21&62:120:486	Tropical Field Biology (2)
21&62:120:487	Systems Ecology (3)
21&62:120:491	Problems in Biology (3)
21&62:120:492	Problems in Biology (3)
21&62:120:493	Seminar in Biology (1)
21&62:120:494	Seminar in Biology (1)

5. All students are required to take two laboratory-based courses beyond Foundations of Biology. One of these may be a field course.

6. A lab- and/or field-based senior thesis is required of all students. The thesis must be in written form and passed by two faculty readers.

7. Required cognate courses:

1. Chem 124, 125, 126 General Chemistry I and II plus Lab (NJIT) *or* 21:160:113, 115, 114, 116 General Chemistry I and II plus Lab
2. Chem 243, 244, 244A Organic Chemistry I and II plus Lab (NJIT) *or* 21:160:331, 335, 336 Organic Chemistry I and II plus Lab
3. Phys 111, 111A, 121, 121A Physics I and II plus Labs (NJIT) *or* 21:750:203, 204, 205, 206 General Physics I and II plus Labs
4. Math 111, 112, 211 Calculus I, II and III (NJIT) *or* 21:640: 135, 136, 235 Calculus I, I and III
5. Math 340 Applied Numerical Methods (NJIT)
6. CIS 114 Introduction to Computer Science II (NJIT)

Minor in Biology

The biology minor requires a minimum of 20 credits and includes the following courses:

1. 21&62:120:101-102 General Biology (4,4)
2. 21&62:120:301 Foundations in Biology: Cell and Molecular Biology (4)
3. One course from each of three of the four categories (a-d) of courses listed under Major Conceptual Approaches to Organisms in the description of the biology major in this catalog (12 to 15 credits).

Questions concerning the minor may be directed to the undergraduate coordinator of the Department of Biological Sciences, Room 135, Smith Hall; 973/353-1268.

Teacher Certification

Students seeking teacher certification in biology must complete the requirements for the biology major as well as satisfy other requirements for certification. For details regarding admission to the teacher education program and the requirements, students are urged to consult the education department at 420 Conklin Hall, 973/353-5245.

Botany (B.A. only)

The Department of Biological Sciences offers a strong fundamental curriculum in botany, which can be tailored to the individual needs of students. Students with interests or career goals in the fields of botany, plant biotechnology, biology, teaching biology, plant pathology, mycology, ecology, plant physiology, genetics, forestry, horticulture, and agriculture are urged to discuss their academic program with a faculty adviser in the plant science area in the Department of Biological Sciences.

Major Requirements

All courses required for a major in botany, including cognate courses, must be completed with a grade of *C* or better. Students are urged to meet with their advisers regularly.

1. A minimum of 35 credits in the biological sciences is required for the botany major, including:
 - 21&62:120:101-102 General Biology (4,4)
 - 21&62:120:211 Plant Kingdom (4)
 - 21&62:120:301 Foundations in Biology: Cell and Molecular Biology (4)
 - 21&62:120:330 Plant Physiology (4)
 - 21&62:120:370 Plant Ecology (3)
 - 21&62:120:430 Plant Growth and Development (4)

Elective courses in the plant sciences (12 credits)
Nonmajor courses may *not* be used to fulfill the botany major or minor.
2. The following cognate courses also are required for the botany major:
 - a. 21&62:160:115-116 General Chemistry (4,4) *and* 21&62:160:113-114 General Chemistry Laboratory (1,1)
 - b. 21&62:160:335-336 Organic Chemistry (3,3) *and* 21&62:160:331 Organic Chemistry Laboratory (2)
 - c. 21&62:750:203,204 General Physics I, II (3,3) *and* 21&62:750:205,206 Introductory Physics Laboratory (1,1)
 - d. 21&62:640:135 Calculus I (4)

Minor in Botany

The following courses are required for the botany minor:

- 21&62:120:101-102 General Biology (4,4)
- 21&62:120:211 Plant Kingdom (4)
- 21&62:120:301 Foundations in Biology: Cell and Molecular Biology (4)

Additional course from those offered in the plant sciences by the Department of Biological Sciences for a minimum of 20 credits. Credits used for the botany minor cannot be used for a biology or zoology major.

Zoology (B.A. only)

Major Requirements

All courses required for a major in zoology, including cognate courses, must be completed with a grade of *C* or better. Students are urged to meet with their advisers regularly.

The major in zoology requires a minimum of 35 credits in the Department of Biological Sciences. The major must include:

1. 21&62:120:101-102 General Biology (4,4)
2. 21&62:120:301 Foundations in Biology: Cell and Molecular Biology (4)
3. 21&62:120:335 General Microbiology (4) *or* 21&62:120:360 Biochemistry (3)
4. 21&62:120:340 Mammalian Physiology (4)
5. 21&62:120:320 Comparative Anatomy of Vertebrates (4) *or* 21&62:120:327 Biology of Invertebrates (4)
6. 21&62:120:342 Developmental Biology (4) *or* 21&62:120:325,326 Animal Parasites and Laboratory Exercises in Parasitology (3,1) *or* 21&62:120:358 Microanatomy of Cells and Tissues (4)
7. 21&62:120:322 Evolution (3) *or* 21&62:120:382 Animal Behavior (3)
8. 21&62:120:380 Animal Ecology (3) *or* 21&62:120:481 Marine Biology (4)
9. A minimum of one 400-level course offered by the Department of Biological Sciences, not including 21&62:120:491,492 Problems in Biology
10. The following cognate courses must be completed prior to the senior year:
 - a. 21&62:160:115-116 General Chemistry (4,4) *and* 21&62:160:113-114 General Chemistry Laboratory (1,1)
 - b. 21&62:160:335-336 Organic Chemistry (3,3) *and* 21&62:160:331 Organic Chemistry Laboratory (2)
 - c. 21&62:750:203,204 General Physics I, II (3,3) *and* 21&62:750:205,206 Introductory Physics Laboratory (1,1)
 - d. 21&62:640:135 Calculus I (4)

The following courses are recommended for zoology majors: 21&62:198:101 Computers and Programming I and 21&62:220:231 Statistical Methods.

Minor in Zoology

The following courses are required for the zoology minor:

- 21&62:120:101-102 General Biology (4,4)
 21&62:120:301 Foundations in Biology: Cell and Molecular Biology (4)

Additional courses from those offered in the zoology major by the Department of Biological Sciences, for a minimum of 20 credits.

Courses

21&62:120:101-102. GENERAL BIOLOGY (4,4)

Lec. 3 hrs., lab. self-paced, averaging 3 hrs per wk.

Lectures, laboratories, and small group discussions on major biological principles and their relevance to humans. Topics in 101 include the anatomy, physiology, and ecology of animals and plants. Topics in 102 include cell biology, genetics, and evolution.

21&62:120:104. HUMAN HEALTH AND DISEASE (3)

Intended for students with no previous college biology or chemistry. May not be used for credit toward biology, botany, or zoology majors or minors.

Provides an introduction to the functions of the healthy human body and the mechanisms and consequences of various pathologic conditions.

21&62:120:109. BASIC PLANT SCIENCE (3)

Not open to majors or to those who have taken or plan to take 21&62:120:101-102.

Introduction to basic botany and the applied plant sciences; plant biology with applications to ecology and conservation, food and drug problems, horticulture, and agriculture; demonstrations in greenhouses and campus plantings.

21&62:120:110. BASIC PLANT SCIENCE LABORATORY (1)

Not open to majors or to those who have taken or plan to take 21&62:120:101-102.

May be taken with 21&62:120:109 to fulfill the laboratory science requirement when taken with 21&62:120:206,207.

Laboratory exercises in the areas covered in the description of 21&62:120:109.

62:120:203. PLANT BIOLOGY (3)

May not be used for credit toward biology, botany, or zoology majors or minors.

An evolutionary survey of the plant kingdom, with emphasis on the flowering plants, their structure, and major life processes.

21&62:120:204. ECONOMIC BOTANY (3)

May not be used for credit toward biology, botany, or zoology majors or minors.

The influence of plants and plant cultivation on the economic, social, and cultural history of man; introduction to economically important plants and their products, especially as sources of food, shelter, clothing, drugs, and industrial raw materials; current problems of agriculture, plant industry, and medicine; the use and conservation of natural plant resources.

21&62:120:205. ENVIRONMENTAL ISSUES (3)

May not be used for credit toward the biology, botany, or zoology majors or minors.

Basic ecological principles; the human population and attempts to control it; human impact on the environment—air and water pollution, land use and misuse, conservation of resources.

21&62:120:206. GENERAL HORTICULTURE (3)

May not be used for credit toward biology, botany, or zoology majors or minors.

Basic principles of horticultural science; environmental control of plant growth; theories and methods of plant propagation and cultivation; introduction to ornamental plants.

21&62:120:207. HORTICULTURE LABORATORY (1)

Pre- or corequisite: 21&62:120:206. May not be used for credit toward biology, botany, or zoology majors. May be taken with 21&62:120:206 to satisfy laboratory science requirement in conjunction with 21&62:120:109,110.

Practical experience in horticulture; emphasis on plant growth, propagation and maintenance in laboratory greenhouse, experimental gardens, and growth chambers.

21&62:120:208. HUMAN SEXUALITY (3)

May not be used for credit toward the biology, botany, or zoology majors or minors.

Reproductive biology, including anatomy and development of sexual structures, menstrual cycle, pregnancy, and childbirth; self-examination, contraception and abortion, and sexually transmitted diseases; role of emotions, communication skills, and values in sexuality; diversity of sexual behavior and legal and commercial aspects of sexuality.

21&62:120:211. PLANT KINGDOM (4)

Lec. 3 hrs., lab. 3 hrs. Pre- or corequisites: 21&62:120:101-102 or permission of instructor.

A survey of the major groups in the plant kingdom; the morphology, reproduction, and evolution of plants with emphasis on their role in nature and importance to man.

BIOLOGICAL SCIENCES: ZOOLOGY

21&62:120:230. BIOLOGY OF SEED PLANTS (4)

Lec. 3 hrs., lab. 3 hrs. Pre- or corequisites: 21&62:120:101-102 or permission of instructor.

The morphology, physiology, and reproduction of flowering plants, plant structures, functions, and products essential to human life; the cultural and applied aspects of plant science.

21&62:120:235. MICROBIOLOGY (3)

Lec. 2 hrs., lab. 3 hrs. Prerequisites: 21&62:120:241-242 or equivalent. May not be used for credit toward biology, botany, or zoology majors or minors.

Fundamentals of microbiology, including the distinguishing characteristics of the various groups of microbial cells; microbial control, including physical and chemical agents and chemotherapeutic agents; applications in personal and public health and in industry; mechanisms of disease production and host resistance; prevention and control of disease.

21&62:120:241-242. ANATOMY AND PHYSIOLOGY (4,4)

Lec. 3 hrs., lab. 3 hrs. May not be used for credit toward the biology, botany, or zoology major. Intended for students with career goals in allied health sciences. Either course may be taken first.

Examination of integrated structure and function of the human body from the aspect of levels of organization. Emphasis is on homeostatic mechanisms.

21&62:120:301. FOUNDATIONS OF BIOLOGY: CELL AND MOLECULAR BIOLOGY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisites: 21&62:120:101-102 or placement exam and 21:160:115.

Lectures, discussions, and laboratory exercises in cell structure, thermodynamics, membrane biology, energy utilization and transfer, and nucleic acid structure and function, transcription, translation, and genetic regulation.

21&62:120:311. TAXONOMY OF VASCULAR PLANTS (4)

Lec. 3 hrs., lab. and field trips 3 hrs. Prerequisite: 21&62:120:211 or 230 or permission of instructor.

The principles of plant systematics, especially as applied to vascular plants. The identification, classification, and evolutionary relationship of major plant groups with emphasis on the local flora with extensive field trips.

21&62:120:320. COMPARATIVE ANATOMY OF VERTEBRATES (4)

Lec. 3 hrs., lab. 3 hrs. Pre- or corequisites: 21&62:120:101-102.

Phylogeny of gross structure and structural integration in the vertebrates; laboratory work on amphioxus, lamprey, dogfish, and cat.

21&62:120:322. EVOLUTION (3)

Prerequisites: 21&62:120:352.

Principles and mechanisms of evolution and history of evolutionary theory; mechanisms of animal speciation and adaptive radiation; the role of population and genetics in understanding microevolution.

21&62:120:325. ANIMAL PARASITES (3)

Pre- or corequisites: 21&62:120:301 plus one advanced course in zoology.

The parasitic protozoa, flatworms, roundworms, and arthropods in relation to their hosts.

21&62:120:326. LABORATORY EXERCISES IN PARASITOLOGY (1)

Lab. 3 hrs. Prerequisites: 21&62:120:301 plus one advanced course in zoology. Corequisite: 21&62:120:325.

Visualization, preparation, and identification of parasitic animals (protozoa, flatworms, roundworms, and arthropods) and host-parasite interactions.

21&62:120:327. BIOLOGY OF INVERTEBRATES (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisites: 21&62:120:101-102.

The major animal phyla; emphasis throughout on reasoning about the interrelationships of structure, function, and behavior in their ecological and evolutionary contexts. Laboratory work emphasizes living animals; supplemented by fieldwork. One weekend field trip required.

21&62:120:328. ORNITHOLOGY (3)

Lec. 3 hrs. Prerequisites: 21&62:120:101-102.

A survey of birds and their biology. Includes such topics as the diversity of birds and how they live; avian evolution; classification; structure and physiology; embryology and development; flight; migration and navigation; breeding biology; social organization and communication; instinct, learning, and intelligence; birds and people. Lectures supplemented by films and optional visits to museums and a field trip.

21&62:120:330. PLANT PHYSIOLOGY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisite: 21&62:120:301 or permission of instructor.

Growth and metabolism of plants; water relations, photosynthesis, inorganic nutrition, metabolism of organic materials, and plant growth regulators.

21&62:120:335. GENERAL MICROBIOLOGY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisites: 21&62:120:301 and 21&62:160:331.

Biology of prokaryotic organisms: their taxonomy, physiology, metabolism, and significance in nature.

21&62:120:340. MAMMALIAN PHYSIOLOGY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisite: 21&62:120:301.

The physiology of the human as a mammal. Function and homeostatic regulation of neuromuscular, cardiovascular, respiratory, endocrine, digestive, and excretory systems.

21&62:120:342. DEVELOPMENTAL BIOLOGY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisite: 21&62:120:301. Recommended: 21&62:120:320.

Descriptive and experimental approaches to molecular, cellular, and organismal changes during development; mechanisms of cell differentiation, organogenesis, morphogenesis, and pattern formation.

21&62:120:352. GENETICS (3)

Prerequisite: 21&62:120:101-102.

The basic principles and mechanisms of genetics and their application to current problems.

21&62:120:355. CELL BIOLOGY (3)

Prerequisites: 21&62:120:301, 21&62:160:116, and one term of organic chemistry.

Emphasis on the cell as the structural and functional unit of life; recent advances in molecular biology are integrated with recent knowledge of the ultrastructure and function of cells; includes features of prokaryotes and eukaryotes of plants and animals and an introduction to viruses.

21&62:120:356. MOLECULAR BIOLOGY (3)

Prerequisite: 21&62:120:301.

The molecular basis of gene regulation in eukaryotic cells, including DNA technology, chromosome structure, gene organization and expression.

21&62:120:358. MICROANATOMY OF CELLS AND TISSUES (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisite: 21&62:120:301. Open to juniors and seniors only.

Structure and function of cells, organelles, tissues, and organs.

21&62:120:360. BIOCHEMISTRY (3)

Prerequisites: 21&62:120:301; 21&62:160:335. Corequisite: 21&62:160:336.

The chemistry and metabolism of proteins, carbohydrates, lipids, nucleic acids, and other biologically important compounds.

21&62:120:370. PLANT ECOLOGY (3)

Pre- or corequisites: 21&62:120:101-102.

Study of plants in relation to their environment; emphasis on local plant communities, modern methods of analysis, and applications to forestry and conservation.

21&62:120:371. FIELD STUDIES IN PLANT ECOLOGY (3)

Prerequisite: 21&62:120:370 or permission of instructor.

Modern and classical methods are employed in the study of plant communities and plant geography across the region.

21&62:120:380. ANIMAL ECOLOGY (3)

Pre- or corequisites: 21&62:120:101-102.

The principles of ecology, with emphasis on vertebrate animals; factors affecting their distribution and abundance.

21&62:120:381. FIELD STUDIES IN ANIMAL ECOLOGY (3)

Lec. 1 hr., lab. and field trips 3 hrs. Prerequisites: 21&62:120:380 or permission of instructor.

Basic field techniques for the study of animals in their natural habitats; principles of animal ecology as demonstrated in field and laboratory work.

21&62:120:382. ANIMAL BEHAVIOR (3)

Pre- or corequisites: 21&62:120:101-102.

From the genetic and neurobiological bases of behavior through animal communication and social systems; evolutionary processes that shape the behaviors of animals in their natural environment.

21&62:120:403. BIOLOGICAL ULTRASTRUCTURE (3)

Lec. 2 hrs., lab. 3 hrs. Prerequisites: 21&62:120:301 and permission of instructor.

For the student who has some histological background; makes the transition from light microscopy to electron microscopy; examines the ultrastructural appearance and functions of the sub-cellular organelles.

21&62:120:404. LIGHT AND ELECTRON MICROSCOPY (4)

Lec. 2 hrs., lab. 6 hrs. Prerequisite: 21&62:120:403.

Processing of pieces of tissue through to finished light microscope slides and electron micrographs; the techniques involved in producing micrographs; a paper interpreting content of the micrographs required.

21&62:120:413. MYCOLOGY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisite: 21&62:120:301 or permission of instructor.

Morphology, physiology, and reproduction of the fungi; emphasis given to cytomorphology, evolution of the principal families of the fungi, and the important relationships between fungi and other organisms, including man.

21&62:120:414. PHYCOLOGY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisite: 21&62:120:211.

The structure, function, reproduction, and evolutionary relationships of the algae, with emphasis on ecological and physiological aspects.

21&62:120:415. PALEOBOTANY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisite: 21&62:120:211 or 230, or permission of instructor.

Survey of evolutionary trends in the plant kingdom; comparative study of the morphology, anatomy, and reproduction of fossil plants and their survivors, with emphasis on the vascular plants.

21&62:120:430. PLANT GROWTH AND DEVELOPMENT (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisites: 21&62:120:230 and 330, or permission of instructor.

Study of the dynamics of growth and development of plants as influenced by physiological and environmental factors. Laboratory focuses on plant tissue culture and applications to biotechnology.

21&62:120:435. MICROBIAL PHYSIOLOGY AND METABOLISM (3)

Prerequisites: 21&62:120:335, 360.

Biology of prokaryotic organisms. Emphasis on those physiological, biochemical, and ecological aspects that are unique to bacteria.

21&62:120:443. IMMUNOLOGY (3)

Prerequisite: 21&62:120:301 or permission of instructor.

The capability of the body to respond to disease organisms; the immune response, current theories of antibody formation, transplantation, hypersensitivity, and response to cancer viruses and carcinogens; basic immunologic techniques.

21&62:120:445. ENDOCRINOLOGY (3)

Prerequisites: 21&62:120:301, 21&62:160:113-114 and 115-116.

The structures and functions of the endocrine glands and their role in the integration of the organism.

21&62:120:451. LABORATORY IN CELLULAR AND MOLECULAR BIOLOGY I: CELLULAR BIOPHYSICS (4)

Lec. 3 hrs., lab. 3 hrs. Admission by permission of instructor only. Prerequisites:

21&62:120:486. TROPICAL FIELD BIOLOGY (2)

Prerequisite: Written permission of instructor. Enrollment limited to twelve students. Course is for two weeks at the University of Puerto Rico (Mayaguez). The course fee includes round trip airfare, housing, local transportation, and all expenses except meals. Because vigorous outdoor activity is required, students must be in good physical condition.

An intensive two-week summer course in tropical biology given in Puerto Rico. Emphasis on principles of ecology and diversity of organisms. Extensive field trips to tropical rain forest, desert, mangrove swamp, Karst topography, coral reef, and commercial plantations.

21&62:120:487. SYSTEMS ECOLOGY: ECOSYSTEMS IN THE LANDSCAPE (3)

Prerequisite: 21&62:120:370 or 380.

Lectures and problem sets on ecological energetics, soil-plant-atmosphere continuum, effect of spatial pattern on ecological process, landscape ecology, and other broad-scale approaches to ecology.

21&62:120:491,492. PROBLEMS IN BIOLOGY (BA,BA)

Outstanding juniors and seniors may enroll in this course under the supervision of a qualified faculty member with written permission of the faculty member and th (o)13 (n)1 ()214 (i)-8 (o)-23 (n)] TJ 0 -7.6 TD [(tr)-286 (m)-21mbe(b)2 (e)-11 (l)-4 (th-19 (u)-4 (e)-11 (d)-26 (r)19 (m)14 (i)-8 (s)13 (n-250 (o)13 .e)-11 (N)13 (d)-26 ((a)15 (y)-27 ()-214 (3

CHEMISTRY 160**Department of Chemistry**

Olson Hall (973/353-5329), or see <http://chemistry.rutgers.edu>.

The chemistry major and minor are offered at NCAS.

Major Requirements

The undergraduate curriculum in chemistry is designed to provide instruction in each of the major areas of chemistry. It provides excellent training for those who intend to go to graduate school or professional schools of medicine, dentistry, veterinary medicine, law, and pharmacy, and for those seeking employment in the vast chemical research industry of New Jersey.

The degrees offered by the chemistry department are accredited by the American Chemical Society. A suggested sequence of courses leading to the B.A. degree in chemistry is outlined below. The department is very well equipped with current state-of-the-art research instrumentation in several fields of chemical inquiry. Chemistry majors are encouraged to participate in research conducted by the faculty starting as early as the sophomore or junior year, contingent on the student's progress.

First Year**Fall Term**

- 21&62:350:101 English Composition (3)
 21&62:120:101 General Biology (3)*
 21&62:160:113 General Chemistry Laboratory (1)
 21&62:160:115 General Chemistry (4)
 21&62:640:135 Calculus I (4) †
 history (3)
 social science (3)

Spring Term

- 21&62:350:102 English Composition (3)
 21&62:120:102 General Biology (3)*
 21&62:160:114 General Chemistry Laboratory (1)
 21&62:160:116 General Chemistry (4)
 21&62:640:136 Calculus II (4)
 history (3)
 social science (3)

Sophomore Year**Fall Term**

- 21&62:160:207 Structure and Bonding (3) ‡
 21&62:160:335 Organic Chemistry (3)
 21&62:750:203 General Physics I (3) or 21&62:750:213
 Elements of Physics (3)
 21&62:750:205 Introductory Physics Laboratory (1)
 literature (3)
 foreign language or elective (3)

Spring Term

- 21&62:160:331 Organic Chemistry Laboratory (2)
 21&62:160:336 Organic Chemistry (3)
 21&62:750:204 General Physics II (3) or 21&62:750:214
 Elements of Physics (3)
 21&62:750:206 Introductory Physics Laboratory (1)
 literature (3)
 foreign language or elective (3)

* Optional, but strongly recommended for premedical students. Taken in place of history or social science elective, which would be taken instead in a later term.

† 21&62:640:114 Precalculus may be enrolled in first. If so, students enroll in Calculus I in the spring term and Calculus II in the fall term of the sophomore year.

‡ May be enrolled in fall term of junior year.

Junior Year**Fall Term**

- 21&62:160:227 Experimental Analytical Chemistry (3)
 21&62:160:345 Physical Chemistry (3)
 interdisciplinary elective (3)
 electives (6)

Spring Term

- 21&62:160:346 Physical Chemistry (3)
 21&62:198:101 Computers and Programming I (3)
 fine arts elective (3)
 electives (6)

Senior Year**Fall Term**

- 21&62:160:413 Inorganic Chemistry (3)
 21&62:160:427 Physical Chemistry Laboratory (4)
 21&62:160:453 Seminar (1)
 electives (9)

Spring Term

- 21&62:160:448 Synthesis and Characterization (4)
 21&62:160:454 Seminar (1)
 electives (12)

Minor Requirements

The Department of Chemistry requires the following courses for the minor:

- 21&62:160:113-114 General Chemistry Laboratory (1,1)
 21&62:160:115-116 General Chemistry (4,4)
 21&62:160:227 Experimental Analytical Chemistry (3)
 21&62:160:340 Physical Chemistry for the
 Life Sciences (3)
 5 additional credits in chemistry

American Chemical Society Certification

To qualify for American Chemical Society certification, students must complete 26:160:581 Biochemistry and one additional 3-credit graduate chemistry course in addition to the requirements for the bachelor's degree.

Teacher Certification

Students seeking teacher certification in comprehensive science must complete the requirements for a major in the chemistry department as well as satisfy other requirements for certification. For details regarding admission to the teacher education program and the requirements, students should consult both their department adviser and the chairperson of the education department.

Courses**21&62:160:101-102. WORLD OF CHEMISTRY (3,3)**

A nonmathematical course for nonscience majors; major concepts and the interfaces of chemistry with technology, biology, and the environment.

21&62:160:106-107. INTRODUCTION TO CHEMISTRY (2,2)

The two courses in this sequence cover the same material covered in the one-term course 21&62:160:115 General Chemistry.

21&62:160:108. ORGANIC BIOCHEMISTRY (3)

Emphasis on biochemical aspects of organic chemistry.

CLINICAL LABORATORY SCIENCES

21&62:160:109,110. WORLD OF CHEMISTRY LABORATORY (1,1)

Lab. 3 hrs. For laboratory science requirement.

A basic laboratory in chemistry which may be elected to accompany 21&62:160:101-102. Part I of the course (21&62:160:109) may be taken without enrolling in 21&62:160:101. See <http://genchem.rutgers.edu> for more information.

21&62:160:113-114. GENERAL CHEMISTRY LABORATORY (1,1)

Lab. 4 hrs. Pre- or corequisites: 21&62:160:115-116.

General chemistry laboratory for science majors. Emphasis on some of the principles of quantitative and qualitative chemical analysis. See <http://genchem.rutgers.edu> for more information.

21&62:160:115-116. GENERAL CHEMISTRY (4,4)

Lec. 4 hrs., rec. 1 hr. Prerequisite: One year of high school chemistry.

Note: Students must have successfully completed, or have placed out of, 21&62:640:113 College Algebra before registering for 21&62:160:115. Students must have successfully completed, or placed out of, 21&62:640:114 Precalculus before registering for 21&62:160:116. Designed for science majors. Credit not given for the course without the successful completion of 21&62:160:113-114.

Introduction to the fundamental principles of chemistry.

21&62:160:207. STRUCTURE AND BONDING (3)

Prerequisite: 21&62:160:116.

Introduction to mathematical topics necessary for understanding physical chemistry. Additional topics include atomic structure, symmetry and group theory, and an introduction to molecular orbital theory.

21&62:160:227. EXPERIMENTAL ANALYTICAL CHEMISTRY (3)

Lec. 1 hr., lab. 6 hrs. Prerequisites: 21&62:160:113-114, 115-116.

A course for students requiring additional training in analytical techniques; analyze unknowns chosen to illustrate basic techniques and some newer instrumental methods.

21&62:160:331. ORGANIC CHEMISTRY LABORATORY (2)

Lab. 4 hrs. Lec. 1 hr. Prerequisites: 21&62:160:113-114, 115-116, 335. Pre- or corequisite: 21&62:160:336.

Introduction to the techniques and the safety precautions of practical organic chemistry; the synthesis, isolation, purification, and behavior of compounds representing important classes.

21&62:160:335-336. ORGANIC CHEMISTRY (3,3)

Prerequisites: 21&62:160:115-116.

Study of carbon compounds with emphasis on the principal classes of aliphatic and aromatic compounds; molecules and systems of biological interest.

21&62:160:340. PHYSICAL CHEMISTRY FOR THE LIFE SCIENCES (3)

Prerequisites: 21&62:160:115-116 and 21&62:640:135.

Introduction to physical chemical concepts as applied to life sciences; thermodynamics, kinetics, solutions of electrolytes, and electrochemistry.

21&62:160:345,346. PHYSICAL CHEMISTRY (3,3)

Prerequisites: 21&62:160:116, 207; 21&62:640:136; and 21&62:750:203-204 or 213-214.

The gaseous, liquid, and solid states: phase equilibria, properties of solution, fugacity and activity, free energy changes of chemical reactions, and surface and colloid chemistry; atomic and molecular structure, crystal chemistry, the chemical bond, chemical kinetics, and statistical thermodynamics.

21&62:160:413. INORGANIC CHEMISTRY (3)

Prerequisites: 21&62:160:207, 345,346.

Atomic and molecular structure, transition metal chemistry, descriptive chemistry of the representative elements, and some special topics.

21&62:160:427. PHYSICAL CHEMISTRY LABORATORY (4)

Lec. 1 hr., lab. 8 hrs. Prerequisites: 21&62:160:345,346, 21&62:350:101-102, and senior standing or permission of instructor

An integrated physical chemistry laboratory course, including the synthesis of inorganic compounds with emphasis on instrumental methods of analysis. Course content parallels that of the lecture courses 21&62:160:345,346 and 413.

21&62:160:448. SYNTHESIS AND CHARACTERIZATION (4)

Prerequisites: A grade of C or better in 21&62:160:207, 227, 331, 335-336, 413, and 21&62:350:101-102.

Advanced, firsthand experience with organic and inorganic reactions and syntheses on varying scales. Synthesize, isolate, and purify organic and organometallic materials and characterize them using chromatographic and spectroscopic methods.

21&62:160:451,452. CHEMICAL RESEARCH (BA,BA)

Open to qualified students with permission of instructor. Hours to be arranged.

21&62:160:453,454. SEMINAR (1,1)

Hours to be arranged.

Seminar in chemistry required of all majors in their senior year. Invited speakers present seminars and each student is required to address the group at least once during the year.

CLASSICS 190 (See Ancient and Medieval Civilizations)

CLINICAL LABORATORY SCIENCES 191

Coordinator: Douglas W. Morrison, 973/353-1268

A major in Clinical Laboratory Sciences (CLS) leading to the bachelor of science degree is offered jointly with the University of Medicine and Dentistry of New Jersey–School of Health Related Professions in Newark (UMDNJ–SHRP) and the Department of Biological Sciences at Rutgers–Newark. The major is offered at NCAS. Students graduating with degrees in CLS become members of health care teams contributing to the diagnosis and treatment of disease. CLS majors are readily employed in a variety of health care, industrial, governmental, and educational settings and also may elect graduate programs in a number of specializations, such as basic and applied science, medical school, and dental school.

Clinical Laboratory Science majors take three years of course work at Rutgers–Newark. They must apply to the senior clinical year at UMDNJ–SHRP beginning the following June through a separate admissions process. Admission requirements for the senior clinical year include a cumulative grade-point average of 2.75 and grades of C or better in all prerequisite core science courses taken at Rutgers–Newark. Once admitted, students register for their senior clinical year at UMDNJ–SHRP specializing in cytotechnology, medical technology, or toxicology. For more information about the joint program, contact the undergraduate coordinator, or:

Dr. Rita Turkall, Chairperson
Department of Clinical Laboratory Sciences
School of Health Related Professions
University of Medicine and Dentistry of New Jersey
65 Bergen Street
Newark, NJ 07107
973/972-5578

Course requirements to be taken at NCAS and at UMDNJ–SHRP for the three options are as follows.

Core Rutgers–NCAS courses required of all CLS majors (38 credits)

21&62:120:101-102 General Biology (4,4)
21&62:120:301 Foundations in Biology: Cell and Molecular Biology (4)
21&62:120:340 Mammalian Physiology (4)

21&62:120:355 Cell Biology (3)
 21&62:160:113-114 General Chemistry Laboratory (1,1)
 21&62:160:115-116 General Chemistry (4,4)
 21&62:160:331 Organic Chemistry Laboratory (2)
 21&62:160:335-336 Organic Chemistry (3,3)
 21&62:960:211 Statistics I (3)

Cytotechnology Option

Required Rutgers–Newark Courses (11 credits)

21&62:120:320 Comparative Anatomy of Vertebrates (4)
 21&62:120:335 General Microbiology (4)
 21&62:640:114 Precalculus (3)

Elective Rutgers–Newark Courses (12 credits)

It is recommended that electives be chosen from:

21&62:120:325 Animal Parasites (3)
 21&62:120:342 Developmental Biology (4)
 21&62:120:352 Genetics (3)
 21&62:120:358 Microanatomy of Cells and Tissues (4)
 21&62:120:403 Biological Ultrastructure (3)
 21&62:120:404 Light and Electron Microscopy (4)
 21&62:120:443 Immunology (3)
 21&62:120:445 Endocrinology (3)

Professional Courses at UMDNJ–SHRP (38 credits)

Fourth Year

First Term

CYTO 4110 Gynecologic Cytology (4)
 CYTO 4120 Gynecologic Cytology Laboratory (4)
 CYTO 4169 Clinical Practicum I (2)
 CYTO 4289 Cytoprep Techniques I (1)
 CYTO 4350 Cytogenetics (1)
 CYTO 4389 Cytoprep Techniques II (2)
 IDST 4111 Dynamics of Health and Society I (1)

Second Term

CYTO 4209 Respiratory Cytology (3)
 CYTO 4239 Urinary Cytology (2)
 CYTO 4249 Body Fluid Cytology (3)
 CYTO 4312 Clinical Laboratory Skills (1)
 CYTO 4369 Clinical Practicum II (2)
 CYTO 4370 Independent Study (3)
 CYTO 4390 Gastric Cytology (2)

Summer Term

CYTO 4469 Clinical Practicum III (7)

Medical Technology Option

Required Rutgers–Newark Courses (10 credits)

21&62:120:335 General Microbiology (4)
 21&62:120:443 Immunology (3)
 21&62:640:114 Precalculus (3)

Elective Rutgers–Newark Courses (12 credits)

It is recommended that electives be chosen from:

21&62:120:352 Genetics (3)
 21&62:120:356 Molecular Biology (3)
 21&62:160:227 Experimental Analytical Chemistry (3)
 21&62:750:203,204 General Physics (3,3)
 21&62:750:205,206 General Physics Laboratory (1,1)

Professional Courses at UMDNJ–SHRP (45 credits)

Third Year

Summer Term

CLSC 2119 Clinical Laboratory Skills I (2)
 CLSC 2129 Hematology I (2)

CLSC 2169 Body Fluids (1)
 CLSC 2239 Immunoematology and Clinical Immunology I (4)

Fourth Year

First Term

CLSC 2249 Clinical Chemistry I (4)
 CLSC 2279 Clinical Microbiology I (4)
 CLSC 4339 Immunoematology II (2)
 CLSC 4449 Clinical Practice in Chemistry (2)
 IDST 4111 Dynamics of Health and Society I (1)

Second Term

CLSC 4319 Clinical Laboratory Skills II (2)
 CLSC 4329 Hematology II (3)
 CLSC 4349 Clinical Chemistry II (3)
 CLSC 4359 Clinical Immunology II (1)
 CLSC 4379 Clinical Microbiology II (2)
 CLSC 4429 Clinical Practice in Hematology and Urinalysis (2)

Summer Term

CLSC 4339 Clinical Practice in Immunology (2)
 CLSC 4379 Clinical Practice in Microbiology (2)
 CLSC 4390 Medical Technology Seminar (2)
 CLSC 4489 Independent Study (3)

Toxicology Option

Required Rutgers–Newark Courses (7 credits)

21&62:160:227 Experimental and Analytical Chemistry (3)
 21&62:640:135 Calculus I (4)

Elective Rutgers–Newark Courses (17 credits)

It is recommended that electives be chosen from:

21&62:120:335 General Microbiology (4)
 21&62:120:352 Genetics (3)
 21&62:120:356 Molecular Biology (3)
 21&62:750:203,204 General Physics (3,3)
 21&62:750:205,206 General Physics Laboratory (1,1)

Professional Courses at UMDNJ–SHRP (38 credits)

Third Year

Summer Term

TOXC 4110 Toxic Agents (3)
 TOXC 4115 Organ System Toxicity (3)

Fourth Year

First Term

TOXC 4220 Principles of Pharmacology (4)
 TOXC 4239 Clinical Toxicology (3)
 TOXC 4241 Forensic Toxicology (1)
 TOXC 4250 Pathology for Toxicology (4)
 TOXC 4291 Research in Toxicology (2)
 IDST 4111 Dynamics of Health and Society I (1)

Second Term

TOXC 4339 Clinical Toxicology Internship (4)
 TOXC 4349 Forensic Toxicology Internship (1)
 TOXC 4370 Regulatory Toxicology (2)
 TOXC 4380 Toxicology Seminar (2)
 TOXC 4399 Research in Toxicology II (4)

Summer Term

TOXC 4469 Industrial Externship (4)

COMPUTER SCIENCE 198**Department of Mathematics and Computer Science**

Smith Hall (973/353-5156), or see <http://newark.rutgers.edu/~nwkmath/>.

The major and minor in computer science and the major in information systems are offered at NCAS and UC–N by the Department of Mathematics and Computer Science.

Computer science (CS) and information systems (IS) majors are offered jointly with the New Jersey Institute of Technology (NJIT). Students take courses at Rutgers under the 21&62:198 prefixes. They may register at Rutgers for courses at NJIT through cross-registration under the 28:198 prefix. The school code 28 identifies a course offered at NJIT. For example, the course listed as CIS 490 in the NJIT catalog becomes 28:198:490 for Rutgers students. A listing of computer science courses offered at NJIT is given in the section of this catalog entitled, "Consortium with New Jersey Institute of Technology."

The computer science and information systems majors share a common core of computer science courses. The CS major is intended for those students who wish to concentrate on the theoretical and practical aspects of computer science. It requires additional courses in mathematics and advanced computer science. The IS major is intended for those students who wish to prepare for a career in business involving computers. Students may not major in both computer science and information systems.

Major Requirements: Computer Science

A total of 57 credits is required for the computer science major. The following are required computer science courses:

21&62:198:101	Computers and Programming I (3)
21&62:198:102	Computers and Programming II (3)
21&62&28:198:231	Machine and Assembly Language Programming (3)
28:198:251	Computer Organization (3)
28:198:332	Principles of Operating Systems (3)
21&62&28:198:335	Data Structures and Algorithm Design (3)
28:198:435	Advanced Data Structures and Algorithm Design (3)
28:198:490	Guided Design in Software Engineering (3)
21&28:198:491	Computer Science Project (3)

Three elective courses from a list of 300- or 400-level courses offered by the Department of Mathematics and Computer Science or by the NJIT CIS department are required. No more than 3 credits may be taken from among the following courses: 21&62:198:493, 494, 495, and 496. The following is a list of recommended courses offered at NJIT:

28:198:333	Introduction to UNIX Operating Systems (3)
28:198:341	Introduction to Logic and Automata (3)
28:198:352	Parallel Computers and Programming (3)
28:198:370	Introduction to Artificial Intelligence (3)
28:198:432	Advanced Operating Systems (3)
28:198:438	Interactive Computer Graphics (3)
28:198:451	Introduction to Data Communications and Networks (3)
28:198:453	Microcomputers and Applications (3)
28:198:461	Systems Simulations (3)
28:198:485	Special Topics in Computer Science I (3)
28:198:486	Special Topics in Computer Science II (3)

Other required courses are:

Mathematics

21&62:640:135	Calculus I (4)
21&62:640:136	Calculus II (4)
21&62:640:235	Calculus III (4)
21&62:640:237	Discrete Structures (3)
21&62:640:327	Probability and Statistics (3) <i>or</i> 28:640:333 (NJIT)
21&62:640:473	Numerical Analysis (3) <i>or</i> 28:198:421 (NJIT)

Recommended but not required, are:

21&62:750:205,206	Introductory Physics Laboratory (1,1)
21&62:750:213,214	Elements of Physics (3,3)

The following is a recommended sequence for completing the courses required for a computer science major. Additional courses are required by the student's college of matriculation for graduation.

First Year*Fall Term*

21&62:198:101	Computers and Programming I (3)
21&62:640:135	Calculus I (4)

Spring Term

21&62:198:102	Computers and Programming II (3)
21&62:640:136	Calculus II (4)

Sophomore Year*Fall Term*

21&62&28:198:231	Machine and Assembly Language Programming (3)
21&62:640:237	Discrete Structures (3)

Spring Term

28:198:251	Computer Organization (3)
21&62&28:198:335	Data Structures and Algorithm Design (3)
21&62:640:235	Calculus III (4)

Junior Year*Fall Term*

28:198:332	Principles of Operating Systems (3)
28:198:435	Advanced Data Structures and Algorithm Design (3)
21&62&28:198:___	Computer science elective

Spring Term

21&62&28:198:___	Computer science elective
21&62:640:327	Probability and Statistics (3)

Senior Year*Fall Term*

28:198:490	Guided Design in Software Engineering (3)
21&62&28:198:___	Computer science elective
21&62:640:473	Numerical Analysis (3)

Spring Term

21&62&28:198:491	Computer Science Project (3)
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Major Requirements: Information Systems

A total of 60 credits is required for the information systems major. The following are required computer science courses:

- 21&62:198:101 Computers and Programming I (3)
- 21&62:198:102 Computers and Programming II (3)
- 28:198:265 Information Systems and Productivity Toolware (3)
- 28:198:270 Multimedia Information Systems (3)
- 28:198:332 Principles of Operating Systems (3)
- 21&62&28:198:335 Data Structures and Algorithm Design (3)
- 28:198:350 Computers and Society (3)
- 28:198:365 File Structures and Management (3)
- 28:198:390 Requirements Analysis and Systems Design (3) *or* 29:623:318 Systems Analysis and Design (3)
- 28:198:431 Database System Design and Management (3)
- 28:198:455 Computer Systems Management (3)
- 28:198:456 Open Systems Networking (3)
- 28:198:465 Advanced Information Systems (3)
- 28:198:492 Information Systems Project (3)

Three elective courses from a list of courses offered by the Department of Mathematics and Computer Science or by the NJIT CIS department are required. Consult with the department for a current list of approved courses. No more than 3 credits may be taken from among the following: 21&62:198:493, 494, 495, and 496.

The following is a list of recommended courses offered at NJIT:

- 28:198:251 Computer Organization (3)
- 28:198:333 Introduction to UNIX Operating Systems (3)
- 28:198:370 Introduction to Artificial Intelligence (3)
- 28:198:447 Human Computer Interfaces (3)
- 28:198:451 Introduction to Data Communications and Networks (3)
- 28:198:461 Systems Simulation (3)
- 28:198:490 Guided Design in Software Engineering (3)

Students wishing to concentrate in business may use any of the following business and economics courses as electives.

- 29:010:203 Introduction to Financial Accounting (3)
- 29:010:204 Introduction to Managerial Accounting (3)
- 21&62:220:102 Introduction to Economics, Macro (3)
- 29:390:329 Finance (3)
- 29:620:318 Management Fundamentals (3)
- 29:620:325

Courses

21&62:198:100. INTRODUCTION TO COMPUTERS AND INFORMATION PROCESSING (3)

Prerequisite: Fulfillment of mathematics proficiency. May not be used for credit by computer science or information systems majors. This course fulfills the technology course requirement in the teacher certification program.

Covers a general knowledge of computer use; history of computers and information processing, survey of modern computer science concepts, practical instruction in the use of a variety of data processing environments, and use of available software packages and databases; introduction to the Internet.

21&62:198:101. COMPUTERS AND PROGRAMMING I (3)

Prerequisite: Fulfillment of mathematics proficiency. This course fulfills the technology course requirement in the teacher certification program.

Introduction to problem-solving using the computer; basic organization of a computer, file manipulation, use of editors and compilers. Programming using a higher-level language; iteration and conditional statements; subprograms; elementary data structures.

21&62:198:102. COMPUTERS AND PROGRAMMING II (3)

Prerequisite: 21&62:198:101.

Solution of problems using recursive methods and dynamic data structures. Recursive functions, pointer variables, text processing, external files, and elementary software engineering.

21&62&28:198:231. MACHINE AND ASSEMBLY LANGUAGE PROGRAMMING (3)

Prerequisite: 21&62:198:102.

Computer architecture and representation of data, instructional codes, arithmetic operations and conversions, addressing, linkages, debugging, macros.

21&28:198:251. COMPUTER ORGANIZATION (3)

Prerequisite: 21&62:198:102.

An introduction to computer system structure and organization. Topics include representation of information, circuit analysis and design, register-transfer level, processor architecture, and input/output.

28:198:265. INFORMATION SYSTEMS AND PRODUCTIVITY TOOLWARE (3)

Prerequisite: 21&62:198:101.

Information systems is the study of how organizations use information technology. This course is an overview of the information systems discipline, the role of information systems in organizations, and the changing nature of information technology. Computer tools for analysis and presentation are used.

28:198:270. MULTIMEDIA INFORMATION SYSTEMS (3)

Prerequisite: 21&62:198:102.

Multimedia combines text, graphics, sound, video, and animation in a single application. Preparation for creating multimedia information systems, and understanding the crucial issues involving technology, design, and effectiveness of multimedia applications. Programming techniques for integrating video, sound, animation, and graphics, and design strategies for multimedia information systems.

21&28:198:332. PRINCIPLES OF OPERATING SYSTEMS (3)

Prerequisite: 21&62&28:198:335.

Organization of operating systems covering structure, process management, and scheduling; interaction of concurrent processes; interrupts; I/O, device handling; memory and virtual memory management and file management.

28:198:333. INTRODUCTION TO UNIX OPERATING SYSTEMS (3)

Prerequisites: 28:198:332 or equivalent, and knowledge of C language.

Covers the UNIX system kernel including initialization, scheduling, context switching, process management, memory management, device management, and the file system. Also includes the organization of shells, editors, utilities, and programming tools of the UNIX operating system.

21&62&28:198:335. DATA STRUCTURES AND ALGORITHM DESIGN (3)

Prerequisites: 21&62:198:102 and 21&62:640:237.

Explores trees, paths, linear lists, strings, arrays, stacks, queues, linked structures, and algorithms for searching, sorting, merging.

28:198:341. INTRODUCTION TO LOGIC AND AUTOMATA (3)

Prerequisites: 21&62:198:101 and 21&62:640:237.

Introduction to logic and formal grammars. Theoretical models such as finite state machines and push-down stack machines are developed and related to issues in programming language theory.

28:198:350. COMPUTERS AND SOCIETY (3)

Prerequisites: 21&62:198:101 or 28:198:113; and 21&62:350:101.

Examines the historical evolution of computer and information systems and explores their implications in the home, business, government, medicine, and education. Topics include automation and job impact, privacy, and legal and ethical issues.

28:198:352. PARALLEL COMPUTERS AND PROGRAMMING (3)

Prerequisites: 28:198:251 and 28:198:332.

Introduction to parallel computers and parallel programming. General structures and design techniques of parallel computers are described. Programming paradigms and algorithm design considerations for parallel processors also are discussed.

28:198:353. ADVANCED COMPUTER ORGANIZATION (3)

Prerequisites: 28:198:251 or instructor-approved equivalent.

Emphasis on the basic design principles or various components in a computer, as well as how the components are organized to build a computer. Topics include design methodology, arithmetic and logic unit design, control unit design, memory hierarchy, memory system design, input and output devices, peripheral devices, and interfacing computers using software. Students build a computer.

28:198:365. FILE STRUCTURES AND MANAGEMENT (3)

Prerequisites: 21&62&28:198:335 and knowledge of COBOL.

Covers design and implementation of commercial application software systems. Concepts of organization and management of data and files, including file operations and organization of sequential access, relative access, indexed sequential access, virtual storage access, and multi-key access methods. The COBOL language is used to illustrate these concepts and to implement application systems.

28:198:370. INTRODUCTION TO ARTIFICIAL INTELLIGENCE (3)

Prerequisite: 21&62&28:198:335.

Exploration of concepts, approaches, and techniques of artificial intelligence. Emphasizes both underlying theory and applications. Topics include knowledge representation, parsing language, search, logic, abduction, uncertainty, and learning. LISP and Prolog programming languages used extensively. Programming assignments and term project; review of case studies.

28:198:375. APPLICATIONS DEVELOPMENT FOR THE WORLD WIDE WEB (3)

Prerequisite: 28:198:332.

A state-of-the-art computer programming language/environment, such as Java and related tools, is studied and used as a vehicle to build applications that involve graphical user-interfaces, simple graphics, multithreading, images, animation, audio, database connectivity, remote objects, and networking.

28:198:390. REQUIREMENTS ANALYSIS AND SYSTEMS DESIGN (3)

Prerequisite: 21&62:198:102.

The information systems development life cycle, from the initial stages of information requirements analysis and determination to the ultimate activities involving systems design. Theory, methodologies, and strategies for information requirements analysis, including the assessment of transactions and decisions, fact-finding methodologies, structured analysis development tools, strategies of prototype development, and an overview of computer-aided software engineering (CASE) tools. Theory, methodologies, and strategies for systems design, including design of user-interfaces, particularly menu-driven and keyword dialogue strategies, and issues in the proper design of computer output.

28:198:421. NUMERICAL ALGORITHMS (3)*Prerequisites: 21&62:198:101 and 21&62:640:136.*

Fundamentals of numerical methods, including discussion of errors, interpolation and approximation, linear systems of equations, solution of nonlinear equations, and numerical solution of ordinary differential equations. Emphasis on algorithmic approach and the efficient use of the computer.

28:198:431. DATABASE SYSTEM DESIGN AND MANAGEMENT (3)*Prerequisite: 21&62&28:198:335.*

Database system architecture, including data modeling using the semantic object and entity-relationship model; storage of databases; the hierarchical, network, and relational data models; formal and commercial query languages; functional dependencies and normalization for relational database design; relation decomposition; concurrency control and transactions management. Student projects involve the use of a DBMS package.

28:198:432. ADVANCED OPERATING SYSTEMS (3)*Prerequisites: 28:198:251 and 28:198:332.*

Survey of the design and implementation of distributed operating systems, both by introducing basic concepts and considering examples of current systems. Topics include communication, synchronization, processor allocation, and distributed file systems.

21&28:198:435. ADVANCED DATA STRUCTURES AND ALGORITHM DESIGN (3)*Prerequisite: 21&62&28:198:335.*

Advanced topics in data structures and algorithms, including mathematical induction, analysis and complexity of algorithms, and algorithms involving sequences, sets, and graphs such as searching, sorting, order statistics, sequence comparisons, and graph traversals. Optional topics include geometric, algebraic, and numeric algorithms.

28:198:438. INTERACTIVE COMPUTER GRAPHICS (3)*Prerequisite: 21&62:198:101.*

Introduces fundamental concepts of interactive graphics oriented toward computer-aided design systems used in engineering, architecture, and manufacturing. Topics include computer data structures for representation of two- and three-dimensional objects and algorithms for definition, modification, and display of these objects in applications. Discussion of special topics in interactive graphics.

28:198:447. HUMAN-COMPUTER INTERFACES (3)*Prerequisite: 28:198:390.*

Design and evaluation of the human-computer interface in interactive computer systems. Topics include approaches to interface design such as menus, commands, direct manipulation; screen layout strategies; metaphor models; models of human information process; evaluation approaches such as protocol for analysis, interactive monitoring, use of surveys; and requirements for documentation and help.

28:198:451. INTRODUCTION TO DATA COMMUNICATIONS AND NETWORKS (3)*Prerequisite: 21&62&28:198:335.*

Fundamental concepts in data communications. Topics include circuit and packet switching, layered network architecture, ISO network protocols, performance analysis of data communication systems, flow control and alternate routing strategies and algorithms, various types of networks and their interconnections, network security and privacy. Additional topics include systems analysis and design, traffic engineering, planning and forecasting methodologies as applied to data communication networks.

28:198:453. MICROCOMPUTERS AND APPLICATIONS (3)*Prerequisite: 21&62&28:198:231.*

Basic principles of microprocessors and their support modules, including memory and serial and parallel interfaces. Focus on software system design for control by microcomputers. Software system design for control by microcomputers. Instructor-assigned exercises and one student-designed project.

28:198:455. COMPUTER SYSTEMS MANAGEMENT (3)*Prerequisite: 21&62:198:102.*

An overview of computing centers and their organization for accomplishing specific objectives. Includes a classification of systems, analysis of cost and size, layout of equipment, methods of accessing computer facilities, equipment selection, and facilities evaluation.

28:198:456. OPEN SYSTEMS NETWORKING (3)*Prerequisite: 21&62&28:198:335.*

An introduction to internetworking, including an in-depth study of the architecture of network interconnections, the Internet services, and the protocols needed to provide these services. Topics include architecture of interconnected networks, Internet addresses and the address resolution problem, Internet protocols, the domain name system, the socket interface, the client-server model of interaction, the OSI transport and application support protocols, and the TCP/IP application protocols.

28:198:461. SYSTEMS SIMULATION (3)*Prerequisites: 21&62:198:101 and 21:640:327.*

Introduction to computer simulation as an algorithmic problem-solving technique. Includes discrete simulation models, elementary theory, stochastic processes, use of simulation languages, random number generators, simulation of probabilistic processes, design of simulation experiments, validation of models, queueing systems, and applications to the design and analysis of operational systems. The GPSS language is studied in detail.

28:198:465. ADVANCED INFORMATION SYSTEMS (3)*Prerequisite: 28:198:431.*

Design and programming concepts presented for automation of management information systems. Includes the organization of files and techniques for processing information based upon organizational requirements and available hardware and software. Case studies presented and analyzed. Advanced design strategies for information systems. Preparation of a proposal for an information systems project that includes its functional specifications and preliminary design required.

28:198:478. SOFTWARE TOOLS FOR SOLVING PROBLEMS (3)*Prerequisites: Junior or senior standing, permission of instructor.*

Students interact directly with industry and solve problems using various information-systems software tools. Company representatives present problems they are facing, and the students work in groups to develop a solution, which they present at the end of the term. Presentation skills, working in groups, and using software tools for problem solving stressed.

21&62:198:481,482. ADVANCED MATHEMATICS IN COMPUTER SCIENCE (3,3)*Prerequisites: 21&62:198:102 and 21&62:640:237 or 238 or permission of instructor.*

Covers one or more topics common to mathematics and computer science. Possible topics include applications of abstract algebra to data security problems, digital systems processing, automata theory, asynchronous machines and petri nets, applications of algebra to computer programming, formal language theory, advanced numerical analysis and its theory of errors.

28:198:485. SPECIAL TOPICS IN COMPUTER SCIENCE I (3)*Prerequisites: Junior standing and/or department approval.*

The study of new and/or advanced topics in an area of computer science not regularly covered in any other CIS course. The precise topics to be covered, along with prerequisites, are announced in the term prior to the offering of the course. A student may register for no more than two terms of special topics courses.

28:198:486. SPECIAL TOPICS IN COMPUTER SCIENCE II (3)*Prerequisites: Junior standing and/or department approval.*

A continuation of CIS 485.

28:198:490. GUIDED DESIGN IN SOFTWARE ENGINEERING (3)

Prerequisite: Senior standing or departmental approval.

Focuses on the methodology for developing software systems. Methods and techniques for functional requirements analysis and specifications, design, coding, testing and proving, integration and maintenance discussed. Students prepare a project proposal, including functional specifications and preliminary design.

21&28:198:491. COMPUTER SCIENCE PROJECT (3)

Prerequisites: 28:198:490, senior standing, and project proposal approval.

An opportunity for students to integrate the knowledge and skills gained in previous computer science work into an individual research project. Involves investigation of current literature as well as computer implementation of either a part of a large program or the whole of a small system. Topic should be consonant with the emphasis of direction chosen by the students in their computer science studies. To register for this course, students must have a written project proposal approved by their faculty adviser. The proposal must be submitted and approved in the prior term, usually the third week of November or April.

21&28:198:492. INFORMATION SYSTEMS PROJECT (3)

Prerequisites: 28:198:465, senior standing, and, in a prior term, project proposal approved by the faculty adviser.

Integration of knowledge and skills gained in previous information systems courses into an individual research project. Entails investigation of current literature and the design, implementation, and evaluation of an information system.

21&62:198:493,494. INDIVIDUAL STUDIES IN COMPUTER SCIENCE (3,3)

Prerequisite: Permission of instructor.

Individual study for students interested in specialized study or research in computer sciences.

21&62:198:495,496. INTERNSHIP IN COMPUTER SCIENCE OR INFORMATION SYSTEMS (3,3)

Prerequisite: Approval of a proposal by faculty adviser.

Pursuit of a project of relevant educational value in an employment setting. Requires a proposal and report to be agreed upon and evaluated by employer and adviser.

CRIMINAL JUSTICE 202

School of Criminal Justice

Center for Law and Justice (973/353-1300)

The criminal justice major and minor are offered at NCAS and at UC-N.

The program in criminal justice offers students a focused interdisciplinary exposure to all aspects of crime and criminal justice. Courses in the program deal with crime, violence, and other forms of deviance and the responses to these problems by police, courts, and corrections; contemporary criminal justice issues; and ethical concerns and research. Students majoring in criminal justice receive excellent preparation for further study in graduate or professional schools as well as for careers in criminal justice.

Major Requirements: NCAS and UC-N

1. Seven 3-credit required courses:
 - 21&62:202:201 Introduction to Criminal Justice (3)
 - 21&62:202:203 The Police and the Community (3)
 - 21&62:202:204 Corrections (3)
 - 21&62:202:303 Criminology (3)
 - 21&62:202:304 Delinquency and Juvenile Justice (3)
 - 21&62:202:305 Case Processing: The Law and the Courts (3)
 - 21&62:202:404 Criminal Justice: Ethical and Philosophical Foundations (3)

2. Two 4-credit courses in research methods and statistics, specifically:
 - either:* 21&62:830:301 Statistical Methods for the Cognitive and Behavioral Sciences (4)
 - or:* 21&62:920:301-302 Social Research I,II (4,4)
3. Three 3-credit elective courses in criminal justice or, with the consent of an adviser, in other courses related to the student's interests.

Minor Requirements: NCAS and UC-N

1. Three 3-credit required courses:
 - 21&62:202:201 Introduction to Criminal Justice (3)
 - 21&62:202:303 Criminology (3)
 - 21&62:202:304 Delinquency and Juvenile Justice (3)
2. 12 credits of approved electives in criminal justice.

Courses

21&62:202:201. 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 pressures that enhance or impair the improvement of criminal laws and the fair administration of criminal justice.

21&62:202:202. GENDER, CRIME, AND JUSTICE (3)
An in-depth survey of changing social values about gender, 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.

21&62:202:203. THE POLICE AND THE COMMUNITY (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.

21&62:202:204. CORRECTIONS (3)
Examines and analyzes the major types of custodial and community-based criminal corrections in contemporary America. Discusses purposes of corrections, correctional organization, impact of corrections, and contemporary issues facing the field.

21&62:202:301. WHITE-COLLAR CRIME (3)
Crimes organized by persons whose economic, political, and privileged positions facilitate the commission; relative impunity of unusual crimes that are often national and international in scope and that have serious, long-term consequences.

21&62:202:302. CONSTITUTIONAL ISSUES IN CRIMINAL JUSTICE (3)
Examines the Bill of Rights as it pertains to criminal justice practices and procedures. Also analyzes the important judicial opinions, trials, and congressional investigations and reports concerning criminal justice laws, policies, and practices.

21&62:202:303. CRIMINOLOGY (3)
Crime and criminal behavior, theories, and research. Causes of crime. Crime rates. U.S. and international comparisons.

21&62:202:304. DELINQUENCY AND JUVENILE JUSTICE (3)
Prerequisite: 200-level course in criminal justice.
Causes and rates of delinquent behavior. The nature and operation of the juvenile justice system. International comparisons.

21&62:202:305. CASE PROCESSING: THE LAW AND THE COURTS (3)
The criminal laws and judicial opinions that influence the policies, procedures, personnel, and clients of the criminal justice system in New Jersey; the origin, development, and continuing changes in criminal law, administration of criminal justice, and the state's criminal courts.

21&62:202:306. COMMUNITY CORRECTIONS (3)

The theory and practice of major community-based correctional responses (such as probation, parole, and diversion programs) to convicted criminal offenders; community corrections as an important social movement and the countermovement to abolish the parole function.

21&62:202:307. CULTURE AND CRIME (3)

Anthropological approach to crime as a pattern of social behavior. Crime and punishment in other societies, especially non-Western societies that lack institutional systems of criminal justice; the social evolution of crime and crime-related institutions in U.S. history; anthropological studies of people and organizations on both sides of the crime problem.

21&62:202:401. CONTEMPORARY PROBLEMS IN POLICING (3)

Critical law enforcement problems, including organized crime, alcohol, drugs, policing of civil and natural disturbances, and the diffusion and multiplicity of police agencies; crime reporting, assessment difficulties, and the public reaction; the administrative problems of staffing, supervision, employee morale and militancy, and public charges.

21&62:202:402. CONTEMPORARY PROBLEMS IN CORRECTIONS (3)

The impact of alternatives to incarceration, the growing prisoner rights movement, strikes by correctional employees, and public resentment toward persistently high rates of recidivism; special study of issues concerning correctional education, job training, work release, and postincarceration employment.

21&62:202:403. COMPARATIVE CRIMINAL JUSTICE SYSTEMS (3)

Approaches to law enforcement, criminal procedure and criminal law, corrections, and juvenile justice; worldwide overview of cultural and legal traditions related to crime.

21&62:202:404. CRIMINAL JUSTICE: ETHICAL AND PHILOSOPHICAL FOUNDATIONS (3)

Ethical and philosophical issues and moral dilemmas within the field of criminal justice, including principles of justice, deontology and utilitarianism, philosophical issues in sentencing, police and ethics, ethics and research, and the scope of state control.

21&62:202:405. RESEARCH SEMINAR IN CRIMINAL JUSTICE (3)

Prerequisite: Special permission.

Develops rudimentary tools needed for conducting research and writing reports and scholarly papers in criminal justice.

21&62:202:406. INDEPENDENT STUDY IN CRIMINAL JUSTICE (3)

Prerequisite: 21&62:202:405 or special permission.

Independent research or special project under faculty supervision.

21&62:202:407. TOPICS IN CRIMINAL JUSTICE (3)

Current issues and problems; topics vary. May be taken more than once for different topics.

21&62:202:413. INTERNSHIP IN CRIMINAL JUSTICE (BA)

Prerequisites: Special permission and junior or senior standing.

ECONOMICS 220

Department of Economics

Hill Hall (973/353-5259), or see newark.rutgers.edu/~econnwk.

The economics major and minor are offered at NCAS and UC-N.

Major Requirements

Economists study social behavior with the assumption that individuals engage in activities when the benefits of doing so exceed the costs. This simple assumption

is the foundation of economic studies of growth and development, international trade and exchange rates, inflation, taxation, financial markets and the organization of financial institutions, and the determination of market prices.

The major in economics includes a 24-credit core curriculum, including 21&62:640:119 Basic Calculus, and an additional 18 elective credits. At least one-half of these credits must be completed at Rutgers–Newark. All courses must be completed with a grade of *C* or better.

Three of the following four courses in the School of Management—29:390:315 Investments, 29:390:329 Finance, 29:390:330 Corporate Finance, and 29:390:386 Futures and Options—may be counted as elective credits. Students with an interest in applied economic analysis and in developing computer skills should take 21&62:220:402 Advanced Econometrics after 21&62:220:322 Introduction to Econometrics.

Seniors with at least a *B* average and with permission from the director of graduate studies may enroll in courses from the graduate economics curriculum.

Core Courses

21&62:220:101	Introduction to Economics, Micro (3)
21&62:220:102	Introduction to Economics, Macro (3)
21&62:220:231	Statistical Methods (3)
21&62:220:322	Introduction to Econometrics (3)
21&62:220:323	Intermediate Microeconomic Theory (3)
21&62:220:324	Intermediate Macroeconomic Theory (3)
21&62:220:406	Seminar in Applied Economics (3)
21&62:640:119	Basic Calculus (3)

Minor Requirements

The minor requires 21 credits in economics courses to be completed with a grade of *C* or better. The 21 credits must include the following:

21&62:220:101	Introduction to Microeconomics (3)
21&62:220:102	Introduction to Macroeconomics (3)
21&62:220:323	Intermediate Microeconomic Theory (3)
21&62:220:324	Intermediate Macroeconomic Theory (3)

School of Management courses 29:390:315 Investments, 29:390:329 Finance, 29:390:330 Corporate Finance, and 29:390:386 Futures and Options may *not* be used to satisfy the credit requirements for the minor.

Courses

Note: Courses 21&62:220:101,102 Introduction to Economics are prerequisites for all other courses in the department. College Algebra (21&62:640:113) or its equivalent, or tested proficiency in college algebra, is a prerequisite for all economics courses except 21&62:220:101,102 Introduction to Economics and 21&62:220:200 Economic Analysis of Social Problems. *Proficiency in 21&62:640:113 College Algebra is highly recommended for students taking 21&62:220:101,102 Economics.*

21&62:220:101. INTRODUCTION TO ECONOMICS, MICRO (3)

Proficiency in 21&62:640:113 College Algebra is highly recommended.

Consumer theory and market demand; production theory and market supply; market equilibrium; income distribution; and international trade.

21&62:220:102. INTRODUCTION TO ECONOMICS, MACRO (3)

Proficiency in 21&62:640:113 College Algebra is highly recommended.

Major issues confronting the American economy; the nature of our private enterprise system, the role of government, the influence of the banking system, the problem of controlling inflation and deflation, and the requisites for a high level of national income and employment and a rising standard of living.

21&62:220:200. ECONOMIC ANALYSIS OF SOCIAL PROBLEMS (3)

May not be taken for credit by students who have already received credit for 21&62:220:101 Introduction to Economics, Micro and/or 21&62:220:102 Introduction to Economics, Macro; nor can it be used as a substitute for those two courses to satisfy any other requirements or prerequisites that currently require 21&62:220:101 and/or 102. Not open to economics or business majors.

Introduction to economic principles (both micro and macro) with applications to current social problems. Intended for students who plan to take only a single term of economics. Topics include distribution of income, poverty, education, crime, health care, pollution, discrimination, unemployment, inflation, and the role of government in a market economy.

21&62:220:201. PRINCIPLES OF FINANCE (3)

Introduction to microeconomic foundations of financial theory; overview of financial markets; individual saving and investment decisions, consumer attitudes toward risk, capital formation, financial effects of inflation, properties of various financial assets and markets, and government policy regarding securities markets.

21&62:220:231. STATISTICAL METHODS (3)

Not open to students who have taken a course in statistics or its equivalent in another department.

Descriptive statistics, probability, sampling, estimation, hypothesis testing, and regression analysis; realistic application with the computer employed as a major tool.

21&62:220:303. ECONOMICS OF INDUSTRIAL RELATIONS (3)

Development of labor organization in the U.S., from its origins to the present; examination of public policy toward unions and collective bargaining; analysis of collective bargaining agreements; private techniques and public policy for settling industrial disputes.

21&62:220:304. ECONOMICS OF LABOR (3)

Analysis of the market forces determining employment, wages, hours, and productivity in the firm and economy; influence of union organization, collective bargaining, and public policy on the labor market; historical and cyclical behavior of the labor force and earnings.

21&62:220:305. DEVELOPMENT OF THE AMERICAN ECONOMY (3)

The origins, development, and transformation of the American economy. Illustrations of the operation of "economic law" through examination of various aspects of the country's past from the colonial period to the present.

21&62:220:312. WOMEN IN THE AMERICAN ECONOMY (3)

The economic aspects of the role of women in our society; changes in this role over the course of the twentieth century and continuing changes. The basic focus is work—in the home and in the labor market—and the division of labor. Topics include labor force participation, discrimination, relative earnings, birth rates, and family size.

21&62:220:315. MANAGERIAL ECONOMICS (3)

The economic foundation of managing the private enterprise; demand forecasting, pricing, cost analysis and competitive strategy, and capital budgeting; integration of microeconomics and strategic planning with case studies; emphasis on practical application of economics to business decisions.

21&62:220:316. ECONOMICS OF HEALTH (3)

Economic analysis of the U.S. health care sector; theories of consumer demand for health and medical care, of physician behavior, and of hospital administration; economic aspects of health policy issues such as national health insurance, competition between medical care providers, medical cost inflation, and public health programs.

21&62:220:322. INTRODUCTION TO ECONOMETRICS (3)

Prerequisite: 21&62:220:231.

Application of regression and other statistical techniques to economic problems; classical linear regression model developed with analysis of the underlying assumptions and the consequences of their violation; use of econometric techniques in micro- and macroeconomic problems; computer assisted applications.

21&62:220:323. INTERMEDIATE MICROECONOMIC THEORY (3)

Development of the fundamental tools of price and distribution theory; analysis of commodity and factor price determination under competitive and noncompetitive market conditions from the standpoint of the household and the firm; introduction to welfare economics.

21&62:220:324. INTERMEDIATE MACROECONOMIC THEORY (3)

Theoretical analysis of national income, employment, and price-level determination; roles of consumer and investor demand, interest rates, money supply, and fiscal and monetary policy considered within the framework of Keynesian, post-Keynesian, monetarist, and new classical theories.

21&62:220:327,328. HISTORY OF ECONOMIC THOUGHT (3,3)

First term: the evolution of economic doctrines from the Middle Ages to about 1870, emphasizing the writings of Smith, Ricardo, Malthus, Mill, Marx, and their critics. *Second term:* neoclassical and Keynesian theory.

21&62:220:335,336. INTERNATIONAL ECONOMIC RELATIONS (3,3)

Theoretical and practical considerations underlying international trade and finance; economic effects of tariffs and exchange restrictions; foreign investment and the problems of underdeveloped areas; a review of the U.S. foreign aid program and of the work of international financial institutions.

21&62:220:337. PUBLIC FINANCE (3)

Prerequisite: 21&62:220:323.

Economics of the public sector emphasizing the functions of allocation, distribution, and stabilization; equity and efficiency in the provision of public services; fiscal federalism and comparative fiscal systems, emphasizing major expenditures and revenue sources; the political economy of regulation and public choice theories.

21&62:220:339. ECONOMIC DEVELOPMENT (3)

Review the alternative theories of economic development and examine the process of economic development in an international perspective. Examination of the broad diversity of experience in selected Pacific rim countries used as a point of departure to illustrate the validity of alternative development theories. Although emphasis is placed on East Asian countries, comparison between East Asian and Latin American countries is made in the context of the political-economic approach.

21&62:220:356. BUSINESS CYCLES (3)

Results of empirical investigations of business fluctuations, with emphasis on the nature of short-run cyclical variations and secular growth; leading types of business cycle theory reviewed and a systematic study made of the general relation between income and employment, money and prices, savings and capital formation, and their influence on self-generating cyclical movements; the nature and effectiveness of monetary and fiscal policy also reviewed.

21&62:220:361. INDUSTRIAL ORGANIZATION (3)

Theoretical analysis of economic behavior under different market structures; welfare criteria employed; conditions of market failure considered and appropriate policy implications studied.

21&62:220:365. MONEY AND BANKING (3)

The structured operation and consequences of the monetary system; role of money and banking in the organization and fluctuations of our economic system; recent changes in the functions of the Federal Reserve System.

21&62:220:367. MONETARY ECONOMICS (3)

Theory of the demand and supply of money and of monetary disturbances; historical development and current state of monetary theory and policy.

21&62:220:402. ADVANCED ECONOMETRICS (3)

Prerequisite: 21&62:220:322.

Intensive introduction and extension of the classical regression model; simultaneous model estimation, simulation, and evaluation; specification error analysis; nonlinear estimation; and time series methods.

21&62:220:406. SEMINAR IN APPLIED ECONOMICS (3)

Prerequisite: 21&62:220:322 or permission of instructor.

Examination of empirical studies current in the economics literature; original research project and presentation of findings and progress in oral and written form.

21&62:220:407,408. LABOR SEMINAR (3,3)

Prerequisite: 21&62:220:304.

Completion of one or more papers in a specialized area of the labor market, such as employment, income distribution, wages, collective bargaining, and productivity, or in industrial relations, such as the history and structure of labor organizations, and public policy toward unions and collective bargaining.

21&62:220:409. INTRODUCTION TO MATHEMATICAL ECONOMICS (3)

Prerequisite: 21&62:640:119 or equivalent.

Introduction to the use of mathematics in economic analysis; survey of the economics and finance literature that employs calculus and basic topology.

21&62:220:414,415. ANALYSIS OF CURRENT ECONOMIC CONDITIONS (3,3)

Detailed study of the major indicators of economic conditions, their derivation, historical movements, current position, and their role in assessing economic change.

21&62:220:439. FINANCIAL ECONOMICS (3)

Establish financial market fundamentals; survey asset pricing theories; examine market patterns and trading strategies.

21&62:220:499. INDIVIDUAL STUDY IN ECONOMICS (BA)

Prerequisites: Permission of department chairperson and instructor. Restricted to economics majors in their last term before graduation. Maximum of 3 credits.

EDUCATION 240-310

*Department of Education and Academic Foundations
Conklin Hall (973/353-5245)*

Teacher certification is offered at NCAS and UC-N.

The Department of Education and Academic Foundations is committed to preparing students to teach in elementary and secondary schools, with an emphasis on urban education. Student teaching takes place primarily in urban schools. Thirty credits are required to complete the program. All students must major in a liberal arts subject.

Secondary students major in the discipline they plan to teach. Psychology and sociology majors are acceptable for elementary students, but the department recommends majors in history, the arts, the sciences, or English. Certification is offered in art, music, biological sciences, earth science (through a geology major), English, French, German, Italian, Spanish, mathematics, and social studies (through history, political science, or other social studies majors). Except for music and art, certification in a content area permits teaching in a departmentalized assignment in the content area at any grade. A K-8 certificate also is available for elementary school teaching. Education courses fulfill the 15-credit college restricted elective requirement. All students interested in the education programs should inquire in Conklin Hall, Room 420.

Admission to the Teaching Programs

Students interested in teaching should consult with the Department of Education during their first year. Students interested in certification must apply to the program and declare their college major in the department offering that major.

Students must meet the following criteria to apply to the department:

1. A 2.8 grade-point average each term, a 3.0 grade-point average in their major;
2. An *A* or *B* in 21&62:350:102 English Composition II, and completion of college algebra;
3. Successful completion of 21&62:830:323 Developmental Psychology;
4. Successful completion of 21&62:310:417 (fall)/418(spring) Topics in Education

The following requirements, all of which also satisfy the general curriculum requirements, should be fulfilled during the first and second years:

5. Completion (earning an *A* or *B*) of one 3-credit course in African-American experience or culture in the U.S., and one 3-credit course in the experience or culture of Latinos/Latinas in the U.S. Students may select from courses offered by the departments of Afro-American and African Studies, Classical and Modern Languages and Literatures, English, or History, or by the Puerto Rican Studies program.
6. Completion (earning an *A* or *B*) of one 3-credit course in American history offered by the history department.
7. Completion (earning an *A* or *B*) of one of the following 3-credit courses in fine arts;
 - 21&62:082:101 Introduction to Art History I (3)
 - 21&62:082:102 Introduction to Art History II (3)
 - 21&62:700:101 Introduction to Music (3)
 - 21&62:700:111 Fundamentals of Music I (3)
 - 21&62:700:265 Jazz (3)

Continuation in the program and acceptance to student teaching are contingent upon the student maintaining a 2.8 grade-point average each term, a 3.0 grade-point average in the major, three letters of recommendation by the major department, and grades of *A* or *B* in all education courses. The ability to write coherently using standard grammar and correct punctuation is required in all courses.

Application for Student Teaching

Students must apply one year in advance for a student teaching assignment. Upon completion of the education program, students must pass the appropriate Praxis exams required for their field of teaching.

Teacher Certification

Upon successful completion of the program, students apply for state certification through the Rutgers–Newark Department of Education.

Course Sequence

Students seeking elementary certification *must* take the education department courses in the following order:

- 21&62:310:417,418 Topics in Education (3,3)
- 21&62:310:410 Issues in Urban Education and Sophomore Practicum (3)
- 21&62:310:411 Social Foundations of Education (3)
- 21&62:240:336 Communication Skills and Social Studies Pre-K–8 (fall) (3)
- 21&62:240:342 Methods of Teaching Mathematics Pre-K–8 (fall) (3)
- 21&62:240:343 Methods of Teaching Science and Health (spring) (3)
- 21&62:300:314 Methods of Teaching Reading and Junior Practicum (6)
- 21&62:250:487 Student Teaching and Seminar (6)

Students seeking secondary certification *must* take education department courses in the following order:

- 21&62:310:417,418 Topics in Education (3,3)
- 21&62:310:410 Issues in Urban Education and Sophomore Practicum (3)
- 21&62:310:411 Social Foundations of Education (3)
- 21&62:240:360 Introduction to Teaching Secondary School (4)
- 21&62:300:386 Principles and Techniques of Teaching Secondary School (spring) (6)
- 21&62:300:314 Methods of Teaching Reading and Junior Practicum (6)
- 21&62:250:487 Student Teaching and Seminar (6)

Courses

21&62:240:336. COMMUNICATION SKILLS AND SOCIAL STUDIES PRE-K–8 (3)

Corequisite: 21&62:240:342.

Examines the role of language arts and language development, the writing process, and social studies in the elementary school curriculum; theory methods and materials. Fieldwork required.

21&62:240:342. METHODS OF TEACHING MATHEMATICS PRE-K–8 (3)

Corequisite: 21&62:240:336.

Arithmetical concepts needed to teach math in grades pre-K–8; technology, methods and materials for teaching these concepts; math journals; tutoring of a young child required.

21&62:240:343. METHODS OF TEACHING SCIENCE AND HEALTH PRE-K–8 (3)

Underlying principles of a sound science program; multimedia materials, equipment, and methods for teaching hands-on science; development of children's scientific concepts; health science and physical education; teaching methods; cooperative learning; and classroom management. Fieldwork required.

21&62:240:360. INTRODUCTION TO TEACHING SECONDARY SCHOOL (4)

Theory and methods of cooperative learning, thematic, and interdisciplinary instruction; what constitutes learning; and social construction of knowledge. Fieldwork in secondary schools required.

21&62&250:487. STUDENT TEACHING AND SEMINAR (6)

Prerequisites: Permission of department chairperson; completion with an A or B of all education courses; a grade-point average of 2.8 or better each term; recommendation by a major department and education department and academic foundations; successful completion of junior practicum.

Students must apply to student teach a year in advance; fifteen weeks of student teaching required in an urban school.

21&62:300:314. METHODS OF TEACHING READING AND JUNIOR PRACTICUM (6)

Theory and methods of teaching literacy, including remedial techniques, diagnostic and prescriptive tests and measurements; techniques of individualization, improving literacy in the content areas, choosing books for class instruction, and challenging stereotypes, omissions, and distortions in children's trade and textbooks. Three hours of fieldwork required for ten weeks of term beginning in second month (time arranged by instruction). Fieldwork includes observation of literacy instruction at the elementary or secondary level and teaching by the junior practicum student.

21&62:300:324. LEARNING DISABILITIES AND EDUCATIONAL TECHNIQUES (3)

Learning problems that classroom teachers may encounter; special techniques to assist teachers in designing strategies for emotionally or physiologically based learning problems.

21&62:300:386. PRINCIPLES AND TECHNIQUES OF TEACHING SECONDARY SCHOOL (5)

Recent trends and innovations in media, materials, and methods of teaching secondary school; highly individualized (each student works with a master teacher to learn materials and methods specific to major subject area); weekly fieldwork required.

21&62:300:427. SUPERVISED TEACHING I AND SEMINAR (3)

Prerequisites: Permission of department chairperson; same requirements as 21&62:250:487.

Designed for students who are full-time teachers, teaching courses appropriate to the state certification sought; includes observation, conferences, and classroom teaching.

21&62:300:428. SUPERVISED TEACHING II AND SEMINAR (3)

Prerequisites: Permission of department chairperson; same requirements as 21&62:250:487.

Designed for students who are full-time teachers, teaching courses appropriate to the state certification sought; includes observation, conferences, and classroom teaching.

21&62:310:410. ISSUES IN URBAN EDUCATION AND SOPHOMORE PRACTICUM (3)

Interdisciplinary, multiethnic study of education; the urban environment in which city schools exist; educational equity, the politics of schools, the disadvantaged student, the education of ethnic minorities, and student achievement. Fieldwork required.

21&62:310:411. SOCIAL FOUNDATIONS OF EDUCATION (3)

Survey of historical developments and sociological and philosophical issues bearing on education in America since the colonial era. Application of ideas to urban teaching.

21&62:310:316. RESEARCH IN EDUCATION (3)

Prerequisite: Permission of department chairperson.

For students interested in special educational problems; appropriate for advanced students.

21&62:310:417,418. TOPICS IN EDUCATION (3,3)

Introductory course.

Explores selected topics, with emphasis on current practices, school organization, the hidden curriculum, student-teacher interaction, and the normative nature of schools. Fieldwork required.

ENGLISH (English 350, American Literature 352, Journalism, Media, and Writing 570)

Department of English

Hill Hall (973/353-5279)

The English major and minor are offered at NCAS and UC–N. Students also may major or minor in journalism at NCAS.

Major Requirements

English Major

This major introduces the student to a variety of epochs in English and American literature, with opportunities to select advanced work in authors, genres, periods, topics, and writing.

The major requires 45 credits as follows:

- 21&62:350:215 Literary Masterpieces (3)
21&62:350:308 Foundations of Literary Study (3)
21&62:350:319 *or* 320 Shakespeare (3,3)
- 9 credits in literature prior to the nineteenth century;
3 credits in nineteenth-century literature;
6 credits in:
African, Caribbean, or Asian literatures (offered by the English department or the Department of Afro-American and African Studies);
foreign language study beyond the elementary level;
or literatures in translation (offered by the Department of Classical and Modern Languages and Literatures).
- 18 additional credits in any courses offered by the English department, of which 6 credits may be in creative writing courses. *Note:* 21&62:350:216 does not count toward the major.

A list of courses meeting these requirements is available in the English department office. The department assigns advisers to all students majoring in English and urges students to consult regularly with their advisers. Students expecting to attend graduate schools are strongly urged to choose period courses and to acquire competency in third-year college-level French, German, Greek, or Latin.

Journalism Major

Required core (29 credits)

- 21:570:201 Journalism and Communications Media (3)
21:965:202 Journalism and Communications Media (3)
21:570:338 Advanced Reporting (3)
21:570:344 Journalism, Ethics, and the Law (3)
21&62:570:459, 460 Journalism Internship (3,3) *or*
21&62:965:394 Internship—Television (3)
21&62:965:253 *or* 254 TV and Society (3,3)
21&62:965:319 *or* 433 Studio Production I (4) *or*
Field Production I (4)
21&62:965:440 *or* 441 Topics in Television (3,3)

Electives (9 credits)

Electives are to be chosen from courses in English 350, American Literature 352, Journalism, Writing, and Media 570, Television 965, or Art and Design 080.

Minor Requirements

A student can minor in English by completing 21 credits, of which 6 credits are in 200-level courses and 15 credits are in 300- and 400-level courses in literature. A student can minor in journalism by completing 18 credits.

Teacher Certification

Students seeking teacher certification in English must complete the requirements for a major in the English department as well as satisfy other requirements for certification. For details regarding admission to the teacher education program and the requirements, students should consult both their department adviser and the chairperson of the education department.

Prerequisites for English Courses

English courses 21&62:350:101-102 or 103-104 English Composition, or 121-122 Expository Writing or an approved equivalent, or special permission of the department, are prerequisite to all other English and journalism courses.

Courses (English 350)

21&62:350:101-102. ENGLISH COMPOSITION (3,3)

Open to students on basis of placement test only. 21&62:350:101-102 is the introductory composition sequence for students who have not completed 6 credits in English composition at another institution. Prerequisite: For entry into 21&62:350:102 students must have completed 21&62:350:101 with a grade of C or better.

101: Analytical writing based on nonfiction readings. Emphasis on revising skills and critical thinking. Students must demonstrate the ability to write accurately, coherently, and thoughtfully in response to representative university-level readings.

102: Extensive analytical writing based on literary texts, including fiction, poetry, and drama. Introduction to library resources and to writing that incorporates research.

21&62:350:103-104. HONORS ENGLISH COMPOSITION (3,3)

Designed for highly qualified first-year students.

In lieu of 21&62:350:101-102, this course carries well-prepared students beyond the limits of the regular first-year program.

21&62:350:121-122. EXPOSITORY WRITING I,II (3,3)

21&62:350:121-122 is primarily intended for transfer students who have previously completed 6 credits of writing instruction and need to develop further their writing skills. Prerequisite: for entry into 21&62:350:122, students must have completed 21&62:350:121 with a grade of C or better.

121: Analytical writing based on nonfiction readings from a variety of disciplines. Review of writing fundamentals, with stress on revising and editing. Emphasis on the ability to summarize accurately and respond thoughtfully to representative university-level material.

122: Extensive analytical writing based on fiction and nonfiction readings. Emphasis on the development of arguments and the ability to write about readings in relation to one another. Introduction to library resources and to research papers appropriate for various fields of study.

21&62:350:205. FICTION INTO FILM (3)

The responses of the English language and its literary conventions to the special demands of film.

21&62:350:215,216. LITERARY MASTERPIECES (3,3)

See also 21&62:350:275,276.

Introduction to great works of world literature; develops the ability to read with understanding and to enjoy literature that appeals to educated and mature readers. Correlated with advanced writing to extend the composition training of 21&62:350:101-102 or 21&62:350:121-122.

21&62:350:221,222. SURVEY OF ENGLISH LITERATURE (3,3)

Literature of the British Isles, from its beginnings to the twentieth century.

21&62:350:227,228. SPECIAL TOPICS FOR NONMAJORS (3,3)

Courses in the "strictly for nonmajors" track are more interdisciplinary and multicultural than traditional English courses to complement students of the sciences, social sciences, and professions. While the syllabi include important literature and film, emphasis falls on relating the works to a wide range of human experiences, dilemmas, and endeavors.

21&62:350:247,248. FORCES IN MODERN LITERATURE (3,3)

Focuses on the relationships between imaginative literature and some of the main social, political, and scientific forces in the nineteenth and twentieth centuries.

21&62:350:254. LITERATURE AND POLITICS IN THE THIRD WORLD (3)

Revolutionary movements and literatures of the peoples and nations of the third world. The development of national liberation and socialist revolution in the historical context of colonization and its aftermath. Detailed exploration of exemplary literature and film from Africa, Asia, Latin America, and the Caribbean.

21&62:350:260,261. INTRODUCTION TO LITERATURE (3,3)

An introduction to literary study using a range of texts from world literature to introduce concepts of genre, period, canon. Various critical approaches; practice in writing literary analysis.

21&62:350:275,276. HONORS LITERARY MASTERPIECES (3,3)

Prerequisite: Permission of department chairperson.

Similar to but somewhat more challenging than 21&62:350:215,216.

21&62:350:302. WRITING WITH COMPUTERS (3)

Prerequisites: 21&62:350:101-102 or equivalent.

An advanced writing course with emphasis on how computers serve the needs of academic, technical, creative, or business writers; computer techniques for writing dissertations, theses, scholarly articles, term papers, or pedagogic materials; handling scientific, foreign language, or graphics materials; business writing integrating spreadsheets and database programs into correspondence, reports, and proposals. See the *Schedule of Classes* for each term; special emphasis sections are limited to designated majors.

21&62:350:303. WRITING FOR BUSINESS AND THE PROFESSIONS (3)

Prerequisites: 21&62:350:101-102 or equivalent.

Development of skills in analysis and writing of articles, essays, reports, reviews, and interviews, with exploration of individual abilities and interests.

21&62:350:306. ADVANCED EXPOSITION (3)

Prerequisites: 21&62:350:101-102 or equivalent.

How to plan, revise, edit, and document lucid and persuasive preprofessional and professional memoranda, articles, reports, and research papers; meticulous evaluation of student writings; conferences.

21&62:350:308. FOUNDATIONS OF LITERARY STUDY (3)

Provides English majors with a firm foundation in the terms, concepts, and issues of literary analysis. Reading includes selections from the major genres (poetry, fiction, drama, nonfiction prose) together with a variety of critical and historical approaches. Projects introduce students to the goals and methods of literary research, including the use of computers, and provide practice in writing about literature.

21&62:350:310. ENGLISH GRAMMAR (3)

Advanced English grammar; a survey of transformational-generative approaches, with attention to classroom practice and problems, including dialects of black English, English as a second language, and remedial English.

21&62:350:311. SEVENTEENTH-CENTURY LITERATURE (3)

A study of nondramatic prose and poetry from 1600 to 1660, exclusive of Milton; attention given to historical background.

21&62:350:313. THE ART OF SATIRE (3)

History, theory, and practice from Jonson to the present.

21&62:350:315,316. ENGLISH RENAISSANCE LITERATURE (3,3)

A study of nondramatic prose and poetry from 1500 to 1600; readings from the works of More, Wyatt, Surrey, Sidney, Spenser, Marlowe, Shakespeare, Gascoigne, Lyly, Nashe, and Deloney.

21&62:350:317. READINGS IN THE ENGLISH PRE-ROMANTICS (3)

Survey of the quest for new literary forms, in poetry and prose, from James Thomson to William Godwin.

21&62:350:318. ENGLISH BIOGRAPHY AND AUTOBIOGRAPHY IN THE EIGHTEENTH CENTURY (3)

Brief survey of the field from Plutarch through the eighteenth century; the theory and practice of biography and autobiography in writers such as Colley, Cibber, Fielding, Hume, Gibbon, Goldsmith, Jonson, and Boswell.

21&62:350:319,320. SHAKESPEARE (3,3)

A sampling of history, tragedy, comedy, and romance in plays representing the span of Shakespeare's creative life.

21&62:350:323,324. ENGLISH DRAMA TO 1642, ASIDE FROM SHAKESPEARE (3,3)

From the beginnings of English drama—miracle and morality plays, interludes—to the work of Shakespeare's contemporaries and successors.

21&62:350:325,326. THE EIGHTEENTH CENTURY (3,3)

First term: Swift, Pope, and their contemporaries; *second term:* the period of Jonson.

21&62:350:329,330. THE ROMANTIC PERIOD (3,3)

First term: works of Blake, Wordsworth, and Coleridge; *second term:* works of Byron, Shelley, Keats, and their contemporaries.

21&62:350:331. THE ART OF THE FILM (3)

The viewing, analysis, and discussion of selected motion pictures by such directors as Griffith, Eisenstein, Ford, Huston, Welles, Bergman, Fellini, Buñuel, and Kurosawa; some films studied in relation to their literary sources.

21&62:350:332. AMERICAN FILM (3)

The dominant tendencies in the rise of American film from the silent era to the present, with emphasis on comedy, the western, and the gangster-thriller.

21&62:350:333,334. THE VICTORIAN PERIOD (3,3)

Poetry and prose of the years 1832 to 1900; social, political, and artistic background of the period.

21&62:350:337,338. TOPICS IN LITERATURE (3,3)

Social conflict, personal values, urban problems, technology; relation of literature to mythology, psychology, and philosophy. A different theme or topic each term.

21&62:350:339,340. MAJOR WRITERS OF THE TWENTIETH CENTURY (3,3)

Backgrounds of modern British and American literature; major prose writers and poets of our century. *First term:* works produced between 1900 and 1939; *second term:* works from World War II to contemporary writing.

21&62:350:341. MYTHOLOGY IN LITERATURE (3)

Mythology from the ancient cultures influential in later literature and thought. Topics include the birth of the gods, the creation of the universe, love sacred and profane, the cult of the hero, and visions of the afterlife.

21&62:350:342. MODERN ENGLISH POETRY (3)

Poetry from the 1920s to the present: Eliot, Auden, Spenser, Thomas, Hughes, Larkin, and others.

21&62:350:343. THE BIBLE AS LITERATURE I (3)

A study of the Bible, its literary variety, and historical and religious development in the Old Testament.

21&62:350:344. THE BIBLE AS LITERATURE II (3)

A study of the Bible, its literary variety, and historical and religious development in the New Testament.

21&62:350:345,346. MODERN DRAMA (3,3)

Dramatic literature beginning with the advent of realism in the 1860s; European, English, Irish, and American plays studied, with attention to major movements and the philosophical and artistic forces which produced them. *First term:* plays by Ibsen, Chekhov, Strindberg, Wilde, Shaw, and O'Neill; *second term:* works by Brecht, Pirandello, Beckett, Hellman, Miller, Williams, and Genet.

21&62:350:349,350. THE ENGLISH NOVEL (3,3)

Beginnings and development through the nineteenth century; *first term:* novels by Defoe, Richardson, Fielding, Goldsmith, Sterne, Godwin, and Lewis; *second term:* works by Austen, Dickens, Thackeray, the Brontës, George Eliot, Hardy, and Butler.

21&62:350:351,352. SURVEY OF WORLD LITERATURE (3,3)

A survey, through translations, of significant works in world literature and their influence on Western thought.

21&62:350:353,354. MODERN AND CONTEMPORARY ENGLISH NOVEL (3,3)

English fiction from 1900 to the present. Selected works of Virginia Woolf, D.H. Lawrence, Doris Lessing, A.S. Byatt, and Pat Barker illustrate formal shifts linked to social and economic changes. Questions are posed about narratives and how to read and write novels.

21&62:350:355. THE TECHNIQUE OF POETRY (3)

A study of metrical structure, the development of poetic form, and poetry in relation to other forms of literary expression.

21&62:350:356. CARIBBEAN LITERATURE (3)

Familiarizes the student with the basic themes and issues of Caribbean societies as represented in literature. The choice of texts reflects the linguistic and radical diversity of Caribbean cultures, as well as emphasizing the links among them.

21&62:350:360. TOPICS IN WOMEN AND LITERATURE (3)

The images and writing styles of women's poetry, drama, fiction, and nonfiction prose in different cultures; common themes and variations connected with class, ethnic, racial, and other differences; use and revision of conventions and stereotypes by both male and female writers.

21&62:350:361. WOMEN IN LITERATURE (3)

Prerequisite: Junior or senior standing or permission of instructor.
Selected literature by women that focuses specifically on women; works by Marge Piercy, Kate Chopin, Charlotte Perkins Gilman, Alice Walker, and Mary Wollstonecraft. Emphasis on changing and continuous notions of womanhood and their formal representation in fiction; particular paradigms employed are female identity and the novel of female development.

21&62:350:362. WOMEN IN LITERATURE (3)

Prerequisite: Junior or senior standing or permission of instructor.
Selected literature by women that focuses specifically on women; works by Jane Austen, Louisa May Alcott, Virginia Woolf, and Toni Morrison examined. Emphasis on changing and continuous notions of womanhood and their formal representation in fiction; particular paradigms employed are marriage and the community of women.

21&62:350:363,364. SPECIAL TOPICS IN FILM (3,3)

Prerequisite: At least 3 credits in a college-level film course.
Topics change from year to year; topics include themes (e.g., women in film, the war film); studies in a major director (e.g., Bergman, Ford, Fellini, Hitchcock); national cinemas other than the American film; and film theory and criticism.

21&62:350:365. WORLD DRAMA TO 1900 (3)

A survey of drama throughout the world, from the Greek classics to forerunners of modern realism.

21&62:350:368. RESTORATION AND EIGHTEENTH-CENTURY DRAMA (3)

English drama from Dryden to Sheridan, with emphasis on theatrical backgrounds.

21&62:350:371. MILTON (3)

Literary and social backgrounds; the life of Milton, and his English and Latin works (the latter in translation).

21&62:350:373. CHAUCER (3)

Literary and social backgrounds; the life of Chaucer, Chaucer's language, and extensive reading of his works.

21&62:350:375. WRITING NONFICTION (3)

Prerequisites: 21&62:350:101-102 or equivalent.
Workshop survey of nonfictional forms, including autobiography, oral history, case study, and factual narrative; nonfiction writing projects, workshop discussion, individual consultations, and, where appropriate, collaboration in writing projects with other disciplines.

21&62:350:377. SCIENCE FICTION, TECHNOLOGY, AND SOCIETY (3)

Science fiction as a principal cultural expression of the impact of science and technology on society from the Industrial Revolution to the present and future.

21&62:350:378. MIDDLE ENGLISH LITERATURE, ASIDE FROM CHAUCER (3)

Survey of medieval English literature from 1200 to 1500, with emphasis on the romances, popular ballads, lyrics, dramas, and religious and political allegories; selections read in modernized versions.

21&62:350:379. COMPUTERS AND LITERATURE (3)

Prerequisites: 21&62:350:101-102 or equivalent.
The use and image of computers in literature and literary study; word processing, online retrieval, computer-assisted instruction and learning (CAI and CAL), artificial intelligence (AI), and information technology (IT); how computers parse sentences, write machine poetry, make literary indexes, create concordances, and do stylistic analyses; the image of computers and other intelligent technology in imaginative literature, with readings by Swift, Blake, Butler, Huxley, Orwell, Clarke, Asimov, Burgess, Vonnegut, Pynchon, Lessing, Joyce, and Dylan Thomas.

21&62:350:380. THE EUROPEAN RENAISSANCE AND ENGLISH LITERATURE (3)

Historical background and significant works of European literature during the rise of humanism and the Reformation; emphasis on their relation to contemporary English literature.

21&62:350:381. THE SHORT STORY (3)

Reading and critical study of classical, medieval, and modern short stories; discussion of predominant techniques and theories.

21&62:350:382. JAMES JOYCE (3)

A survey of Joyce's writings; intensive study of some major works.

21&62:350:385. EIGHTEENTH- AND NINETEENTH-CENTURY DRAMA (3)

English drama and its background from Farquhar to Wilde.

21&62:350:391. WRITING FOR PUBLICATION (3)

Prerequisite: Writing sample must be presented to instructor before registration. Credit not given for both this course and 21&62:570:391.

Advanced feature and article writing; students function as editorial board, discussing ideas for news features and magazine articles, and offering constructive criticism to each member-writer; students must produce a newspaper feature and a magazine article; the process is from query letter to finished feature and article.

21&62:350:393,394. STUDIES IN LITERARY RELATIONS (3,3)

Critical relations between works of different periods or genres; the variety of literary responses to a given historical moment; the relation of English and American literature to its intellectual and social origins; the effects of literary works on society. Various special topics film courses (e.g., studies in film genre or the works of a director) also are offered.

21&62:350:395. NUCLEAR WAR AND LITERATURE (3)

Credit not given for both this course and 21&62:050:395.

The development of nuclear weapons in culture and history from their first appearance as fiction in the first decade of the twentieth century through the imagined futures that now form part of everyday life. Readings of works from Japan, the U.S., the former Soviet Union, and other nations.

21&62:350:398. LITERATURE OF PROTEST (3)

Literary works of several nations and eras; themes include economic, political, or social injustice and oppression; authors include Blake, Dos Passos, Gaskell, Mill, Shaw, Silone, Sinclair, Solzhenitsyn, Swift, and Thoreau.

21&62:350:405,406. MAJOR VICTORIAN AUTHORS (3,3)

Intensive study of two or more Victorian writers each term; the relation of their work to the intellectual and historical background of their times.

21&62:350:407,408. INDEPENDENT STUDY IN ENGLISH (3,3)

Prerequisite: Permission of program adviser. See also 21&62:350:495, 496.

Designed for students who wish to pursue literary studies (and who do not qualify for the Honors Program 21&62:350:495, 496) outside the scope of existing courses. The student must interest a faculty member in supervising the project, convince him or her that the student has the ability to do the work, and then submit a written request to the department chairperson naming the consenting faculty supervisor. All other arrangements are determined by the student and supervisor.

21&62:350:411. DEVELOPMENT OF THE ENGLISH LANGUAGE (3)

Historical study of Old, Middle, and Modern English, with a survey of lexicography.

21&62:350:415,416. SEMINAR IN LITERATURE (3,3)

Prerequisites and topic to be determined by instructor.

Course material is specialized and changes from year to year. Some appropriate subjects include politics and fiction, theories and forms of tragedy, the Irish Renaissance.

21&62:350:417,418. LITERARY CRITICISM (3,3)

Prerequisite: Junior or senior standing or permission of instructor.

Important concepts of literary value; *first term:* the beginnings and development through the early nineteenth century; *second term:* more recent trends.

21&62:350:419,420. AUTHORS (3,3)

Intensive study of the life and works of one or more major authors; possible authors include Dickens, Faulkner, Pound, Eliot, Frost, Yeats, Hawthorne, and Melville.

21&62:350:429,430. ASPECTS OF THE EUROPEAN NOVEL (3,3)

Prerequisites: 21&62:350:215, 216 or equivalent.

Selected writings by Stendhal, Dostoevski, Conrad, Proust, and Malraux; development of the art of fiction.

21&62:350:431. THE WORLD NOVEL TO 1900 (3)

Major novels selected from the world's literatures, such as the Russian, French, Spanish, Japanese, and German, read in translation.

21&62:350:432. THE WORLD NOVEL IN THE TWENTIETH CENTURY (3)

Major novels from the literatures of Europe, Latin America, Africa, and the East, read in translation.

21&62:350:433. ASIAN-AMERICAN LITERATURE (3)

Students are introduced to the most important works and issues in the emergence of Asian-American literature; covered are Chinese-American, Japanese-American, Korean-American, Filipino-American, and Indian-American works, among others; readings from Bulosan, Sone, Hong-Kingston, Mukherjee, Hwang, and Tan.

21&62:350:449,450. POPULAR CULTURE (3,3)

A history of the popular book, newspapers, magazines, photography, film, radio, television, and other media as they have influenced and been influenced by literature, commencing with the eighteenth and nineteenth centuries in the first term and continuing to the present in the second term.

21:350:458,459. INTERNSHIP (3,3)

Placement in an appropriate publishing, public relations, or media firm for eight to ten hours per week; a journal reflecting each working day's activities plus a paper to be agreed upon by the academic supervisor and the intern.

21&62:350:461. CREATIVE WRITING (3)

Introduction to the elements of fiction. Exercises and practice in learning the basic tools of fiction writing and how to use them to tell a story.

21&62:350:462. CREATIVE WRITING (3)

Prerequisite: 21&62:350:461 or permission of instructor.

Advanced course in recognizing and applying the elements of fiction and shaping them into various forms of story.

21&62:350:463,464. CREATIVE WRITING: POETRY (3,3)

Prerequisite: Permission of instructor.

Creative workshop in the forms of poetry and verse.

21&62:350:467. RECENT TRENDS IN BRITISH DRAMA (3)

An analysis of post World War II British dramatic literature; emphasis on theatrical movements, major figures, and major plays; topics include the "new realism" and the development of the antihero as a dramatic character; readings from Arden, Bond, Delaney, Orton, Osborne, Pinter, and Stoppard.

21&62:350:469,470. LITERARY GENRES (3,3)

Readings in the development of a single literary form or type each term (e.g., tragedy, comedy, fantasy, romance, epic, detective fiction).

21&62:350:479. MAJOR BRITISH AUTHORS I (3)

Selected British literature from *Beowulf* to Pope.

21&62:350:480. MAJOR BRITISH AUTHORS II (3)

May be taken independent of 21&62:350:479.

Selected British literature from Blake to T.S. Eliot.

21&62:350:481. READINGS IN A MAJOR AUTHOR (3)

An intensive study of the works of a single author whose name is announced in the term preceding the course offering; Faulkner, Joyce, the Brontës, and O'Neill recently offered.

21&62:350:482. READINGS IN A MAJOR AUTHOR (3)

May be taken independent of 21&62:350:481.

Supplements 21&62:350:481 and uses a similar approach.

21&62:350:495,496. HONORS PROGRAM—STUDIES IN LITERATURE (3,3)

Open only to honors students. Prerequisite: Permission of program adviser. See also 21&62:350:407,408.

The pursuit of special projects outside the scope of any of the existing courses under the guidance of a member of the department. The student must interest a faculty member in supervising the project and then submit a written request to the department chairperson naming the consenting faculty supervisor. All other arrangements are determined by student and supervisor.

21&62:350:497,498. HONORS PROJECT—ENGLISH (3,3)

Prerequisites: Junior or senior standing and permission of department chairperson.

Courses (American Literature 352)**21&62:352:222. MAJOR AMERICAN WRITERS (3)**

Open to qualified first-year students with permission of instructor or department chairperson.

Intensive study of the works of two or more major American writers.

21&62:352:223,224. SURVEY OF AMERICAN LITERATURE (3,3)

Open to sophomores and juniors. Can be taken as elective toward English major.

The effects of intellectual and social changes, and the relationship between important authors and their times. American literature to the Civil War in the first term, continuing to the present in the second term.

21&62:352:300,301. AMERICAN POETRY (3,3)

American poetry and its backgrounds, critical standards, and techniques from the seventeenth century to the present.

21&62:352:333. AMERICAN DRAMA (3)

A survey of American plays in their historical context from early melodramas, romances, and comedies through the modern realistic and expressionistic work of O'Neill, Odets, Anderson, Hellman, Miller, Williams, Albee, Baraka, and others.

21&62:352:337,338. AMERICAN LITERATURE OF THE NINETEENTH CENTURY (3,3)

Studies in two or more related authors; emphasis on Emerson, Thoreau, Poe, Hawthorne, or Melville in the first term and on Whitman, Twain, James, or Dickinson in the second term.

21&62:352:343,344. AMERICAN LITERATURE OF THE TWENTIETH CENTURY (3,3)

Major fiction, poetry, and other writing by Dreiser, Anderson, Hemingway, Fitzgerald, Eliot, O'Neill, Dos Passos, Frost, Faulkner, or other recent American authors.

21&62:352:348,349. MINORITIES IN AMERICAN LITERATURE (3,3)

First term: poetry, short fiction, autobiographies, and novels from the nineteenth to mid-twentieth centuries; *second term:* texts from the twentieth century. Texts by African-American, Native American, Hispanic, Asian-American, Jewish-American, and other "minority" or immigrant writers; emphasis on social, historical, and political contexts, and social construction of "race" and ethnicity.

21&62:352:350. THE VIETNAM WAR AND AMERICAN LITERATURE (3)

Interdisciplinary course exploring the interrelations between the U.S. war in Vietnam and American culture—before, during, and after. Students study fiction, poetry, autobiography, documentary films, and primary documents, including treaties, previously classified reports, and internal analyses written by the decision makers.

21&62:352:351. CRIME AND PUNISHMENT IN AMERICAN LITERATURE (3)

Crime and punishment in representative and influential works of American literature from the mid-nineteenth century to the present.

21&62:352:361. STUDIES IN AMERICAN AUTHORS I (3)

Selections from the colonial period to the Civil War.

21&62:352:362. STUDIES IN AMERICAN AUTHORS II (3)

May be taken independent of 21&62:352:361.

Selections from the post-Civil War period to the twentieth century.

21&62:352:363,364. THE NOVEL IN AMERICA (3,3)

First term: novels of the nineteenth and early twentieth centuries; *second term:* novels of the twentieth century. A diverse range of American novels by both canonical and noncanonical writers; emphasis on the social and historical contexts of fictional conventions.

21&62:352:368,369. SPECIAL TOPICS IN AMERICAN LITERATURE (3,3)

Topics change from year to year; specific topic noted in the *Schedule of Classes*.

21&62:352:376. MODERN AMERICAN POETRY (3)

Poetry from the imagist revolt of the 1920s to the present: Frost, Stevens, Williams, Moore, Roethke, Lowell, Plath, Cummings, Sexton, and others.

21&62:352:377,378. CONTEMPORARY AMERICAN LITERATURE (3,3)

Survey of American fiction, poetry, drama, and other forms from World War II to the present.

21&62:352:395,396. AFRO-AMERICAN LITERATURE (3,3)

Survey of the significant poetry and prose of black writers in Africa and the United States.

21&62:352:420. RECENT TRENDS IN AMERICAN FICTION (3)

American fiction from 1930 to the present.

21&62:352:468. RECENT TRENDS IN AMERICAN DRAMA (3)

Post-World War II American plays and playwrights and the major influences that determined the direction of American drama; recent developments in American theater, the influence of the avant-garde, the changing character of the American scene, the growth of black theater, and the "new realism"; readings from Albee, Bullins, Guare, Pintero, Rabe, Shepard, Ward, and others.

Courses (Journalism, Media, and Writing 570)**21&62:570:201. JOURNALISM AND COMMUNICATIONS MEDIA (3)**

Introductory seminar introducing the historical and philosophical development of journalism and media operations in the U.S. Analysis and evaluation of the functions, practices, policies, and responsibilities of media institutions in the dissemination of information to the public. Emphasis on ethical and aesthetic issues related to newspapers, magazines, books, other print-based media, and new communications technologies. *Second term:* offered in the Department of Visual and Performing Arts as 965:570:202.

21&62:570:337. BASIC REPORTING (3)

Prerequisite: 21&62:570:201 or permission of the journalism director.

Basic news gathering techniques used at newspapers, magazines, and television and radio stations; fieldwork; stories are written at computers under newsroom conditions.

21&62:570:338. ADVANCED REPORTING (3)

Prerequisite: 21&62:570:337.

Urban affairs reporting; police headquarters, city hall, courts, board of education, and other urban beats.

21&62:570:339. INVESTIGATIVE REPORTING (3)

Prerequisite: Junior or senior standing.

The art of the exposé; full investigation of a complex story; techniques for acquiring records; the investigative interview; rights of reporters; final project earmarked for professional publications.

21&62:570:343. PUBLIC RELATIONS PRACTICES (3)

Prerequisites: 21&62:570:201, 337.

A study of the public relations process in the public and private sectors; students complete a public relations project.

ENVIRONMENTAL SCIENCES

21&62:570:344. JOURNALISM, ETHICS, AND THE LAW (3)

Prerequisites: 21&62:570:201.

Libel, ethics, and media law; emphasis on protection of sources, privacy, fair trial, free press, controversy, and freedom of information statutes.

21&62:570:346. INDEPENDENT STUDY (3)

A special journalism project for qualified students, conducted with a member of the faculty.

21&62:570:348. SPORTS REPORTING (3)

Prerequisites: 21&62:570:201, 337 or permission of the journalism director.

Examination of sports journalism and its impact on the urban environment; students produce articles dealing with this aspect of reporting.

21&62:570:385. PHOTOJOURNALISM (3)

Prerequisites: 21&62:570:201, 337, 338 or permission of instructor.

Using a camera as a journalism textbook; how to take pictures and develop them under deadline conditions.

21&62:570:386. TELEVISION NEWS WRITING (3)

Prerequisites: 21&62:570:201, 337, 338 or permission of instructor.

Writing copy to picture; how to take a print story and make it a television story; outside field production work.

21&62:570:387. RADIO NEWS WRITING (3)

Prerequisites: 21&62:570:201, 337, 338 or permission of instructor.

Writing news copy for the ear; how to take a print story and make it an airwaves success; how to combine reality and copy to make a good radio news feature.

21&62:570:388. WORLD JOURNALISM (3)

Prerequisites: 21&62:570:201, 337, 338 or permission of department chairperson.

Modern journalism in different countries, the advent of technology, private and government press structures, media services, and practices in nations of the world.

21&62:570:391. WRITING FOR PUBLICATION (3)

Prerequisite: Writing sample must be presented to instructor before registration. Credit not given for both this course and 21&62:350:391.

Advanced feature and article writing; students function as editorial board, discussing ideas for news features and magazine articles, and offering constructive criticism to each member-writer; students must produce a newspaper feature and a magazine article; the process is from query letter to finished feature and article.

21&62:570:400. TOPICS IN JOURNALISM (3)

Prerequisites: 21&62:570:201, 337, 338 or permission of department chairperson.

Study in a specialized field of journalism, including education, politics, or crime.

21&62:570:455,456. JOURNALISM MASTERS (3,3)

The literature of journalism. *First term:* from journalism's historic roots to 1937; *second term:* from World War II to the present. Works of Hemingway, Orwell, Reed, and Agee.

21&62:570:457. COPY EDITING (3)

Prerequisites: 21&62:570:201, 337, 338.

Modern methods of copy editing, including video terminals; functions and responsibilities of the copy editor.

21&62:570:459,460. JOURNALISM INTERNSHIP (3,3)

Open only to seniors.

For those who have demonstrated superior skill in their field; work at least one day a week at a newspaper, magazine, broadcasting station, or public relations firm. Evaluation by staff executives of the participating organization.

21&62:570:490. JOURNALISM LABORATORY (1)

Fieldwork in the advanced reporting course.

21&62:570:493,494. NEWSROOM WORKSHOP (3,3)

Prerequisites: 21&62:570:201, 337, 338 or permission of department chairperson.

Seminar for advanced students on a term project; professional level performance on newspapers and in broadcast organizations.

ENVIRONMENTAL SCIENCES 375

Program in Environmental Sciences

Boyd Hall (973/353-5100)

A major in environmental sciences is offered at NCAS.

Major Requirements

The major in environmental sciences is an interdisciplinary program among the departments of Geology, Biology, and Chemistry. The goal of the program is to give students a well-rounded background in science as it relates to the environment. The program is rigorous and is designed either to prepare graduates for technical positions in the environmental industry or to allow them to continue their education in graduate studies. The program also prepares students to pursue an environmental career through the fields of law, business, sociology, health, or political science.

The environmental science major requires at least 65 credits in the following courses:

Foundation Courses (27 credits)

- 21&62:120:101-102 General Biology (4,4)
- 21&62:120:205 Environmental Issues (3)
- 21&62:160:113-114 General Chemistry Laboratory I,II (1,1)
- 21&62:160:115-116 General Chemistry I,II (3,3)
- 21&62:460:103 Planet Earth (3)
- 21&62:460:104 Planet Earth Laboratory (1)
- 21&62:460:206 Environmental Geology (3)
- 21&62:460:207 Environmental Geology Laboratory (1)

Quantitative Courses (7 credits)

- 21&62:640:135 Calculus I (4)
- 21&62:640:327 Probability and Statistics (3)

Field Courses (5-6 credits)

- 21&62:120:381 Field Studies in Animal Ecology (2) *or*
- 21&62:120:470 Field Ecology (3)
- 21&62:460:311 Geologic Field Problems (3)

Senior Seminar (3 credits)

- EVSC 613 Environmental Problem Solving (3) (NJIT course)

Advanced Science Courses (22 credits)

- 21&62:120:335 General Microbiology (4)
- 21&62:120:370 Plant Ecology (3) *or* 21&62:120:380 Animal Ecology (3)
- 21&62:160:227 Experimental Analytical Chemistry (3)
- 21&62:460:309 Geomorphology (3)
- 21&62:460:427 Hydrogeology (3)
- Chem 360 Environmental Chemistry (3) (NJIT course)
- Chem 365 Environmental Organic Chemistry (3) (NJIT course)

Recommended Electives

- 21&62:120:311 Taxonomy of Vascular Plants (4) *or*
- 21&62:120:327 Biology of Vertebrates (4)

21&62:460:114,115	Earth and Life History, Laboratory (4)
21&62:460:406	Applied Geophysics (3)
21&62:750:203	General Physics (3)
21&62:750:205	Physics Laboratory (1)
ENE 560	Chemistry for Engineers (3) (NJIT course)
STS 418	Environmental Economics (3) (NJIT course)
STS 560	Ethics and the Environment (3) (NJIT course)

FRENCH 420

*Department of Classical and Modern Languages and Literatures
Conklin Hall (973/353-5498)*

The French major and minor are offered at NCAS.

The department offers major programs in Ancient Mediterranean Civilizations (Classics 190, Greek 490, Hebraic Studies 500, Latin 580), Central and Eastern European Studies 149, French 420, German 470, and Spanish 940. Students majoring in one language area may concurrently major or minor in another language area. The department also participates in the interdisciplinary major, a multi-disciplinary minor in International Affairs, the Rutgers Study Abroad Program, and offers courses in Portuguese, Arabic, and Linguistics.

Major Requirements

The requirements for a major in French are the following:

1. 30 credits in French language and literature, which may include 21:420:131,132 Intermediate French. Any of the French language and literature courses numbered 200 or higher may be taken to satisfy this requirement, with the exception of 21:420:311,312 French Literature in English Translation. The prerequisite for advanced literature courses is 21:420:205,206 Introduction to French Literature.
2. 9 credits in other courses within the department, at least three of which must be in literature in the original language or in translation.
3. 6 credits from one or more of the following as approved by an adviser: English literature courses numbered higher than 215,216; philosophy; music history; art history.

Minor Requirements

A minor in French requires 18 credits in French language and literature. These credits may include 21:420:131,132 Intermediate French and must include 6 credits in courses numbered 300 and above, with the exception of 21:420:311,312 French Literature in English Translation.

The Department of Classical and Modern Languages and Literatures also offers minors in Ancient Mediterranean Civilizations, German, Italian, Portuguese, Slavic, and Spanish. Students may pursue one or more minor concentrations.

Teacher Certification

Students seeking teacher certification in French must complete the requirements for a major in French as well as satisfy other requirements for certification. For details

regarding admission to the teacher education program and the requirements, students should consult both their department adviser and the chairperson of the education department.

Courses

21:420:101-102. ELEMENTARY FRENCH (3,3)

Intended for students with little or no previous knowledge of French. Both terms must be completed to receive credit.

The fundamentals of grammar with drill in speaking and reading. A minimum of ten hours of language laboratory work per term is required in NCAS elementary language courses.

62:420:101-102. ELEMENTARY FRENCH (3,3)

Intended for students with little or no previous knowledge of French. Experience in some foreign language learning recommended.

Beginning course designed to develop the basic skills of listening, speaking, reading, and writing; study of basic grammar and vocabulary. Students are urged to do supplementary work in the language laboratory.

21:420:131,132. INTERMEDIATE FRENCH (3,3)

Prerequisite: 21:420:102 or equivalent as determined by placement examination.

Grammar review and selected readings in literature and cultural areas. Emphasis on speaking and writing French.

62:420:131,132. INTERMEDIATE FRENCH (3,3)

Practice in speaking, reading, and writing French; review of grammar; readings from representative authors and contemporary French texts. Students are urged to do supplementary work in the language laboratory.

21:420:203. CONVERSATION AND COMPOSITION (3)

Grammar review through oral and written usage. Oral exposés; compositions; language laboratory for conversation, grammar, and pronunciation reinforcement.

21:420:204. COMPOSITION AND CONVERSATION (3)

Prerequisite: 21:420:203 or permission of instructor.

Intensive practice in oral and written French.

21:420:205,206. INTRODUCTION TO FRENCH LITERATURE (3,3)

Prerequisite: 21:420:132 or equivalent. 21:420:205 and 206 are prerequisites to advanced courses in French literature.

Readings in French literature chosen to illustrate various literary forms and periods. Conducted as far as is practical in French.

21&62:420:260. CONTEMPORARY FRANCE (3)

Taught in English. Not open to French majors or minors.

Interdisciplinary study of contemporary France and the French: political, social, and economic concerns; technological innovations; the arts and their function in society; the continuity of tradition and the challenge of change.

21:420:301. ADVANCED GRAMMAR AND COMPOSITION (3)

Prerequisites: 21:420:203,204. For prospective teachers and others who wish to acquire more fluency in spoken and written French.

Special stress on unusual points of grammar and syntax.

21:420:302. ADVANCED GRAMMAR AND CONVERSATION (3)

Prerequisites: 21:420:203,204.

Conversation practice and free composition on a wide range of subjects. Emphasis on unusual points of grammar and syntax.

21:420:304. BLACK WRITERS IN FRENCH FROM AFRICA AND THE WEST INDIES (3)

Prerequisites: 21:420:203,204 or 205,206.

Study of the major writers of French-speaking Africa and the West Indies, with emphasis on the poets of "négritude," especially Césaire, Senghor, and Damas.

GEOLOGICAL SCIENCES

21:420:311,312. FRENCH LITERATURE IN ENGLISH TRANSLATION (3,3)

Open to all students except French majors and minors. Prerequisite: 21&62:350:102.

In-depth reading of major works in French literature; content varies each term. When the theme of "Sexual Politics in the Novel and Drama" is taught, 3 credits toward the women's studies major and minor are granted. Other themes include "The Novel as Social Document" and "The Many Faces of Love in Various Genres."

21:420:347. FRENCH CIVILIZATION (3)

The development of French political, social, cultural, and artistic institutions and traditions from pre-Roman Gaul to the twentieth century.

21:420:353,354. INDIVIDUAL STUDY IN FRENCH (3,3)

Prerequisite: Permission of department chairperson or instructor.

Individual study for students interested in specialized topics and research in French language or literature.

21:420:361. MOLIÈRE (3)

Prerequisites: 21:420:205,206.

Major and selected minor plays; lectures, class discussions, reports.

21:420:362. VOLTAIRE (3)

Prerequisites 21:420:205,206; or permission of instructor.

Historical works, drama, poetry, satire, and fiction; lecture, class discussion, papers.

21:420:415. MEDIEVAL FRENCH LITERATURE (3)

Deals principally with the Chansons de Geste, the Arthurian romances, the Tristan story, the theater, and lyric poetry.

21:420:416. FRENCH LITERATURE OF THE RENAISSANCE (3)

Deals principally with Rabelais and Montaigne and the development of lyric poetry from Marot to La Ceppède.

21:420:417. THE FRENCH THEATER SINCE 1700 (3)

Major works and critical theories of the last three centuries; close reading of selected plays.

21:420:418. FRENCH POETRY (3)

An exploration of poetry—forms, language, themes—in works by Ronsard, Christine de Pisan, Lamartine, Baudelaire, La Fontaine, Anna de Noailles, and others.

21:420:421,422. FRENCH LITERATURE OF THE GOLDEN AGE (3,3)

Readings of seventeenth-century masterpieces, with a background of critical theory and literary history; the Baroque and *préciosité*—examples of late Renaissance style; analysis of French classicism; emphasis on the theater of Corneille, Racine, and Molière; and various works by La Fontaine.

21:420:427,428. SEMINAR IN FRENCH LITERATURE (3,3)

Prerequisites: 21:420:205,206 or permission of instructor.

Exploration of ideas and concepts as they are reflected in diverse genres of French literature throughout the eight centuries of its history; content varies each term.

21:420:431,432. EIGHTEENTH-CENTURY FRENCH LITERATURE (3,3)

The major writers and genres of the century; *first term:* Voltaire and the Age of Reason; *second term:* Rousseau and the Age of Sentiment.

21:420:441. NINETEENTH-CENTURY FRENCH LITERATURE (3)

The innovative movements of romanticism and realism in prose fiction, criticism, verse, and drama; thematic and structural study of major texts by Lamartine, Musset, Hugo, Vigny, Madame de Staël, Constant, Chateaubriand, Balzac, Stendhal, and others.

21:420:442. NINETEENTH-CENTURY FRENCH LITERATURE (3)

The development of the romantic movement through realism, naturalism, *Parnasse*, and symbolism; thematic and structural analysis of works of Flaubert, Gautier, Heredia, Leconte de Lisle, Zola, Baudelaire, Verlaine, and Rimbaud.

21:420:451,452. TWENTIETH-CENTURY FRENCH LITERATURE (3,3)

First term: in-depth reading and analysis of the major novelists and playwrights of this century: Proust, Mauriac, Colette, Cocteau, Anouilh, and the surrealist poets. *Second term:* existentialism, the theater of the absurd, and the new novel, with special attention to Malraux, Sartre, de Beauvoir, Camus, Beckett, Ionesco, Genet, and Rochefort.

21:420:453,454. THE FRENCH NOVEL (3,3)

French novelists from Mme. de Lafayette to Robbe-Grillet and other authors of the *nouveau roman*.

GEOLOGICAL SCIENCES (Geology 460, Meteorology 670)

Department of Geological Sciences

Boyden Hall (973/353-5100)

The major and minor in geology are offered at NCAS.

Major Requirements

The Department of Geological Sciences aims to foster the intellectual development of its students within a geological perspective, and to prepare them to evaluate critical contemporary issues and problems relating to the earth's physical environment. For anyone contemplating graduate studies and a professional career in geology, certain ancillary courses are required and others strongly recommended.

Geology majors may (A) choose a traditional curriculum, (B) design their own curriculum, or (C) select an environmental geology track curriculum. These curricula may serve as a preparation for graduate studies or a career in the petroleum or mining industries, environmental geology, oceanology, land-use planning, teaching, business, and law.

Environmental Geology also offers graduate studies in several areas of geology; it is possible to obtain the B.A. (or B.S. as an option) and M.S. degrees in five years.

Curriculum A

This classic geology curriculum requires 58 credits.

Required courses (29 credits)

21&62:460:103	Planet Earth (3)
21&62:460:104	Planet Earth Laboratory (1)
21&62:460:114	Earth and Life History (3)
21&62:460:115	Earth and Life History Laboratory (1)
21&62:460:309	Geomorphology (3)
21&62:460:311	Geologic Field Problems (3)
21&62:460:314	Stratigraphy (4)
21&62:460:320	Structural Geology (4)
21&62:460:321	Mineralogy (4)
21&62:460:322	Petrology (3)

At least three of the following recommended courses (9 credits):

21&62:120:415	Paleobotany (4)
21&62:460:206-207	Environmental Geology and Laboratory (3,1)
21&62:460:313	Invertebrate Paleontology (3)
21&62:460:331	Oceanology (3)
21&62:460:401	Introduction to Geochemistry (3)
21&62:460:403	Optical Mineralogy (3)
21&62:460:406	Applied Geophysics (3)
21&62:460:414	Advanced Readings in Geology (2)
21&62:460:427	Hydrogeology (3)

Required cognate courses (20 credits)

- one year of general chemistry with laboratory (8)
- one year of general physics with laboratory (8)
- one term of mathematics (calculus) (4)

Curriculum B

Students are encouraged to discuss with faculty members the possibility of their graduating through curriculum B. Those students who qualify for this curriculum are formally admitted to it by invitation of a faculty sponsor and must successfully complete the following requirements:

1. Grades of *B* or better in all geology courses
2. 24 to 27 credits in geology courses to be determined by the sponsor in consultation with the student
3. A written report based on a major research project, consisting of 6–9 credits
4. Year courses in mathematics, chemistry, physics and/or biology, and one year of a foreign language (French, German, or Russian)

Curriculum C

The environmental geology track requires a total of 64 credits.

Required geology courses (36 credits)

- 21&62:460:103 Planet Earth (3)
- 21&62:460:104 Planet Earth Laboratory (1)
- 21:460:114 Earth and Life History (3)
- 21:460:115 Earth and Life History Laboratory (1)
- 21&62:460:206-207 Environmental Geology and Laboratory (3,1)
- 21&62:460:309 Geomorphology (3)
- 21&62:460:311 Geologic Field Problems (3)
- 21&62:460:314 Stratigraphy (4)
- 21&62:460:320 Structural Geology (4)
- 21&62:460:321 Mineralogy (4)
- 21&62:460:322 Petrology (3)
- 21&62:460:427 Hydrogeology (3)

Two additional geology courses (6 credits) to be chosen from the following list:

- 21&62:120:415 Paleobotany (4)
- 21&62:460:313 Invertebrate Paleontology (3)
- 21&62:460:331 Oceanology (3)
- 21&62:460:401 Introduction to Geochemistry (3)
- 21&62:460:403 Optical Mineralogy (3)
- 21&62:460:406 Applied Geophysics (3)
- 21&62:460:414 Advanced Readings in Geology (2)

Required cognate courses (19 credits)

- one year of general chemistry with laboratory (8)
- one year of general biology with laboratory (8)
- one term of statistics (3)

Additional cognate courses (3–4 credits) to be chosen from the following list:

- 21&62:120:205 Environmental Issues (3)
- 21&62:120:370 Plant Ecology (or other field biology course) (3)
- 21&62:160:227 Experimental Analytical Chemistry (3)
- 21&62:670:303 Meteorology (3)
- 21&62:790:310 Science, Technology, and Public Policy (3)
- CE 341/CE 341A Soil Mechanics with Laboratory (4) (NJIT course)

- CE 506 Remote Sensing of the Environment (3) (NJIT course)
- EM 631 Legal Aspects in Environmental Engineering (3) (NJIT course)
- ENE 360 Environmental Engineering (3) (NJIT course)
- ENE 361 Environmental Problems (3) (NJIT course)
- ENE 560 Environmental Chemistry (3) (NJIT course)
- SET 420 Land Information Systems (3) (NJIT course)
- STS 382 Geographic Perspectives on the Environment (3) (NJIT course)
- STS 413 Environmental History and Policy (3) (NJIT course)
- STS 418 Environmental Economics (3) (NJIT course)

Minor Requirements

Students must fulfill 20 credits for a minor in the geological sciences.

The required courses are as follows:

1. Laboratory science (8 credits)
 - 21&62:460:103 Planet Earth (3)
 - 21&62:460:104 Planet Earth Laboratory (1)
 - 21&62:460:114 Earth and Life History (3)
 - 21&62:460:115 Earth and Life History Laboratory (1)
2. 12 additional credits of 200 or higher-numbered geology courses; 9 of the 12 credits must be in the 300- or 400-level courses.

Teacher Certification

Students seeking teacher certification in earth science must complete the requirements for a major in the geological sciences department as well as satisfy other requirements for certification. For details regarding admission to the teacher education program and the requirements, students should consult both their department adviser and the chairperson of the education department.

Courses (Geology 460)**21&62:460:101. INTRODUCTION TO THE EARTH (3)**

Not intended for geology majors or students who have taken or plan to take 21&62:460:103.

A nonlaboratory description of the earth; the processes that affect its composition, evolution, and history; the earth's interaction with the atmosphere and oceans.

21&62:460:102. AFRICA: A VIRTUAL FIELD TRIP TO THE CONTINENT (3)

Study of land and atmospheric processes through examination of the African plate, including its geology, tectonics, climate, resources, landscapes, and the impact of the geosciences on aspects of African history, economy, and politics.

21&62:460:103. PLANET EARTH (3)

Not open to students who have taken 21&62:460:101. To complete the laboratory science requirement, students taking 21&62:460:103 and 104 must select either 21&62:460:113 and 116 or 21:460:114 and 115.

The earth as a dynamic, evolving planet; its origin and nature considered as the interaction of solid earth, hydrosphere, and atmosphere; physical geology of our planet and the complex problems of environment and natural resources.

GEOLOGICAL SCIENCES

21&62:460:104. PLANET EARTH LABORATORY (1)

Pre- or corequisite: 21&62:460:103. To complete the laboratory science requirement, students taking 21&62:460:103 and 104 must select either 21&62:460:113 and 116 or 21:460:114 and 115.

Laboratory exercises on the following: the physical properties and identification of earth materials (materials and rocks); the use of maps and aerial photographs in the study of landforms and earth processes. Field trips to field stations in New Jersey and New York.

21&62:460:106. ENVIRONMENTAL GEOLOGY (3)

Prerequisite: 21&62:460:103.

The geologic controls on environmental problems and methods for mitigation are studied in a topical approach and with emphasis on urban-suburban settings. Topics include groundwater pollution and processes, soil pollution, air pollution and weather, slope stability, radiation, earthquake hazards, and coastal processes.

21&62:460:113. HISTORY OF LIFE (3)

Prerequisites: 21&62:460:103,104 or permission of instructor.

The evolution of life as recorded in the fossil record; the appearance of major groups of organisms and the transition to terrestrial environments leading to the appearance of man; interpretation of the fossil record in terms of the interaction of organisms and their environment.

21&62:460:114. EARTH AND LIFE HISTORY (3)

Prerequisites: 21&62:460:103,104 or permission of instructor.

Selected topics of geological significance in the earth's cosmic and geological history, particularly related to the physical and biological evolution of the earth and its inhabitants.

21&62:460:115. EARTH AND LIFE HISTORY LABORATORY (1)

Pre- or corequisite: 21:460:114.

A laboratory course related to 21&62:460:114. Examination of the important fossils, rocks, and geologic maps and their use in interpreting the earth's history; geology of the moon; field trips to the American Museum of Natural History.

21&62:460:116. HISTORY OF LIFE LABORATORY (1)

Pre- or corequisite: 21&62:460:113.

A laboratory course related to 21&62:460:113. Examination and interpretation of fossils as the record of past life; their morphology and ecology; their function as indicators of geologic time, and as documents of the course of evolution. Laboratory work as well as field trips to the American Museum of Natural History.

21&62:460:203. NATURAL DISASTERS (3)

Science and societal impact of natural disasters, including earthquakes, volcanoes, floods, landslides, and storms. The science includes the processes that control the disasters using worldwide examples as illustrations. The societal impact includes direct loss of life and economic life as well as long-term societal and historical adaptations. Also focuses on how people cope with such disasters.

21&62:460:206. ENVIRONMENTAL GEOLOGY (3)

Prerequisites: 21&62:460:103,104. For science majors only.

Geologic controls on environmental problems and methods for mitigation studied in a topical approach, with emphasis on urban-suburban settings. Topics include groundwater pollution and processes, soil pollution, air pollution and weather, slope stability, radiation, earthquake hazards, and coastal processes.

21&62:460:207. ENVIRONMENTAL GEOLOGY LABORATORY (1)

Pre- or corequisite: 21&62:460:106 or 206. For science majors only.

Applied hands-on exercises demonstrate the processes of groundwater movement, slope stability, soil pollution, water chemistry, air pollution and weather, evolution, and earthquakes. One class field trip.

21&62:460:215. THE PHYSICAL ENVIRONMENT AND MAN (3)

A problem-oriented course relating geologic, oceanographic, and atmospheric factors to man's activities and survival; water and air pollution, waste disposal, earth resources, urban and engineering geology; natural hazards to man's environment such as earthquakes, mud flows and avalanches, tidal waves, storms, and radiation.

21&62:460:252. FUELS AND ENERGY (3)

Prerequisite: 21&62:460:103 or permission of instructor.

Origin, occurrence, distribution, production, and reserves of coal, oil, natural gas, uranium, and solar, geothermal, and other exotic forms of energy; the role of fuels and energy in our civilization, economy, and environment; living with the energy crisis.

21&62:460:309. GEOMORPHOLOGY (3)

Lec. 2 hrs., lab. 3 hrs. Prerequisite: 21&62:460:311 or permission of instructor.

A study of landform-making processes and their relation to climate and structure, as illustrated by landscapes and their elements.

21&62:460:311. GEOLOGIC FIELD PROBLEMS (3)

Prerequisite: 21&62:460:107 or 114 or permission of instructor.

Geologic field methods, the collection and recording of data in the field in a variety of geologic terrains; preparation of a geologic map and technical reports based on individual fieldwork.

21&62:460:313. INVERTEBRATE PALEONTOLOGY (3)

Lec. 2 hrs., lab. 3 hrs. Prerequisite: 21&62:460:113 or 106 or 21&62:120:101-102 or permission of instructor.

The development of invertebrate life through geologic time; classification, morphology, ecology, and evolution of fossil invertebrates.

21&62:460:314. STRATIGRAPHY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisite: 21&62:460:311.

Principles of stratigraphy and sedimentation, with emphasis on interpretation of the stratigraphic records examined on all-day field trips through the Newark basin, Coastal Plains, Hudson Highlands, and Appalachian Foldbelt. Description, identification, and classification of sedimentary rocks.

21&62:460:315. MINERAL RESOURCES (3)

The nature and distribution of the stratigraphic and economically important minerals, fuels, and ores; their origin, exploitation, and conservation; international aspects of mineral resources, their role in industrial civilization, and influence on national power and world affairs.

21&62:460:320. STRUCTURAL GEOLOGY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisite: 21&62:460:311 or permission of instructor.

Stress/strain and deformation of the earth and resultant structures; field and laboratory work in structural analysis and projections (stereographic, map, cross-section); basic mechanics and material science; structures of mountain belts, rifts, and other tectonic settings.

21&62:460:321. MINERALOGY (4)

Lec. 3 hrs., lab. 3 hrs. Prerequisite: 21&62:460:113 or 106 or permission of instructor.

Introductory study of minerals; their origin, occurrence, crystal systems, properties, and uses; emphasis on sight identification based on simple physical and chemical tests; X-ray analysis methods.

21&62:460:322. PETROLOGY (3)

Lec. 2 hrs., lab. 3 hrs. Prerequisite: 21&62:460:321.

Description, identification, and classification of igneous and metamorphic rocks; discussion of their origin.

21&62:460:331. OCEANOLOGY (3)

Prerequisites: 21&62:460:113 or 106, or any laboratory science plus 21&62:460:101 or 103.

The origin, evolution, and characteristics of the oceans; geology of the ocean basins; waves, currents, and tides; coastal features; mineral resources of the sea; life in the sea.

21&62:460:333. PRINCIPLES OF CLIMATOLOGY AND PALEOCLIMATOLOGY (3)

Prerequisite: 21&62:670:303.

Study of ancient climates through the application of climatologic and meteorologic principles to the geologic record. Fieldwork.

21&62:460:401. INTRODUCTION TO GEOCHEMISTRY (3)

Lec. 2 hrs., lab. 3 hrs. Prerequisites: 21&62:460:322 and one year of chemistry, or permission of instructor.

The application of principles of chemistry to the study of geologic processes such as weathering, lithification, metamorphism, melting, and crystallization of rocks; distribution of elements; crystal chemistry; phase equilibria; ore mineralization.

21&62:460:403. OPTICAL MINERALOGY (3)

Lec. 2 hrs., lab. 3 hrs. Prerequisite: 21&62:460:321.

The behavior of light in crystalline substances and the optical properties of minerals; use of polarizing microscope; identification of nonopaque minerals in thin-section and using immersion media.

21&62:460:406. APPLIED GEOPHYSICS (3)

Lec. 2 hrs., lab. 3 hrs. Prerequisites: 21:460:114, and 115, 21&62:640:114 or 21&62:640:119, or permission of instructor.

Theory and practical application of geophysical prospecting methods, including reflection and refraction seismology, gravity, magnetics, and electrical methods. Field use of geophysical equipment and survey design.

21&62:460:414. ADVANCED READINGS IN GEOLOGY (2)

Open only to majors in their senior year. Prerequisite: Permission of instructor.

Students prepare, present, and participate in critical discussion of selected topics in geology.

21&62:460:415,416. GEOLOGIC PROBLEMS (BA,BA)

Hours to be arranged.

Special problems involving field, laboratory, and library work; presentation of written report.

21&62:460:427. HYDROGEOLOGY (3)

Lec. 2 hrs., lab. 3 hrs. Prerequisites: 21&62:460:322 and 21&62:640:114 or 119, or permission of instructor.

Geologic factors influencing the occurrence and distribution of surface and ground water and its effects on man; principles of hydrology; water-systems analysis and planning; water quality and pollution; exploration and development of water resources; field studies in New Jersey.

21&62:460:485,486. SEMINAR IN GEOLOGY (1,1)

Inquiry into selected topics in geology; qualified students should consult with their advisers.

Course (Meteorology 670)
21&62:670:303. METEOROLOGY (3)

Introduction to weather elements and atmospheric systems, forecasting, solar radiation, atmospheric optics, air pollution, biometeorology, and climatology.

GEOSCIENCE ENGINEERING 465

A major in geoscience engineering is offered at NCAS, leading to a B.S. degree.

Major Requirements

The major in geoscience engineering is an interdisciplinary, interdepartmental, and intercollegiate major between the Department of Geological Sciences and the Department of Civil and Environmental Engineering at NJIT. The goal of the program is to train students to combine evaluative and remedial capabilities in one degree. The program is rigorous and designed to prepare graduates for technical and management positions in industry or to continue their education in graduate studies.

The program is designed to lead to certification as a professional engineer (PE).

First Year
Fall Term

21&62:160:113	General Chemistry Laboratory I (1)
21&62:160:115	General Chemistry I (3)
21&62:198:101	Computers and Programming I (3)
21&62:350:101	English Composition I (3)
21&62:640:135	Calculus I (4)
21&62:750:205	Introductory Physics Laboratory I (1)
21&62:750:213	Elements of Physics I (3)
FED 101	Fundamentals of Engineering (2)

Spring Term

21&62:160:114	General Chemistry Laboratory II (1)
21&62:160:116	General Chemistry II (3)
21&62:350:102	English Composition II (3)
21&62:640:136	Calculus II (4)
21&62:750:206	Introductory Physics Laboratory II (1)
21&62:750:214	Elements of Physics II (3)
NCAS	fine arts elective (3)

Sophomore Year
Fall Term

21&62:460:103	Planet Earth (3)
21&62:460:104	Planet Earth Laboratory (1)
21&62:640:327	Probability and Statistics (3)
Mech 235	Statics (3)
NCAS	economics elective (3)

Spring Term

21&62:640:314	Differential Equations (3)
Chem 365	Environmental Organic Chemistry (3)
Mech 236	Dynamics (2)
Mech 237	Strength of Materials (3)
Mech 237A	Strength of Materials Laboratory (1)
NCAS	social science elective (3)

It is strongly recommended that students receive forty hours of OSHA training during the summer.

Junior Year
Fall Term

21&62:460:311	Geologic Field Problems (3)
21&62:460:321	Mineralogy (4)
21&62:460:406	Applied Geophysics (3)
CE 200B	Surveying Laboratory (1)
CE 320	Fluid Mechanics (4)
NCAS	history elective (3)

Spring Term

21&62:460:320	Structural Geology (4)
21&62:460:427	Hydrogeology (3)
CE 321	Water Resources Engineering (3)
CE 341	Soil Mechanics (3)
CE 341A	Soil Mechanics Laboratory (1)
NCAS	history elective (3)

Senior Year
Fall Term

21&62:460:309	Geomorphology (3)
CE 406	Remote Sensing (3)

GERMAN

CE 494	Geological/Environmental Engineering Design I (3)
NCAS	literature elective (3) technical elective (3) (see below)
<i>Spring Term</i>	
21&62:750:315	Thermodynamics (3)
CE 495	Geological/Environmental Engineering Design II (3)
NCAS	Interdisciplinary (3)
NCAS	literature elective (3) technical elective (3) (see below)

It is recommended that students take 21&62:460:314 Stratigraphy and 21&62:460:322 Petrology, although any from the list below will fulfill the requirement:

Technical Electives:

21&62:460:314	Stratigraphy (4)
21&62:460:322	Petrology (3)
21&62:460:401	Introduction to Geochemistry (3)
21&62:460:403	Optical Mineralogy (3)
CE 322	Hydraulic Engineering (3)
CE 332	Structures I (3)
CE 443	Foundation Design (3)
CE 545	Rock Mechanics I (3)
EE 405	Electrical Engineering Principles (3)
ENE/EvSc 610	Hazardous Substance Procedures (3)
SET 420	Land Information Systems (3)

GERMAN 470

*Department of Classical and Modern Languages and Literatures
Conklin Hall (973/353-5498)*

The German major and minor are offered at NCAS.

The department offers major programs in Ancient Mediterranean Civilizations (Classics 190, Greek 490, Hebraic Studies 500, Latin 580), Central and Eastern European Studies 149, French 420, German 470, and Spanish 940. Students majoring in one language area may concurrently major or minor in another language area. The department also participates in the interdisciplinary major, a multi-disciplinary minor in international Affairs, and the Rutgers Study Abroad Program, and offers courses in Portuguese, Arabic, and linguistics.

Major Requirements

The requirements for a major in German are the following:

- 30 credits in German language and literature, which may include 21:470:131,132 Intermediate German (or equivalent preparation as demonstrated by proficiency examination). Any of the German language and literature courses numbered 200 or higher may be taken to satisfy this requirement, with the exception of German literature in English translation. Prerequisite for advanced literature courses is 21:470:205,206 Introduction to German Literature.
- 9 credits in other courses within the department, at least three of which must be in literature in the original language or in translation.
- 6 credits from one or more of the following as approved by an adviser: English literature courses numbered higher than 216, philosophy, music history, art history.

Minor Requirements

A minor in German requires 18 credits in German language and literature, which may include the intermediate courses 21:470:131,132 Intermediate German (or equivalent preparation as demonstrated by proficiency examination). Any of the German language and literature courses numbered 200 or higher may be taken to satisfy this requirement, with the exception of German literature in English translation.

The Department of Classical and Modern Languages and Literatures also offers minors in ancient medieval civilizations, French, Italian, Portuguese, Slavic, and Spanish. Students may pursue one or more minor concentrations.

Courses

21:470:101-102. ELEMENTARY GERMAN (3,3)

Intended for students with little or no previous knowledge of German. Both terms must be completed to receive credit.

Training in pronunciation and grammar, easy composition, and reading of simple prose. A minimum total of ten hours of language laboratory work per term is required in NCAS elementary language courses.

21:470:125-126. SCIENTIFIC GERMAN (3,3)

Prerequisite: 21:470:102 or equivalent.

Review and drill as in 21:470:131,132; reading and vocabulary work is chosen in accordance with the needs of students in the natural sciences.

21:470:131,132. INTERMEDIATE GERMAN (3,3)

Prerequisite: 21:470:102 or equivalent as determined by a placement examination.

Review of grammar, readings in literature, and other cultural areas.

21:470:133,134. GERMAN FOR BUSINESS AND INDUSTRY (3,3)

Prerequisite: 21:470:102 or equivalent.

Introduction to practical German business terminology and phraseology pertinent to commercial correspondence, trade, banking, production, marketing, and management. Cultural differences discussed.

21:470:203,204. CONVERSATION AND COMPOSITION (3,3)

Prerequisite: Permission of instructor.

Intensive practice in oral and written use of German.

21:470:205,206. INTRODUCTION TO GERMAN LITERATURE (3,3)

Prerequisite: 21:470:132 or equivalent. 21:470:205,206 are prerequisites for advanced courses in German literature.

Readings in German literature selected to illustrate various literary forms and periods.

21:470:301. ADVANCED GRAMMAR AND COMPOSITION (3)

Recommended for German majors and students planning to teach German.

Advanced grammar review, composition, diction, special problems as required.

21:470:302. ADVANCED CONVERSATION AND COMPOSITION (3)

Prerequisite: 21:470:301 or permission of instructor. Recommended for German majors and students planning to teach German.

Critical literary discussion and composition in German.

21:470:303. GERMAN DRAMA OF THE NINETEENTH CENTURY (3)

Study of leading dramatists from romanticism to naturalism, with discussion of representative plays; readings include Tieck, Kleist, Grillparzer, O. Ludwig, Hebbel, and Hauptmann.

21:470:304. GERMAN DRAMA SINCE 1890 (3)

Representative modern plays from the neoromanticism of the Viennese theater, the expressionist stage, and the "epic" and absurd theater; readings emphasize Hofmannsthal, Kaiser, Wedekind, Brecht, Dürrenmatt, Frisch, and Weiss.

21:470:307. THE GERMAN NOVEL TO 1890 (3)

Critical reading of representative novels by Goethe, K.P. Moritz, Keller, Stifter, and Raabe.

21:470:308. THE GERMAN NOVEL SINCE 1890 (3)

Critical reading of representative novels with special attention to the work of Fontane, T. Mann, Kafka, Döblin, Musil, and Broch.

21:470:327. GERMANIC MYTHOLOGY AND FOLKLORE (3)

Major pre-Christian myths and legends of the Germanic peoples as exemplified primarily in the *Eddas* and the Icelandic sagas; introduces the cultural scene of the Viking Age in northern Europe.

21:470:336. GERMAN LYRIC POETRY (3)

Reading and critical analysis of the works of major German poets from Klopstock to Rilke and Benn; history and interpretation of the changing modes in lyric poetry in Germany.

21:470:337. GERMAN CIVILIZATION (3)

The relationships between German society, literature, art, and music in selected historical periods.

21:470:353,354. INDIVIDUAL STUDY IN GERMAN (3,3)

Prerequisite: Permission of department chairperson or instructor.
Individual study or research in German language or literature.

21:470:355. LESSING AND THE AGE OF REASON (3)

The chief tendencies of the Enlightenment in Germany, with special emphasis on the unique contributions of Lessing.

21:470:356. HERDER, GOETHE, SCHILLER (3)

The revolt against rationalism and the development of German classicism.

21:470:367,368. GERMAN LITERATURE IN ENGLISH TRANSLATION (3,3)

Open to nonmajors. Prerequisite: 21&62:350:102.
Literary examination of representative works of German literature, with emphasis on the twentieth century; Goethe, Fontane, Mann, Kafka, Frisch, Böll, Grass, Brecht, Dürrenmatt, and Weiss.

21:470:407. HISTORY OF THE GERMAN LANGUAGE (3)

Prerequisite: Two years of college German or equivalent.
Traces and explains the development of the German language from its origins (Proto-Indo-European and the Indo-European languages) through the period of its closest relationship to English (Proto-Germanic and Germanic languages) up to its emergence as a modern language (Old, Middle, New High German); examines linguistic phenomena (e.g., ablaut, umlaut, ersatzdehnung) and the sociopolitical, cultural, and technological forces that have left their imprint on the German vocabulary.

21:470:477. GERMAN BAROQUE LITERATURE (3)

Leading writers of the seventeenth century in Germany, seen against the background of their time; readings from Opitz, Dach, Fleming, Gryphius, Bidermann, Weckherlin, Grimmelshausen, and Hofmannswaldau.

21:470:478. MEDIEVAL GERMAN LITERATURE (3)

Major forms of medieval German literature as exemplified by the *Hildebrandslied*, *Nibelungenlied*, *Kudrun*, *Gregorius*, *Parzifal*, Gottfried's *Tristan*, and the songs of the Minnesänger.

GREEK 490 (See Ancient and Medieval Civilizations)**HEBRAIC STUDIES 500 (See Ancient and Medieval Civilizations)****HISTORY (History 510, American History 512)****Department of History**

Conklin Hall (973/353-5410)

The history major and minor are offered at NCAS and UC-N.

The major in history gives students a broad grasp of world history and the cultural backgrounds of many segments of contemporary society. Students learn methods of historical research and exposition that may be applied not only by the professional historian but also by those interested in pursuing careers in government, law, the media, and other fields. Since many history majors decide to go on to graduate school, proficiency in at least one foreign language is useful for these students. The major is offered jointly by Rutgers and NJIT and draws on faculty and courses from both universities.

Major Requirements

All majors in history develop, with the assistance of a faculty member, a course of study that meets the needs of the student. The courses identified and the rationale for their selection must be intellectually coherent; course work outside the student's area of specialization must be included. A grade of *C* or higher is required for history courses credited toward the major. Each program requires the written approval of the adviser and the chairperson of the department. Each course of study must include 42 credits, distributed as follows:

1. 6 credits: 21&62:510:201,202 History of Western Civilization.
2. 24 credits in history, at least fifteen of these at the 300 level or above. Fifteen credits of these 24 in history should be in one field, either geographic or thematic. Nine credits should be in courses outside the field of concentration. Fields of concentration are defined as follows: the Americas; Europe; Asia and Africa; or a thematic approach outlined by the student and adviser.
3. 6 additional credits related to the course of study, as approved by the adviser. These credits may be in history or any of the following fields: anthropology, art, classics, economics, history of education, literature (English or a foreign language), music, philosophy, political science, psychology, sociology, or statistics.
4. 6 credits, including a 3-credit senior readings seminar and a 3-credit senior research and writing seminar, culminating in a research paper.

Students considering the history major are encouraged to visit the department to discuss their interests and to obtain a copy of the department's student guide, *Majoring in History*, which outlines the major and its requirements in greater detail. Majors enrolled in University College-Newark should consult their advisers to obtain specific information about UC-N major requirements.

Minor in History

The following credits are required for the minor in history:

- 21&62:510:201,202 History of Western Civilization (3,3)
electives in history (15 credits)

Minor in Asian Studies

Director: Odoric Wou

For students planning careers in any field involving contact with Asian cultures, such as business, law, teaching, or social work, the Department of History offers an interdisciplinary minor in Asian Studies. Two areas of concentration are possible: Near and Middle Eastern Studies, and Far Eastern Studies. Students must write a substantial research paper in a course approved for the minor and complete the following credits:

1. 9 credits in history (concentration in Near and Middle Eastern history or Far Eastern history). *
2. 6 credits in language (modern Arabic, Hebrew, or Chinese). †
3. 6 credits in humanities and social sciences. *

Teacher Certification

Students seeking teacher certification in social studies must complete the requirements for a major in the history department as well as satisfy other requirements for certification. For details regarding admission to the teacher education program and the requirements, students should consult both their department adviser and the chairperson of the education department.

Education Courses

Students majoring in history may enroll in the following education courses for elective credit: 21&62:300:401 History of Education and 21&62:300:402 History of Education in the United States. For course descriptions, see the Education section of this catalog.

Courses (History 510)

21&62:510:201,202. HISTORY OF WESTERN CIVILIZATION (3,3)

The main developments in history of ideas and institutions from earliest times to the present; consideration of historical material serves as a point of departure for discussion of present-day problems.

21&62:510:207,208. HISTORY OF LATIN AMERICA (3,3)

Survey of the Indian and Iberian background of Latin America; conquest and colonization; cultural clash and fusion; institutions and economic activities of the colonial period; the wars of independence; political, economic, social, and cultural history and international relations of the Latin-American countries to the present.

21&62:510:226,227. TOPICS IN HISTORY (1.5,1.5)

Mini courses run either twice a week for seven weeks or once a week for fourteen weeks; topics change from year to year; courses may not be used to fulfill any distribution requirement, but may be used as general credit for graduation; information about topics may be obtained from the department chairperson.

21&62:510:235,236. THE ANCIENT WORLD (3,3)

Civilization of the ancient Near East and of the Mediterranean littoral from their emergence during the fourth millennium B.C. to the fall of the Roman Empire in the West; political, social, and economic life of the ancient peoples; the evolution of religions, law, science, and the arts.

21&62:510:249. AN INTRODUCTION TO CHINA (3)

Development of Chinese civilization from the past to the present, with reference to geographical implication, government structure, social institutions, economy, literary development, and Asian-American heritage.

21&62:510:263,264. HISTORY OF AFRICA (3,3)

Political, religious, economic, and social development of the peoples of Africa south of the Sahara from about 500 A.D. to the present.

21&62:510:286. THE ANCIENT NEAR EAST (3)

General survey of the history of the ancient Near East from the first appearance of civilization in the fertile crescent to the unification of the Near East in the Persian Empire. Covers the political, social, economic, religious, cultural, and intellectual development of the primary civilizations of Mesopotamia and Egypt, as well as the later city-states and empires.

21&62:510:287,288. HISTORY OF ISLAMIC CIVILIZATION (3,3)

The history, culture, and institutions of the Islamic world, from the age of the prophet Muhammad to the present. *First term:* evolution of classical Islamic civilization in its Near and Middle Eastern heartland. *Second term:* the Ottoman, Safavid, and Mughal empires; Islam in central, east, and southeast Asia; traditional Islamic society, and the problems of colonialism, imperialism, and modernization.

21&62:510:297,298. FAR EASTERN HISTORY (3,3)

Major developments in Far Eastern history, particularly in China and Japan, from early times to the present; cultural, economic, and political aspects and contemporary problems.

21&62:510:317. HISTORY OF THE CARIBBEAN (3)

Caribbean history from the colonial period to the present; the development of a sugar economy; the competition among foreign powers for control; nineteenth-century struggles for independence; contemporary social upheavals.

21&62:510:319,320. THE CLASSICAL WORLD: GREECE AND ROME (3,3)

The political, intellectual, and cultural development of the Greek, Hellenistic, and Roman civilizations.

21&62:510:321. MILITARY HISTORY OF THE WESTERN WORLD (3)

History of warfare in the western world from the Middle Ages to the twentieth century. Interrelationships between technological, economic, political, and social developments. A society's warfare as a reflection of that society.

21&62:510:323,324. HISTORY OF PUERTO RICO (3,3)

History of Puerto Rico from the pre-Columbian period to the nineteenth century; Taino, Spanish, and black civilizations and their significance in the evolution of Puerto Rico's national consciousness.

21&62:510:325. HISTORY OF MEXICO AND CENTRAL AMERICA (3)

Historical development of Mexico and Central America from the pre-Columbian civilizations to the present. Contemporary issues affecting the region.

21&62:510:327,328. CIVILIZATION OF THE MIDDLE AGES (3,3)

Western Europe from the barbarian invasions to the close of the thirteenth century; the structure of society and its economic organization; readings provide a basis for the study of feudalism, agrarian life, and the rise of the towns; religious developments and conflicts, church-state relationships, the Crusades; the rise of the feudal monarchies; cultural achievements.

21&62:510:329,330. CIVILIZATION OF MEDIEVAL EASTERN EUROPE AND THE NEAR EAST (3,3)

History and civilization of the Later East Roman/Byzantine Empire; the Islamic lands of the Eastern Mediterranean and Slavic Eastern Europe in the Middle Ages.

* A list of courses approved for each category may be obtained in the Department of History. Students may substitute other courses with permission of Professor Wou.

† Students proficient in any Asian language may substitute other courses for the language requirement.

21&62:510:331,332. BRITISH HISTORY (3,3)

British history from the Roman occupation to the present; emphasis on the interrelationship between constitutional and social developments. *First term:* medieval England and the Tudor-Stuart period. *Second term:* changes in politics and society resulting from the industrial revolution.

21&62:510:333. HISTORY OF IMPERIALISM (3)

The historical background of imperialism; the expansion of empires; the effects on the relations among the great powers; the development in the colonial territories since World War II.

21&62:510:334. TWENTIETH-CENTURY FASCISM (3)

The roots of fascism and its triumph in Germany and Central Europe in the twentieth century; the rise of fascism viewed against a background of declining liberalism, the growth of socialism, and other nonliberal political movements; the role and nature of fascism and neofascism since World War II.

21&62:510:335,336. HISTORY OF SOCIALISM AND COMMUNISM (3,3)

Socialist and communist movements, with emphasis on their origins, development, and major social-political implications in the nineteenth and twentieth centuries. *First term:* the Industrial Revolution; the emergence of an urban proletariat; the origins of socialist movements, their development and role within individual countries, and their attempt to forge international unity before World War I. *Second term:* the impact of World War I and the Russian Revolution on socialist movements; the relations between socialist and communist parties during the interwar period; the expansion of socialist and communist influence after World War II.

21&62:510:337. THE HISTORY OF IRAN (3)

History of Iran from ancient times to the present; the forces that have shaped modern Iran.

21&62:510:338. THE OTTOMAN EMPIRE (3)

History of the Ottoman state from its origins as a Ghazi state (thirteenth century) to its collapse in the twentieth century; the Ottoman impact, politically and culturally, on the peoples of Eastern Europe.

21&62:510:340. WOMEN IN EUROPEAN HISTORY (3)

Changes in women's economic, social, and legal position from classical times to the present; women and the family; women and the Industrial Revolution; witchcraft; women in politics, war, and revolution; women under socialism and fascism; women and sexuality; the development of the modern feminist movement.

21&62:510:341,342. THE AGE OF REVOLUTION, 1789–1849 (3,3)

The great transformation wrought by the French and Industrial Revolutions; the emergence of modern concepts of democracy, popular sovereignty, nationalism, liberalism, republicanism, and socialism; advent of industrial societies in England and on the continent, and the creation of a revolutionary tradition throughout Europe.

21&62:510:343,344. RENAISSANCE AND REFORMATION (3,3)

Features of European civilization in the fifteenth and sixteenth centuries, and of representative modes of feeling and thought. *First term:* political and cultural developments in Italy. *Second term:* the great religious revolt of the sixteenth century in northern Europe and its political and cultural repercussions.

21&62:510:346. MEDIEVAL LEGAL HISTORY (3)

Legal systems of continental Europe; the barbarian law codes; church penitentials and canon law; medieval Roman law; feudal and manorial customs; mercantile law; commercial custom; urban and royal law.

21&62:510:349,350. MODERN EUROPEAN DIPLOMATIC HISTORY (3,3)

The development of the diplomatic institutions, practices, and interests of the European states; relates diplomacy to internal developments in the various states from 1815 to modern times.

21&62:510:351,352. HISTORY OF FRANCE (3,3)

First term: survey of French history from the late middle ages through the French Revolution. *Second term:* French history from 1815 to the present. Emphasizes ideas, politics, culture, and the development of national cohesion and identity.

21&62:510:353,354. MODERN CHINA (3,3)

Evolution of the Chinese nation from the Opium War to the establishment of the People's Republic; problems arising out of rebellion, reform, and revolution discussed in connection with modernization and acculturation.

21&62:510:355. TRADITIONAL CHINA: INSTITUTIONS AND SOCIETY (3)

Chinese history from the Shang to the Ming dynasties (1766 B.C.–1643 A.D.); patterns of social change and social mobility; feudalism; dynastic cycles; modernization; Oriental despotism.

21&62:510:356. HISTORY OF THE PEOPLE'S REPUBLIC OF CHINA (3)

The revolutionary experience of the Chinese people; the efforts of the Chinese communists to modernize the nation; the processes and problems of adapting to a communist system.

21&62:510:357,358. MODERN EUROPE: WAR AND REVOLUTION (3,3)

Significant political, economic, social, and diplomatic developments during the past century. *First term:* industrialization, imperialism, and international rivalries before 1914. *Second term:* readjustment efforts after 1918; the rise of totalitarianism, World War II; the Cold War.

21&62:510:361. THE NEAR AND MIDDLE EAST (3)

Introduction to the modern Near and Middle East. Review of the formation of classical Islamic civilization in the region. Political, economic, social, and ethnic problems resulting from Western influences and the dismemberment of the Ottoman empire. Modern Iranian development and the creation of Israel.

21&62:510:364. CONTEMPORARY ISSUES IN PUERTO RICAN HISTORY (3)

Prerequisite: 21&62:510:324.

Selected topics in contemporary Puerto Rican history, covering both the island community and the Puerto Rican community in the United States since 1945. Emphasis on the modernization of the economy, political evolution of self-government, and social problems that brought about the exodus of nearly one-third of Puerto Rico's population.

21&62:510:366. HISTORY OF POLAND (3)

History, social concerns, and culture of Poland and the Polish people from the time of their conversion to Christianity and early kings to the present.

21&62:510:367,368. HISTORY OF RUSSIA AND THE SOVIET UNION (3,3)

First term: Russian politics and civilization from the founding of Kiev to 1864. *Second term:* the history of Russia from 1865 to the present time, with emphasis on Soviet affairs.

21&62:510:369. MODERN EASTERN EUROPE (3)

Political, social, and cultural developments in Eastern Europe in the seventeenth, eighteenth, and nineteenth centuries; twentieth century, World War I, the revolutions, the successor states, and their relations with the USSR.

HISTORY

21&62:510:370. HISTORY OF MODERN UKRAINE (3)

Ukrainian history from the sixteenth century to the present. Emergence of cossacks, the religious controversy, the rise and fall of the cossack state, and the national revival in the nineteenth century.

62:510:371,372. INTELLECTUAL AND CULTURAL HISTORY OF MODERN EUROPE I, II (3,3)

A study of the major currents of thought—political, religious, social, economic—from the Renaissance to the present.

21&62:510:373. THE ENGLISH NOVEL IN HISTORY (3)

The novel as a reflection of English society during the last 150 years; emphasizes the historical development of Great Britain.

21&62:510:375. HISTORY OF SPAIN (3)

The history of Spain from its unification in 1469 to the present. Emphasizes politics, the role of the church, the promotion of national and regional identity, and problems of economic development and modernization.

21&62:510:377. PORTUGAL AND ITS EMPIRE (3)

The history of Portugal and its overseas empire from the fourteenth century to the present, examining the country's politics, economics, and culture, as well as its global expansion and relations with colonies, particularly Brazil.

21&62:510:379. COLONIALISM AND DECOLONIZATION (3)

The final century of colonialism, focusing on imperialist thought and justifications for empire, mutual perceptions of colonizers and colonized, and the growth of anti-imperialism.

21&62:510:380. CULTURE AND MEDIA IN TWENTIETH-CENTURY EUROPE (3)

Examines major cultural movements and ideas, and reactions to new art forms and mass media in twentieth-century Europe. Topics include political uses of radio and cinema, reactions to American culture, debates over "high" and "low" culture, and issues in media policy.

21&62:510:385,386. A HISTORY OF SOUTHERN AFRICA (3,3)

History of southern Africa from 1000 A.D. to the present; precolonial African societies; European colonization; European impact; industrial development; the Zulu and Boer Wars; the evolution of apartheid; the African nationalist movements.

21&62:510:391,392. THE HISTORY OF GERMANY (3,3)

Germany from the eighteenth century to the present. *First term:* the rise of Prussia, the impact of the French Revolution and the Empire, the growth of nationalism and liberalism, the Revolution of 1848, and unification. *Second term:* internal developments, foreign policy, and intellectual movements after 1871; examines Germany in the First World War, the Weimar Republic, the rise of Nazism, the drive for European domination in the Second World War, and the postwar era.

21&62:510:394. THE PEOPLES AND CULTURES OF CENTRAL ASIA (3)

Introduction to the history and cultures of the Iranian, Turkic, Mongolian, and Tungus-Manchu peoples of the Eurasian steppes and inner Asian borderlands of China from earliest times to the seventeenth century; the cultural significance of this region as the recipient of Chinese, Indian, Muslim, and Eastern Christian cultural and religious influences.

21&62:510:399. TUDOR-STUART ENGLAND (3)

Selected topics in British history from the accession of Henry VII through the Revolution of 1688; cultural, economic, political, and social issues; developments in the transition from medieval to early modern England; background of the empire.

21&62:510:401. TOPICS IN EUROPEAN HISTORY (3)

Prerequisites: 21&62:510:201,202 or permission of instructor.

21&62:510:403. TOPICS IN SOCIAL HISTORY (3)

Prerequisites: 21&62:510:201,202 or permission of instructor.

21&62:510:404. TOPICS IN INTELLECTUAL HISTORY (3)

Prerequisites: 21&62:510:201,202 or permission of instructor.

21&62:510:431,432. TOPICS IN AFRICA IN THE NINETEENTH AND TWENTIETH CENTURIES (3,3)

Prerequisites: 21&62:510:201,202 or 21&62:510:263,264, or permission of instructor.

21&62:510:433. TOPICS IN ISLAMIC HISTORY (3)

Prerequisites: 21&62:510:201,202 or permission of instructor.

21&62:510:435. TOPICS IN MEDIEVAL AND EARLY MODERN HISTORY (3)

Prerequisites: 21&62:510:201,202 or permission of instructor.

21&62:510:441,442. TOPICS IN LATIN AMERICAN AND CARIBBEAN HISTORY (3,3)

Prerequisites: 21&62:510:201,202 or permission of instructor.

21&62:510:449,450. TOPICS IN ASIAN, CHINESE, AND FAR EASTERN HISTORY (3,3)

Prerequisites: 21&62:510:201,202 or permission of instructor.

21&62:510:451,452. TOPICS IN THE HISTORY OF EASTERN EUROPE AND THE SOVIET UNION (3,3)

Prerequisites: 21&62:510:201,202 or permission of instructor.

21&62:510:458. TOPICS IN WOMEN'S HISTORY (3)

Prerequisites: 21&62:510:201,202 or permission of instructor.

21&62:510:461. TOPICS IN COMPARATIVE HISTORY (3)

Prerequisites: 21&62:510:201,202 or permission of instructor.

21&62:510:479,480. READINGS IN NON-AMERICAN HISTORY (3,3)

Prerequisites: Written permission of department chairperson and instructor. Designed for the history major who desires to undertake extensive reading in a particular historical area, selected in close consultation with a member of the department. Limited to students whose grade-point average within the department is 2.0 or higher. Only one reading course may be taken per term, and no more than 9 credits in reading courses may be applied toward the history major.

21&62:510:489. SENIOR SEMINAR—READINGS (3)

21&62:510:490. SENIOR SEMINAR—RESEARCH (3)

21&62:510:491,492. HONORS PROGRAM IN NON-AMERICAN HISTORY (3,3)

Research and writing for candidates for honors in history.

62:510:497. HONORS PROJECT—HISTORY (3)

Open only to honors students. Prerequisite: Permission of program adviser. An individual research project.

21&62:510:499. INDIVIDUAL STUDY IN HISTORICAL RESEARCH, NON-AMERICAN (BA)

Prerequisites: Permission of department chairperson and instructor. Restricted to history majors in their senior year. Introductory historical research on a more systematic level than is normally possible in lecture courses.

Courses (American History 512)

21&62:512:121,122. COMMUNITY AND CHARACTER IN AMERICAN HISTORY (3,3)

Introduction to the study of American culture. The relationship of the individual to the community. The development of individualism, the tensions between the individual and the community, and the creation of diverse communities divided by gender, race, and class.

21&62:512:201,202. DEVELOPMENT OF THE UNITED STATES (3,3)
Political, economic, and social phases of American history that have influenced or determined the development of the U.S. from 1607 to the present.

21&62:512:303. TOPICS IN THE HISTORY OF NEWARK (3)
Major economic, social, and political developments in Newark from 1830 to the present; focus on late nineteenth- and twentieth-century trends in demography, housing, and community development.

21&62:512:309,310. A HISTORY OF AMERICAN THOUGHT (3,3)
Origins and developments in American thinking on social, economic, and political questions and in the fields of the arts and sciences, religion, and philosophy.

21&62:512:311. COLONIAL AMERICA (3)
The colonial origins of the U.S. and divergence from England; relations with the Indians; slavery; Puritanism and the waning and revival of religion; family and gender roles; role of the colonies in the British empire; and the transformation of colonial political culture, leading to the Revolution.

21&62:512:315. U.S. HISTORY IN FICTION AND FACT (3)
Explores critical events and problems in U.S. history by juxtaposing closely related works of history, biography, memoir, and fiction. Topics include Lincoln and Gettysburg; the legacy of slavery and reconstruction; Huey Long and the Great Depression.

21&62:512:318. LABOR HISTORY (3)
The impact of industrialization on the work force in the U.S.; examines economic pressures; technological developments; immigration patterns; entrepreneurial policies; ethnic and black subcultures; the emergence of urban institutions as they relate to the working class and class consciousness.

21&62:512:330. HISTORY OF AMERICAN IMMIGRATION (3)
The central role of immigration in American history; English migration in the seventeenth century, involuntary African migration in the eighteenth century, Irish migration in the mid-nineteenth century, southern and eastern European migrations, Asian migration, and the more recent Mexican, Cuban, Puerto Rican, and West Indian migrations; comparisons and contrasts of experiences; the tensions of cultural assimilation and separatism and the concept of American national identity.

21&62:512:333,334. AFRO-AMERICAN HISTORY (3,3)
The black American's role in the U.S. from the seventeenth century to the present.

21&62:512:337. HISTORY OF THE FAMILY IN THE UNITED STATES (3)
The changing nature of the American family; the Puritan family; the Victorian family and the cult of true womanhood; the black family; childhood, marriage, and old age.

21&62:512:343. THE CREATION OF THE AMERICAN REPUBLIC (3)
The history of the U.S. from 1776 to 1820. The Revolutionary War, the writing of the Constitution, establishment of political parties, and contrasting philosophies of Jefferson and Hamilton. Emphasis on changes in religion, gender roles, race relations, social structure, and political thought.

21&62:512:344. THE DEMOCRATIC AGE IN AMERICAN HISTORY: 1820–1880 (3)
Development of democracy in America and its trial in the Civil War. Jacksonian democracy, revivalism and reform, slavery, abolitionism, the cult of true womanhood, and the growth of sectionalism. The origins, course, and consequences of the Civil War through the end of Reconstruction.

21&62:512:349. ANTEBELLUM REFORM MOVEMENTS (3)
Explores the origins, evolution, and impact of evangelical, utopian, and philanthropic movements committed to the reform of American culture and institutions during the first half of the nineteenth century.

21&62:512:357,358. AMERICAN ECONOMIC AND BUSINESS HISTORY (3,3)
Survey of the economic development of the U.S. from colonial times to the present; the nation's westward march; relationships between the American economy and the economies of other nations; the changing emphasis and growing complexity of American economic life.

21&62:512:361,362. URBAN HISTORY OF THE UNITED STATES (3,3)
The history of the American city and its role in American social, economic, and political development.

21&62:512:365,366. AMERICAN LEGAL HISTORY (3,3)
The interaction between political and economic forces and the role of law in American history; readings from the fields of history, political science, and Constitutional development.

21&62:512:367. THE AGE OF THE CORPORATION: 1880–1920 (3)
Survey of American history from 1880–1920, focusing on economic and societal transformation and the populist and progressive response. Industrialization, the rise of modern corporate power, and social and intellectual currents.

21&62:512:368. MODERN AMERICA (3)
Survey of the history of the United States between 1890 and 1945, with emphasis on immigration, migration, and battles waged over labor, leisure, and definitions of American identity.

21&62:512:369. AMERICA IN WORLD WAR II AND THE POSTWAR PERIOD (3)
The relationship between domestic politics, economic developments, and social change in a wartime situation that began with World War II and culminated with the Korean War; the international and domestic factors related to the rise of the cold war.

21&62:512:371. CONTEMPORARY AMERICA (3)
Survey of the history of the United States from 1945 to the present, with emphasis on corporate liberalism, McCarthyism, the rise of suburbia, the Vietnam War, the counterculture of the 1960s, and the "Reagan Revolution."

21&62:512:373,374. HISTORY OF WOMEN IN THE UNITED STATES (3,3)
The role of women in American life from colonial times to the present; the nature of men and women and their relations; women's roles in social change; the organizational mechanisms by which their influence has been exerted.

21&62:512:377. RACE RELATIONS IN TWENTIETH-CENTURY AMERICA (3)
Explores the busy intersections of black and white in the U.S. since Reconstruction, and the lines of social class, culture, gender, and history that run through them. Events and phenomena covered include Reconstruction, politics and economics in the post-Civil War South, segregation and disfranchisement, lynching, the Atlanta compromise, the great migration, World Wars I and II, the Harlem renaissance, the Depression, and the civil rights movement.

21&62:512:379. U.S. HISTORY IN THE COURTROOM (3)
Explores modern U.S. history through the lens of a number of celebrated court cases and the controversies surrounding them.

21&62:512:383. UNITED STATES FOREIGN POLICY IN THE ERA OF THE COLD WAR (3)
Selected topics, such as the origins and nature of the cold war, the U.S. and the Arab-Israeli dispute, U.S. policy in Africa, Asia, and Latin America since 1945, and the Indo-China War.

21&62:512:385,386. HISTORY OF AMERICAN POLITICS (3,3)
The formation and development of politics in the U.S.; function and history of political parties in America; changes in elections, campaigns, voting behavior, and the American party system; the rise of bossism and machine politics; periodic attempts to reform American politics.

HISTORY

21&62:512:389. THE 1960S IN AMERICA (3)

Survey of the issues and events of the 1960s, including the civil rights movement, the Vietnam War, the antiwar movement, the new left, the youth counterculture, the women's rights movement, and the gay- and lesbian-rights movement.

21&62:512:395,396. HISTORY OF SCIENCE (3,3)

History of science in the U.S. from colonial times to the mid-twentieth century.

21&62:512:397,398. AMERICAN FOREIGN AFFAIRS (3,3)

Analysis of American foreign policy from the colonial period to the present; emphasis on power politics, geopolitics, world trade, public opinion, and the interrelation between domestic and foreign affairs.

21&62:512:402. TOPICS IN AMERICAN INTELLECTUAL HISTORY (3)

Prerequisites: 21&62:512:201,202 or permission of instructor.

21&62:512:403. TOPICS IN AMERICAN POLITICAL HISTORY (3)

Prerequisites: 21&62:512:201,202 or permission of instructor.

21&62:512:404. TOPICS IN AMERICAN BUSINESS AND ECONOMIC HISTORY (3)

Prerequisites: 21&62:512:201,202 or permission of instructor.

21&62:512:405. TOPICS IN THE HISTORY OF SCIENCE (3)

Prerequisites: 21&62:512:201,202 or permission of instructor.

21&62:512:408. TOPICS IN AMERICAN SOCIAL AND CULTURAL HISTORY (3)

Prerequisites: 21&62:512:201,202 or permission of instructor.

21&62:512:410. TOPICS IN THE HISTORY OF AMERICAN FOREIGN POLICY AND DIPLOMACY (3)

Prerequisites: 21&62:512:201,202 or permission of instructor.

21&62:512:438. INTERNSHIP: ADMINISTRATION OF HISTORICAL MANUSCRIPTS (3)

Prerequisite: Permission of department chairperson.

Basic principles and techniques of modern archives administration with emphasis on accession, appraisal, arrangement, description, and conservation. The practicum for this course may entail the full processing of a historical manuscript collection; requires approximately seventy hours.

21&62:512:452. TOPICS IN LEGAL HISTORY (3)

Prerequisites: 21&62:512:201,202 or permission of instructor.

21&62:512:462. TOPICS IN RECENT AMERICAN HISTORY (3)

Prerequisites: 21&62:512:201,202 or permission of instructor.

21&62:512:472. TOPICS IN AFRO-AMERICAN HISTORY (3)

Prerequisites: 21&62:512:201,202 or permission of instructor.

21&62:512:473. TOPICS IN WOMEN'S HISTORY (3)

Prerequisites: 21&62:512:201,202 or permission of instructor.

21&62:512:499. READINGS IN AMERICAN HISTORY (3)

Prerequisites: Written permission of department chairperson and instructor.

Designed for the history major who desires to undertake extensive reading in a particular historical area, selected in consultation with a member of the department. Limited to students whose grade-point average within the department is 2.0 or higher. Only one reading course may be taken during a term, and no more than 9 credits in reading courses may be applied toward the history major.

History Courses (NJIT)

Hist 334. ENVIRONMENTAL HISTORY OF NORTH AMERICA (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

The history of interactions between humans and their natural environment on the North American continent. Considers perceptions of, use of, and alteration of the environment. Traces the cultural, intellectual, economic, political, and technological transformations from early colonial times to the late twentieth century. Addresses the diverse environmentalisms that have emerged the last several decades.

Hist 341. THE AMERICAN EXPERIENCE (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

American history from the colonies to the twentieth century, with concentration on several selected themes basic to an understanding of the changing cultural patterns and social values of American civilization.

Hist 343. AFRICAN-AMERICAN HISTORY I (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Introduction to African-American history from precolonial West Africa to emancipation in the mid-nineteenth century. Topics include the African slave trade, the economics and politics of slavery, gender and culture in the slave community, and the free black experience in both the North and South.

Hist 344. AFRICAN-AMERICAN HISTORY II (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Introduction to African-American history from the mid-nineteenth century to the present. Covers race relations and the civil rights movement, as well as migration, black social and political thought, gender roles, and class formation.

Hist 345. COMMUNICATION THROUGH THE AGES (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Modes of communication, ancient and modern, in their social and cultural context—from cave painting to computers. Topics include literacy and economic development in the West; the technological revolution in media beginning with Daguerre, Morse, and Bell; the institutional development of mass media and popular culture; and contemporary trends in world communication and interaction.

Hist 351. ANCIENT GREECE AND THE PERSIAN EMPIRE (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

The political, institutional, and cultural developments of ancient Greece and the Persian Empire from the Mycenaean period to the King's Peace (386 B.C.).

Hist 352. THE HELLENISTIC STATES AND THE ROMAN REPUBLIC (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

The political and cultural developments of the Hellenistic states and their influence on the Republic of Rome to 30 B.C.

Hist 359. HISTORY OF THE MIDDLE EAST I (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

The political, cultural, and institutional developments in the Middle East from the Parthians to the capture of Constantinople by the Ottoman Turks. Four periods will be analyzed: the Parthian, the Sassanid Persian, the Caliphate, and the Seljuk and Ottoman Turks.

Hist 360. HISTORY OF THE MIDDLE EAST II (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

The political, cultural, and institutional developments in the Middle East from the capture of Constantinople by the Ottoman Turks to the impact of the Arab-Israeli conflict on the world today.

Hist 361. THE FOUNDING OF THE AMERICAN NATION (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

North America in the colonial and revolutionary periods, with emphasis on patterns of cultural and institutional development from early settlement through the ratification of the Constitution.

Hist 363. THE UNITED STATES AS A WORLD POWER (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

American domestic and foreign policy in the twentieth century. Topics include imperialism, the Progressive Era, the Depression, the New Deal, World Wars I and II, the Cold War, America and the world today.

Hist 365. COMPARATIVE COLONIAL HISTORY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Comparative analysis of the relationship between expanding Western nations and selected regions of Africa, Asia, and South America, from 1500 to 1970. Case study approach illuminates key historical processes, with emphasis on economic development and cultural change in colonial settings. Topics include European perceptions of culturally different peoples, race relations in colonial societies, forms of rebellion and resistance to European rule, nationalist movements.

Hist 366. GENDER, RACE, AND IDENTITY IN AMERICAN HISTORY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Surveys social construction of gender in American from the seventeenth century to the present. Examines changing gender roles and relations that have characterized and structured the historical experiences of different racial and ethnic groups. In a multicultural framework, covers impact that colonization, industrialization, slavery, immigration and migration, urbanization, war, and social movements have had on the ways that women and men think of themselves in terms of gender, as well as their respective roles in families and larger social networks.

Hist 367. LEGAL HISTORY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Examines the interaction of law and society and the role of law in political and cultural change. Regions, themes, and time periods covered vary and may include American Constitutional law, gender and law in American history, and comparative legal history.

Hist 368. COMPARATIVE ECONOMIC HISTORY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

A comparative analysis of the history of economic development, with particular attention to industrialization, shifting patterns of global trade, and changing labor markets. Topics include the Industrial Revolution, the rise of the world economy, the transformation of non-Western economies, labor migration, and newly industrializing countries.

Hist 372. CONTEMPORARY EUROPE (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

European society in the twentieth century, nationalism, imperialism, totalitarianism, movements toward European unity, and prominent cultural developments.

Hist 374. MODERN RUSSIAN CIVILIZATION (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Russia under the last tsars, the 1917 upheavals, rise of the Soviet state to world power under Lenin, Stalin, and others, until the collapse of the communist dictatorship.

Hist 377. CITIES IN HISTORY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Examines social, cultural, and economic changes in urban areas. Regions and themes vary and may include urbanization in Europe, the rise of cities in Latin America, and urban change in contemporary America.

Hist 379. HISTORY OF MEDICINE (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Focuses on the evolving institutions, values, concepts, and techniques through which doctors attempted to control the impact of disease and preserve the health of Americans, beginning with the shaman and colonial physician through post-World War II changes in the medical care system.

Hist 382. WAR AND SOCIETY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

The evolution of warfare and the impact of war on political, economic, cultural, and social institutions, including the two World Wars and post-1945 conflicts.

Hist 383. THE MAKING OF MODERN THOUGHT (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

The formation of contemporary images of human nature since the mid-nineteenth century. Emphasis on Marx, Darwin, and Freud and their legacy to twentieth-century thought. Theories of the family, sexuality, and the changing role of women in society explored.

Hist 385. TECHNOLOGY AND SOCIETY IN EUROPEAN AND WORLD HISTORY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Introduction to the social history of European and global technology from the Middle Ages to the second Industrial Revolution of the late nineteenth century. Emphasis on such themes as the process of technological innovation, the nature of technological systems, the diffusion of technology, the interaction of Western and non-Western technology, the changing relations of science and technology, and the role of technology in broader historical movements.

Hist 386. TECHNOLOGY IN AMERICAN HISTORY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Survey of the history of American technology emphasizing the social and economic environments of technological change. Topics include transfer of technology in building canals and cities, rise of the factory system, emergence of the American system of manufacturing, and development of major technological systems such as the railroad, telegraph, electric light and power, and automobile production and use. Focus on the professionalization of engineering practice, the industrialization of invention, and the growing links between engineers and corporate capitalism in the twentieth century.

Hist 388. BRITAIN IN THE TWENTIETH CENTURY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Survey of British history from the death of Queen Victoria to 1964, with emphasis on the social and political transformation resulting from Britain's declining economy and world position. Topics include the causes and impact of the two world wars, the transition from liberal democracy to welfare state, the turn from empire to Europe, social and economic trends, as well as foreign relations.

Hist 390. HISTORICAL PROBLEMS OF THE TWENTIETH CENTURY THROUGH FILM (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Study of selected problems in the twentieth century using film as a "window into history." Such topics as the rise of Nazi Germany, America in the thirties, World War II and American society, the development of cities, and the emergence of the "third world" will be considered. Only two topics will be selected for study in any one term. The material for the course will include documentary films, newsreels, TV news films, and theatrical feature films, as well as selected readings.

Hist 401,402. INDEPENDENT STUDIES IN HISTORY (3-0-3)

Prerequisites: Junior or senior standing; and before registering, permission from one of the following: federated history department chairperson, associate chairperson, history major adviser, history minor adviser.

Pursuit of special interests in history not covered in a regular elective course. A history faculty member provides guidance and assigns readings and papers.

Hist 489H. SENIOR HISTORY HONORS SEMINAR:

READINGS (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Limited to senior history majors who are enrolled in the Albert Dorman Honors College or who receive permission from the undergraduate history adviser. Meets with 21&62:510:489, but includes more advanced readings.

Hist 490H. SENIOR HISTORY HONORS SEMINAR:

RESEARCH (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Limited to senior history majors who are enrolled in the Albert Dorman Honors College or who receive permission from the undergraduate history adviser. Meets with 21&62:510:490, but includes more rigorous research and writing requirements.

HONORS 525

HONORS HISTORY AND LITERATURE (3,3,3,3)

Graduation requirements include two terms of history and two terms of literature. For Honors College students, these two, year-long requirements are merged into a single history-literature experience; topic changes each year. These linked courses are required of Honors College sophomores; registration for these courses is handled in the Honors College office.

21:350:103-104. HONORS ENGLISH COMPOSITION (3,3)

Open to first-year Honors College students only by permission of the director; required for first-year Honors College students.

Instruction in writing analytic, text-based essays; culminates in research-based papers. Honors English Composition insists on computer and information literacy; provides opportunities for collaborative projects, as well as oral presentations.

21:525:100,101. FIRST-YEAR HONORS COLLOQUIUM (3,3)

Theme-based seminar; theme changes each year. Offers students an opportunity to get to know one another and to "ease into" college-level classroom experience at honors level.

21:525:250,252,254. HONORS SPECIAL TOPIC SEMINARS (3,3,3)

Open to Honors College students only by permission of the director. Students enrolled in NCAS Honors College are required to take at least one of the three special topic seminars.

Provides opportunities for intellectual exploration each term; Honors College students can elect those of interest to them.

21:525:401. HONORS COLLEGE INDEPENDENT STUDY (BA)

Open to Honors College students only by permission of the director.

Independent study offers students an opportunity to explore an area of special interest with the guidance and expertise of a faculty member.

21:525:450. HONORS COLLEGE INTERNSHIPS (BA)

Open to Honors College students only by permission of the director.

Research internships both on and off campus encourage students to understand and to test the applicability of their education experience. Students may receive academic credit for their projects.

21:525:497-498. SENIOR HONORS PROJECT (3,3)

Open to Honors College seniors only by permission of the director. Both terms must be completed to receive credit. This is the capstone of the Honors College requirements.

Honors College seniors culminate their undergraduate experience with a year-long effort that may take one of three forms: they may take the capstone course, a theme-based course in which students may (1) work collaboratively on a common project or (2) complete an individual research project on a subject related to the course theme. (3) Students also may elect to complete an individual thesis, not part of an organized course, supervised by a faculty member. The project may be focused on a student's major area of study or may reflect a special interest or talent of the student outside of his or her major. Credit is given only upon completion of the project.

62:525:497,498. SENIOR HONORS PROJECT (3,3)

Open to University College Honors College students only.

An inquiry-methods course. The first term of the course is theme-based and includes several speakers' presentations on the theme. Students then work collaboratively, with special attention to research methods. In the second term, students work independently on research projects and gain experience in traditional research methods, as well as multimedia techniques.

HUMAN-COMPUTER INTERACTION 531

The major in human-computer interaction is offered jointly by the Department of Psychology, 301 Smith Hall and the Department of Computer and Information Science, Room 4400 Guttenberg Information Technologies Center, New Jersey Institute of Technology, pending formal approval.

Human-computer interaction (HCI) combines disciplines within the fields of computing and information sciences (information systems, software engineering, artificial intelligence) and the behavioral sciences (cognitive science, cognitive psychology, sociology, organizational psychology, and social psychology) to study the design, implementation, and evaluation of interactive computer-based technology. The main purpose of this field is to understand the nature of human-computer interaction and the constraints on design of such systems from understanding perceptual and cognitive aspects of humans. Examples of HCI products include intelligent tutoring systems, wearable computers, and highly interactive web applications.

The Bachelor of Science in human-computer interaction, a joint degree program with NJIT, provides the student with the necessary background to conduct design activities, including eliciting from the client, formulating, and articulating functional specifications; knowing how human factors and cognitive models should inform design; knowing the principles of, and having experience with, communication design; understanding how implementation constraints should inform design; and incorporating evaluation results into iterated designs.

Students implement their design knowledge by using their analysis and programming skills and demonstrating their computational literacy, i.e., knowledge sufficient for effective communication and decision making about interface construction tools and languages, multimedia authoring tools, data structures and algorithms and systems development. They also become proficient in evaluation activities, including experimental design, survey methods, usability testing, and statistical analysis. The program includes the following specialty areas, which consist of four courses each: learning systems, human systems, applications development, publishing and multimedia communications, networks, the web, and other tailored specialty areas of computer applications.

B.S. in Human-Computer Interaction (73 credits)

Major Requirements: NCAS and UC-N

Required Core Courses

A total of 56 credits of core courses are required for the human-computer interaction major. The following courses are required:

21&62:198:101	Computers and Programming I (3)
21&62:198:102	Computers and Programming III (3)
21&62&28:198:335	Data Structures and Algorithm Design (3)
28:198:350	Computers and Society (3) (NJIT)
28:198:375	Applications Development for the World Wide Web (NJIT)
28:198:390	Requirements Analysis and Systems Design (3) (NJIT)
28:198:431	Introduction to Database Systems Design and Management (3) (NJIT)
28:198:447	Human-Computer Interfaces (3) (NJIT)
28:198:475	Evaluation of Computer Applications (NJIT)
21&62:640:119	Basic Calculus (3)
21&62:640:237	Discrete Structures (3)
21&62:640:251	Linear Algebra (3)
21&62:830:103	Introduction to Cognitive Science I
21&62:830:104	Introduction to Cognitive Science II (3)
21&62:830:301	Statistical Methods for the Cognitive and Behavioral Sciences (4)
21&62:830:302	Experimental Methods for the Cognitive and Behavioral Sciences (4)
21&62:830:335	Social Psychology (3)
21&62:830:372	Perception (3)

Specialization Tracks

The HCI major further requires 12 credits in one of the following specialization tracks. Each track emphasizes a significant aspect of HCI and allows the student further depth in these areas. The specialization track is a sequence of four (300/400-level) courses, focusing on an area and/or subject relevant to the methodologies of, the design of, or the application of computing systems. The specialization courses must form a coherent unit, should be chosen from a set of courses complementary to the courses required for this major, and must be approved by the faculty adviser. The following specialization tracks are offered:

- **Learning Systems:** Human learning and the systems and technology to support learning and educational processes.
- **Human Systems:** Groups and organizations and their use of information and computer applications.

- **Applications Development:** Further studies of the technology for development of applications. Recommended for students aiming to work in small organizations or end user units where the designer also may be the implementer.
- **Publishing and Multimedia:** Further studies of the technology involving the production of material in multimedia forms and specialized areas such as graphics and data visualization.
- **Communications, Networks, and the Web:** Further studies of the technology involving the nature of applications in communication environments and the relationship of design to groups, communities, and organizations.
- **Individualized Study:** Any possible area of computer application of particular interest to the student (also for students with graduate school objectives in a specific field). Must be developed with the approval of the department adviser.

INTERNATIONAL AFFAIRS

The minor in international affairs, an interdisciplinary program administered by the Department of Political Science and the Department of Classical and Modern Languages and Literatures, is offered at NCAS.

Minor Requirements

The minor in international affairs requires 21 credits as follows:

1. Prerequisite:
Foreign language: successful completion of the intermediate course 132 or its equivalent preparation, demonstrated through a proficiency examination.
2. Core Courses:
 - a. 21&62:220:335 International Economic Relations (3)
or 21&62:790:317 International Political Economy (3)
 - b. 21&62:512:398 American Foreign Affairs (3)
 - c. 21&62:790:321 World Politics (3)
 - d. 6 credits in foreign literature at the 205,206 level.
3. Two additional courses at the 300 or 400 level, in one of the cooperating disciplines, selected in consultation with an adviser (6 credits).
4. The civilization course in the target foreign language area or study abroad with an approved college program is strongly recommended.

Note: The student majoring in one of the cooperating disciplines may count no more than 6 credits of this minor toward the major.

ITALIAN 560

*Department of Classical and Modern Languages and Literatures
Conklin Hall (973/353-5498)*

The Italian minor is offered at NCAS.

The department offers major programs in Ancient Mediterranean Civilizations (Classics 190, Greek 490, Hebrew Studies 500, Latin 580), Central and Eastern European Studies 149, French 420, German 470, and Spanish 940. Students majoring in one language area may concurrently major or minor in another language area. The department also participates in the interdisciplinary major, a

multidisciplinary minor in international affairs, and the Rutgers Study Abroad Program, and offers courses in Portuguese, Arabic, and Linguistics.

Minor Requirements

A minor in Italian requires 18 credits in Italian language and literature, which may include 21:560:131,132 Intermediate Italian (or equivalent preparation as demonstrated by proficiency examination). Any of the Italian language and literature courses numbered 200 or higher may be taken to satisfy this requirement, with the exception of 21:560:311,312 Italian Literature in English Translation.

The Department of Classical and Modern Languages and Literatures also offers minors in ancient medieval civilizations, French, German, Portuguese, Slavic, and Spanish. Students may pursue one or more minor concentrations.

Courses

21:560:101-102. ELEMENTARY ITALIAN (3,3)

Intended for students with little or no previous knowledge of Italian. Both terms must be completed to receive credit.

The fundamentals of grammar with drill in speaking and reading. A minimum total of ten hours of language laboratory work per term is required in NCAS elementary language courses.

21:560:131,132. INTERMEDIATE ITALIAN (3,3)

Prerequisite: 21:560:102 or equivalent as determined by placement examination.
Review of grammar, readings in literature, and other cultural areas.

21:560:203. GRAMMAR AND COMPOSITION (3)

Advanced grammar review, composition, diction, special problems as required.

21:560:204. COMPOSITION AND CONVERSATION (3)

Prerequisite: 21:560:203 or permission of instructor.
Intensive practice in oral and written Italian.

21:560:205,206. INTRODUCTION TO ITALIAN LITERATURE (3,3)

Prerequisite: 21:560:132 or equivalent. 21:560:205,206 is prerequisite for advanced courses in Italian literature.

The development of Italian literature traced from its origins through the contemporary period; readings from important works, reports, and discussions. Conducted, as far as is practicable, in Italian.

21:560:301. ADVANCED GRAMMAR AND COMPOSITION (3)

Prerequisites: 21:560:203, 204.
Special stress on unusual points of grammar and syntax.

21:560:311,312. ITALIAN LITERATURE IN ENGLISH TRANSLATION (3,3)

Not open to Italian minors.
Literary examination of representative works of Italian literature; writers such as Dante, Petrarca, Boccaccio, Ariosto, Machiavelli, Goldoni, Alfieri, Manzoni, Leopardi, Verga, Carducci, Deledda, Pirandello, Ungaretti, and Montale are discussed.

21:560:343. ITALIAN CIVILIZATION (3)

The relationships among Italian society, literature, art, and music in selected historical periods. Taught in English.

21:560:353,354. INDIVIDUAL STUDY IN ITALIAN (3,3)

Prerequisite: Permission of department chairperson or instructor.
Individual study or research in Italian language or literature.

21:560:415,416. DANTE (3,3)

Dante's life and works, with emphasis on the *Divina Commedia*, which is read in its entirety.

21:560:433. ITALIAN SHORT STORY (3)

Intensive study of the *novella* in Italy from the *conti* of the thirteenth century to the *racconti* of the twentieth century.

21:560:434. ITALIAN DRAMA (3)

History of Italian theater from the early Renaissance discovery and imitation of Greek and Roman tragedies and comedies, through the sixteenth-century emergence of original Italian dramatic forms, down to modern and contemporary playwrighting.

21:560:451,452. ITALIAN LITERATURE OF THE TWENTIETH CENTURY (3,3)

First term: major currents in poetry from the turn of the century to the period following World War II; reading and discussion of poems by Gozzano, Marinetti, Saba, Ungaretti, Montale, Quasimodo, and others. *Second term:* continuity of tradition and rebellion against present and past; reading of major novels by Pirandello, Deledda, Brancati, Vittorini, Moravia, Pavese, Cassola, and Calvino.

21:560:477,478. ITALIAN LITERATURE OF THE NINETEENTH CENTURY (3,3)

Neoclassicism, romanticism, and *verismo*; readings from the most significant authors of these movements. *First term:* a study of the outstanding poets of the century—Foscolo, Leopardi, Carducci, Pascoli, and D'Annunzio. *Second term:* a study of the representative novelists—Manzoni, Fogazzaro, Verga, D'Annunzio, and Suevo.

LATIN 580 (See Ancient Medieval Civilizations)

LEGAL STUDIES

The minor in legal studies, an interdisciplinary program administered by the Department of History and the Department of Political Science, is offered at NCAS.

Minor Requirements

The legal studies minor requires 21 credits as follows:

1. Required course: 21:790:304 Introduction to Law and Legal Research (3)
2. Electives: 18 credits, with no more than 11 from a single department; no more than 6 credits may be applied to both a major and a minor program.

Classics

21:190:335,336 Ancient Law (3,3)

History

21&62:510:346 Medieval Legal History (3)

21&62:512:365,366 American Legal History (3,3)

21&62:512:452 Topics in Legal History (3)

Political Science

21&62:790:302 Politics of the European Union (3)

21&62:790:367 Jurisprudence and Legal Theory (3)

21&62:790:375,376 American Political Theory (3,3)

21&62:790:387 International Law (3)

21&62:790:401-402 American Constitutional Law and Politics (3,3)

Sociology

21&62:920:349 Law and Society (3)

LINGUISTICS 615

21&62:615:201. INTRODUCTION TO LINGUISTICS (3)
 An introduction to the scientific study of language: how languages agree and differ in their systems of sound, grammar, and meaning; the nature of language acquisition and the processing mechanisms that shape the course of language development of speakers; the role language plays in society and in the shaping of culture.

21&62:615:302. LANGUAGE AND HISTORY (3)
Prerequisite: 21&62:615:201.
 A discussion and appraisal of the three major models (neogrammarian, structuralist, transformational generative) proposed to account for the phenomenon of language change in time. Other topics include the social and cultural motivation of language change; bilingualism and interference between languages; pidgins and creoles; and linguistic reconstruction and prehistory.

21&62:615:320. TEACHING METHODOLOGIES FOR WORLD LANGUAGES (3)
 An introduction to applied linguistics, second language acquisition, and teaching methodologies in line with current cognitive models and perspectives. Open to all students of foreign language, especially those seeking teaching certification in a foreign language. Methods appropriate for K-12 teaching in the New Jersey World Languages curriculum are treated in detail.

MATHEMATICS (Mathematics 640, Statistics 960)

*Department of Mathematics and Computer Science
 Smith Hall (973/353-5156); <http://newark.rutgers.edu/~nwkmath>*

The major in mathematics is offered at NCAS. The minor in mathematics is offered at NCAS and at UC-N. The major in applied mathematics is offered at NCAS and at UC-N.

Major Requirements: NCAS

Mathematics

A total of 51 credits is required for the mathematics major. The following are required courses:

- 21&62:640:135 Calculus I (4)
- 21&62:640:136 Calculus II (4)
- 21&62:640:235 Calculus III (4)
- 21&62:640:238 Foundations of Modern Mathematics (3)
- 21&62:640:251 Linear Algebra (3)
- 21&62:640:311 Advanced Calculus I (3)
- 21&62:640:312 Advanced Calculus II (3)
- 21&62:640:314 Elementary Differential Equations (3)
- 21&62:640:491 or 492 Mathematics Seminar (3,3)

In addition, 12 credits are required in mathematics courses at the 300 or 400 level, 6 credits of which must be at the 400 level. The following courses also are required:

- 21&62:198:101 Computers and Programming I (3)
- 21&62:750:213 Elements of Physics I (3)
- 21&62:750:214 Elements of Physics II (3)

The following is a recommended sequence for completing the courses required for a mathematics major. Additional courses are required by the student's college of matriculation for graduation.

First Year

Fall Term
 21&62:198:101 Computers and Programming I (3)
 21&62:640:135 Calculus I (4)

Spring Term
 21&62:640:136 Calculus II (4)

Sophomore Year

Fall Term
 21&62:640:235 Calculus III (4)
 21&62:640:238 Foundations of Modern Mathematics (3)
 21&62:750:213 Elements of Physics I (3)

Spring Term
 21&62:640:251 Linear Algebra (3)
 21&62:750:214 Elements of Physics II (3)

Junior Year

Fall Term
 21&62:640:311 Advanced Calculus I (3)
 21&62:640:___ Mathematics elective

Spring Term
 21&62:640:312 Advanced Calculus II (3)
 21&62:640:314 Elementary Differential Equations (3)
 21&62:640:___ Mathematics elective

Senior Year

Fall Term
 21&62:640:___ Mathematics elective

Spring Term
 21&62:640:491 Mathematics Seminar (3)
 21&62:640:___ Mathematics elective

Applied Mathematics

The applied mathematics major is offered jointly by the Department of Mathematics and Computer Science at Rutgers-Newark and the Department of Mathematical Sciences at New Jersey Institute of Technology (NJIT). The program is designed to provide students with preparation for employment in technology-based industries or graduate study in a number of scientific fields, including applied mathematics and mathematics. Students may register for mathematics, computer science, and physics courses offered at NJIT under the prefixes 28:640, 28:198, 28:750, respectively. Thus, for example, the course listed as MATH 346 in the NJIT catalog becomes 28:640:346 for Rutgers students.

A total of 57 credits is required for the applied mathematics major.

Three sequences of courses are required:

1. 21&62:198:101,102 Computers and Programming I,II * (3,3) or 28:198:113,114 *
2. 21&62:640:135,136, 235 Calculus I,II,III * (4,4,4) or 28:640:111,112, 213
3. 21&62:750:213,214 Elements of Physics I,II † (3,3) or 28:750:111, 121 †

* Students must take all courses from one sequence, either all at Rutgers or all at NJIT.

† It is strongly recommended that both courses be taken from one sequence, either both at Rutgers or both at NJIT.

MATHEMATICS

The following individual courses also are required:

- 21&62:640:238 Foundations of Modern Mathematics (3)
or 21&62:640:237 Discrete Structures (3)
(238 preferred)
- 21&62:640:251 Linear Algebra (3) or 28:640:337 (3)
- 21&62:640:314 Elementary Differential Equations (3) or
28:640:222 (3)
- 21&62:640:327 Probability and Statistics (3) or
28:640:333 (3)
- 21&62:640:423 Elementary Partial Differential Equations
(3) or 28:640:331 (3)
- 21&62:640:473 Numerical Analysis (3) or 28:198:421 (3)
- 21&62:640:475 Applied Mathematics I (3) or
28:640:560 (3)
- 21&62:640:476 Applied Mathematics II (3) or
28:640:561 (3)

In addition, three mathematics courses at the 300 or 400 level are required. Some recommended electives are:

- 21&62:640:311 Advanced Calculus I (3)
- 21&62:640:312 Advanced Calculus II (3)
- 28:640:344 Regression Analysis (3)
- 28:640:346 Mathematics of Finance (3)
- 28:640:371 Physiology and Medicine I (3)
- 21&62:640:403 Introductory Theory of Functions of a
Complex Variable (3) or 28:640:332
- 21&62:640:410 Vector Analysis (3) or 28:640:335
- 21&62:640:424 Operations Research (3)

The following is a recommended sequence for completing the courses required for an applied mathematics major. Additional courses are required by the student's college of matriculation for graduation.

First Year

Fall Term

- 21&62:198:101 Computers and Programming I (3)
- 21&62:640:135 Calculus I (4)

Spring Term

- 21&62:198:102 Computers and Programming II (3)
- 21&62:640:136 Calculus II (4)

Sophomore Year

Fall Term

- 21&62:640:235 Calculus III (4)
- 21&62:640:238 Foundations of Modern Mathematics (3)
or 21&62:640:237 Discrete Structures (3)
- 21&62:750:213 Elements of Physics I (3)

Spring Term

- 21&62:640:251 Linear Algebra (3)
- 21&62:750:214 Elements of Physics II (3)

Junior Year

Fall Term

- 21&62:640:473 Numerical Analysis (3)
- 21&62:640:___ Mathematics elective [21&62:640:311
Advanced Calculus I (3) is
recommended]

Spring Term

- 21&62:640:314 Elementary Differential Equations (3)
- 21&62:640:___ Mathematics elective [21&62:640:312
Advanced Calculus II (3) is
recommended]

Senior Year

Fall Term

- 21&62:640:423 Elementary Partial Differential
Equations (3)
- 21&62:640:475 Applied Mathematics I (3)
- 21&62:640:___ Mathematics elective

Spring Term

- 21&62:640:476 Applied Mathematics II (3)

Minor Requirements: NCAS and UC-N

A mathematics minor requires the following courses:

- 21&62:640:136 Calculus II (4)
- 21&62:640:235 Calculus III (4)
- 21&62:640:251 Linear Algebra (3)
- 21&62:640:314 Elementary Differential Equations (3)
- 21&62:640:327 Probability and Statistics (3)
- 21&62:640:473 Numerical Analysis (3)

Teacher Certification

Students seeking teacher certification in mathematics must complete the requirements for a major in the mathematics department as well as satisfy other requirements for certification. For details regarding admission to the teacher education program and the requirements, students should consult both their department adviser and the chairperson of the education department.

Courses (Mathematics 640)

21&62:640:037. STUDY SKILLS FOR MATHEMATICS DEVELOPMENT (N2)

Prerequisite: Placement by examination. Corequisite: 21&62:640:112.

21&62:640:103. MATHEMATICS FOR THE LIBERAL ARTS (3)

Prerequisite: Placement by examination. Successful completion of this course with a grade of C or better fulfills the mathematics proficiency requirement. May not be used as an elective for the math major or minor. Intended for students who do not plan to enroll in additional courses in mathematics.

Fundamental ideas of mathematics, selected from graph theory, game theory, mathematical logic, number theory, geometry, probability, and statistics.

21&62:640:112. COLLEGE ALGEBRA INTENSIVE (3)

Prerequisite: Placement by examination. Corequisite: 21&62:640:037.

Credit is not given for both 21&62:640:112 and 21&62:640:113. Successful completion of this course with a grade of C or better fulfills the mathematics proficiency requirement.

Covers the same material as 21&62:640:113, but meets for three eighty-minute sessions each week. Intended for students who need extra class time and individualized attention.

21&62:640:113. COLLEGE ALGEBRA (3)

Prerequisite: Placement by examination. Successful completion of this course with a grade of C or better fulfills the mathematics proficiency requirement.

Functions and operations of functions; operations on polynomials, fractions; solution of linear and quadratic equations and inequalities; graphing of linear and quadratic functions; solution of word problems.

21&62:640:114. PRECALCULUS (3)

Prerequisite: 21&62:640:112 or 113 or placement by examination. Intended for students who plan to enroll in additional courses in mathematics.

Algebraic, rational, trigonometric, logarithmic, and exponential functions; functions and inverse functions; solutions of nonlinear inequalities; advanced factoring techniques.

21&62:640:119. BASIC CALCULUS (3)

Prerequisite: 21&62:640:112 or 113 or placement by examination. Credit not given for both 21&62:640:119 and 21&62:640:135. Intended for students majoring in business, social science, or the liberal arts.

Intuitive approach to calculus, with emphasis on applications, differential and integral calculus, and multivariable calculus.

21&62:640:135. CALCULUS I (4)

Prerequisite: 21&62:640:114 or placement by examination. Credit not given for both 21&62:640:135 and 21&62:640:119.

Introduction to analytic geometry; inequalities, functions, limits, continuity, differentiation of algebraic functions, applications, and introduction to definite and indefinite integration, calculus of exponential and logarithmic functions.

21&62:640:136. CALCULUS II (4)

Prerequisite: 21&62:640:135 or equivalent.

Applications of integrals, calculus of trigonometric and inverse trigonometric functions, techniques of integration, indeterminate forms, infinite series and Taylor's series, polar coordinates.

21&62:640:155-156. HONORS CALCULUS (4,4)

Prerequisite: Invitation by department based on placement examination. Open to all majors.

Covers material selected from 21&62:640:135,136, 235 in greater depth with emphasis on mathematical rigor.

21&62:640:235. CALCULUS III (4)

Prerequisite: 21&62:640:136 or equivalent.

Introduction to vectors in the plane, solid analytic geometry and vectors in three dimensions; partial differentiation; multiple integrals; applications.

21&62:640:237. DISCRETE STRUCTURES (3)

Prerequisite: 21&62:640:119 or 135.

Sets, relations, functions, graphs, trees, formal expressions, mathematical induction, and some algebraic structures; applications to probability and computer science and enumerative problems in combinatorial analysis.

21&62:640:238. FOUNDATIONS OF MODERN MATHEMATICS (3)

Prerequisite: 21&62:640:136 or permission of instructor.

Basic concepts on which modern mathematics is founded; language and logical structure of mathematics; elementary set theory, including set operations, relations, and mappings; the structure of the real number system and elements of real analysis. Proof techniques are stressed.

21&62:640:251. LINEAR ALGEBRA (3)

Prerequisite: 21&62:640:119 or 135 or permission of instructor.

The algebra and geometry of linear spaces; elementary arithmetic of matrices and determinants; systems of linear equations; other applications such as linear programming, Markov chains, and connectivity properties of graphs.

21&62:640:311,312. ADVANCED CALCULUS I,II (3,3)

Prerequisites: 21&62:640:235, 238, and 251, or permission of instructor.

The calculus of functions of one or more real variables; transformations and implicit functions; line and surface integrals.

21&62:640:314. ELEMENTARY DIFFERENTIAL EQUATIONS (3)

Prerequisite: 21&62:640:136.

Ordinary differential equations, including solution by series and their applications; emphasis on linear equations.

21&62:640:327. PROBABILITY AND STATISTICS (3)

Prerequisite: 21&62:640:119 or 135 or permission of instructor.

Modern probability, statistics, and statistical inference; discrete and continuous distributions of random variables, statistical inference, hypothesis testing, linear regression, and correlation.

21&62:640:353. THEORY OF EQUATIONS (3)

Prerequisite: 21&62:640:251.

Algebraic equations, including methods of solving equations; introductory theory of solvability; transformations; algebraic invariants; the fundamental theorem of algebra.

62:640:397,398. MATHEMATICS TEACHING APPRENTICESHIP (3,3)

Practice in the teaching of mathematics supervised by members of the faculty.

21&62:640:403. INTRODUCTORY THEORY OF FUNCTIONS OF A COMPLEX VARIABLE (3)

Prerequisite: 21&62:640:311 or permission of instructor.

Analytic functions; Cauchy's integral theorem; contour integration; residues; series; and conformal mapping.

21&62:640:410. VECTOR ANALYSIS (3)

Pre- or corequisite: 21&62:640:235.

Vector algebra and vector calculus, including line and surface integrals and the theorems of Green, Gauss, and Stokes; applications to physics and geometry.

21&62:640:423. ELEMENTARY PARTIAL DIFFERENTIAL EQUATIONS (3)

Prerequisite: 21&62:640:314.

Partial differential equations of science and engineering. Topics include initial and boundary value problems for parabolic, hyperbolic, and elliptic second-order equations. Stress on separation of variables, special functions, transform methods, and numerical techniques.

21&62:640:424. OPERATIONS RESEARCH (3)

Prerequisite: 21&62:640:235 or permission of instructor.

Major topics and techniques in operations research; topics chosen from transportation problems, scheduling problems, linear programming, dynamic programming, mathematical inventory theory, and game theory.

21&62:640:432. INTRODUCTORY DIFFERENTIAL GEOMETRY (3)

Prerequisites: 21&62:640:235, 238.

Differential geometry; curves in Euclidean 3-space; regular surfaces in space; parametrization of surfaces; first fundamental form for surfaces; Gauss map and second fundamental form; intrinsic geometry of surfaces; intrinsic geometry of manifolds.

21&62:640:433. PROJECTIVE GEOMETRY (3)

Prerequisite: 21&62:640:238.

Projective and affine curves; polynomial rings; ideals; Hilbert's basis theorem; the *nullstellungssatz*; local rings; singularities.

21&62:640:435,436. GEOMETRY I,II (3,3)

Prerequisites: 21&62:640:235, 251.

Axiomatic systems; finite geometries; Euclidean geometry; non-Euclidean geometry.

21&62:640:441,442. TOPOLOGY I,II (3,3)

Prerequisite: 21&62:640:238 or permission of instructor.

General topological spaces and continuous mappings; linear point set theory and plane point set theory; separation, connectedness, and compactness; localization; topological products and Tychonoff's theorem; metric spaces and isometrics.

21&62:640:450. VECTOR SPACES AND MATRICES (3)

Prerequisite: 21&62:640:251 or permission of instructor.

Vector spaces; matrices and systems of linear equations; the algebra of matrices and canonical forms.

21&62:640:451,452. ABSTRACT ALGEBRA (3,3)

Prerequisites: 21&62:640:238, 251, or permission of instructor.

Elementary set theory; fundamental structures of algebra, including semigroups, groups, rings, and fields; homomorphisms and isomorphisms; factor group, rings of residue classes, and other factor structures.

21&62:640:456. THEORY OF NUMBERS (3)

Prerequisite: 21&62:640:238 or permission of instructor.

Divisibility of integers; the series of primes; number-theoretic functions; continued fractions; congruences; diophantine equations; quadratic residues; the Pell equation.

21&62:640:473. NUMERICAL ANALYSIS (3)

Prerequisites: 21&62:198:101 and 21&62:640:136.

Error analysis; interpolation theory; numerical solution of equations; polynomial approximations; numerical differentiation and integration; solution of differential equations.

MUSIC

21&62:640:475,476. APPLIED MATHEMATICS I,II (3,3)

Prerequisite: 21&62:640:314 or permission of instructor.

Fourier series and integrals; boundary value problems; matrices; finite differences; special functions; numerical methods.

21&62:640:477. FUNDAMENTAL MATHEMATICAL PROBABILITY (3)

Prerequisite: 21&62:640:136 or permission of instructor.

Fundamentals of probability theory for discrete and continuous distributions; random variables and probability distributions; Bayes's theorem; the Bernoulli and Poisson distributions; central limit theorem; strong law of large numbers.

21&62:640:491,492. MATHEMATICS SEMINAR (3,3)

Prerequisite: Permission of instructor. Students may enroll multiple times.

Selected topics in mathematics; individual study stressed.

21&62:640:493,494. INDIVIDUAL STUDIES IN MATHEMATICS (3,3)

Prerequisite: Permission of instructor. Students may enroll multiple times.

Individual studies of selected topics in mathematics.

Courses (Statistics 960)

21&62:960:211-212. STATISTICS I,II (3,3)

Prerequisite: Mathematics proficiency.

Principles, methods, and application of statistical methodology; includes frequency distributions, measures of central tendency and dispersion, simple probability, sampling, regression and correlation analysis, curve fitting, and tests of significance.

MEDICAL TECHNOLOGY 660

(See Clinical Laboratory Sciences 191)

METEOROLOGY 670

(See Geological Sciences)

MICROBIOLOGY (See Biological Sciences)

MUSIC (Music 700, Music Performance 701)

Department of Visual and Performing Arts

Bradley Hall (973/353-5119)

The music major and minor are offered at NCAS; an M.A. in jazz history and research is offered through the Graduate School–Newark.

The music faculty uniquely offers expertise in all types of music, including jazz, classical, and world music, integrating the varieties of musical experience wherever possible. The music offerings are designed to foster a broad view of music encompassing traditions around the world. Students have frequent contact with faculty advisers, who aid in planning work and defining goals. The major is designed to assist the student to function easily with music. Today's musician should strive to be competent as a scholar, as a creator, and as a performer.

Major Requirements

The following courses are required:

- 21&62:700:101 Introduction to Music (3)
- 21&62:700:121 Music Theory I (3)
- 21&62:700:122 Music Theory II (3)

21&62:700:224 Applied Musicianship (3)

21&62:700:235 Harmony I (3)

21&62:700:236 Harmony II (3)

21&62:700:237,238 Survey of Western Music (3,3)

21&62:700:265 Jazz (3)

21&62:700:280 World Music (3)

Four music performance (701) courses (4)

Students majoring in music must enroll each term in a departmental ensemble (chorus or band).

Applied Music. All students majoring in music are expected to study an instrument or voice each term. A secondary instrument, or voice, also is urged.

Music Ensembles. Membership in an instrumental ensemble (jazz, chamber music) or chorus is required each term (21&62:700:231,232, 234, 357,358, 359,360 Rutgers University Chorus; 21:701:255,256, 355,356, 455,456 Instrumental Ensemble I,II,III).

Minor Requirements

The music minor requires 18 credits, as follows:

21&62:700:101 Introduction to Music (3)

21&62:700:121 Music Theory I (3)

21&62:700:122 Music Theory II (3)

21&62:700:237,238 Survey of Western Music (3,3)

or an approved substitution

4 credits in music performance (private lessons)

Teacher Certification

Students seeking teacher certification in music must complete the requirements for a major in the music program as well as satisfy other requirements for certification. For details regarding admission to the teacher education program and the requirements, students should consult both their department adviser and the chairperson of the education department.

Sequence in Arts Management

The faculty of the Department of Visual and Performing Arts in conjunction with members of the Faculty of Management offer a sequence of six courses as pre-professional training for a wide spectrum of not-for-profit arts management opportunities. The sequence provides students with the opportunity to acquire specific business skills that can be applied to a profession in the arts. For practical experience, a wide variety of internships is available, some of which provide stipends. The sequence comprises the following 18 credits:

21&62:080:393,394 Internship in Art (3,3)

21&62:084:395,396 Issues in Arts Management I,II (3,3)

21&62:084:408,409,410,411 Topics in Arts Management I,II,III,IV (3,3,3,3)

Courses (Music History 700)

21&62:700:101. INTRODUCTION TO MUSIC (3)

A comprehensive view of music designed to develop critical ability as a listener; significant composers, representative works, forms, and styles.

21&62:700:135. MUSIC AND FILM (3)

Relationship between music and film from the silent era of live accompaniment to the modern era of synchronized soundtracks; philosophical relationship of music to visual arts.

21&62:700:219. WOMEN IN MUSIC (3)

Women in pop, jazz, and classical music; their lives and society's changing attitudes toward women performers and composers.

21&62:700:229. AMERICAN MUSIC (3)

Previous musical knowledge not required.

Survey of a representative sampling of U.S. musical traditions, including Native American, African-American, Ukrainian, Irish, Italian, Polish, Hispanic, and others; processes of change, development, and preservation, as well as musical features.

21&62:700:237,238. SURVEY OF WESTERN MUSIC (3,3)

The forms and styles of Western music from the early medieval period to the present day.

21&62:700:265. JAZZ (3)

A survey of jazz from its earliest roots to its present level of sophistication; lectures illustrated by recordings and live performances.

21:700:280. WORLD MUSIC—AN INTRODUCTION (3)

World folk and ethnic musics, including Asian, African, European; musical instruments; methods of approach to diverse instrumental and vocal performance styles; lecture-demonstrations by visiting ethnic musicians.

21:700:303. THE AGE OF BACH (3)

Discussion of vocal and instrumental forms of the early eighteenth century, with emphasis on the works of Bach.

21&62:700:304. THE AGE OF BEETHOVEN (3)

The evolution of the classical style; emphasis on the life and works of Beethoven.

21:700:311,312. OPERA AND MUSIC DRAMA (3,3)

A study of the development of dramatic forms in music, based on a selection of significant operas.

21&62:700:317. MUSIC IN THE ROMANTIC ERA (3)

A study of the period c. 1815 to 1900; works of Schubert, Schumann, Berlioz, Liszt, Brahms, Wagner, and Verdi.

21&62:700:318. MUSIC IN THE TWENTIETH CENTURY (3)

Study of the principal stylistic tendencies from c. 1900 to the present; works of Debussy, Schoenberg, Stravinsky, Hindemith, and Bartók; experimental music and the contributions of American composers.

21&62:700:319. TOPICS IN JAZZ (3)

Changing topics, which may include the work of a particular performer, or style, or the sociology of jazz.

21&62:700:321. TOPICS IN MUSIC HISTORY (3)

Changing topics delving into intriguing aspects of music history.

Courses (Music Theory 700)**21&62:700:111. FUNDAMENTALS OF MUSIC I (3)**

Music notation as it applies to melody, harmony, and rhythm. Scales and beginning harmony.

21&62:700:112. FUNDAMENTALS OF MUSIC II (3)

Prerequisite: 21&62:700:111 or permission of instructor.

Continuing study of harmony; exercises in elementary composition; analysis of musical examples.

21&62:700:121. MUSIC THEORY I (3)

Review of scales, intervals, triads; elementary part-writing; analysis of pertinent music examples.

21&62:700:122. MUSIC THEORY II (3)

Prerequisite: 21&62:700:121 or permission of instructor.

Continuing study of harmony; exercises in elementary composition; analysis of musical examples.

21&62:700:211. CREATIVE MUSICIANSHIP (3)

Study of musical techniques and concepts through improvisation, composition, performance, and other creative activities.

21&62:700:224. APPLIED MUSICIANSHIP (3)

Prerequisite: 21&62:700:111 or permission of instructor.

Ear training, sight singing, and dictation; study of harmony at the keyboard.

21&62:700:235. HARMONY I (3)

Prerequisite: 21&62:700:112 or permission of instructor.

Study of common-practice harmony, including altered and chromatic chords; written exercises; harmonic and formal analysis of selected compositions.

21&62:700:236. HARMONY II (3)

Prerequisite: 21&62:700:235.

Continuation of 21&62:700:235.

21&62:700:325,326. STUDIES IN COUNTERPOINT (3,3)

Contrapuntal theory and practice based on analysis of the works of Renaissance and baroque masters; composition in the various contrapuntal forms.

21&62:700:342. ORCHESTRATION (2)

Application of the principles and techniques of orchestration; score reading.

21&62:700:349. CONDUCTING (2)

Conducting and rehearsal techniques in theory and practice.

21&62:700:365,366. JAZZ COMPOSITION AND ARRANGING (3,3)

Prerequisite: 21&62:700:236 or permission of instructor.

Introduction to the techniques of composing and arranging for jazz ensemble (small combo, big band, and studio orchestra); emphasis on original creative work in the contemporary jazz idiom as well as the study of classic compositions from the jazz repertoire; studio and other commercial applications considered.

21&62:700:419,420. SPECIAL STUDIES IN MUSIC HISTORY AND COMPOSITION (3,3)

Problems of music history with reports of individual inquiry; concentrated studies in creative composition.

21&62:700:435,436. ADVANCED STUDIES IN THEORY AND COMPOSITION (3,3)

Prerequisite: 21&62:700:236.

Analysis of late romantic and contemporary compositions; creative composition in small forms.

Courses (Music Ensembles 700, 701)**21&62:700:231,232. RUTGERS UNIVERSITY CHORUS (2,2)**

Students may enroll in terms in any order. Prerequisite: Permission of instructor.

Intensive study of choral literature and its forms from the sixteenth century to the present. Emphasis on group vocal training, with at least one major performance each term.

21&62:700:234. RUTGERS UNIVERSITY CHORUS (2)

Continuation of 21&62:700:231,232.

21&62:700:241,242. VOICE TRAINING (1,1)

Fundamentals of singing, tone production, diction, breathing.

21&62:700:357,358. RUTGERS UNIVERSITY CHORUS (1,1)**21&62:700:359,360. RUTGERS UNIVERSITY CHORUS (2,2)****21:701:255,256. INSTRUMENTAL ENSEMBLE I (2,2)**

Prerequisite: Permission of instructor.

Study and performance of music for instrumental ensembles, including jazz, popular music, and chamber music. On occasion singers may join these ensembles.

PHILOSOPHY

21:701:355,356. INSTRUMENTAL ENSEMBLE II (1,1)

21:701:455,456. INSTRUMENTAL ENSEMBLE III (1,1)

21&62:701. JAZZ IMPROVISATION (BA,BA)

An introduction to the art of jazz improvisation, applicable to all instruments and voice; relationship of improvisation to musical form and structure; improvising in small groups. Students will enroll under practical instruction as listed below.

Courses (Music Performance 701)

Individual Instruction

Individual instruction is offered to any qualified student in the college. Students should contact the department for information. Courses are to be taken in sequence, beginning with the 100 level. Lessons must be arranged with the department prior to or during the first week of classes. Studies available for the following: bassoon, clarinet, double bass, electric bass, flute, french horn, guitar, jazz improvisation, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, violoncello, and voice.

First Year

21&62:701:163,164 PRACTICAL INSTRUCTION (1,1)

Second Year

21&62:701:263,264 PRACTICAL INSTRUCTION (1,1)

Third Year

21&62:701:363,364 PRACTICAL INSTRUCTION (1,1)

Fourth Year

21&62:701:463,464 PRACTICAL INSTRUCTION (1,1)

PHILOSOPHY 730

Department of Philosophy

Conklin Hall (973/353-5029)

The philosophy major and minor are offered at NCAS and UC-N.

Major Requirements

The philosophy major is designed to give students an understanding of the historical development of philosophic concepts and to introduce students to the logical tools applicable to philosophical work. A variety of electives are offered, which are intended to enrich the student's understanding of the field.

Philosophy Major

The major requires 30 credits in philosophy courses that must include the following:

- 21&62:730:201 Introduction to Logic (3)
- 21&62:730:206 Introduction to Greek Philosophy (3)
- 21&62:730:207 Introduction to Modern Philosophy (3)

Subject to the approval of the philosophy department, up to 6 of the 30 philosophy credits required for the philosophy major may be taken in upper-level (300 level or above) courses dealing with theoretical issues from the following disciplines: Economics 220, History 510, Mathematics 640, Political Science 790, Psychology 830, and Sociology 920. The following are some examples of acceptable courses:

21&62:510:335,336 History of Socialism and Communism (3,3)

21&62:640:393 Development of Mathematics (3)

21&62:790:372 Modern Political Theory (3)

21&62:840:398 Topics in Religious Studies (3)

21&62:920:409 Classical Sociological Theory (3)

21&62:920:415 Contemporary Sociological Theory (3)

Minor Requirements

Philosophy Minor

A student may minor in philosophy by taking a program of 18 credits to be developed in consultation with the philosophy department.

Applied Ethics Minor

A minor in applied ethics requires 18 credits, including:

21&62:730:105 Current Moral and Social Issues (3)

21&62:730:112 Introduction to Ethics (3)

At least 12 credits from the following:

NCAS

21&62:730:243 Philosophical Issues in Punishment and Human Rights (3)

21&62:730:251 Business and Professional Ethics (3)

21&62:730:258 Philosophy and the Black Experience (3)

21&62:730:327 Philosophical Issues of Feminism (3)

21&62:730:328 Social and Political Philosophy (3)

21&62:730:350 Decision Theory and Ethics (3)

NJIT

Phil 334 Engineering Ethics and Technological Practice

Phil 346 Ethical Issues in Public Policy

Phil 351 Biomedical Ethics

STS 360 Ethics and the Environment

A student may petition the department to substitute other courses for those listed above to satisfy any of the major or minor requirements in philosophy.

Courses (Philosophy 730)

21&62:730:103. INTRODUCTION TO PHILOSOPHY (3)

Introduction, for beginners, to central philosophical problems, primarily in the Western tradition, including such topics as morality, truth, knowledge, mind, reality, and the existence of God.

21&62:730:105. CURRENT MORAL AND SOCIAL ISSUES (3)

Examines such issues as sexual morality and abortion, capital punishment, sexism, racism and affirmative action, censorship, privacy, drug abuse and drug laws, economic distribution and justice, and consumption and scarcity of natural resources.

62:730:107. CRITICAL THINKING (3)

Intended primarily for first-year students and sophomores.

Develops and improves fundamental skills of clear, coherent, and critical thinking, speaking, and writing. Aims to foster confidence in the student's ability to solve problems by reasoning. Emphasizes rules of critical reasoning and techniques for applying them to real-world problems in science, management, law, aesthetics, and politics.

21&62:730:112. INTRODUCTION TO ETHICS (3)

Principal ethical theories, primarily in the Western philosophical tradition, advanced by theorists from Plato to twentieth-century philosophers.

21&62:730:201. INTRODUCTION TO LOGIC (3)

Introduction to the concepts of valid reasoning and proof in modern logic.

21&62:730:206. INTRODUCTION TO GREEK PHILOSOPHY (3)

Origins and development of Western philosophy among the ancient Greeks; study of the pre-Socratics, Socrates, Plato, Aristotle, and later Greek and Roman philosophers.

21&62:730:207. INTRODUCTION TO MODERN PHILOSOPHY (3)

The formative period of modern Western philosophy from its emergence out of medieval thought; emphasis on works of major philosophers of the sixteenth to eighteenth centuries from Montaigne to Kant.

21&62:730:208. EXISTENTIALISM AND CONTINENTAL PHILOSOPHY (3)

The philosophical roots and dimensions of existentialism and its relations with phenomenology and the contemporary continental tradition; works by Kierkegaard, Nietzsche, Husserl, Heidegger, Sartre, Habermas, and Derrida.

21&62:730:225. PHILOSOPHY OF SCIENCE (3)

Classical problems of induction and interpretation. The idealized picture of scientific method as fallible but self-correcting, converging to truth in the long run, is examined in the light of elementary probability theory. The problem of interpretation is introduced in the context of the theoretician's dilemma and illustrated by the case of geometric theory. The realist and instrumentalist interpretations are contrasted in the light of elementary concepts of logical theory.

21&62:730:227. PHILOSOPHY OF RELIGION (3)

Major controversies over the nature of religious belief, the "logic" of religious language, and the justification of religious claims; contemporary and traditional positions considered, but primary emphasis given to those aspects of religion open to rational argument.

21&62:730:228. PHILOSOPHY AND THE ARTS (3)

The nature of aesthetic experience as a significant form of human activity; aesthetic analysis, meaning and truth in the arts, the foundation of value judgment, and criticism in the arts.

21&62:730:243. PHILOSOPHICAL ISSUES IN PUNISHMENT AND HUMAN RIGHTS (3)

The reason(s) for which punishment is justified, and the conduct for which punishment is appropriate; examines relationships between punishment, justice, and human rights. Uses cases from American law as well as writings by philosophers on the legitimacy of punishment.

21&62:730:251. BUSINESS AND PROFESSIONAL ETHICS (3)

Not open to first-year students.

Ways of thinking about moral issues that arise in business and the professions: conflicts of interest and obligation, professional responsibility, whistle-blowing and loyalty, corporate social responsibility, dealing with local practices overseas, corporate culture, employees' rights, and the moral status of capitalism and other economic systems.

21&62:730:258. PHILOSOPHY AND THE BLACK EXPERIENCE (3)

An analysis of what constitutes the black experience; issues in the black experience, e.g., racial integration, racial separatism, racism, and black values.

21&62:730:260. PHILOSOPHICAL IDEAS IN LITERATURE (3)

Philosophical issues in literary works, primarily in the Western tradition; freedom and determinism, conceptions and reality of the self, the quest for meaning, the existence of evil.

21&62:730:262. EASTERN PHILOSOPHY (3)

A comparative analysis of Eastern, mainly Indian, and Western perspectives on key issues, e.g., God, self, and universe; explores the role of reason vis à vis contemplation; studies philosophies, including Vedanta, Buddhism, Jainism, and others.

21&62:730:272. METAPHYSICS AND PHILOSOPHY OF MIND (3)

Analyzes such topics as time, universals, identity, causation and freedom, mind and body, and the relation of thought and reality in classical and contemporary texts primarily in the Western philosophical tradition.

21&62:730:309. CONTEMPORARY ANALYTICAL PHILOSOPHY (3)

Introduction to the origins and directions of present-day philosophy and its recent accomplishments, especially in the English-speaking world: the giants of the early twentieth century; positivism and ordinary language philosophy; major postwar figures; and the present generation (Rorty, Putnam, Davidson). Emphasis on understanding what philosophers are doing now and why.

21&62:730:312. PHILOSOPHICAL IDEAS IN THE UNITED STATES (3)

American contributions to idealism, realism, and pragmatism; readings from Royce, Dewey, James, and Rorty.

21&62:730:327. PHILOSOPHICAL ISSUES OF FEMINISM (3)

Examines different theories of nature and source of women's oppression; liberal, radical, Marxist, and socialist feminism; the concept of oppression, woman's nature, individual rights and social justice, the meaning of equality, the role of the family (actually and ideally), and the importance of biological, social, and economic categories.

21&62:730:328. SOCIAL AND POLITICAL PHILOSOPHY (3)

The interrelationship of the state, law, and morality; examination of the interdependence of ideology and political obligation; the equivocal meanings of liberty, rights, and justice; major approaches such as Social Contract Theory and Marxism.

21&62:730:332. FORMAL LOGIC (3)

Prerequisite: 21&62:730:201 or permission of instructor.

Completeness and consistency of classical sentential and predicate logic; the problem of decidability and elementary model theory.

21&62:730:342. THEORIES OF KNOWLEDGE (3)

The nature and limits of knowledge; the problems of rationalism and empiricism, realism and idealism, and meaning and truth.

21&62:730:348. PHILOSOPHY OF LANGUAGE (3)

Currently disputed issues arising from the philosophical study of language: its use, structure, and limitation; contemporary theories of meaning, speech acts, the relevance of transformational grammar, and exploratory consideration of the role of analogies; readings from Frege, Chomsky, Austin, and Davidson.

21&62:730:350. DECISION THEORY AND ETHICS (3)

Introduction to Bayesian decision theory and two-person game theory, with applications to ethical, ecological, and economic problems. Alternative foundations for the theory of utility and subjective probability are studied, and their philosophical significance examined. Alternative solutions to the cooperative game are studied and their philosophical foundations examined.

21&62:730:441,442. INDIVIDUAL STUDY IN PHILOSOPHY (BA,BA)

Enrollment only by permission of department.

21&62:730:451,452. ADVANCED SEMINAR IN PHILOSOPHY (3,3)

Prerequisites: Four courses in philosophy or permission of program adviser.

The focus may be a concentrated study of a particular text, philosopher, or school of thought or an examination of a particular philosophic concept, methodology, or problem.

Other Related Course

21&62:310:415. INTRODUCTION TO PHILOSOPHY OF EDUCATION (3)

See Education 310.

Students who major in philosophy may enroll in this course for elective credit.

Courses (Religious Studies 840)

21&62:840:105,106. INTRODUCTION TO RELIGION (3,3)

The basic religious concerns of humanity and the ways in which religions have developed in Eastern and Western history, giving intellectual, moral, and institutional expression to the meaning of human existence and its relationship to the transcendent.

First term: folk religions and the religions of the East. *Second term:* religions of the West and modern religious developments.

21&62:840:202. BIBLICAL STUDIES: NEW TESTAMENT (3)

Recommended: 21:500:205.

Analysis of the New Testament and contemporary methods of interpretation; theological development of earliest Christianity and the problem of the historical Jesus.

21&62:840:204. SEMINAR ON RELIGION AND CULTURE (3)

Prerequisites: 21&62:840:105,106. Designed for religious studies minors; others with permission of instructor.

Interdisciplinary survey of religious themes in literature and the fine arts and of religious concerns as they relate to other academic disciplines.

21&62:840:398,399. TOPICS IN RELIGIOUS STUDIES (3,3)

Each term the course will offer a different topic for intensive, interdisciplinary study in a seminar format.

PHYSICS 750

Department of Physics

Smith Hall (973/353-5250)

The major and minor in physics and the major in applied physics are offered at NCAS.

Major Requirements

Physics 750

The program in physics is designed to enable a major to graduate with a sound and thorough preparation in basic physics. The student is prepared either for subsequent graduate study in physics or for employment in physics or allied fields at a level commensurate with a good undergraduate physics background. Individual study and participation in ongoing research within the department are encouraged for those interested and qualified. Research opportunities also exist in undergraduate research programs organized or sponsored by the American Institute of Physics and the National Science Foundation, on a competitive basis.

The physics major may be combined with undergraduate programs or selected course work in the areas of pre-medicine, prebusiness, and prelaw; this provides excellent credentials and background for entrance into professional programs in these fields. A modified physics program is also available to students in the field of education, which leads to certification for high school teaching in the area of physical science.

The requirements for the major include 37 credits in

The applied physics program consists of a common core of basic physics and mathematics courses and currently offers two tracks, one in computational physics and one in microelectronics. The computational physics track addresses industry's current need for personnel in scientific computing, software design, modeling, and simulation. The microelectronics track augments standard training in microchip engineering with the fundamental physics and mathematics underlying the technology necessary for research and development.

The course requirements for successful completion of this program are:

Physics courses:

- 21&62:750:205,206 Introductory Physics Laboratory (1,1)
 21&62:750:213,214 Elements of Physics* (3,3)
 (21&62:750:203,204 General Physics I, II [3,3] may be substituted under special circumstances)
 21&62:750:315 Introductory Thermodynamics (3)
 21&62:750:316 Introduction to Modern Physics (3)
 21&62:750:333 Applications of Mathematics to Physics (3)
 21&62:750:361 Mechanics I (3)
 21&62:750:385,386 Electromagnetic Fields and Waves I,II (3,3)
 21&62:750:404 Quantum Mechanics (3)
 21&62:750:406 Introductory Solid-State Physics (3)
 21&62:750:407,408 Advanced Physics Laboratory I,II (1,1)
 21&62:750:461 Computational Methods in Applied Physics (3)
 EE 251 Digital Design †

Mathematics and Computer Science courses:

- 21&62:198:101,102 Computers and Programming I,II (3,3)
 21&62:640:135,136 Calculus I,II (4,4)
 21&62:640:314 Elementary Differential Equations (3)

Electrical Engineering courses:

- EE 231,232 Circuits and Systems I,II †
 EE 291 Electrical Engineering Laboratory †

Additional computer science courses required for the computational physics track:

- CIS 438 Computer Graphics †
 CIS 461 Systems Simulations †

Additional physics courses required for the microelectronics track:

- Phys 481,482 Microelectronics I,II †

The following courses are recommended, not required, as electives:

- 21&62:198:453 Microcomputers (3)
 21&62:640:251 Linear Algebra (3)
 21&62:640:327 Probability and Statistics (3)
 21&62:640:375 Fourier Series and Boundary Value Problems (3)
 21&62:640:403 Introductory Theory of Functions of a Complex Variable (3)

- 21&62:750:362 Mechanics II (3)
 21&62:750:403 Introduction to Atomic and Nuclear Physics (3)
 21:750:410 Physical Electronics (2)
 21&62:750:411 Physical Optics (3)
 21&62:750:462 Mathematical Methods of Theoretical Physics (3)
 21&62:750:491 Physics Seminar (1)
 CIS 421 Numerical Calculus †
 CIS 438 Programming for Interactive Computer Graphics †

Minor Requirements

A total of 18 credits is required for the physics minor. The following courses are required:

- 21&62:750:203,204 General Physics I, II (3,3) *or*
 21&62:750:213,214 Elements of Physics (3,3)
 21&62:750:205,206 Introductory Physics Laboratory (1,1)

In addition, 10 credits must be earned from among the following courses:

- 21&62:750:109 Astronomy and Cosmology (3)
 21&62:750:307 Computer Electronics (4)
 21&62:750:315 Introductory Thermodynamics (3)
 21&62:750:316 Introduction to Modern Physics (3)
 21&62:750:333 Applications of Mathematics to Physics (3)
 21&62:750:407 Advanced Physics Laboratory I (1)
 21&62:750:408 Advanced Physics Laboratory II (1)
 21:750:410 Physical Electronics (2)

Teacher Certification

Students seeking teacher certification in comprehensive science must complete the requirements for a major in the physics department and satisfy other requirements for certification. For details regarding admission to the teacher education program and the requirements, students should consult both their department adviser and the chairperson of the education department.

Courses

21&62:750:109. ASTRONOMY AND COSMOLOGY (3-0-3)

Recommended for nonscience majors.

A nonmathematical presentation of contemporary views of the origin, evolution, and structure of the solar system, stars, galaxies, and the universe. Special topics include neutron stars, black holes, gravitationally strange objects, and the "Big Bang." This course is offered at NJIT as Phys 202.

21&62:750:202. PHYSICS AS A LIBERAL ART (3)

Recommended for nonscience majors.

Nonmathematical treatment of the major ideas in physics from ancient times to the present: relativity, the uncertainty principle, quantum theory, cosmology, and the atom as viewed by classical and modern physics; atomic energy; impact on culture and society.

21&62:750:203,204. GENERAL PHYSICS I,II (3,3)

Prerequisite: 21&62:640:114. Students who major in physics and mathematics are advised to enroll in 21&62:750:213,214 instead of this course.

An algebra-based course treating the basic concepts of mechanics, sound, electricity and magnetism, light, basic thermodynamics and some modern physics. These courses are offered at NJIT as Phys 102 and Phys 103, respectively. Phys 102 is offered during the spring term; Phys 103 is offered during the fall term.

* Entering students with a grade of 4 or 5 on the Advanced Placement Examination may receive credit for 21&62:750:213,214.

† Course available through cross-registration with the New Jersey Institute of Technology (NJIT).

POLITICAL SCIENCE

21&62:750:205,206. INTRODUCTORY PHYSICS LABORATORY (1,1)

Lab. 3 hrs. Pre- or corequisites: 21&62:750:203,204 or 21&62:750:213,214.

Laboratory courses for 750:203,204 or 750:213,214 are offered at NJIT as Phys 102A and Phys 103A, respectively. Phys 102A is offered during the spring term; Phys 103A is offered during the fall term.

21&62:750:209. GENERAL PHYSICS III (3)

Prerequisites: 21&62:750:203,204 or equivalent.

Supplements the general physics sequence: fluids, thermal physics, physical optics, and modern physics.

21&62:750:213,214. ELEMENTS OF PHYSICS (3,3)

Pre- or corequisites: 21&62:640:135,136. Intended for physics and mathematics majors and preengineering students, but open to all qualified students.

A calculus-based introductory course in physics. Topics include mechanics, wave phenomena, electricity and magnetism, and optics.

21&62:750:315. INTRODUCTORY THERMODYNAMICS (3)

Prerequisites: 21&62:750:203,204 or 213,214 and one year of introductory calculus.

Concludes the introductory sequence in physics. Interpretation and application of the laws of thermodynamics, kinetic theory, and statistical physics.

21&62:750:316. INTRODUCTION TO MODERN PHYSICS (3)

Prerequisites: 21&62:750:203,204 or 213,214.

Interaction of radiation with matter; elementary quantum theory; atomic and nuclear physics; relativity; solid-state physics.

21&62:750:333. APPLICATIONS OF MATHEMATICS TO PHYSICS (3)

Prerequisites: 21&62:750:213,214 or 21&62:750:203,204; 21&62:640:136.

Emphasis on applications of mathematical techniques to physical problems: infinite series, matrices, determinants, partial differentiation, multiple integrals, vector analysis, and Fourier series.

21&62:750:361,362. MECHANICS I,II (3,3)

Prerequisites: 21&62:640:314; 21&62:750:315,316,333; or permission of instructor.

Dynamics of particles and systems; theory of small oscillations and mechanical waves; rigid bodies; Lagrange and Hamilton formalism.

21&62:750:385,386. ELECTROMAGNETIC FIELDS AND WAVES (3,3)

Prerequisites: 21&62:750:315,316, 333; 21&62:640:314; or permission of instructor.

Electrostatics; magnetostatics; Maxwell's equations with applications; electrodynamics.

21&62:750:402. STATISTICAL MECHANICS (3)

Prerequisites: 21&62:750:315, 361,362.

Statistical thermodynamics, classical and quantum statistical mechanics, and elementary transport theory.

21&62:750:403. INTRODUCTION TO ATOMIC AND NUCLEAR PHYSICS (3)

Prerequisites: 21&62:750:361,362, 385,386 or permission of instructor.

Discussion of experiments that led to the quantum theory; atomic spectra; atomic structure; and nuclear physics.

21&62:750:404. QUANTUM MECHANICS (3)

Prerequisites: 21&62:750:361, 385,386 or permission of instructor.

Schrodinger equation; operators; correspondence principle; uncertainty principle; the harmonic oscillator; the hydrogen atom; elementary scattering theory; elements of matrix mechanics; perturbation theory.

21&62:750:406. INTRODUCTORY SOLID-STATE PHYSICS (3)

Prerequisites: 21&62:750:361, 385,386 or permission of instructor.

Crystallography and structure of crystals; bonding of atoms; structure and properties of metals, semiconductors, and insulators; luminescence and fluorescence of crystals, photoconductivity; solid-state devices.

21&62:750:407. ADVANCED PHYSICS LABORATORY I (1)

Corequisites: 21&62:750:315,316, 333 or permission of instructor.

Design of experiments and instrumentation techniques; data acquisition and analysis; graphic representation of experimental data; study of errors and reliability of results; AC and DC circuit theory.

21&62:750:408. ADVANCED PHYSICS LABORATORY II (1)

Lab. 3 hrs. Corequisites: 21&62:750:315,316 or permission of instructor.

Detailed examination of design concepts and measurement techniques; experiments in physical and geometric optics, coherent optics, acoustics, microwave signal propagation, and atomic and nuclear physics.

21:750:410. PHYSICAL ELECTRONICS (2)

Lec. 1 hr., lab. 3 hrs. Prerequisites: 21&62:640:135,136; 21&62:750:213,214 or 203,204.

Development of physical models for nonlinear devices (diodes, transistors) used in modern electronic circuits; analysis of practical circuits; construction and examination of rectifiers, signal generators, basic digital circuits, and measurement systems.

21&62:750:411. PHYSICAL OPTICS (3)

Prerequisites: 21&62:750:385,386 or permission of instructor.

Electromagnetic theory of light, interference, diffraction, polarization, double refraction, absorption, scattering, dispersion, and introduction to quantum optics.

21&62:750:461. COMPUTATIONAL METHODS IN APPLIED PHYSICS (3)

Prerequisite: 21&62:640:314. Pre- or corequisite: 21&62:750:404.

General computer programming modeling methods and techniques; numerical solutions to integro-differential equations; eigenvalue problems; applications of computer-aided design and other packages.

21&62:750:462. MATHEMATICAL METHODS OF THEORETICAL PHYSICS (3)

Prerequisites: 21&62:640:314; 21&62:750:361; or permission of instructor.

Vector and tensor analysis; matrix methods; complex variables; Sturm-Liouville theory; special functions; Fourier series and integrals; integral equations; numerical solutions of differential equations.

21&62:750:471. INTRODUCTORY RELATIVITY THEORY (3)

Prerequisite: Permission of instructor.

Special theory: simultaneity, Lorentz transformations, four vectors, and electromagnetic field transformation; General theory: principle of equivalence, parallel displacements, and geodesics.

21&62:750:485,486. INDIVIDUAL RESEARCH IN PHYSICS (BA,BA)

Qualified students may undertake individual research under the supervision of a member of the department.

21&62:750:491,492. PHYSICS SEMINAR (1,1)

Prerequisite: Permission of instructor.

Group discussions of selected current topics in physics.

21&62:750:493,494. READINGS IN PHYSICS (BA,BA)

Prerequisite: Permission of instructor.

Independent study supervised by a member of the department. For qualified students who wish to investigate a specific area or topic in physics in greater depth than is normally covered elsewhere in the curriculum.

POLITICAL SCIENCE 790

Department of Political Science

Hill Hall (973/353-5105)

The major and minor in political science are offered at NCAS and UC-N.

Major Requirements

The undergraduate political science major is designed to give students a well-rounded background in the social sciences and to prepare them for a variety of fields that require a thorough knowledge of politics. These fields include law, government service (federal, state, local), teaching, business, publishing, social service, and others. The department also offers graduate work leading to the master's degree.

The major at NCAS requires 36 credits in political science that must include:

- 21&62:790:201 American National Government (3)
- 21&62:790:202 America and the World (3)
- 21&62:790:203 Introduction to Comparative Politics (3)

At least 3 additional credits in each of four fields:

- (a) American government and politics,
- (b) comparative politics, (c) international politics,
- and (d) political theory (21&62:790:371, 372, 375, or 376). A list of which courses fall under each field is available in the department office.

Enough additional credits in political science to make a total of 36 credits.

At least 12 additional credits from three of the following fields: anthropology, economics, history, psychology, sociology. However, no more than 3 of these credits may be in history, and those credits must be in addition to the general history credit requirement at NCAS and UC-N.

The major at UC-N is identical to the one at NCAS except that the number of credits required is 33.

Minor Requirements

The minor requires 21 credits in political science, which must include:

- 21&62:790:201 American National Government (3)
- 21&62:790:203 Introduction to Comparative Politics (3)
- 3 credits in international relations
- 3 credits in political theory

See also International Affairs and Legal Studies.

Certificate in Public Administration and Policy Studies

A certificate in public administration and policy studies is offered at NCAS and UC-N.

Program Director: Frank Fischer

The Department of Political Science administers an interdisciplinary certificate program in public administration and policy analysis. A 24-credit upper-division course of study, the certificate may be earned in conjunction with other majors, such as management, economics, sociology, and urban studies.

The certificate requirements consist of:

- 15 credits of core requirements
- 21&62:220:231 Statistical Methods (3) (or equivalent)
- 29:620:318 Management Fundamentals (3)
- 21&62:790:201 American National Government (3)
- 21&62:790:307 Public Policy Analysis (3)
- 21&62:790:341 Public Administration (3)

9 approved elective credits. Recommended courses include:

- 29:010:443 Governmental Accounting and Auditing (3)
- 29:522:334 Business, Government, and Society (3)
- 29:620:325 Organizational Behavior (3)
- 21&62:790:310 Science, Technology, and Public Policy (3)
- 21&62:790:360 Urban Politics and Public Policy (3)
- 21&62:790:499 Individual Study of Government (BA)

For further information, see Professor Frank Fischer, political science department.

Courses

Prerequisites for Political Science Courses

Course 21&62:790:201 is prerequisite for all other political science courses. Some courses carry additional prerequisites.

21&62:790:201. AMERICAN NATIONAL GOVERNMENT (3)

Concepts and theory regarding the policymaking process in American national government. Topics include political ideas; constitutional development and law; institutions of government; political parties, elections, and voting behavior; the significance of interest groups divided along race, gender, class, or other lines; and the role of the media and public opinion. Comparisons with other political systems and generalizations are applied to several policy issues.

21&62:790:202. AMERICA AND THE WORLD (3)

Basics of international relations (sources of national power, sovereignty, security, international law and organization, international economics), and factors (historical, political, economic, social, governmental) in the formation of American foreign policy. Extensive attention to current problems.

21&62:790:203. INTRODUCTION TO COMPARATIVE POLITICS (3)

Aspects of government and politics of several countries; introduces students to the techniques of comparative analysis; democratic, totalitarian, and developing political systems.

21&62:790:301. WESTERN EUROPEAN POLITICS (3)

Comparative study of the governments and politics of France, Germany, Great Britain, Italy, and other European countries. Emphasis on electoral systems, constitutional orders, political parties, interest groups, ethnicity, and nationalism.

21&62:790:302. POLITICS OF THE EUROPEAN UNION (3)

Analysis of the development of European integration from the immediate postwar period through the Single European Act and the Maastricht Treaty; emphasis on economic integration and monetary union, legal integration; the question of sovereignty, intergovernmental cooperation regarding interior and justice affairs, common foreign policy, and defense.

21&62:790:304. INTRODUCTION TO LAW AND LEGAL RESEARCH (3)

The nature and function of law, the process of legal growth, the roles of judges and lawyers, and the decision-making process; the use and retrieval of law-related materials.

21&62:790:305. AMERICAN STATE AND LOCAL GOVERNMENT (3)

Organization, functions, and administration of state and local governments in the U.S.; analysis of state constitutions and city charters; the political, administrative, and judicial processes; examination of various types of intergovernmental relationships.

21&62:790:306. POLITICS AND LITERATURE (3)

Prerequisite: Junior standing or permission of instructor. Political elements in American and/or European novels and plays; consideration of works such as *The Octopus*, *In Dubious Battle*, *All the King's Men*, *Brave New World*, 1984.

POLITICAL SCIENCE

21&62:790:307. PUBLIC POLICY ANALYSIS (3)

Perspectives utilized in the analysis and evaluation of public policymaking and policy results; topics include the public interest, cost-benefit allocations, normative constraints, uncertainty, and the political implications of systematic policy analysis.

21&62:790:310. SCIENCE, TECHNOLOGY, AND PUBLIC POLICY (3)

This course fulfills the technology course requirement in the teacher certification program.

Study of political issues that involve science and technology, such as arms control, energy resources, environmental pollution, public health, occupational safety, and technology transfer.

21&62:790:311. GOVERNMENT AND POLITICS OF LATIN AMERICA (3)

Prerequisite: 21&62:790:203.

The political process in Latin America; emphasis on the role of political parties, social sectors, and special groups such as the military, labor, and students; specific problems of Latin-American political development and government economic and social policymaking in an era of modernization.

21&62:790:316. GOVERNMENTS AND POLITICS OF THE FAR EAST (3)

Governments and politics of the Far East with particular stress on China and Japan. Political culture, party systems, political development, economics, social change, foreign policies. The role of the region in world politics.

21&62:790:317. INTERNATIONAL POLITICAL ECONOMY (3)

The interdependence of political and economic structures and processes in the development and management of the modern world economy.

21&62:790:318. GOVERNMENT AND POLITICS OF AFRICA (3)

Prerequisite: 21&62:790:203.

Major political systems in Africa; the development of states and the modification of social and political systems; general survey of the area and focus on selected countries.

21&62:790:321. WORLD POLITICS (3)

Prerequisite: 21&62:790:202.

Approaches to the analysis of politics from local to global, emphasizing a range of actors, from individuals to firms to international regimes; the role of nations as distinct from states; simultaneous processes of integration and fragmentation. Attention to the changing nature of security concerns, increasing globalization of the world economy, and the evolution of trans-national norms.

21&62:790:325. MUNICIPAL GOVERNMENT (3)

Analysis of modern urban government; social and political problems of the city; types of governmental organization and the relations of the city to other units of local government.

21&62:790:326. MUNICIPAL ADMINISTRATION (3)

Prerequisite: 21&62:790:325 or permission of instructor.

Study of the problems of public administration in municipal government; the functional services peculiar to urban government.

21&62:790:329. FOREIGN POLICY OF THE FORMER SOVIET UNION (3)

Aims and methods of Russian foreign policy and its ideological and practical determinants as applied to the Western world, the underdeveloped countries, the former Soviet republics and communist bloc, and international organizations.

21&62:790:330. EASTERN EUROPEAN GOVERNMENTS AND POLITICS (3)

Prerequisite: 21&62:790:203.

Politics and governments of Eastern Europe; policy as the outcome of ideological and situational influences on the political needs of the regimes and the basic human needs of the people.

21&62:790:333. GOVERNMENTS AND POLITICS OF THE MIDDLE EAST (3)

Prerequisite: 21&62:790:203.

Political, social, economic, and cultural problems of the Middle East as a region and in selected individual countries; problems arising from the area's relations to the European powers, from the social revolution it shares with other developing areas, and from its own internal and historical situation.

21&62:790:334. INTERNATIONAL RELATIONS OF THE MIDDLE EAST (3)

Prerequisite: 21&62:790:202.

Role of international factors in influencing the development of a critical area of the world and affecting world order and stability; the Arab-Israeli dispute, great-power politics, and the role of oil.

21&62:790:337. GOVERNMENTS AND POLITICS OF SOUTHEAST ASIA (3)

Prerequisite: 21&62:790:203.

Contemporary problems of government, politics, social and economic forces, and foreign relations of the states in Southeast Asia.

21&62:790:338. POLITICAL ECONOMY OF GOVERNMENT-BUSINESS RELATIONS (3)

Government-business relations within advanced market economies; focus on the U.S. Empirical and normative questions raised that range from the actual to the desirable ordering of relations between public and private authorities.

21&62:790:341,342. PUBLIC ADMINISTRATION (3,3)

Structure and organization of administration machinery; fiscal and personnel management; methods of law enforcement; responsibility of administrators to voters, legislatures, and the courts.

21&62:790:345. INTERNATIONAL RELATIONS OF LATIN AMERICA (3)

Prerequisite: 21&62:790:202.

International relations of Latin America from independence to the present; emphasis on evolving policies of leading hemisphere governments, including the U.S., as well as on patterns and problems of inter- and intra-American association since World War II.

21&62:790:351. POLITICAL PARTIES IN THE UNITED STATES (3)

The development of American political parties; party functions, organization, and methods; the nominating process, campaigns, and elections; money and politics.

21&62:790:352. POLITICS, ELECTIONS, AND PUBLIC POLICY (3)

Elections and voting behavior; political attitudes and opinions; the role of parties and interest groups in policymaking and government; party reform.

21&62:790:356. SEX, LAW, AND PUBLIC POLICY (3)

Political issues in the U.S. related to gender differentiation; sex-based discrimination in law and public policy, differences in political participation according to gender, ideological justifications for such differences, and political movements designed to rectify discrimination.

21&62:790:358. PUBLIC OPINION (3)

The formation of public opinion, opinion measurement, opinion change, and the relationships between public opinion and public policy; field work in which students prepare their own survey and conduct an opinion poll; processing and analysis of data.

21&62:790:359. GOVERNMENT AND POLITICS OF NEW JERSEY (3)

Organization, functions, and administration of the state government; emphasis on significant state problems.

21&62:790:360. URBAN POLITICS AND PUBLIC POLICY (3)

Analysis of urban policy issues; municipal public policy areas—poverty, unemployment, education, housing, health, crime, transportation, and the environment; policy as an instrument of social change.

21&62:790:362. THE POLITICS OF POVERTY (3)

Examines the causes of poverty in the United States, and the origins and consequences of public antipoverty policies, with special focus on welfare and welfare reform, and on urban poverty.

21&62:790:363. AMERICAN FEDERALISM (3)

Constitutional, political, and institutional relationships among federal, state, and local governments in the U.S.; grants-in-aid, revenue sharing, interstate compacts, and intergovernmental cooperation.

21&62:790:364. POLITICS OF MINORITY GROUPS (3)

Tactics, goals, and impact of organized minorities in the American political arena; groups studied include African Americans, Chicanos, various ethnic groups, and selected third-party movements.

21&62:790:367. JURISPRUDENCE AND LEGAL THEORY (3)

Major traditions in jurisprudence, including positivism, natural law, and legal realism; analysis of selected theoretical questions that arise within the framework of law and law enforcement, including justice, punishment, civil disobedience, human rights, the rule of law, the enforcement of morals; definition of law and of a legal system, the relationship between law and morality, and the notion of legalism as an ideology.

21&62:790:371. EARLY POLITICAL THEORY (3)

Prerequisite: Junior standing or permission of instructor.

Selected writers and doctrines in the tradition of Western thought on politics and society, from Greece through the Reformation.

21&62:790:372. MODERN POLITICAL THEORY (3)

Prerequisite: Junior standing or permission of instructor.

Selected writers and doctrines in the tradition of Western thought on politics and society, from Hobbes through Marx.

21&62:790:375,376. AMERICAN POLITICAL THEORY (3,3)

Leading American political thinkers, their ideas, and their contributions to the development of the American political system.
First term: political ideas from colonial times to the 1880s.
Second term: political thoughts in America since the Civil War.

21&62:790:377. IDEOLOGY AND POLITICS (3)

Prerequisite: Junior standing or permission of instructor.

Major ideologies involved in the political conflicts of the twentieth century; topics include mass movements, fascism, Marxism, nationalism, and democratic theory.

21&62:790:379. GOVERNMENT AND POLITICS OF THE COMMONWEALTH OF INDEPENDENT STATES (3)

Prerequisite: 21&62:790:203.

Evolution and current status of the first communist government from a multifactor point of view; interrelationship of Marxist ideology, personality and historic influences, and the pressures of basic human needs.

21&62:790:381. JUDICIAL PROCESS (3)

Judicial decision making in the U.S.; the process of litigation, the recruitment of judges, the influences and limits on judicial decisions, and the impact of judicial policies within the political system; findings of recent empirical research and the application of the scientific method to the study of judicial behavior.

21&62:790:382. ENVIRONMENTAL POLITICS AND POLICY (3)

Examination of the environmental movement and the politics of specific issues, from air and water pollution to biodiversity and global warming. American policy is assessed from comparative perspective.

21&62:790:385. RELIGION, POLITICS, AND PUBLIC POLICY (3)

The influence of religious activities on politics and public policy. The influence of conservative evangelicals and fundamentalists, concerns of Muslims and Jews, efforts of religious groups to shape public policy, constitutional issues of religious liberty and church-state separation, global fundamentalism.

21&62:790:387. INTERNATIONAL LAW (3)

Prerequisite: 21&62:790:202.

Basic principles and practices governing legal relations among states; relations of law to politics explored to highlight the strengths and shortcomings of international law in dealing with contemporary world problems.

21&62:790:395. CONTEMPORARY AMERICAN FOREIGN POLICY (3)

Prerequisite: 21&62:790:321 or permission of instructor.

Analysis of the formulation and administration of American foreign policy; political, economic, and social forces influencing the decision-making process; the background, alternatives, and principal issues since World War II.

21&62:790:397. WASHINGTON INTERNSHIP (BA)**21&62:790:401,402. AMERICAN CONSTITUTIONAL LAW AND POLITICS (3,3)**

The decision-making and policymaking roles of the Supreme Court in selected areas, including the executive and legislative branches, federal-state relations, the economy, reapportionment, welfare, civil liberties, and civil rights.

21&62:790:405. THE UNITED STATES AND ASIA (3)

Prerequisite: 21&62:790:321 or permission of instructor.

The relations and role that the U.S. has played in Asia, through examination of topics such as the characteristics of revolution and modernization in Asia, the U.S. Asian policy, and the Asian response to the U.S.; present-day problems of American involvement.

21&62:790:408. SEMINAR IN POLITICAL PHILOSOPHY (3)

Open only to juniors and seniors

Joint discussion and analysis of selected readings in the literature of political philosophy.

21&62:790:409. LAW AND PUBLIC POLICY (3)

Impact of law on the political process and public policy in selected areas such as legislation, civil rights, civil liberties, and constitutional interpretation; the use of law as an instrument of social change.

21&62:790:415. SEMINAR IN POLITICAL DEVELOPMENT (3)

Open only to juniors and seniors

Problems encountered by developing nations as they seek to become viable, independent societies; problems of political and social modernization.

21&62:790:417. PROBLEMS IN INTERNATIONAL RELATIONS (3)

Prerequisite: 21&62:790:321.

Focus on specific issues in global politics of current interest and importance.

21&62:790:418. SEMINAR IN INTERNATIONAL RELATIONS (3)

Open only to juniors and seniors. Prerequisite: 21&62:790:321.

Analysis, research, and writing on selected topics of enduring and/or major contemporary interest in the field of international relations. Students normally explore the utility of theory in the field as a tool for the analysis of foreign policymaking or the evolution of particular international issues.

21&62:790:420. COMPARATIVE FOREIGN POLICIES (3)

Examines the intrasocietal and extrasocietal factors that shape the external behavior of states, from several perspectives: states representing major powers, regions of the world, collectivist and noncollectivist political systems, and new states, and states with a longer tradition of participation in world affairs.

21&62:790:421. THEORY AND PRACTICE OF MARXISM (3)

Transformation of Marxist theory due to the practical exigencies of sociopolitical conditions; analysis of Marx's writings and selected theorists of the Second and Third Internationals; relations between Leninism and Stalinism; role of Marxism today.

PORTUGUESE AND LUSOPHONE WORLD STUDIES

21&62:790:431. PUBLIC ADMINISTRATION AND ORGANIZATIONAL BEHAVIOR (3)

Theoretical perspectives on administrative decision making, budgeting, labor relations, and organizational politics in the public context.

21&62:790:435. THE AMERICAN PRESIDENCY (3)

The dynamics of the presidency: the president's powers and how they are used; the executive's relations with Congress, the court, and the public; various presidents' conceptions of their role.

21&62:790:436. LEGISLATURES AND THE LEGISLATIVE PROCESS (3)

Survey of the organization of the legislative power; working facilities; principles, procedures, and problems of statute making; the legislature as arbiter of conflicting interests; the relationship between the legislature and the executive.

21&62:790:441. CIVIL LIBERTIES (3)

Prerequisite: 21&62:790:401 or 402 or permission of instructor.

Ways that the American political system balances individual liberty against the necessity to maintain a stable society; consideration of a few problems (e.g., censorship, racial equality, and church and state); role of the federal courts.

21&62:790:446. COMPARATIVE POLITICAL PARTIES (3)

Prerequisites: 21&62:790:201, 301; or permission of instructor.

Comparative study of political parties and interest groups in Canada, Great Britain, and the U.S.; evaluation of different approaches to comparative analysis.

21&62:790:450. CHINESE FOREIGN POLICY (3)

Study of Chinese foreign policy through the examination of the tradition of foreign relations; ideology; strategies; capabilities; relations with the West, the former communist nations, and the third world; China's role in international organization.

21&62:790:452. SEMINAR IN LAW AND SOCIAL CHANGE (3)

Open only to juniors and seniors.

Analysis of topics relating to law and social and political change drawn from legal history, jurisprudence, legal systems and institutions, law and public policy, and law and politics.

21&62:790:454. SEMINAR IN PROBLEMS OF AMERICAN GOVERNMENT (3)

Open only to juniors and seniors.

Selected problems of American government with respect to labor, business, agriculture, social welfare, and governmental reform.

21&62:790:457. SEMINAR IN POLITICAL PARTIES (3)

Open only to juniors and seniors.

Selected problems of political parties and political behavior in the U.S.

21&62:790:459. SEMINAR IN PROBLEMS OF MUNICIPAL GOVERNMENT (3)

Open only to juniors and seniors.

Problems of municipal government, including the various functional activities and intergovernmental relationships of present concern.

21&62:790:460,461. TOPICS IN POLITICAL SCIENCE (3,3)

Open only to juniors and seniors.

Advanced study and research on a political problem that either is not covered in the curriculum or deserves more in-depth treatment than is possible in a general course.

21&62:790:462. SEMINAR IN POLITICAL IDEAS AND INSTITUTIONS (3)

Open only to juniors and seniors.

Problems in the theory and practice of modern government.

21&62:790:467. PSYCHOLOGY AND POLITICS (3)

The psychological roots of political behavior; theoretical formulations and applied studies; analyses of leaders (revolutionary leaders, American presidents, and movements); political implications of personality theories.

21&62:790:485. SEMINAR IN PROBLEMS OF STATE GOVERNMENT (3)

Open only to juniors and seniors.

Problems of state government, including administrative reorganization, legislative and judicial reform, intergovernmental relationships, and functional activities performed by the state that are of present concern.

21&62:790:491. RESEARCH METHODS IN POLITICAL SCIENCE (3)

Based on the assumption that the method of observation often creates the phenomena or influences the conclusions, the student uses a number of political science methodologies to study one subject; methodological approaches may include survey analysis of public opinion, including questionnaire construction and validation, use of computer and quantitative methods, content analysis, planning, programming and budgeting (PPB), decision-making theory, game theory, and communications theory.

21&62:790:492. READINGS IN POLITICAL SCIENCE (BA)

Prerequisite: Permission of instructor.

Closely supervised exploration of political subjects through the outstanding readings in the field; a tutorial relationship with the instructor; credits fixed according to the outline of work adopted by student and instructor.

21&62:790:494. WASHINGTON RESEARCH (6)

21&62:790:495,496. SENIOR HONORS SEMINAR (3,3)

Open to seniors by department invitation. Intended for candidates for special honors in political science.

Readings, research, and critical writing in selected fields of political science.

21&62:790:497,498. INTERNSHIP IN POLITICAL SCIENCE (3,3)

Prerequisites: 21&62:790:201, 6 additional credits in political science, junior or senior standing, department approval, and acceptance by employing agency.

Placement in an appropriate governmental or other agency of political organization for eight to ten hours of work per week; a log on each working day's activities and a paper to be agreed upon by the intern and the academic supervisor are required.

21&62:790:499. INDIVIDUAL STUDY OF GOVERNMENT (BA)

Prerequisites: Permission of department chairperson and instructor.

Individual study and research on selected problems in political science.

PORTUGUESE AND LUSOPHONE WORLD STUDIES 810

*Department of Classical and Modern Languages and Literatures
Conklin Hall (973/353-5494)*

Program Director: Kimberly DaCosta Holton

The minor in Portuguese and Lusophone World Studies is interdisciplinary. It consists of 21 credits in Portuguese language, literature, and culture, as well as courses from appropriate cooperating departments. Students may choose from two differing concentrations:

- Concentration A: Continental Portuguese Studies
- Concentration B: Lusophone World Studies

Both concentrations require the completion of 15 core credits:

6 credits in language:

21&62:810:131, 132 Intermediate Portuguese

6 credits in civilization:

21&62:810:342,343 Introduction to Portuguese and Brazilian Civilization and Culture

3 credits in literature:

(conducted either in Portuguese or in translation)

The remaining 6 credits may be satisfied by choosing electives offered within the Portuguese program or other designated classes in cooperating NCAS departments. These electives must concern continental Portugal for Concentration A or Brazil and Lusophone Africa/Asia for Concentration B. A list of classes from outside the Portuguese program that satisfy the elective requirements may be obtained in the CMLL office. Students interested in pursuing this minor should consult the program director.

21&62:810:101-102. ELEMENTARY PORTUGUESE (3,3)

Not open to students who have had two or more years of secondary school Portuguese or are near-native speakers of the language. These students must take a placement test in the department for proper advising. Both terms must be completed to receive credit.

Fundamentals of grammar; drill in speaking and writing. A minimum total of ten hours of language laboratory work per term is required of all students in NCAS elementary language courses and is recommended for UC-N and NJIT students.

21&62:810:131,132. INTERMEDIATE PORTUGUESE (3,3)

After examination, students may be placed in a section for nonnative or native speakers. Successful completion of both terms may be accredited for a major/minor option.

Grammar review and vocabulary expansion. Continued development of speaking and reading skills; intensive practice in reading and composition based on short literary and journalistic texts.

21&62:810:207. INTRODUCTION TO PORTUGUESE LITERATURE (3)

Prerequisites: 21&62:810:131,132 or demonstrable reading/writing knowledge of the language. Fulfills literature requirement. Conducted in Portuguese.

Survey of Portuguese literature, with emphasis on reading and discussion of literary texts representative of significant literary movements and authors of Portugal.

21&62:810:208. INTRODUCTION TO BRAZILIAN LITERATURE (3)

Prerequisites: 21&62:810:131,132 or demonstrable reading/writing knowledge of the language. Conducted in Portuguese.

Survey of Brazilian literature, with emphasis on reading and discussion of literary texts representative of significant literary movements and authors of Brazil.

21&62:810:311,312. PORTUGUESE LITERATURE IN ENGLISH TRANSLATION (3)

Fulfills literature requirement.

Reading and discussion of major authors and texts representative of Portugal's rich literary tradition. Two-term sequence covers Vicente and Camões up to twentieth-century authors.

21&62:810:315. PORTUGUESE FOR BUSINESS AND COMMERCE (3)

Open to students who can demonstrate adequate reading/writing/conversational skills at the level of 21&62:810:132 Intermediate Portuguese. This includes NJIT students and students from graduate programs and NCAS. Conducted in Portuguese.

Intensive study of business and commercial Portuguese. Emphasis on practical business terminology and procedures used in business letters and documents, banking, trade, export and import, stock market, and modern-day global economic institutions. Familiarization with Portuguese business practices and cultural differences.

21&62:810:318. BRAZILIAN AND LUSOPHONE WORLD LITERATURE IN ENGLISH TRANSLATION (3)

Fulfills literature requirement.

Reading and discussion of literary works representative of the different literary trends, movements, and authors of the Portuguese-speaking world (Angola, Mozambique, the Azores, the Cape Verde Islands, and Brazil).

21&62:810:321. ORAL HISTORY OF NEWARK'S IRONBOUND NEIGHBORHOOD (3)

Focuses on the Portuguese and Brazilian immigrant community of Newark's Ironbound neighborhood. Explores ethnographic fieldwork (participant observation and tape-recorded interviews) and compiling oral history. Readings of anthropological, literary, and historical texts. Issues covered include migratory patterns, adaptation and assimilation, post-colonial conflict and collaboration, cultural heritage, and immigrant identity.

21&62:810:342,343. INTRODUCTION TO PORTUGUESE AND BRAZILIAN CIVILIZATION AND CULTURE (3,3)

Conducted alternately in English and Portuguese.

Discussion of significant historical, social, and cultural trends in the Portuguese-speaking world. The first term emphasizes Portugal, Portuguese Africa, and the Portuguese in the United States; second term focuses on Brazil.

21&62:810:440,441. TOPICS IN PORTUGUESE AND BRAZILIAN CULTURE (3,3)

Conducted alternately in Portuguese and English.

Explores significant themes, topics, concepts, movements, trends, and complex issues with regard to the diverse Portuguese and Brazilian societies and cultures.

PSYCHOLOGY 830

Department of Psychology

Smith Hall (973/353-5440)

The major and minor in psychology are offered at NCAS and UC-N.

Major Requirements

Psychology is the study of the behavior of the individual. It is a multifaceted discipline ranging from the study of the biological basis of behavior to the study of the individual in a social context.

A minimum of 41 credits for the major in psychology is required. The credits must include:

Core Courses

- 21&62:830:101,102 Principles of Psychology (first or sophomore year) (3,3)
- 21&62:830:301 Statistical Methods for the Cognitive and Behavioral Sciences (sophomore or junior year) (4)
- 21&62:830:302 Experimental Methods for the Cognitive and Behavioral Sciences (4)
- 21&62:830:423 History and Modern Viewpoints in Psychology (3)

Area Requirements

- 21&62:830:304 Cognitive Processes (3)
- 21&62:830:323 Developmental Psychology (3)
- 21&62:830:335 Social Psychology (3)
- 21&62:830:484 Physiological Psychology (3)

Electives

12 additional elective credits in psychology

A grade-point average of 2.5 or better in the major is required.

For students interested in counseling or social services, a double major with social work provides hands-on opportunities through course work and field experiences. Advising should be obtained from both departments.

Interdisciplinary Option in Psychology and Sociology

As an alternative to the psychology major, students may select an interdisciplinary option in psychology and sociology that is designed to give the student insight into the interaction between individual behavior and the social setting in which it occurs.

The requirements for the interdisciplinary option include the following:

1. A grade-point average of 2.5 or better in the major.
2. A minimum of 30 credits in psychology and sociology courses that must include:
 - 21&62:830:101,102 Principles of Psychology (3,3)
 - 21&62:830:301 Statistical Methods for the Cognitive and Behavioral Sciences (4) *and* 21&62:830:302 Experimental Methods for the Cognitive and Behavioral Sciences (4) *or* 21&62:920:301-302 Introduction to Social Research I,II (4,4)
 - 21&62:830:423 History and Modern Viewpoints in Psychology (3) *or* 21&62:830:308 Critical Thinking in Psychology (3)
 - 21&62:920:201,202 Sociology I,II (3,3)
 - 21&62:920:409 Classical Sociological Theory (3) *or* 21&62:920:415 Contemporary Sociological Theory (3)

Additional elective courses are arranged in consultation with the departmental adviser. Students interested in pursuing this option should contact the chairpersons of the Department of Psychology and the Department of Anthropology, Sociology, and Criminal Justice, who will arrange a written contract specifying the requirements for the interdisciplinary option.

Minor Requirements

The psychology minor requires a minimum of 18 credits including 21&62:830:101,102, any two area requirements, and any two other psychology courses. Courses are chosen in a conference between the student and a psychology adviser.

Courses

21&62:830:101. PRINCIPLES OF PSYCHOLOGY (3)

21&62:830:101 and 102 may be taken in either order.

Scientific study of human behavior, including historical foundations, methodology, physiological basis of behavior, sensation and perception, and cognition.

21&62:830:102. PRINCIPLES OF PSYCHOLOGY (3)

21&62:830:101 and 102 may be taken in either order.

Scientific study of human behavior, including development, personality, social influences, abnormal behavior, and therapy.

21&62:830:103. COGNITIVE SCIENCE I (3)

Introduction to the new discipline emerging from the interaction of psychology, artificial intelligence, linguistics, philosophy, neuroscience, and evolutionary biology. Examines a variety of approaches to the study of how humans and other intelligent systems represent, understand, perceive, and use language; as well as learn and plan purposeful actions. Foundational topics in philosophy, evolution, neuroscience, and computation.

21&62:830:104. COGNITIVE SCIENCE II (3)

See 21&62:830:103. In Cognitive Science II, learning and connectionism, action, cognitive development, cognitive neuroscience, and language are covered.

21&62:830:301. STATISTICAL METHODS FOR THE COGNITIVE AND BEHAVIORAL SCIENCES (4)

Prerequisites: 21&62:640:113 or equivalent and 21&62:830:101,102.

Basic statistical methods in the psychological sciences, starting with basic probability, descriptive statistics, and inferential statistics. Methods are put in the context of basic experimental research in the cognitive and behavioral sciences. Includes such methods as z-tests, t-tests, ANOVA, regression and correlation.

21&62:830:302. EXPERIMENTAL METHODS FOR THE COGNITIVE AND BEHAVIORAL SCIENCES (4)

Prerequisite: 21&62:830:301.

Basic methods and paradigms in the cognitive and behavioral sciences. Research from areas of psychology in psychophysics, learning, memory, and perception are used to illustrate basic paradigms used in the cognitive and behavioral sciences. Students conduct experiments, analyze data, and write reports in standard psychology formats.

21&62:830:304. COGNITIVE PROCESSES (3)

Prerequisites: 21&62:830:101,102.

Introduces the study of human cognition. Topics include perception, attention, memory, knowledge representation, language, problem solving, thinking, and reasoning. How is the world represented and what are the processes underlying those representations? Considers the real-world implications of laboratory findings.

21&62:830:308. CRITICAL THINKING IN PSYCHOLOGY (3)

Prerequisites: 21&62:830:101,102.

Scientific method in the context of popular ideas about psychology. Examination of the best scientific evidence concerning ESP, astrology, hypnosis, and other claims of paranormal powers. Analysis of controversial topics at the intersection of psychology and public policy, such as child-rearing and the nature/nurture debate.

21&62:830:323. DEVELOPMENTAL PSYCHOLOGY (3)

Prerequisites: 21&62:830:101,102 or permission of instructor.

Child behavior and development; motor abilities, language, intelligence, social and emotional behavior and attitudes; prevention of maladjustment; relevant research findings; practical questions of child care and child rearing.

21&62:830:327. COGNITIVE DEVELOPMENT (3)

Prerequisites: 21&62:830:101,102 and 21&62:830:304 or 323.

Development of human capacities, with emphasis on the growth patterns of perception and thought.

21&62:830:335. SOCIAL PSYCHOLOGY (3)

Prerequisites: 21&62:830:101,102.

Psychological study of the individual's social interaction; theories of interaction and the empirical research employed in the investigation of topics such as attitude formation and change, group structure and process, motivation, learning, and perception in a social context.

21&62:830:346. PSYCHOLOGY OF LANGUAGE (3)

Prerequisites: 21&62:830:101,102.

Research investigations of language behavior as an aspect of intellectual functioning; comparative study of human and animal communication; biological and neurological determinants of language; innate vs. acquired mechanisms; information theory; encoding and decoding phonological skills; language models and theories evaluated, including mathematical models, learning theorists (e.g., Skinner, Osgood), and the transformational linguistics of Chomsky.

21&62:830:354. THE PSYCHOLOGY OF ADULTHOOD AND AGING (3)

Prerequisites: 21&62:830:101,102. *Recommended:* 21&62:830:323.

Psychological, biological, and cultural aspects of the life cycle from young adulthood to the later years; becoming a person and becoming partners; experimenting with lifestyles; deciding about children and how to relate to them; middle years—changes, crises, new opportunities; retirement and leisure compared with the work ethic; facts and fallacies about old age; death and how we deal with it.

21&62:830:358. INTRODUCTION TO CLINICAL PSYCHOLOGY (3)

Prerequisites: 21&62:830:101,102.

Short stories, plays, projective testing, paintings, and material from clinical interviews to introduce normal, creative, and pathological personalities; increases sensitivity to the situational, psychological, and historical determinants of human personality.

21&62:830:363. ABNORMAL PSYCHOLOGY (3)

Prerequisites: 21&62:830:101,102.

Psychopathologies, their probable causes, and usual behavioral manifestations; theories of pathology and research techniques employed in the investigation of abnormality.

21&62:830:369,370. FIELDWORK IN PSYCHOLOGY (3,3)

Prerequisites: 21&62:830:101,102, junior or senior standing, and permission of instructor.

Fieldwork at accredited agencies under the supervision of a departmental faculty member and an agency supervisor. Consult the advisers to determine the number of hours required for participation at an agency; advisers have a current listing of accredited agencies participating in this program.

21&62:830:371. PSYCHOLOGY OF PERSONALITY (3)

Prerequisites: 21&62:830:101,102.

Major theoretical and experimental contributions to the understanding of normal personality and its development; relative adequacy of different theories in dealing with specific empirical data.

21&62:830:372. PERCEPTION (3)

Prerequisites: 21&62:830:101,102.

Classical problems of perception—the constancies, form perception and the illusions, the perception of movement, neutral color, direction, and orientation; important theoretical issues of perception.

21&62:830:373. PSYCHOLOGY OF WOMEN (3)

Prerequisites: 21&62:830:101,102 and either 323 or 354.

Psychological roles of women in the human situation, traditional and contemporary; functions fulfilled by, and problems inherent in, the subordination of Eve to Adam; wider social-psychological implications of the new feminism; novels, films, and journalistic, social-philosophic, psychoanalytic, and anthropological materials.

21&62:830:378. ADVANCED ABNORMAL PSYCHOLOGY (3)

Prerequisites: 21&62:830:363 and permission of instructor.

Current theory and research in abnormal psychology; psychological and biochemical theories of psychopathology; examination of methods and findings of relevant experimental data.

21&62:830:407. PARENTAL BEHAVIOR IN MAMMALS (3)

Prerequisites: 21&62:830:101,102.

Evolution of the biological and psychological basis of parental care among mammals. Relationship between mode of reproduction and patterns of parental care and how these patterns are adapted to the ecological niche of the species. Evolution of mechanisms between parents and offspring.

21&62:830:410. PERCEPTUAL DEVELOPMENT (3)

Prerequisites: 21&62:830:101,102 and either 21&62:830:323 or 372.

Classical and current empirical and theoretical approaches to the development of perceptual capacities. Development of the ability to perceive surfaces, color, patterns, motion, depth, and objects with a focus on how studies of perceptual development inform understanding of mature visual systems and vice versa.

21&62:830:411. INTRODUCTION TO COGNITIVE NEUROSCIENCE (3)

Prerequisites: 21&62:830:101,102; 301,302; 304; 484.

Evidence from cognitive psychology, neuropsychology, behavioral neuroscience, and brain imaging used to investigate brain systems and mental representations underlying sensation and perception, movement, memory, and language. Brain anatomy, neurophysiology, and relation of brain and cognitive states to our experience of the world.

21&62:830:417. THEORIES OF INTERPERSONAL AND SOCIAL CONFLICT (3)

Prerequisites: 21&62:830:101,102.

Major theoretical perspectives of interpersonal and social conflict and the application of these perspectives to describe and understand personal conflicts and those in the world at large. Design research to explore and evaluate hypotheses derived from one or more of these perspectives.

21&62:830:419. ANIMAL BEHAVIOR LABORATORY (3)

Prerequisites: 21&62:830:101,102.

Provides firsthand experience in all phases of behavioral research; ethical treatment of animals, experimental design, observational techniques, analysis and presentation of results, methodological and theoretical issues.

21&62:830:421. LEARNING AND OBJECT RECOGNITION (3)

Prerequisites: 21&62:830:101,102; 372.

Learning of skills and patterns of behavior as well as restrictions and limitations; recognition of objects in familiar and unfamiliar situations; historical and modern research perspectives.

21&62:830:423. HISTORY AND MODERN VIEWPOINTS IN PSYCHOLOGY (3)

Prerequisites: Junior or senior standing in the major and 21&62:830:101,102.

Critical study, with historical background, of several schools of psychological thought and theory; behaviorism and learning theory, psychoanalysis, Gestalt psychology, cognitive psychology, existentialism, and Russian psychology.

21&62:830:424. HEALTH PSYCHOLOGY (3)

Prerequisites: 21&62:830:101,102.

Psychological influences on health, illness, and the improvement of the health care system. Impact of judgments, attitudes, and beliefs on health; emotions and emotional control on health and coping; effects of gender, culture, and individual differences; interpersonal and organizational conflict in health care settings; patient-practitioner interaction; management of chronic illness.

21&62:830:434. ATTACHMENT THEORY (3)

Prerequisites: 21&62:830:101,102.

Effects of early childhood rearing on subsequent cognitive abilities, interpersonal and romantic relationships, coping styles, separation, loss, and mourning. Attachment theory examined from psychological, psychoanalytic, evolutionary, and ethological perspectives.

21&62:830:440. ANIMAL COGNITION (3)

Prerequisites: 21&62:830:101,102.

Cognitive capacities of animals, including perception and attention, recognition and learning, concept formation and categorization, intentionality and communication. Continuity of mental states across human and nonhuman species, evolution of cognitive capacities and the animal language controversy. Attention to historical, philosophical, and methodological aspects.

PUERTO RICAN STUDIES

21&62:830:481. COMPARATIVE PSYCHOLOGY (3)

Prerequisites: 21&62:830:101,102.

Comparative study of animal behavior; organization of behavior, and the relations among structure, physiology, and behavior at representative levels in the animal kingdom; comparative ontogeny of behavior and the question of learned and unlearned components; the evolution of behavior in the formation of species.

21&62:830:484. PHYSIOLOGICAL PSYCHOLOGY (3)

Prerequisites: 21&62:830:101,102.

Physiological basis of behavior; basic structure and function of the nervous system; physiological basis of motivation and emotions; relations between hormones and behavior; physiological aspects of perception and learning; organization of the cerebral cortex; psychosomatics.

21&62:830:486. NEUROPHYSIOLOGY AND BEHAVIOR (3)

Prerequisites: 21&62:830:101,102; 484.

Structure and function of the mammalian nervous system; neuroanatomy, neurophysiology, and neuropharmacology; functions of the spinal cord, autonomic nervous system, limbic system, higher brain mechanisms, reproductive behavior, pain modulation, sensorimotor and viscerosomatic integration.

21&62:830:491,492. RESEARCH IN PSYCHOLOGY (BA,BA)

Prerequisites: Junior or senior standing and permission of instructor.

Design and execution of an original research project under supervision; project may be a psychological experiment, an attitude survey, or a library study; learning how to do research by means of firsthand experience.

21&62:830:493,494. INDIVIDUAL STUDY IN PSYCHOLOGY (BA,BA)

Prerequisites: Junior or senior standing and permission of instructor.

Exploration of contemporary and classical problems in psychology through planned readings and discussions with a faculty member; emphasis on going beyond textbooks and learning to think about psychological issues in depth. Choice of participating in either a seminar class or reading independently and preparing a written report.

21&62:830:496. THE EMOTIONAL BRAIN (3)

Prerequisites: 21&62:830:101,102.

What are emotions? Neural substrates examined from neurobiological perspectives. Individual and social functions of emotions, emotional intelligence.

21&62:830:498. NEUROENDOCRINOLOGY AND BEHAVIOR (3)

Prerequisites: 21&62:830:101,102; 484.

Neuroendocrine control of courtship, mating, and maternal behavior; pregnancy, parturition, sexual differentiation, stress, cellular basis of immune action on the nervous system, and neuroendocrine role of steroids, neuropeptides, monoamines, and amino acids.

PUERTO RICAN STUDIES 836

Puerto Rican Studies Program

Conklin Hall (973/353-1052)

The Puerto Rican studies major and minor are offered at NCAS.

The Puerto Rican studies program at NCAS offers an interdisciplinary and cross-cultural major and minor in order to provide an opportunity for Rutgers students to understand the Puerto Rican community of New Jersey, the United States, and Puerto Rico. To achieve this goal, the courses adopt a comparative approach, making sure to place discussion of Puerto Rican topics in the broader context of the Caribbean and Latin America, and in terms of the complex relationship that has existed since 1898 between Puerto Rico and the United States. Except for the two literature courses, which are offered in Spanish, all

other courses are taught in English. Students with interests in the fields of law, medicine, social work, and criminal justice, among others, or in careers in the public sector find many courses very useful.

Major Requirements

Thirty credits are required for the major. Language training in Spanish to meet course prerequisites does not count toward the major.

1. The required core courses include 18 credits as follows:
21&62:014:301 African Cultural Retentions in the Americas (3)
21&62:510:317 History of the Caribbean (3)
21&62:510:323,324 History of Puerto Rico (3,3)
21:940:270 Puerto Rican Literature (3)
21:940:324 Puerto Rican Narrative (3)
2. The elective courses include 12 credits that are selected under advisement:
21&62:070:352 Peoples and Cultures of Latin America (3)
21&62:510:207,208 History of Latin America (3,3)
21&62:510:364 Contemporary Issues in Puerto Rican History (3)
21&62:790:311 Government and Politics of Latin America (3)
21:836:488 Independent Study in Puerto Rican Topics (3)
21:940:304 Race, Slavery, and the Black Experience in Spanish-American Literature (3)
21:940:383 or 384 Ibero-American Thought (3,3)

Minor Requirements

1. Four of the following courses are required for the minor:
21&62:510:317 History of the Caribbean (3)
21&62:510:323 or 324 History of Puerto Rico (3,3)
21:836:488 Independent Study in Puerto Rican Topics (3)
21:940:270 Puerto Rican Literature (3) or 21:940:324 Puerto Rican Narrative (3)
2. The remaining 6 credits may be selected from the following courses:
21&62:014:301 African Cultural Retentions in the Americas (3)
21&62:070:352 Peoples and Cultures of Latin America (3)
21&62:510:207 or 208 History of Latin America (3,3)
21&62:510:364 Contemporary Issues in Puerto Rican History (3)
21&62:790:311 Government and Politics of Latin America (3)
21:940:304 Race, Slavery, and the Black Experience in Spanish-American Literature (3)
21:940:383 or 384 Ibero-American Thought (3,3)

Course

21:836:488. INDEPENDENT STUDY IN PUERTO RICAN TOPICS (3)
Independent reading or research under the direction of a faculty member affiliated with the program.

Other Related Courses

21&62:014:301. AFRICAN CULTURAL RETENTIONS IN THE AMERICAS (3)

See Afro-American and African Studies 014.

21&62:510:207,208. HISTORY OF LATIN AMERICA (3,3)*See History 510.***21&62:510:317. HISTORY OF THE CARIBBEAN (3)***See History 510.***21&62:510:323,324. HISTORY OF PUERTO RICO (3,3)***See History 510.***21&62:510:364. CONTEMPORARY ISSUES IN PUERTO RICAN HISTORY (3)***See History 510.***21:940:270. PUERTO RICAN LITERATURE (3)***See Spanish 940.***21:940:324. PUERTO RICAN NARRATIVE (3)***See Spanish 940.***21:940:383 or 384. IBERO-AMERICAN THOUGHT (3,3)***See Spanish 940.***RELIGIOUS STUDIES 840 (See courses under Philosophy 730)****SCIENCE, TECHNOLOGY, AND SOCIETY 880**

The major and minor in science, technology, and society are offered at NCAS.

Science, technology, and society, a collaborative program with the New Jersey Institute of Technology (NJIT), explores the foundations and impacts of science and technology in the modern world. The bachelor's degree gives the student a global, multicultural, and environmental perspective, and prepares the student to integrate the scientific and technical disciplines with the humanities and social sciences. Through its cross-disciplinary perspective, the program in science, technology, and society explores the relations among the world of the scientist, the engineer, the politician, and the citizen.

Science, technology, and society graduates find employment in law, government, corporate planning, science policy, urban development, transportation studies, technology assessment, technical communications, and environmental policy and planning.

Major Requirements

All students majoring in science, technology, and society are required to fulfill the core requirements (24 credits) and concentration requirements (15 credits). Additional requirements in related disciplines may reach 36 credits. All courses beginning with the prefix "STS" are offered only at NJIT.

Core Courses

The core courses introduce students to the connections among civilization, technology, and the global environment. Individual core courses focus on historical and cultural foundations, basic ideas and values, dominant institutions, environmental viewpoints, policy developments, and sustainable development.

The senior seminar and project is the capstone course for science, technology, and society majors. Students work closely with the senior seminar director and a faculty

adviser to identify a topic, investigate it in depth, and compose a senior thesis. Seniors also take the lead in monthly faculty-student colloquia on major technological, scientific, and environmental issues.

21&62:512:395,396	History of Science <i>or</i> His 485-486 History of Technology (at NJIT)
21&62:790:310	Science, Technology, and Public Policy
STS 308	Technology and Global Development: Introduction to STS
STS 310	Technology and Human Values
STS 490-491	Senior Seminar and Project

Requirements in Related Disciplines

In order to develop competence in science, technology, and society, students must have an adequate background in quantitative reasoning, social sciences, and the principles of science and technology.

1. 9 credits in calculus, computer science, statistics. (These courses may be used to fulfill the general college requirement.)
2. 9 credits in economics, political science, sociology. (These courses may be used to fulfill the general college requirement.)
3. 19 credits in science and technology. Courses selected should either fulfill the requirements for a minor in one of the science or technology disciplines, or be a coherent group of courses related to the student's area of interest, worked out with an adviser.

Concentration Requirement

Fulfilling the concentration requirement allows science, technology, and society majors to specialize in areas such as history and philosophy of science, environmental studies, and science and technology policy studies. Courses must be selected in consultation with a faculty adviser and should comprise a coherent combination that focuses on some area of study.

The following courses are available for completing the science, technology, and society concentration requirement:

American Studies

21&62:050:305	Nuclear Weapons in America
21:050:395	Nuclear War and Literature
21&62:050:403,404	Technology and Culture in America

Anthropology

21&62:070:309	Medical Anthropology
21&62:070:350	Cultural Ecology

Biology

21&62:120:204	Economic Botany
21&62:120:205	Environmental Issues

Chemistry

21&62:160:101,102	World of Chemistry
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Classics

21&62:190:310	Ancient Technology
21:190:312	Ancient Warfare

Criminal Justice

62:202:203	Scientific Applications in Criminal Justice
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Economics

21&62:220:316	Economics of Health
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English

21&62:350:377	Science Fiction, Technology, and Society
21&62:350:379	Computers and Literature

- Geology*
21&62:460:215 The Physical Environment and Man
- History*
21&62:510:321 Military History of the Western World
21&62:512:395,396 History of Science
- Philosophy*
21&62:730:225 Philosophy of Science
- Physics*
21&62:750:202 Physics as a Liberal Art
- Political Science*
21&62:790:310 Science, Technology, and Public Policy
- Psychology*
21&62:830:423 History and Modern Viewpoints in Psychology
- Science, Technology, and Society*
21&62:880:331,332 Topics in Science, Technology, and Society
- Sociology*
21&62:920:311 Sociology of Industry
21&62:920:318 Sociology of Health Care
21&62:920:338 Sociology of Death and Dying
21&62:920:475 Sociology of Psychotherapies in America

Minor Requirements

All courses in Group I are required of each student minoring in science, technology, and society. *Science majors* must take two courses from Group II. *Nonscience majors* must take two courses from Group III.

Group I

- 21&62:512:395,396 History of Science *or* HIS 485-486
History of Technology (at NJIT)
21&62:790:310 Science, Technology, and Public Policy
STS 308 Technology and Global Development:
Introduction to STS
STS 310 Technology and Human Values

Group II

- 21&62:050:403,404 Technology and Culture in America
21&62:730:225 Philosophy of Science
21&62:880:331,332 Topics in Science, Technology,
and Society
STS 304 Writing about Science, Technology,
and Society
STS 316 Mass Communications, Technology,
and Culture

Group III

- 21&62:120:204 Economic Botany
21&62:120:205 Environmental Issues
21&62:160:101,102 World of Chemistry
21&62:160:215 The Physical Environment and Man
21&62:750:202 Physics as a Liberal Art
21&62:880:331,332 Topics in Science, Technology,
and Society

Courses

21&62:880:331,332. TOPICS IN SCIENCE, TECHNOLOGY, AND SOCIETY (3,3)

Fulfills the technology course requirement in the teacher certification program.
An interdisciplinary approach to issues that face the world, examined from the perspectives of the natural sciences, the social sciences, and the humanities.

SLAVIC 861 (Russian 860)

*Department of Classical and Modern Languages and Literatures
Conklin Hall (973/353-5498)*

Program Director: Myroslava T. Znayenko

The department offers major programs in Ancient Mediterranean Civilizations, Central and Eastern European Studies 149, French 420, German 470, and Spanish 940. Students majoring in one language area may concurrently major or minor in another language area. The department also participates in the interdisciplinary major, the minor in international affairs, the Rutgers Study Abroad Program, and offers courses in Portuguese, Arabic, and linguistics.

The major in Slavic has been replaced by the major in Central and Eastern European Studies (149). Students interested in intensive study of languages, literatures, history, and politics of the area should consult the requirements of this program.

An interdisciplinary minor in Slavic is offered in NCAS.

Minor Requirements

The interdisciplinary minor in Slavic languages, literatures, and cultures requires 21 credits, which may include 21:860:131,132 Intermediate Russian (or equivalent preparation as demonstrated by a proficiency examination in Russian, Polish, Ukrainian, or another Eastern European language), any of the Slavic language and literature courses numbered 200 or higher, and at least two courses in history, politics, business, or economics of Eastern Europe. The minor concentration requires the approval of the program director.

Courses (Russian 860)

21:860:101-102. ELEMENTARY RUSSIAN (3,3)

Intended for students with little or no previous knowledge of Russian. Both terms must be completed to receive credit.

Training in pronunciation, grammar, simple composition, and reading of elementary prose.

21:860:131,132. INTERMEDIATE RUSSIAN (3,3)

Prerequisite: 21:860:102 or equivalent as determined by a placement examination. Grammar review and selected reading in literature and other cultural areas.

21:860:203. RUSSIAN GRAMMAR AND COMPOSITION (3)

Advanced grammar review, composition, and diction.

21:860:204. RUSSIAN COMPOSITION AND CONVERSATION (3)

Prerequisite: 21:860:203 or permission of instructor. Intensive practice in oral and written Russian.

21:860:205,206. INTRODUCTION TO RUSSIAN LITERATURE (3,3)

Prerequisite: 21:860:132 or equivalent. Russian literary history; some major authors are analyzed; readings in the original language.

21:860:269. DOSTOEVSKY AND TOLSTOY IN ENGLISH TRANSLATION (3)

A multidimensional examination of the principal works in the context of the historical, intellectual, and aesthetic forces and influences of the nineteenth century.

21:860:307. ADVANCED RUSSIAN GRAMMAR, CONVERSATION, AND COMPOSITION (3)*Prerequisites: 21:860:203, 204.*

For prospective teachers and others who wish to acquire more fluency in spoken and written Russian.

21:860:311,312. RUSSIAN LITERATURE IN ENGLISH TRANSLATION (3,3)*Prerequisite: 21&62:350:101-102.*

Literary analysis of representative works of Russian literature: authors include Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, Tolstoy, Chekhov, and Zamyatin.

21:860:313,314. SLAVIC LITERATURE IN ENGLISH TRANSLATION (3,3)*Prerequisites: 21&62:350:101-102.*

Analysis of representative works of Czech, Polish, Serbo-Croatian, and Ukrainian writers.

21:860:322. RUSSIAN SHORT STORY (3)

Reading, analysis, and discussion of nineteenth- and twentieth-century Russian short stories.

21:860:323. RUSSIAN CIVILIZATION (3)

Relationships among society, literature, art, and music in the nineteenth and twentieth centuries.

21:860:324. HISTORY OF SLAVIC LANGUAGES (3)

Development of the Slavic languages from Old Church Slavonic, with particular emphasis on the development of the Russian language.

21:860:332. RUSSIAN POETRY (3)

Selected poetry from the eighteenth to the twentieth century.

21:860:341,342. THE RUSSIAN NOVEL (3,3)

Representative novellas and major novels of the nineteenth century.

21:860:347. RUSSIAN DRAMA (3)

Reading and analysis of the major works of Russian drama, from the eighteenth century to the present, in Russian and English.

21:860:355,356. INDIVIDUAL STUDY IN SLAVIC (3,3)*Prerequisite: Permission of department chairperson or instructor.*

Individual study for students interested in specialized study or research in Slavic languages or literatures.

21:860:485. SEMINAR IN SLAVIC (3)

Reading and research in a specific aspect of Slavic languages, literatures, and cultures; presentation of a critical paper.

21:860:486. SEMINAR IN RUSSIAN LITERATURE (3)

Reading and research in a specific aspect of Russian literature; presentation of an analytic and critical paper.

SOCIAL WORK 910***Department of Social Work****Hill Hall (973/353-5145)*

Both the major and the minor in social work are offered at NCAS and UC-N. *

Major Requirements

The social work major prepares students to enter a helping profession that has a long history of concern and action for the well-being of individuals, families, groups, and communities. Students are prepared for beginning-level, generalist practice, with emphasis on special populations including youth and families, the elderly, and those at risk.

The department is accredited by the Council on Social Work Education and includes academic course work and supervised field practice. Graduates are eligible for certification by the New Jersey Board of Social Work Examiners and also for advanced standing if they pursue graduate study in social work. The major may be declared after completing at least 24 credits, including one of the following courses, with a grade of *C* or better: 21&62:910:220, 322, 341, 342 or 345. Academic credit is not given for life experience. Students should contact the department for advising as soon as possible.

The requirements for the social work major include:

- Social Work*
 - 21&62:910:220 Introduction to Social Work and Social Welfare (3)
 - 21&62:910:322 Human Behavior and the Social Environment (3)
 - 21&62:910:324 Social Work Practice Laboratory (3)
 - 21&62:910:341 Social Welfare Policies through 1930s (3)
 - 21&62:910:342 Contemporary Social Welfare Policies (3)
 - 21&62:910:345 Human Diversity (3)
 - 21&62:910:346 Social Work Theory and Methods I (3)
 - 21&62:910:400 Service Placement
 - 21:910:411 Social Work Theory and Methods II (3)
 - 21:910:412 Social Work Theory and Methods III (3)
 - 21&62:910:413 Social Work Senior Seminar I (2)
 - 21&62:910:414 Social Work Senior Seminar II (2)
 - 21:910:471 Field Practice in Social Work I (4)
 - 21:910:472 Field Practice in Social Work II (4)
- Sociology* (one of the following)
 - 21&62:920:201 Introduction to Sociology I (3)
 - 21&62:920:202 Introduction to Sociology II (3)
- Psychology*
 - 21&62:830:102 Principles of Psychology (3,3)
- Political Science*
 - 21&62:790:201 American National Government (3)
- Research*
 - 21&62:920:301-302 Social Research I, II (4,4) *or*
 - 21&62:830:301 Statistical Methods for the Cognitive and Behavioral Sciences (4)
 - and* 21&62:830:302 Experimental Methods for the Cognitive and Behavioral Sciences (4)
- Biology* (one of the following)
 - 21:120:101-102 General Biology (4,4);
 - 62:120:104 Human Health and Disease (3) *or* 62:120:208 Human Sexuality (3)
- Economics* (one of the following)
 - 21&62:220:101 Introduction to Economics, Micro (3)
 - 21&62:220:102 Introduction to Economics, Macro (3)
 - 21&62:220:200 Economic Analysis of Social Problems (3)

* Field placement, although usually available, cannot be guaranteed in the evening.

Minor Requirements

The minor in social work requires 18 credits to be completed with a grade of C or better. Completion of the minor does not fulfill New Jersey state requirements for state social work certification or MSW advanced standing.

- 21&62:910:220 Introduction to Social Work and Social Welfare (3)
 21&62:910:322 Human Behavior and the Social Environment (3)
 21&62:910:341 Social Welfare Policies through 1930s (3)
 21&62:910:342 Contemporary Social Welfare Policies (3)
 21&62:910:345 Human Diversity (3)
- 3 credits from a social work elective or social work independent study

The social work major or minor may be combined with psychology or other social science areas of study. Questions should be directed to the department chair, 973/353-5145.

Courses

21&62:910:220. INTRODUCTION TO SOCIAL WORK AND SOCIAL WELFARE (3)

Introduction to history, values, and ethical and theoretical foundations of social work and social welfare. Exploration of fields of practice through agency visits, volunteer experiences, and special presentations.

21&62:910:322. HUMAN BEHAVIOR AND THE SOCIAL ENVIRONMENT (3)

Prerequisites: 21&62:830:102; 21&62:920:201 or 202.

Study of the individual across the lifecycle, with emphasis on understanding and integrating the bio-psycho-social and value issues related to development.

21&62:910:324. SOCIAL WORK PRACTICE LABORATORY (3)

Corequisite: 21&62:910:346.

Provides experiences to complement the theoretical conceptualizations discussed in 21&62:910:346. Emphasis on the development of skills in relation to the knowledge base.

21&62:910:341. SOCIAL WELFARE POLICIES THROUGH 1930S (3)

Examines the early history of American social welfare and social work through the interplay of values, tradition, politics, economics, and social changes that affected the American response to social needs and social problems.

21&62:910:342. CONTEMPORARY SOCIAL WELFARE POLICIES (3)

American social welfare policies and programs since the late 1930s examined. Analysis made of the impact of changing social conditions on contemporary policies and programs and their impact on members of society. Alternative responses to social need and directions for future social policy explored.

21&62:910:343,344. ISSUES IN SOCIAL WORK (3,3)

Examination of various topical subjects in social work.

21&62:910:345. HUMAN DIVERSITY (3)

Prerequisites: 21&62:830:102; 21&62:920:201 or 202.

Focus on content related to human behavior and the social environment in larger systems. Diversity, immigration issues, community, organizational structures, economic influences, leadership, and their impact analyzed.

21&62:910:346. SOCIAL WORK THEORY AND METHODS I (3)

Prerequisites: 21&62:910:220 and either 322 or 345. *Corequisite:* 21&62:910:324.

First of a three-term, upper-level sequence that builds upon systems theory and the generalist social work problem-solving method. Emphasizes the knowledge components of problem identification and assessment, goal setting, social work values, use of self, and communication with a variety of client systems.

21&62:910:400. SERVICE LEARNING INTERNSHIP (1)

Corequisite: 21&62:910:220.

Forty hours of community service within designated agency to enhance understanding of the social welfare community; placement arranged by the university in conjunction with the student.

21&62:910:411. SOCIAL WORK THEORY AND METHODS II (3)

Prerequisites: 21&62:910:324 and 346. *Corequisites:* 21&62:910:413, 471.

Emphasis on the skills and theoretical implications of planning and intervention techniques in relation to values of social justice, confidentiality, client self-determination, use of supervision. Focus on termination and utilization of groups.

21&62:910:412. SOCIAL WORK THEORY AND METHODS III (3)

Prerequisite: 21&62:910:411. *Corequisites:* 21&62:910:414, 472.

Emphasis on macrolevel theory and practice, including evaluation and analysis of practice, programs/policies, and research. Understanding organizational functioning, role of advocacy. International component of social work also explored.

21&62:910:413. SOCIAL WORK SENIOR SEMINAR I (2)

Corequisites: 21&62:910:411 and 471.

Forum in which progress in field agency assignments is monitored and potential incongruencies in learning experiences and expectations addressed. Analyze and synthesize application of social work theories and methods content to micro and mezzo levels of practice.

21&62:910:414. SOCIAL WORK SENIOR SEMINAR II (2)

Prerequisites: 21&62:910:411, 413, and 471. *Corequisites:* 21&62:910:412 and 472.

Forum in which progress in field agency assignments is monitored and potential incongruencies in learning experiences and expectations addressed. Analyze and synthesize application of social work theories and methods content, with emphasis on macrolevel practice.

21&62:910:467,468. INDEPENDENT STUDY IN SOCIAL WORK (BA, BA)

Prerequisites: Permission of department chairperson; social work major/minor. Independent research or project under faculty supervision.

21&62:910:471-472. FIELD PRACTICE IN SOCIAL WORK (4,4)

Prerequisites: 21&62:910:324, 346. *Corequisites:* 21&62:910:411,412 and 413,414.

Field experience in social work agency under supervision of the agency and department. Placement must be arranged in the term prior to the internship.

21&62:910:473,474. ADVANCED PRACTICUM IN SOCIAL WORK (BA,BA)

Prerequisites: 21&62:910:471-472; permission of instructor.

Develop skills and expand knowledge in a specific social work method or field of practice under the professional guidance that accompanies all forms of field instruction.

SOCIOLOGY 920

Department of Sociology and Anthropology

Hill Hall (973/353-5255)

Major Requirements: NCAS and UC-N

A major in sociology provides the student with a basic understanding of the causes and consequences of the ways people behave in relation to one another. It is a pertinent field of study for anyone whose work focuses on human social behavior, whether that work is in sales, politics, law, management, instruction, advertising, journalism, research, criminal justice, or social welfare.

The requirements for the major include:

1. 38 credits in Sociology 920, Anthropology 070, and/or Criminal Justice 202 or Social Work 910 (maximum of 3 credits) courses, which must include 21&62:920:201 Introduction to Sociology I and 21&62:920:202 Introduction to Sociology II
2. Competence in research methodology, basic sociological theory, and elementary statistics to be demonstrated by completion of:
 - 21&62:920:301-302 Social Research I,II (4,4)
 - 21&62:920:409 Classical Sociological Theory (3)
 - 21&62:920:415 Contemporary Sociological Theory (3)

Candidates for graduate school are advised to take German, French, or, in the case of students interested in Latin American studies, Spanish.

Minor Requirements: NCAS and UC-N

The minor requires a minimum of 24 credits in sociology, including one theory course, either 21&62:920:409 or 415.

Courses

21&62:920:201. INTRODUCTION TO SOCIOLOGY I (3)

Study of society, including social structure, culture, and social interaction; the nature and historical developments of modern forms of social organization and social relationships.

21&62:920:202. INTRODUCTION TO SOCIOLOGY II (3)

Critical themes in modern sociology. Emphasis on communities, minorities, education, religion, leisure, the family, and the economy.

21&62:920:209. CRIME AND JUSTICE IN AMERICAN SOCIETY (3)

Analysis of major criminal justice institutions in American society; the function of courts, police, and judicial systems in helping or impairing the fair administration of criminal law.

21&62:920:301-302. SOCIAL RESEARCH I,II (4,4)

Lec. 3 hrs, lab. 3 hrs. Prerequisites: 21&62:920:201, 202, or equivalent.
The art and the science of doing research; how to develop a researchable question (hypothesis construction and causal modeling); how to collect (observation, surveys, experiments, and secondary analysis) and analyze data (statistics); and how to write a scientific report. Independent research project required.

21&62:920:303. SOCIAL CHANGE AND GLOBALIZATION (3)

Causes and consequences of change, as it touches individuals, small groups, communities, organizations, and societies; analyzes intended and unforeseen changes in both current social relations and the history of social structures.

21&62:920:304. SOCIAL PROBLEMS (3)

Social problems facing Americans today; causes and processes underlying these problems; evaluation of proposed solutions.

21&62:920:306. MARRIAGE AND THE FAMILY (3)

The institution of the family; emphasis on the modern American family and the current search for alternatives to the traditional monogamous family.

21&62:920:307. SOCIAL PROTEST AND REVOLUTION (3)

Problem of order in social groups and entire societies; the production and enforcement of norms; the role of authority in social life; institutional integration and disintegration; oppression, revolution, and normative reconstruction.

21&62:920:308. SOCIAL MOVEMENTS (3)

The manifestations of social change as they appear in diffuse collective behavior and subsequent reintegrative social movements.

21&62:920:310. OCCUPATIONS AND PROFESSIONS (3)

Variations in cultural definitions of work, attitudes toward careers, and the social environment of work; the development of professions; occupational and professional recruitment.

21&62:920:311. SOCIOLOGY OF THE ECONOMY AND INDUSTRY (3)

Development and significance of modern industry and bureaucracy; division of labor; growth of corporations; interplay of formal and informal organization; sources of labor supply; the role of labor unions in industrial conflict; economic classes and status positions in large-scale organizations.

21&62:920:313. CRIMINOLOGY (3)

Crime and criminals in modern society, including causes of crime; machinery of justice; penal and correctional institutions; probation and parole; theories of crime and punishment.

21&62:920:314. BUREAUCRACY AND SOCIETY (3)

Causes and consequences of organizations; internal arrangements; effects of environment; organizational performances and effects on people.

21&62:920:315. THE PERSON IN SOCIETY (3)

The interaction between the development of the self and the social environment in which it occurs.

21&62:920:316. RACE AND ETHNICITY IN MULTICULTURAL SOCIETIES (3)

Comparative view of ethnic relations; origins in migration and mixture of populations; social-psychological consequences of stratification along racial and ethnic lines; prejudice; special emphasis on black Americans.

21&62:920:318. SOCIOLOGY OF HEALTH CARE (3)

The health care system in the U.S.; social behavior of patients and providers within the system; the role of the patient in the delivery of health care; the health professions; health service organizations.

21&62:920:321. SUBURBS, CITIES, AND INNER CITIES (3)

The city as a mosaic of communities; persistence and change in the structure of urban neighborhoods; city life and the urban personality; the sociology of community planning; the future of neighborhood, suburb, and city.

21&62:920:327. PUBLIC OPINION AND COMMUNICATION (3)

Content and transmission of popular culture from a sociological perspective; evaluation of selected forms of popular art and their place in American culture; theories on the social evolution of popular forms from folk and elite cultures; methods employed in analysis of mass culture.

21&62:920:332. CLASS, STATUS, AND POWER (3)

Theories of inequality, social ranking, and the distribution of resources and opportunity as they affect individuals and groups in terms of crime, health, family life, and value systems.

21&62:920:333. JUNIOR READINGS IN SOCIOLOGY (3)

Prerequisites: Junior or senior standing, and permission of instructor.
Critical readings and discussions of a group of classic works in the field of sociology and social research.

21&62:920:336. PUNISHMENT AND PRISONS (3)

Examines and analyzes major types of custodial and community-based criminal corrections in contemporary America. Discusses purposes of corrections, correctional organization, impact of corrections, and contemporary issues facing the field.

21&62:920:337. SOCIOLOGY OF SEX AND GENDER (3)

Relative statuses and roles of men and women in American society, including socialization; historical overview of sex statuses; differentials between males and females in educational and occupational sectors; personal relationships; sexuality.

21&62:920:338. SOCIOLOGY OF DEATH AND DYING (3)

Social factors that influence death and dying in the U.S.; characteristics of patients, professional staff, and institutions as these relate to the dying process and the definition of death; the routinization of death; the impact of technology on dying; current issues in the field.

21&62:920:340. SOCIOLOGY OF RELIGION (3)

Social influences on religious organizations and religious beliefs; aims and methods in the study of churches, sects, cults, and civil religions.

21&62:920:344. SOCIOLOGY OF DEVIANCE (3)

Forms of social deviance; theories of deviant behavior; the amount and distribution of deviance in society; societal reaction to deviants and deviant behavior.

21&62:920:345. SOCIOLOGY OF EDUCATION (3)

The interaction between schools and society; basic social concepts such as stratification, social role, and bureaucratic organization as they relate to the educational system; the system in relation to the larger institutions in the society, with emphasis on both stated objectives and actual social functions.

21&62:920:346. POLITICAL SOCIOLOGY (3)

Perspectives on the nature, organization, and historical development of power in society; social dimensions of the state, democratic politics, and political change; consequences of the social organization of power for other elements of society.

21&62:920:349. LAW AND SOCIETY (3)

Law as a social institution; social processes in the creation and enforcement of law; the professions of law; law as product and producer of social change; ancient and modern legal institutions; modern societies and their legal systems.

21&62:920:354. APPLYING SOCIOLOGY (3)

Sociological practicum; the sociological meaning of the practical experiences in work, internships, volunteer programs, and other "real world" organizational settings.

21&62:920:375. POVERTY AND GROWTH IN AFRICA, ASIA, AND LATIN AMERICA (3)

Comparative study of the developed and the less-developed nations, and of what separates the two; the growth of nationalism; the emergence of new elites; the roles of higher education and the military in development; the sociological determinants of economic growth; modernity as an individual and societal characteristic.

21&62:920:380. CIVIL CONFLICT AND VIOLENCE (3)

Analyzes conflict as a normal process in social life; the emergence and dynamics of conflict; the effects of conflict on individual values and social structures; the processes of conflict resolution; individual, group, and intersocial conflicts.

21&62:920:386. SOCIOLOGY OF SCIENCE (3)

Social organization of scientific knowledge; organization of scientific communities; inequalities among scientists; effects of scientific knowledge on modern ways of life.

62:920:393,394. TOPICAL ISSUES IN SOCIOLOGY (3,3)

Topics vary each term. Consult department for current information.

21&62:920:395. FIELD RESEARCH METHODS (3)

Nonquantitative observational and participant-observational research techniques.

21&62:920:408. SENIOR READING IN SOCIOLOGY (3)

Prerequisites: Senior standing and permission of instructor.
Critical reading and discussion of monographs and journal literature dealing with selected issues in the field of sociology.

21&62:920:409. CLASSICAL SOCIOLOGICAL THEORY (3)

Foundations of social theory; Comte, Durkheim, Marx, Weber, and others—contributors to major orientations in the nature and historical development of modern society in the Western world.

21&62:920:415. CONTEMPORARY SOCIOLOGICAL THEORY (3)

Prerequisite: 21&62:920:409 or permission of instructor.
Current modes of theoretical analysis, and contemporary perspectives on the nature and historical development of modern forms of social organization and social relationships.

21&62:920:454. TOPICS IN CRIMINAL JUSTICE (3)

In-depth exploration of selected issues in criminal justice of general relevance and specific interest to course participants.

21&62:920:491,492. RESEARCH IN SOCIOLOGY (3,3)

Prerequisites: Junior or senior standing, and permission of instructor.

21&62:920:493. SEMINAR IN SOCIOLOGY (3)

Prerequisites: Junior or senior standing, and permission of instructor.
Individualized study of a sociological topic.

21&62:920:494. CONFERENCE IN SOCIOLOGY (3)

Prerequisites: Junior or senior standing, and permission of instructor.
Intensive study of one topic of sociology.

21&62:920:495,496. HONORS SEMINAR IN SOCIOLOGY (3,3)

Prerequisites: Completion of 24 credits in sociology and selection by the department as an outstanding student. For seniors who intend to pursue graduate training in sociology.
Intensive review of general sociology and a practicum in conceptualizing and teaching it.

21&62:920:499. INDEPENDENT STUDY IN SOCIOLOGY (BA)

Prerequisites: Permission of instructor and department chairperson.

SPANISH 940

*Department of Classical and Modern Languages and Literatures
Conklin Hall (973/353-5498)*

Program Director: Asela Laguna

The Spanish major and minor are offered at NCAS.

The department offers major programs in Ancient Mediterranean Civilizations (Classics 190, Greek 490, Hebraic Studies 500, Latin 580), Central and Eastern European Studies 149, French 420, German 470, and Spanish 940. Students majoring in one language area may concurrently major or minor in another language area. The department also participates in the interdisciplinary major, a multidisciplinary minor in international affairs and the Rutgers Study Abroad Program, and offers courses in Portuguese, Arabic, and linguistics.

Major Requirements

There are two Spanish concentrations available to NCAS students: (a) Spanish language and literatures and (b) Hispanic civilization and language studies.

Spanish Language and Literatures

The requirements for a concentration in Spanish language and literatures are the following:

1. 30 credits in Spanish language and literatures, which may include 21&62:940:131,132 Intermediate Spanish (or equivalent preparation as demonstrated by proficiency examination). Any of the Spanish language and literature

courses numbered 200 or higher may be taken to satisfy this requirement, with the exception of literature in English translation.

2. 9 credits in other courses within the department, at least 3 of which must be in literature in the original language or in translation.
3. 6 credits from one or more of the following as approved by an adviser: English literature courses numbered higher than 215, 216, philosophy, music history, art history.

Hispanic Civilization and Language Studies

Program Directors: Elpidio Laguna-Diaz, Asela Laguna (973/353-5594)

The Hispanic civilization and language studies concentration is designed to serve students planning careers for which a thorough knowledge of countries and cultures in the Hispanic world is needed.

Proficiency in Spanish at the intermediate level (21:940:132 or equivalent) is required. The requirements for a major in Hispanic civilization and language studies consist of 39 credits as follows:

1. 12 credits in the following courses: 6 credits in 21:940:207 Introduction to Spanish Literature, 21:940:208 Introduction to Latin American Literature, *or* higher-level Spanish literature courses; 21:940:341,342 Hispanic Civilization
2. 12 credits in other Spanish (language and literature) courses at or above the 200 level, except 21:940:311,312 Spanish Literature in English Translation and 21:940:343,344 Latin American Literature in English Translation.
3. 15 credits chosen by the student in consultation with the Spanish adviser.

Minor Requirements

Eighteen credits in Spanish language and literatures that may include 21&62:940:131,132 Intermediate Spanish (or equivalent preparation as demonstrated by proficiency examination). Any of the Spanish language and literature courses numbered 200 or higher may be taken to satisfy this requirement, with the exception of literature in English translation.

The Department of Classical and Modern Languages and Literatures also offers minors in ancient medieval civilizations, French, German, Italian, Portuguese, and Slavic. Students may pursue one or more minor concentrations.

Courses

21&62:940:101-102. ELEMENTARY SPANISH (3,3)

Intended for students with little or no previous knowledge of Spanish. Both terms must be completed to receive credit.

Fundamentals of grammar; drill in speaking and reading. A minimum total of ten hours of language laboratory work per term is required of all students in NCAS elementary language courses and is recommended for UC-N students.

21&62:940:131,132. INTERMEDIATE SPANISH (3,3)

Prerequisite: 21&62:940:102 or equivalent as determined by a placement examination. *NCAS offers sections for native and for nonnative students.* Review of grammar; selected readings in literature and other cultural areas.

21:940:151. CONTEMPORARY SPANISH LANGUAGE AND CULTURE (3)

Multidisciplinary course designed specifically to improve fluency in Spanish. Emphasis on the active use of the language and on contemporary Hispanic topics.

21:940:203. GRAMMAR AND COMPOSITION (3)

For prospective teachers and others who wish to acquire more fluency in oral and written Spanish.

21:940:204. COMPOSITION AND ORAL COMMUNICATION (3)

Prerequisite: 21:940:203 or permission of instructor. Intensive practice in oral and written Spanish.

21:940:207. INTRODUCTION TO SPANISH LITERATURE (3)

Development of skills in reading literature. Reading of short works in the original language and introduction to literary concepts; conducted in Spanish.

21:940:208. INTRODUCTION TO LATIN AMERICAN LITERATURE (3)

Development of Latin American literature from its colonial origins to the present; conducted in Spanish.

21:940:270. PUERTO RICAN LITERATURE (3)

History and development of Puerto Rican literature from its beginnings to the present. Selected readings in the novel, poetry, short story, essay, and theater; conducted in Spanish.

21:940:304. SLAVERY, RACE, AND BLACK EXPERIENCE IN SPANISH-AMERICAN LITERATURE (3)

Interdisciplinary examination and analysis of major literary themes in the history of the black experience in Spanish America, as seen in antislavery literature of the nineteenth century, and in many texts dealing with miscegenation, race relations, blackness, sexuality, discrimination, and the search for identity; conducted in Spanish.

21:940:307. ADVANCED GRAMMAR AND COMPOSITION (3)

Prerequisites: 21:940:203, 204 or equivalent as determined by a placement examination.

For students with a good command of the Spanish language who wish to perfect their knowledge of written and oral Spanish; grammar analysis includes study of orthography, morphology, and syntax; unusual points of grammar and syntax.

21:940:311,312. SPANISH LITERATURE IN ENGLISH TRANSLATION (3,3)

Not open to Spanish majors or minors.

A chronological survey of Spanish literature from the Middle Ages to the twentieth century, with emphasis on literary traditions and culture.

21:940:315. SPANISH FOR BUSINESS AND COMMERCE (3)

Prerequisites: 21:940:203,204 or equivalent.

For students with a good command of the Spanish language who wish intensive study in commercial and business usage; practical vocabulary and procedures used in business letters and documents, banking, trade, and accounting as practiced in the Spanish-speaking world; conducted in Spanish.

21:940:318. HISTORY OF THE SPANISH LANGUAGE (3)

History of the Spanish language from its beginnings to the present; modern Spanish (Peninsular and Spanish American), its geographical extension and varieties; conducted in Spanish.

21:940:324. PUERTO RICAN NARRATIVE (3)

Literary examination of the contemporary Puerto Rican short story and novel, including representative works by Enrique Laguerre, Luis Rafael Sánchez, Rosario Ferré, and others; conducted in Spanish.

21:940:331. THEMES IN SPANISH AND SPANISH-AMERICAN LITERATURES (3)

Tracing and elaboration of a selected theme in Spanish and/or Spanish-American literary texts (e.g., the caudillo, solitude, mysticism); conducted in Spanish.

21:940:333. THE LATIN AMERICAN SHORT STORY (3)

Historical and theoretical examination of the Latin American short story from its precursors in colonial literature, to its formal inception in the nineteenth century, to modern masterpieces; conducted in Spanish.

21:940:341,342. HISPANIC CIVILIZATION (3,3)

Historical and cultural development of Spain and Latin America.

21:940:343,344. LATIN AMERICAN LITERATURE IN ENGLISH TRANSLATION (3,3)

Not open to Spanish majors or minors.

A chronological survey of Latin American literature from the period of the Conquest to the twentieth century, with emphasis on literary traditions and cultures.

21:940:348. HISPANIC FILM AND LITERATURE (3)

Analysis and comparison of films and written narratives from Spain and Latin America, grouped according to themes relevant to contemporary social, cultural, and aesthetic concerns; conducted in Spanish.

21:940:350. U.S. HISPANIC LITERATURE (3)

Survey of U.S. literature by Hispanic-American writers. Includes work by Chicanos, Puerto Ricans, and writers of Caribbean and Central and South American derivation; conducted in Spanish and English.

21:940:353,354. INDIVIDUAL STUDY IN SPANISH (3,3)

Prerequisite: Permission of department chairperson or instructor.

Individual study or research in Spanish language or literature.

21:940:366. CONTEMPORARY HISPANIC POETRY (3)

Examination of contemporary trends in the poetry of Spain and Spanish America. Reading and critical analysis of representative poets and tendencies from the fifties to the present; conducted in Spanish.

21:940:370. CONTEMPORARY HISPANIC THEATER (3)

Development of contemporary theater in Spain and Spanish America. Reading and critical examination of representative texts and dramatists from the fifties to the present; conducted in Spanish.

21:940:373. LITERATURE AND CULTURE OF POST-FRANCO SPAIN (3)

Reading and discussion of selected novelists, poets, essayists, and dramatists of Spain since Franco's death in 1975, with particular attention to the dramatic sociocultural and political changes and role of the country within the new economic order in Europe; conducted in Spanish.

21:940:375. INDIGENOUS AND "INDIGENISTA" LITERATURE FROM LATIN AMERICA (3)

Study of texts by and about Amerindian peoples of the Caribbean and Central and South America, from pre-Columbian and *indigenista* texts to modern testimonials; conducted in Spanish.

21:940:379. NATIONAL LITERATURES OF SPANISH AMERICA (3)

Study of one national literature, such as Argentinian, Colombian, Cuban, Dominican, or Mexican, treated in the context of the history, geography, and culture of the particular country; conducted in Spanish.

21:940:383. IBERO-AMERICAN THOUGHT IN ENGLISH TRANSLATION (3)

Prerequisite: 21&62:350:102. Not open to Spanish majors or minors.

Development and reception of philosophical trends and ideas in Spain and Latin America extending from the sixteenth to the twentieth centuries, especially in the context of the essay as genre; conducted in English with English texts.

21:940:384. IBERO-AMERICAN THOUGHT (3)

Prerequisite: Reading knowledge of Spanish. Open to majors.

Development and reception of philosophical trends and ideas in Spain and Latin America extending from the sixteenth to the twentieth centuries, especially in the context of the essay as genre; conducted in Spanish with Spanish texts.

21:940:415. MEDIEVAL SPANISH LITERATURE (3)

The development of Spanish literature from its origins to 1500; reading of *Poema del Cid*, popular ballads, lyric poetry, exemplums, and *La Celestina*; conducted in Spanish.

21:940:417,418. SEMINAR IN SPANISH AND LATIN AMERICAN LITERATURES (3,3)

Explores significant themes and concepts as reflected in diverse genres of Spanish and Latin American literatures. Content varies according to the individual professor's specialization and the students' interests; conducted in Spanish.

21:940:421. SPANISH THEATER OF THE GOLDEN AGE (3)

Significance of the Golden Age in relation to the life and thought of the period; reading of works by Lope de Vega, Tirso de Molina, Calderón de la Barca, Juan Ruiz de Alarcón, and others; conducted in Spanish.

21:940:422. SPANISH POETRY AND PROSE OF THE GOLDEN AGE (3)

Readings and critical analysis of works by Santa Teresa de Jesús, Mateo Alemán, Quevedo, Fray Luis de León, San Juan de la Cruz, Gongora, and others; conducted in Spanish.

21:940:429. CERVANTES: DON QUIJOTE DE LA MANCHA (3)

In-depth study of *Don Quijote de la Mancha*: its style, structure, main themes, and overall importance in Spanish literature; conducted in Spanish.

21:940:432. SPANISH-AMERICAN LITERATURE OF THE POST-BOOM (3)

Examination of intellectual and aesthetic currents in the narratives, poetry, and essays of the post-boom period (from 1975 to the present). To be studied in the context of ideas about postmodernism, postindustrialism, and postcolonialism; conducted in Spanish.

21:940:441. NINETEENTH-CENTURY SPANISH LITERATURE: ROMANTICISM AND COSTUMBRISMO (3)

Literary movements of the nineteenth century in Spain with special attention to romanticism and *costumbrismo*; representative essays, plays, and poems; conducted in Spanish.

21:940:442. NINETEENTH-CENTURY SPANISH LITERATURE: REALISM AND NATURALISM (3)

Literary movements of the second half of the nineteenth century in Spain, with special attention to realism and naturalism; representative novels and poetry; conducted in Spanish.

21:940:451. TWENTIETH-CENTURY SPANISH LITERATURE: THE GENERATION OF '98 (3)

Critical study of the poetry and prose of the writers of the generation of 1898; representative works by Unamuno, Azorin, Valle-Inclan, Benavente, Baroja, and others; conducted in Spanish.

21:940:452. TWENTIETH-CENTURY SPANISH LITERATURE: CONTEMPORARY SPANISH POETRY AND PROSE (3)

Prominent literary movements in Spain from *postmodernismo* to the present; representative works by Garcia Lorca, Guillén, Miguel Hernández, Cela, Laforet, Buero Vallejo, and others; conducted in Spanish.

21:940:453. HISPANIC WOMEN WRITERS (3)

Prose, fiction, and poetry of distinguished women writers of Spain and Latin America, primarily of the twentieth century. Reading and discussion of literary texts and viewing of video tapes.

21:940:454. CONTEMPORARY LATIN AMERICAN NOVEL (3)

The development of the Latin American novel after 1940; representative works by Asturias, Carpentier, Fuentes, Garcia Marquez, and others; conducted in Spanish.

21:940:460. EARLY SPANISH-AMERICAN LITERATURE (3)

Development of Spanish-American literature from its colonial origins to the Independence movement; significant works, including chronicles, poetry, prose with novelistic elements, and essays; conducted in Spanish.

21:940:461. NINETEENTH-CENTURY SPANISH-AMERICAN LITERATURE (3)

Development of Spanish-American literature in the nineteenth century, stressing literary trends, historical background, and sociopolitical problems as reflected in the works of representative authors; conducted in Spanish.

21:940:462. SPANISH-AMERICAN LITERATURE: TWENTIETH-CENTURY POETRY AND PROSE (3)

Development of Spanish-American literature in the twentieth century, stressing literary trends, historical background, and contemporary problems as reflected in the works of representative authors; conducted in Spanish.

21:940:498. THEORETICAL APPROACHES TO HISPANIC LITERATURE AND CULTURE (3)

Study of theories of literature and civilization. At the discretion of the instructor, approaches may include psychoanalytic, sociological, phenomenological, poststructuralist, civilizational, and others. Studied in a comparative examination of applications both within and outside the Hispanic world; conducted in Spanish.

21:940:499. SENIOR RESEARCH PROJECT IN SPANISH/SPANISH-AMERICAN LITERATURE OR CIVILIZATION (3)

Open only to Spanish and Hispanic civilization majors

SPEECH 950 (See Theater Arts, Television and Media Arts)**TELEVISION (See Theater Arts, Television and Media Arts)****THEATER ARTS, TELEVISION AND MEDIA ARTS (Theater Arts 965, Speech 950)*****Department of Visual and Performing Arts***

Bradley Hall (973/353-5119, ext. 10)

The major and minor in theater arts/television and media arts is offered at NCAS.

Major Requirements

The major in theater arts/television and media arts affords an opportunity to concentrate in one of two directions: theater or television. Theater provides fundamental experiences in performance, production, and/or arts management necessary for professional goals. Television has similar pre-professional goals that focus on either the news and documentary field or television drama.

1. Theater

All students majoring in theater must complete two sets of course requirements: a core and *one* area of concentration.

Core requirements

- 21&62:965:208 Movement for the Theater (3)
- 21&62:965:211 Living Theater—Introduction to Theater (3)
- 21&62:965:212 From Page to Stage (3)
- 21&62:965:271 Acting Fundamentals (3)
- 21&62:965:311 Theater History I (3)
- 21&62:965:312 Theater History II (3)
- 21&62:965:313 Theater Technology (3)
- 21&62:965:413 Directing I (3)

3 credits from the Department of English offerings, chosen from *one* of the following:

- 21&62:350:319 *or* 320 Shakespeare (3)
- 21&62:350:345 *or* 346 Modern Drama (3)
- 21&62:350:365 World Drama to 1900 (3)

12 credits from department offerings with advising

Concentration requirements (Students choose *one* of the following concentrations and must complete all requirements for the particular concentration they choose):

Performance concentration

- 21&62:965:209 Voice and Speech for the Theater I (3)
- 21&62:965:210 Voice and Speech for the Theater II (3)
- 21&62:965:261 Performance I (3)
- 21&62:965:262 Performance II (3)
- 21&62:965:315 Intermediate Acting (3)
- 21&62:965:411 Special Topics in Theater (3)
- 21&62:965:465 Performance III (3)

Technical theater concentration

- 21&62:965:209 Voice and Speech for the Theater I (3) *or* 21&62:965:210 Voice and Speech for the Theater II (3)
- 21&62:965:259 Production I (3)
- 21&62:965:260 Production II (3)
- 21&62:965:350 Introduction to Scenic Art and Lighting Design (3)
- 21&62:965:409 Stage Management (3)
- 21&62:965:411 Special Topics in Theater (3)
- 21&62:965:467 Production III (3)

Arts management concentration

- 21&62:084:395 Issues in Arts Management I (3)
- 21&62:084:396 Issues in Arts Management II (3)
- 21&62:965:209 Voice and Speech for the Theater I (3) *or* 21&62:965:210 Voice and Speech for the Theater II (3)
- 21&62:965:259 Production I (3)
- 21&62:965:409 Stage Management (3)
- 21&62:965:413 Directing I (3)

6 credits chosen from:

- 21&62:084:408,409,410,411 Topics in Arts Management I,II III,IV (3,3,3,3)

2. Television and Media Arts

All students majoring in television and media arts must complete two sets of course requirements: a core and *one* area of concentration.

21&62:965:212. FROM PAGE TO STAGE (3)

An introduction to understanding the relationship between the literary nature of plays and how they are produced for the stage. Attend select current plays.

21&62:965:253. TELEVISION AND SOCIETY (3)

The political, sociological, psychological, and ethical impact of television; explores examples from the history of the medium and contemporary popular culture and examines the vast social transformation created by television through readings from the social sciences, philosophy, literature, and the arts.

21&62:965:256. THE ART AND HISTORY OF THE FILM (3)

Development of the film as an art form; its origins in stage techniques; the emergence of a film aesthetic through the contributions of various international artists.

21&62:965:259. PRODUCTION I (3)

Recommended: 21&62:965:211, 212, 313. Consult with instructor prior to registration.

A lecture/workshop that combines classes with working in a technical or administrative capacity on a department production.

21&62:965:260. PRODUCTION II (3)

Recommended: 21&62:965:211, 212, 313. Consult with instructor prior to registration. Production I is not a prerequisite.

A lecture/workshop that combines classes with working in a technical or administrative capacity on a department production.

21&62:965:261. PERFORMANCE I (3)

Recommended: 21&62:965:211, 271, 313.

A lecture/workshop that combines classes with a production. A different style or genre of theater is studied each term the course is offered.

21&62:965:262. PERFORMANCE II (3)

Recommended: 21&62:965:211, 212, 271. Performance I is not a prerequisite.

A lecture/workshop that combines classes with a production. A different style or genre of theater is studied each term the course is offered.

21&62:965:263. MODERN FILM (3)

Selected examples of modern filmmaking, with emphasis on the changes and developments following World War II; examples of verisimo, imagination, and the relationship of film to other narrative art forms.

21&62:965:271. ACTING FUNDAMENTALS (3)

Fundamental principles of acting; theory and practice in improvisation emphasizing imagination, movements, rhythm, and group ensemble; basic techniques and exercises.

21&62:965:303. PERFORMANCE FOR TELEVISION (3)

Prerequisites: 21&62:965:209 or 210 and 271.

Building on introductory acting, voice, and speech classes, students learn the basics of acting for the camera; explores the difference between stage and televisual performance, as well as an introduction to television acting and presentation techniques.

21&62:965:304. CONVERGENCE: TELEVISION AND THE NEW MEDIA (3)

Recommended: 21&62:965:253.

Examines early experiments with converging technologies, as well as how digitization, electronic commerce, and new forms of information delivery are changing the nature of television.

21&62:965:309. IMAGERY AND CULTURE (3)

Prerequisites: 21&62:965:253.

Examines multiple approaches to understanding media and culture, including ways in which imagery affects perceptions of race, gender, consumer behavior, politics, and social roles; explores imagery in popular culture, new media, film, and art.

21&62:965:310. INTRODUCTION TO MULTIMEDIA AND INTERNET PRODUCTION (3)

Prerequisites: 21&62:965:304 and either 21&62:965:319 or 333.

Introduction to contemporary multimedia tools, such as web casting and creating CDs, as well as writing and publishing on the Internet.

21&62:965:311, 312. THEATER HISTORY I, II (3,3)

Recommended: 21&62:965:211 or 212.

Study of Euro-American theater history with an emphasis on production rather than dramatic literature. *First term:* ancient Greece and Rome through early post-Renaissance Europe. *Second term:* post-Renaissance Europe to present.

21&62:965:313. THEATER TECHNOLOGY (3)

Prerequisite: 21&62:965:211 or 212.

Materials, equipment, and methods basic to construction of scenery for stage and/or television; properties, lighting, costumes, and makeup; laboratory work in the theater required.

21&62:965:315. INTERMEDIATE ACTING (3)

Prerequisite: 21&62:965:271.

Interpretation of scenes from selected dramas for stage performance; evaluation of practiced techniques in character portrayal through dialogue and action.

21&62:965:319. STUDIO PRODUCTION/MULTI-CAMERA TECHNIQUES (4)

Prerequisite: 21&62:965:204

The television production process; practical technical exercises on cameras, camera control units, switcher, character generator, audio operations, floor plans, and studio lighting.

21&62:965:333. FIELD PRODUCTION/SINGLE CAMERA TECHNIQUES (3)

Prerequisites: 21&62:965:204.

Technical and creative experience in television programming; practical experience in such formats as news, public affairs, documentaries, and commercials.

21&62:965:350. INTRODUCTION TO SCENIC ART AND LIGHTING DESIGN (3)

Prerequisite: 21&62:965:313.

An introduction to the basic components of set and lighting design for the theater. A lab component is required.

21&62:965:351, 352. TOPICS IN AMERICAN FILM (3,3)

Recommended: 21&62:965:256.

Drawing upon the history of American film from the silent era through the studio-dominated 1940s to the present day, the instructor chooses a particular topic to focus upon each term.

21&62:965:353. TRADITIONAL THEATERS OF ASIA (3)

Asian theater forms from India, Japan, China, and Bali. Consideration of the theories underlying the forms as well as a discussion of their influence on the works of several leading contemporary theater artists.

21&62:965:393, 394. INTERNSHIP—TELEVISION (3,3)

Open to theater arts majors in junior or senior year. Prerequisites: Permission of department chairperson and instructor directing the study.

21&62:965:396. INTERNSHIP—THEATER (3)

Open to theater arts majors in junior or senior year. Prerequisites: Permission of department chairperson and instructor directing the study.

21&62:965:402. TELEVISION NEWS AND DOCUMENTARY WRITING(3)

Prerequisites: 21&62:965:202.

Introduction to how broadcast journalists and documentary makers research and write scripts; explores a variety of journalistic formats, standards of publication, as well as related ethical, legal, and social issues.

WOMEN'S STUDIES

21&62:965:409. STAGE MANAGEMENT (3)

Prerequisite: 21&62:965:271 or 313.

The fundamentals of stage management, including an understanding of rehearsal procedures, organizational methods, working with actors and technicians, and running a production from opening night to closing. Includes a lab component.

21&62:965:410. THEORY AND PRACTICE OF VIDEO ART (3)

Open to nonmajors with permission of instructor. Prerequisites: 21&62:080:231 or 261 or 245 or 21&62:965:313 or 319.

Introduction to contemporary theory and practice of video as an art form. Emphasis on the production of individual art works incorporating video technology and critical literature about video.

21&62:965:411. SPECIAL TOPICS IN THEATER (3)

Prerequisite: Permission of instructor.

Each time the course is offered, the instructor chooses a particular topic on which to focus that is not usually covered in general course work. Topics might include experimental theater, performance theory, collective creation, or the work of a particular director.

21&62:965:413,414. DIRECTING I, II (3,3)

Prerequisites: 21&62:965:212, 271, 313. *Enrollment limited by laboratory space.*

Production of short plays or other workshop scenarios; emphasis on the process of synthesizing all theatrical elements toward a structured performance.

21&62:965:415. PROBLEMS IN PERFORMANCE STYLES (3)

Prerequisite: 21&62:965:315.

Continuing examination of patterns of visual and auditory stimuli, as they affect the problems of the performer.

21&62:965:417,418. PROBLEMS IN THEATRICAL DESIGN (3,3)

Prerequisite: 21&62:965:315.

Continuing examination of the temporal-spatial composition through problems and responsibilities in setting, lighting, or costuming.

21&62:965:434. ADVANCED FIELD PRODUCTION (4)

Prerequisite: 21&62:965:333.

Advanced course in the theory and practice of television production; special problems in production, direction, and performance.

21&62:965:440,441. TOPICS IN TELEVISION (3,3)

Open to nonmajors. Prerequisite: 21&62:965:254 or permission of instructor.

Contemporary issues concerning the functions and impact of television in the United States and related public policies, including the latest developments in programming, news, politics, advertising, and relationship of television to the "information superhighway."

21&62:965:445. DRAMA WRITING FOR TELEVISION (3)

Basics of writing drama scripts for television, including how to develop characters, situation, and plot in short, one-act teleplays.

21&62:965:446. DIRECTING TELEVISION DRAMA(4)

Prerequisites: 21&62:965:319; *Recommended:* 21&62:965:445.

Builds on skills learned in introductory production classes; students develop a shooting script and direct an original television drama. Scripts may include those from 21&62:965:445 Drama Writing for Television.

21&62:965:451. AMERICAN THEATER (3)

Theater in the United States from its beginnings to the present day. Areas covered include the beginnings in the colonies, the gradual shift in the early years from touring to the emergence of the theater centers of Philadelphia, Boston, and New York; major movements and figures; and the contribution of regional theaters.

21&62:965:465. PERFORMANCE III (3)

Recommended: 21&62:965:211,212, 271. *Performance I or II are not prerequisites.*

A lecture/workshop that combines class work with a production. A different style or genre of theater is studied each term the course is offered.

21&62:965:467. PRODUCTION III (3)

Recommended: 21&62:965:211,212, 313. *Consult with instructor prior to registration. Production I or II are not prerequisites.*

A lecture/workshop that combines classes with working in a technical or administrative capacity on a department production.

21&62:965:481,482. SEMINAR IN THEATER ART AND HISTORY (3,3)

Research in theater (stage, film, television); may be arranged in consultation with program coordinator.

21&62:965:483,484. INDIVIDUAL STUDY IN THEATER (1-3,1-3)

Prerequisite: Permission of instructor.

Problems in the theory and/or practice of theater; may be arranged in consultation with department chairperson.

21&62:965:487,488. INDIVIDUAL STUDY IN BROADCASTING (1-3,1-3)

Prerequisite: Permission of instructor.

Special problems in the theory and/or practice of broadcasting; may be arranged upon consultation with department chairperson.

Courses (Speech 950)

21&62:950:261. FUNDAMENTALS OF SPEECH (3)

Effective oral communication and effective listening; practice in speech situations; oral organization and logic.

21&62:950:271,272. VOICE AND ARTICULATION (3,3)

The effective use of the voice and speech mechanism; guided ear training; use of the International Phonetic Alphabet.

21&62:950:289,290. PRINCIPLES OF ORAL INTERPRETATION (3,3)

Analysis and oral presentation of types of literature; development of vocal techniques and their use in conveying meaning; analysis of sound values, vocal emphasis, rhythm, poetic diction, prosody, and imagery in relation to oral reading.

WOMEN'S STUDIES 988

Women's Studies Program

Hill Hall (973/353-5817)

Program Director: Frances Bartkowski

The major in women's studies is offered at NCAS. The minor in women's studies is offered at NCAS and UC-N.

Women's history, with its distinctive culture, affects women's present status, education, and career development. New scholarship on the historical and contemporary contributions of women has influenced course offerings in many disciplines within the humanities, the social sciences, and the natural sciences. The interdisciplinary women's studies program provides a framework for the study of gender and the questions of culture, history, politics, and economics. The program also is committed to integrating new scholarship on race, ethnicity, and class together with perspectives on gender.

A variety of courses, including 21&62:988:201,202 Introduction to Women's Studies and 21&62:988:389,390 Topics in Women's Studies, are available to students who wish to direct their future career plans, studies, and research into fields requiring knowledge of the new scholarship on women.

Students also are required to pursue a research project and/or an internship.

The Independent Research in Women's Studies (21&62:988:401) requires a substantial written project, while the Women's Studies Internship (21&62:988:425) involves ongoing organizational work in the campus community or outside agencies.

Students are encouraged to consider a double major that combines women's studies with a traditional discipline such as history or psychology.

Major Requirements

The major consists of 36 credits as follows:

12 credits of required core courses:

- 21&62:988:201 *or* 202 Introduction to Women's Studies (3,3) *or* 21:988:325 Politics of Sexuality (3)
 21:988:301 Feminist History and Theory (3)
 21&62:988:389 *or* 390 Topics in Women's Studies (3,3)
 21&62:988:401 Independent Research in Women's Studies (3) *or* 21&62:988:425 Women's Studies Internship (3)

9 credits in humanities and social sciences from among the following:

- 21&62:350:362 Women in Literature (3)
 21&62:512:337 History of the Family in the United States (3)
 21&62:512:373,374 History of Women in the United States (3,3)
 21&62:790:356 Sex, Law, and Public Policy (3)
 21&62:830:373 Psychology of Women (3)
 21&62:920:306 Marriage and the Family (3)
 21&62:920:337 Sociology of Sex and Roles (3)

15 credits in a *minimum of three departments*, which include a gender-informed perspective, from courses including:

- African-American studies
 anthropology
 art
 classical and modern languages
 economics
 English
 history
 philosophy and religion
 political science
 psychology
 sociology

Minor Requirements

The minor consists of 21 credits as follows:

- 3 credits from below:
 21&62:988:201 *or* 202 Introduction to Women's Studies (3,3) *or* 21:988:325 Politics of Sexuality (3)
 6 credits from below:
 21&62:988:389,390 Topics in Women's Studies (3,3) *and* 21&62:988:401 Individual Research in Women's Studies (3) *or* 21&62:988:425 Women's Studies Internship (3)

In addition, students must choose 12 credits from related courses.

Courses

21&62:988:201,202. INTRODUCTION TO WOMEN'S STUDIES (3,3)
 Addresses the historical influences that have defined women's roles and experiences and have contributed to current reevaluations of women's place in modern society; provides an overview of developments in various fields. 21&62:988:201 emphasizes the humanities. 21&62:988:202 emphasizes the social science perspectives.

21:988:301. FEMINIST HISTORY AND THEORY (3)
 Focuses on understanding culture from a feminist perspective. Explores ways in which gender influences and is influenced by class, ethnicity, race, nationality, language, and religion.

21:988:325. POLITICS OF SEXUALITY (3)
 Examines debates surrounding sex and sexuality in recent decades, while offering an historical perspective regarding other times and places. Addresses such realms as the family, state, church, school, and the law.

21&62:988:389,390. TOPICS IN WOMEN'S STUDIES (3,3)

21&62:988:401. INDIVIDUAL RESEARCH IN WOMEN'S STUDIES (3)
Recommended for the minor in women's studies.
 Permits students to pursue further research in some aspect of women's studies with a faculty member. Requires a substantial research project.

21:988:425. WOMEN'S STUDIES INTERNSHIP (3)
Recommended for the major or minor in women's studies
 Permits students to take academic work into an activist arena on the campus and/or in the wider community.

Related Courses

21&62:014:305. BLACK WOMEN IN THE UNITED STATES (3)
See Afro-American and African Studies 014.

21&62:070:340. COMPARATIVE ROLES OF WOMEN (3)
See Anthropology 070.

21&62:082:207. ART AND WOMEN (3)
See Art History 082.

21&62:220:312. WOMEN IN THE AMERICAN ECONOMY (3)
See Economics 220.

21&62:350:360. TOPICS IN WOMEN IN LITERATURE (3)
See English 350.

21&62:350:361,362. WOMEN IN LITERATURE (3,3)
See English 350.

21&62:420:311,312. FRENCH LITERATURE IN ENGLISH TRANSLATION: SEXUAL POLITICS IN THE NOVEL (3,3)*
See French 420.

21&62:512:337. HISTORY OF THE FAMILY IN THE UNITED STATES (3)
See American History 512.

21&62:512:373,374. HISTORY OF WOMEN IN THE UNITED STATES (3,3)
See American History 512.

21&62:730:327. PHILOSOPHICAL ISSUES OF FEMINISM (3)
See Philosophy 730.

21&62:790:356. SEX, LAW, AND PUBLIC POLICY (3)
See Political Science 790.

21&62:830:323. DEVELOPMENTAL PSYCHOLOGY (3)*
See Psychology 830.

21&62:830:373. PSYCHOLOGY OF WOMEN (3)
See Psychology 830.

21&62:920:306. MARRIAGE AND THE FAMILY (3)
See Sociology 920.

21&62:920:337. SOCIOLOGY OF SEX AND ROLES (3)
See Sociology 920.

62:940:242. SPANISH LITERATURE IN TRANSLATION (3)
See Spanish 940.

* Students wishing to enroll in this course should consult with the program director.

Administration and Faculty

Faculty of Arts and Sciences–Newark

Steven J. Diner, *Ph.D.*, *Dean of the Faculty*
Edward G. Kirby III, *Ph.D.*, *Associate Dean for Academic Affairs and Dean of Instruction*
Gerald Warshaver, *Ph.D.*, *Associate Dean for Administration*
Sallie A. Kasper, *Assistant Dean for Faculty Affairs*
Bernistine N. Little, *B.S.*, *Assistant Dean for Financial Management*

Newark College of Arts and Sciences and University College–Newark

Hill Hall (973/353-5800)

Steven J. Diner, *Ph.D.*, *Dean*
Barbara Gossett, *Ph.D.*, *Dean of Student Affairs; NCAS and UC–N*
Richard Da Silva, *M.I.M.*, *Associate Dean of Student Affairs*
Lydia Rodriguez, *M.S.W.*, *Associate Dean of Student Affairs*
Phillip Jones, *B.A.*, *Assistant Dean of Student Affairs*
Michael Feder, *M.A.*, *Student Counselor*
Barbara Moore, *B.S.*, *Student Counselor*
Elizabeth Taylor, *B.S.*, *Student Counselor*
Joseph H. Gardener III, *M.B.A.*, *Coordinator of Student Affairs*
Thomas J. Hopkins, *M.A.*, *Director, Career Development Center*
David Bills, *M.Ed.*, *Career Counselor*
Eli Rodriguez, *B.S.*, *Career Counselor/Internship Coordinator*

Academic Foundations Center

Conklin Hall (973/353-5604)

Concepcion Wibrowski, *M.A.*, *Ph.D.*, *Acting Associate Dean; Acting Director of Academic Foundations Center/EOF*
Diane Hill, *M.A.*, *Assistant Director, AFC/EOF; Co-director of Center for Pre-College Education and Community Outreach*
Jeffrey Kidder, *M.A.*, *Ph.D.*, *Director of Science Outreach; Co-director of Center for Pre-College Education and Community Outreach*
Gloria Perez, *M.S.W.*, *Assistant Director, AFC/EOF; Counselor*
Rose Bailey-Byers, *M.A.*, *Admissions Administrator; Counselor*
Miriam Cruz, *M.S.W.*, *Counselor; Hispanic Images Project Coordinator*
Carl Milton, *M.A.*, *M.S.E.*, *Counselor*
Brian Taylor, *B.A.*, *Counselor*
Cassandra Davis, *M.A.*, *Upward Bound Program Administrator*
Donna Tollinchi, *B.A.*, *Upward Bound Counselor*
Vernon Pullins, Jr., *J.D.*, *Site Director, Pre-College Consortium program*
Jeanne Giaimis, *M.A.*, *A.B.D.*, *Coordinator, Saturday Academy SAT Prep and Research; Lucent Project Grad Director*
Israel Rodriguez, *B.A.*, *Student Affairs and Enrollment Administrator*
Suja Patel, *M.S.W.*, *Budget and Program Administrator*

Department of Afro-American and African Studies

Conklin Hall (973/353-5528)

Chairperson: Clement Alexander Price

Professor:

Clement Alexander Price, *B.A.*, *M.A.*, *Bridgeport; Ph.D.*, *Rutgers*

Associate Professors:

Belinda Edmondson, *B.A.*, *Southern Illinois; M.A.*, *Ph.D.*, *Northwestern*
Wendell P. Holbrook, *B.A.*, *Morgan State; Ph.D.*, *Princeton*

Assistant Professor:

Jesse A. Rhines, *B.A.*, *Antioch; M.A.*, *UCLA; M.A.*, *Yale; Ph.D.*, *California (Berkeley)*

Department of Biological Sciences (Federated with New Jersey Institute of Technology)

Room 135, Smith Hall (973/353-5347)

Chairperson: G. Miller Jonakait

Associate Chairperson of Undergraduate Studies: Douglas W. Morrison

Professors:

Ann Cali, *B.S.*, *Florida; M.S.*, *Ph.D.*, *Ohio State*
Harvey H. Feder, *B.S.*, *CUNY (City College); Ph.D.*, *Oregon Medical School*
Gerald D. Frenkel, *B.A.*, *Columbia; Ph.D.*, *Harvard*
Doina Ganea, *B.S.*, *Bucharest; Ph.D.*, *Illinois*
Ronald P. Hart, *B.S.*, *Connecticut; Ph.D.*, *Michigan*
G. Miller Jonakait, *A.B.*, *Wellesley College; M.A.*, *Chicago; Ph.D.*, *Cornell Medical School*
David Kafkewitz, *B.S.*, *CUNY (Brooklyn College); M.S.*, *Ph.D.*, *Cornell*
Edward G. Kirby III, *B.S.*, *Michigan; M.S.*, *Ph.D.*, *Florida*
Judith S. Weis, *M.S.*, *Ph.D.*, *New York*
Daniel C. Wilhoft, *B.A.*, *Rutgers; M.A.*, *Ph.D.*, *California (Berkeley)*

Associate Professors:

Edward M. Bonder, *B.A.*, *Ph.D.*, *Pennsylvania*
John H. Crow, *B.A.*, *Whittier College; Ph.D.*, *Washington State*
Lion F. Gardiner, *B.S.*, *Wheaton College; M.S.*, *Michigan; Ph.D.*, *Rhode Island*
Andrew E. Kasper, *B.A.*, *Duquesne; M.S.*, *Ph.D.*, *Connecticut*
John M. Maiello, *B.A.*, *CUNY (Hunter College); Ph.D.*, *Rutgers*
Douglas W. Morrison, *A.B.*, *Rochester; Ph.D.*, *Cornell*
Michael Recce, *Ph.D.*, *University College (London)*

Assistant Professors:

Ditmar Hahn, *Ph.D.*, *Wageningen Agricultural (Netherlands)*
Erik P. Hamerlynck, *B.S.*, *M.S.*, *Wyoming; Ph.D.*, *Kansas*
Eric B. Knox, *B.S.*, *Illinois; M.S.*, *Wisconsin; Ph.D.*, *Michigan*
Farzan Nadim, *B.S.*, *Northeastern; M.A.*, *Ph.D.*, *Boston*

Department of Chemistry

Olson Hall (973/353-5329)

Chairperson: W. Phillip Huskey

Professors:

Stan S. Hall, *B.S.*, *Wisconsin; Ph.D.*, *Massachusetts Institute of Technology*
Frank Jordan, *B.S.*, *Drexel; Ph.D.*, *Pennsylvania*
Rudolph W. Kluibler, *B.S.*, *Illinois; M.A.*, *Columbia; Ph.D.*, *Wisconsin*
Roger A. Lalancette, *B.A.*, *American International College; Ph.D.*, *Fordham*
Richard Mendelsohn, *B.S.*, *McGill; Ph.D.*, *Massachusetts Institute of Technology*
James M. Schlegel, *B.S.*, *Pacific; Ph.D.*, *Iowa State*
Hugh W. Thompson, *B.A.*, *Cornell; Ph.D.*, *Massachusetts Institute of Technology*

Associate Professors:

W. Phillip Huskey, *B.S.*, *Texas A&M; Ph.D.*, *Kansas*
Piotr Piotrowiak, *M.S.*, *Wroclaw (Poland); Ph.D.*, *Chicago*
Susanne Raynor, *B.S.*, *Duke; Ph.D.*, *Georgetown*
John B. Sheridan, *B.S.*, *Ph.D.*, *Bristol (England)*

Assistant Professors:

Ramy S. Farid, *B.S.*, *Rochester; Ph.D.*, *California Institute of Technology*
Elena Galoppini, *M.S.*, *Pisa (Italy); Ph.D.*, *Chicago*
Frieder Jäkle, *M.S.*, *Ph.D.*, *Technical University, Munich*

Department of Classical and Modern Languages and Literatures

Conklin Hall (973/353-5498)

Chairperson: Josephine Grieder

Professors:

Josephine B. Grieder, *French; B.A.*, *Nevada; M.A.*, *California; Ph.D.*, *New York*
Gloria S. Merker, *Classics; B.A.*, *Queen's College; M.A.*, *Missouri; Ph.D.*, *Bryn Mawr*
Leonard J. Wang, *French; B.A.*, *CUNY (City College); M.A.*, *Ph.D.*, *Columbia*
Otto Zitzelsberger, *German; B.A.*, *CUNY (City College); M.A.*, *Ph.D.*, *Columbia*

Associate Professors:

Marie M. Collins, *French; B.A.*, *Trinity; M.A.*, *Middlebury College; Ph.D.*, *New York*
Nancy G. Diaz, *Spanish; B.A.*, *Illinois; M.A.*, *CUNY; Ph.D.*, *Rutgers*
Elpidio Laguna-Diaz, *Spanish; B.A.*, *Puerto Rico; M.A.*, *St. John's; Ph.D.*, *CUNY*
Irwin L. Merker, *Classics; B.A.*, *New York; M.A.*, *Ph.D.*, *Princeton*
Asela Rodriguez de Laguna, *Spanish; B.A.*, *Puerto Rico; M.A.*, *Ph.D.*, *Illinois*

Robert R. Stieglitz, *Hebraic Studies*; B.A., CUNY (City College); M.A., Ph.D., Brandeis
 Myroslava T. Znayenko, *Slavic*; B.A., California; M.A., Yale; Ph.D., Columbia
 Assistant Professor:
 Kimberly DaCosta Holton, *Portuguese*; B.A., M.A., Ph.D., Northwestern

Criminal Justice Program

Center for Law and Justice (973/353-1300)

Professors:

Freda Adler, B.A., M.A., Ph.D., Pennsylvania
 Ronald V. Clarke, B.A., Bristol; M.A., Ph.D., London
 Marcus Felson, B.A., Chicago; M.A., Ph.D., Michigan
 James O. Finckenauer, B.A., Gettysburg; M.A., Ph.D., New York
 Clayton A. Hartjen, B.A., M.A., San Francisco State; Ph.D., New York
 George L. Kelling, B.A., St. Olaf; M.S., Wisconsin (Milwaukee); Ph.D., Wisconsin (Madison)
 Leslie W. Kennedy, B.A., McGill; M.A., Western Ontario; Ph.D., Toronto
 Michael G. Maxfield, B.A., Ohio State; M.A., Ph.D., Northwestern
 Gerhard O.W. Mueller, B.A., Castle of Ploen College; J.D., Chicago; L.L.M., Columbia; L.L.D. (hon.) Uppsala (Sweden)

Associate Professors:

Ko-lin Chin, B.A., National Taiwan; M.B.A., M.A., Houston; Ph.D., Pennsylvania
 Candace McCoy, B.A., Hiram College; J.D., Cincinnati; M.A., Ph.D., California (Berkeley)
 Mercer L. Sullivan, B.A., Yale; Ph.D., Columbia

Assistant Professor:

Travis Pratt, B.A., M.A., Washington State; Ph.D., Cincinnati
 Bonita M. Veyssey, B.A., M.S., Ph.D., SUNY (Albany)

Department of Economics

Hill Hall (973/353-5259)

Chairperson: Peter D. Loeb

Professors:

Douglas C. Coate, B.A., Oregon; Ph.D., CUNY
 John Graham, B.A., Brown; Ph.D., Northwestern
 Peter D. Loeb, B.A., M.A., Ph.D., Rutgers
 Leo Troy, B.A., Pennsylvania State; M.A., Ph.D., Columbia
 James H. VanderHoff, B.S., Michigan State; Ph.D., North Carolina

Associate Professors:

Alvaro Rodriguez, B.A., Universidad de los Andes; Ph.D., Columbia
 Carlos Seiglie, B.A., Rutgers; Ph.D., Chicago

Assistant Professors:

David Goldbaum, B.A., Oberlin; M.S., Ph.D., Wisconsin
 Sara Markowitz, B.A., Rutgers; M.A., Hunter; Ph.D., CUNY
 Yanni Tournas, B.A., Athens; M.A., Illinois; Ph.D., Northwestern

Department of Education and Academic Foundations

Conklin Hall (973/353-5245, 973/353-5434)

Chairperson: Alan R. Sadovnik

Professors:

Jean Anyon, B.A., M.S., Pennsylvania; Ph.D., New York
 Alan R. Sadovnik, B.A., Queen's College; M.A., Ph.D., New York

Associate Professor:

Arthur B. Powell, B.A., Hampshire College; M.S., Michigan

Assistant Professor:

Roberta Schorr, B.S., Brooklyn College; Ed.M., Ed.D., Rutgers

Director of Field and Laboratory Services

Jane Califf, B.S., Hofstra; M.S., Richmond College

Department of English

Hill Hall (973/353-5279)

Chairperson: Gabriel Miller

Professors:

Marianna DaVinci-Nichols, B.A., Hunter College; Ph.D., New York
 John G. Demaray, B.A., Seton Hall; M.A., Ph.D., Columbia

Barbara Foley, B.A., Harvard; M.A., Ph.D., Chicago
 H. Bruce Franklin, B.A., Amherst College; Ph.D., Stanford
 Rachel Hadas, B.A., Radcliffe College; M.A., Johns Hopkins; Ph.D., Princeton
 Carol F. Heffernan, B.A., Barnard College; M.A., Wisconsin; Ph.D., New York
 Michael C. Jaye, B.A., CUNY (City College); M.A., Ph.D., New York
 Gabriel Miller, B.A., Queen's College; Ph.D., Brown
 Virginia M. Tiger, B.A., Trinity; M.A., Ph.D., British Columbia
 Allan L. Wolper, B.A., New York

Associate Professors:

Frances Bartkowski, B.A., Montclair State College; M.A., Ph.D., Iowa
 Louie Crew, B.A., Baylor; M.A., Auburn; Ph.D., Alabama
 George B. Davis, B.A., Colgate; M.F.A., Columbia
 Belinda Edmondson, B.A., Southern Illinois; M.A., Ph.D., Northwestern
 Heyward B. Ehrlich, M.A., Chicago; Ph.D., New York
 Stuart Hirschberg, A.B., Columbia; M.A., Wagner College; Ph.D., New York
 David A. Hoddeson, B.A., Bard College; M.A., New York; Ph.D., SUNY
 Malcolm Kiniry, B.A., Tufts; M.A., Ph.D., Rutgers
 Janet Louise Larson, A.B., Valparaiso; M.A., Ph.D., Northwestern
 Charles Russell, B.A., Wesleyan; Ph.D., Cornell
 Ann Watts, B.A., Radcliffe College; M.A., Ph.D., Yale

Assistant Professors:

David Baker, B.A., Bennington College; M.A., Ph.D., Columbia
 Sterling Bland, B.A., M.A., Rutgers; Ph.D., New York
 Jack Lynch, B.A., Ph.D., Pennsylvania
 S. Shankar, B.A., M.A., Madras (India); Ph.D., Texas

Department of Geological Sciences

Boyd Hall (973/353-5100)

Chairperson: Andreas H. Vassiliou

Professors:

Alexander E. Gates, B.S., SUNY (Stony Brook); M.S., Ph.D., Virginia Polytechnic Institute
 Warren Manspeizer, B.S., CUNY (City College); M.S., West Virginia; Ph.D., Rutgers
 John H. Puffer, B.S., M.S., Michigan State; Ph.D., Stanford
 Andreas H. Vassiliou, B.S., M.A., Ph.D., Columbia

Assistant Professor:

Victoria C. Hover, B.A., Michigan; M.S., SUNY (Stony Brook); Ph.D., Michigan

Department of History (Federated with New Jersey Institute of Technology)

Conklin Hall (973/353-5410)

Chairperson: James Goodman

Professors:

Norma Basch, B.A., Barnard; M.A., Ph.D., New York
 Steven J. Diner, B.A., SUNY (Binghamton); Ph.D., Chicago
 Peter B. Golden, B.A., Queen's College; Ph.D., Columbia
 David Hosford, B.A., Bates; Ph.D., Wisconsin
 Taras Hunczak, B.S., M.A., Fordham; Ph.D., Vienna
 Warren F. Kimball, B.A., Villanova; M.A., Ph.D., Georgetown
 Jan E. Lewis, B.A., Bryn Mawr; A.M., A.M., Ph.D., Michigan
 Jonathan Lurie, A.B., M.A.T., Harvard; Ph.D., Wisconsin
 John O'Connor, B.A., St. John's; M.A., Ph.D., CUNY
 Clement Alexander Price, B.A., M.A., Bridgeport; Ph.D., Rutgers
 Said S. Samatar, B.A., Goshen College; M.A., Ph.D., Northwestern
 Richard Sher, B.A., George Washington; M.A., Ph.D., Chicago
 Odoric Y. Wou, B.A., M.A., Hong Kong; Ph.D., Columbia

Associate Professors:

Lauren Benton, A.B., Harvard; M.A., Ph.D., Johns Hopkins
 James Goodman, B.A., Hobart College; M.A., New York; M.A., Ph.D., Princeton
 Irwin L. Merker, B.A., New York; M.A., Ph.D., Princeton
 Frederick H. Russell, B.A., Swarthmore College; M.A., Chicago; M.A., Ph.D., Johns Hopkins
 Beryl Satter, B.A., Barnard; M.T.S., Harvard; M.A., Ph.D., Yale
 Gabor P. Vermes, B.S., Budapest (Hungary); M.A., Ph.D., Stanford
 Olga J. Wagenheim, B.A., Inter-American (Puerto Rico); M.A., SUNY (Buffalo); Ph.D., Rutgers

Assistant Professors:

Jon Cowans, B.S., Georgetown; M.A., Ph.D., Stanford
 Lisa Herschbach, B.A., M.A., Stanford; Ph.D., Harvard
 Doris Sher, B.A., CUNY (City College); M.A., Columbia

Department of Mathematics and Computer Science

Smith Hall (973/353-5156 ext. 10)

Chairperson: Mark Feighn

Undergraduate Program Director: Edward S. Boylan

Professors:

Mark Feighn, *Sci.B., Brown; M.A., Ph.D., Columbia*

Jane Gilman, *B.S., Chicago; Ph.D., Columbia*

Lee Mosher, *B.S., Michigan State; Ph.D., Princeton*

Ulrich Oertel, *B.Sci., Edinburgh; M.A., Ph.D., UCLA*

Diana Shelstad, *B.A., Tasmania; M.Sci., Monash; Ph.D., Yale*

Associate Professors:

Edward S. Boylan, *A.B., Columbia; M.S., Stevens Institute of Technology; M.A., Ph.D., Princeton*

William F. Keigher, *B.A., Montclair State College; A.M., Ph.D., Illinois*

C. David Keys, *B.S., Louisiana State; M.S., Ph.D., Chicago*

John Randall, *B.A., Sidney Sussex College (Cambridge); M.Sc., Ph.D., Warwick (Great Britain)*

Robert Sczech, *Diploma, Dr. Nat., Bonn*

Jacob Sturm, *B.S., Columbia; Ph.D., Princeton*

Assistant Professors:

Paul E. Gunnells, *B.S., Stanford; Ph.D., Massachusetts Institute of Technology*

Li Guo, *B.S., Lanzhou (China); M.S., Wuhan (China); Ph.D., Washington*

Zhengyu Mao, *B.S., Shanghai Jiaotong; Ph.D., Columbia*

Department of Philosophy

Conklin Hall (973/353-5029)

Chairperson: Pheroze S. Wadia

Professors:

Edwin M. Hartman, *B.A., Haverford College; B.A., M.A., Oxford*

(Balliol College); *M.B.A., Pennsylvania (Wharton School); Ph.D., Princeton*

Pheroze S. Wadia, *B.A., St. Xavier's College (Bombay, India); M.A., Ph.D.,*

New York

Associate Professors:

Nancy Holmstrom, *B.A., CUNY (City College); Ph.D., Michigan*

Michael D. Rohr, *B.A., Harvard; Ph.D., Stanford*

Department of Physics

Smith Hall (973/353-5250)

Chairperson: Earl D. Shaw

Professors:

Daniel E. Murnick, *B.A., Hofstra; Ph.D., Massachusetts Institute of Technology*

Earl D. Shaw, *B.S., Illinois; M.A., Dartmouth; Ph.D., California (Berkeley)*

Grace Marmor Spruch, *B.A., CUNY (Brooklyn College); M.S., Pennsylvania;*

Ph.D., New York

Associate Professor:

Zhen Wu, *M.A., M.Phil., Ph.D., Columbia*

Department of Political Science

Hill Hall (973/353-5105)

Chairperson: Yale H. Ferguson

Professors:

Melvin J. Dubnick, *B.A., Southern Colorado; M.A., Ph.D., Colorado*

Yale H. Ferguson, *B.A., Trinity; Ph.D., Columbia*

Frank Fischer, *B.A., Indiana; Ph.D., New York*

Dennis E. Gale, *B.A., Bucknell; M.Sc., Boston; M.Ed., Harvard;*

M.C.P., Pennsylvania; Ph.D., George Washington

Richard T.B. Langhorne, *B.A., M.A., Cambridge (St. John's)*

Mary C. Segers, *B.A., College of Mount St. Vincent; Ph.D., Columbia*

Associate Professor:

Elizabeth A. Hull, *B.A., Whitman College; M.A., Ph.D., New School for Social Research*

Assistant Professors:

Reynold Koslowski, *B.Sc., Northwestern; M.A., Minnesota; Ph.D., Colorado*

Mara Sidney, *B.Sc., Northwestern; M.A., Minnesota; Ph.D., Colorado*

Elizabeth Strom, *B.A., Swarthmore College; M.A., Ph.D., CUNY*

Virginia Walsh, *B.S., Georgetown; Ph.D., Southern California*

Department of Psychology

Smith Hall (973/353-5436)

Chairperson: Stephen José Hanson

Undergraduate Coordinator: Harold I. Siegel

Professors:

Colin Beer, *B.S., Otago (New Zealand); Ph.D., Oxford*

John A. Ceraso, *B.A., CUNY (Brooklyn College); M.A., Ph.D., New School for Social Research*

Mei-Fang Cheng, *B.S., National Taiwan; Ph.D., Bryn Mawr*

Alan L. Gilchrist, *B.A., Portland State; M.A., Ph.D., Rutgers*

Barry R. Komisaruk, *B.S., CUNY (City College); Ph.D., Rutgers*

Kenneth Kressel, *B.A., CUNY (Queens College); Ph.D., Columbia*

Lillian Robbins, *B.A., CUNY (City College); M.A., Illinois; Ph.D., New York*

Jay S. Rosenblatt, *B.A., M.A., Ph.D., New York*

Associate Professors:

Stephen José Hanson, *B.S., Ph.D., Arizona State*

Maggie Shiffrar, *B.A., California (Santa Cruz); Ph.D., Stanford*

Harold I. Siegel, *B.A., Ph.D., Rutgers*

Assistant Professors:

Ben Martin Bly, *B.A., Princeton; Ph.D., Stanford*

Kent D. Harber, *B.A., Pitzer; Ph.D., Stanford*

Zili Liu, *B.S., Beijing; M.S., Ph.D., Brown*

Gretchen A. Van de Walle, *B.A., Swarthmore College; Ph.D., Cornell*

Puerto Rican Studies Program

Conklin Hall (973/353-1052)

Program Director: Olga Jimenez Wagenheim

Affiliated Faculty:

Elpidio Laguna-Diaz, *B.A., Puerto Rico (Río Piedras); M.A., St. John's; Ph.D., CUNY*

Asela Rodriguez de Laguna, *B.A., Puerto Rico (Mayaguez); M.A., Ph.D., Illinois (Urbana-Champaign)*

Olga Jimenez Wagenheim, *B.A., Inter-American University of Puerto Rico; M.A., SUNY (Buffalo); Ph.D., Rutgers*

Department of Social Work

Hill Hall (973/353-5145)

Chairperson: Phylis J. Peterman

Associate Professor:

Paul G. Shane, *B.A., Cornell; M.S.S.W., Columbia; M.P.H., Sci.D., Johns Hopkins*

Assistant Professors:

Sunday L. Di Palma, *B.A., M.S.W., Ph.D., Rutgers*

Phylis J. Peterman, *B.A., Howard; M.S.W., Rutgers; D.S.W., Columbia*

Director of Field Instruction:

Carol J. Dobos, *B.A., M.S.W., Rutgers*

Department of Sociology and Anthropology

Hill Hall (973/353-5255)

Chairperson: Clayton A. Hartjen

Professors:

R. Brian Ferguson, *M.A., M.Phil., Ph.D., Columbia*

Clayton A. Hartjen, *B.A., M.A., San Francisco State; Ph.D., New York*

Associate Professors:

Anne-Marie Cantwell, *B.A., Columbia; M.A., Ph.D., New York*

Ira J. Cohen, *B.A., Union College; M.S., Pennsylvania State; Ph.D., Wisconsin*

Janet Siskind, *B.A., Sarah Lawrence; Ph.D., Columbia*

Assistant Professors:

Max Arthur Herman, *B.A., Tufts; M.A., Yale; Ph.D., Arizona*

Alexander Hinton, *B.A., Wesleyan; M.A., Ph.D., Emory*

Kurt Schock, *B.A., Cincinnati; M.A., Ph.D., Ohio State*

Arch 531D. HISTORY OF AMERICAN ARCHITECTURE (3-0-3)

Prerequisite: Arch 382.

An investigation of the guiding ideals and dominant stylistic trends in American architecture and planning from colonial times to the mid-twentieth century. Critical shifts in conception and scope of architectural production considered in relation to the prevailing cultural, socioeconomic, and technical contexts out of which they evolved.

Arch 531E. HISTORY OF NON-WESTERN ARCHITECTURE (3-0-3)

Prerequisite: Arch 382.

An examination of major architectural traditions of China, Japan, Southeastern Asia, India, and the Middle East. Each area is considered with reference to a conceptual, iconographic, and stylistic paradigm that evolved from a particular historical context.

Computer and Information Science (NJIT)

Offered by the Department of Computer and Information Science.

CIS 105. COMPUTER PROGRAMMING (1-1-1)

Prerequisite: 100-level GUR course in CIS. May be repeated for credit when a different language is used. Students may repeat CIS 105 with different, department-approved languages and may combine three 1-credit courses (including CIS 305) to be used as a technical elective in a CIS degree program. For students taking a minor in CIS or changing to a CIS major, a combination of an approved CIS 105 and a 100-level GUR course in CIS may be substituted for CIS 113.

Details of programming in one particular computer language. Problems are coded and run on a computer. Languages include ADA, APL, C, C++, FORTRAN, LISP, Pascal, PROLOG, Smalltalk, Java, COBOL, or others.

CIS 113. INTRODUCTION TO COMPUTER SCIENCE I (3-1-3)

Corequisite: CIS 098 or satisfactory performance on placement examination. Open only to science and liberal arts majors. Degree credit not given for both this course and CIS 213.

Fundamentals of computer science introduced, with emphasis on programming methodology and problem solving. Topics include basic concepts of computer systems, software engineering, algorithm design, programming languages and data abstraction, with applications. A high-level language is fully discussed and serves as the vehicle to illustrate many of the concepts. C++ is used.

CIS 114. INTRODUCTION TO COMPUTER SCIENCE II (3-1-3)

Prerequisites: CIS 113 or completion of a required 100-level GUR course in CIS, plus an approved CIS 105. Degree credit not given for both this course and either CIS 335 or CIS 505.

Study of advanced programming topics with logical structures of data, their physical representation, design and analysis of computer algorithms operating on the structures, and techniques for program development and debugging. Covers program specifications, correctness and efficiency, data abstraction, basic aspects of simple data structures, internal searching and sorting, recursion, and string processing. Algorithmic analysis is also discussed.

CIS 150. WEB AUTHORING AND DEVELOPMENT (2-2-3)

Designed for high school students; technologies and techniques of the Internet web. Basic issues of design and HTML coding, including incorporating graphics, frames, and tables into pages. Concepts of TCP/IP, HTTP protocols, web architectures, and MIME types. MS FrontPage and Net Object Fusion.

CIS 151. ADVANCED WEB DEVELOPMENT AND SITE MANAGEMENT (2-2-3)

Prerequisites: Knowledge of Windows, experience with any programming

CIS 213. INTRODUCTION TO COMPUTER SCIENCE (3-0-3)

Prerequisite: 100-level GUR course in CIS. Designed for students not majoring in computer science. Students receiving degree credit for CIS 213 cannot receive degree credit for CIS 113.

A study of the representation of data, its structures, and its algorithms. Programming topics in high-level languages (e.g., C, C++) are included.

CIS 231. MACHINE AND ASSEMBLY LANGUAGE PROGRAMMING (3-1-3)

Prerequisites: CIS 113 or CIS 213 or completion of a required 100-level GUR course in CIS, plus an approved CIS 105. Degree credit not given for both this course and CIS 510.

Fundamentals of machine organization and machine language programming. Representation of computer instructions and data in machine, assembly, and macro-assembly languages together with intensive practice in formulating programming, running, and debugging programs for both numerical and logical problems. Assemblers and loaders are discussed.

CIS 251. COMPUTER ORGANIZATION (3-0-3)

Prerequisite: CIS 113.

Introduction to computer system structure and organization. Topics include representation of information, circuit analysis and design, register-transfer level, processor architecture, and input/output.

CIS 265. INFORMATION SYSTEMS AND PRODUCTIVITY TOOLWARE (3-0-3)

Prerequisite: 100-level GUR course in computer science.

How organizations use information technology. Overview of the information systems discipline, the role of information systems in organizations, and the changing nature of information technology. Computer tools for analysis and presentation are used.

CIS 270. MULTIMEDIA INFORMATION SYSTEMS (3-0-3)

Prerequisites: CIS 113 or completion of a required 100-level GUR course in CIS, plus an approved CIS 105.

Combines text, graphics, sound, video, and animation in a single application. Creation of multimedia information systems. Explores the many issues involving technology, design, and effectiveness of multimedia applications. Programming techniques for integrating video, sound, animation, and graphics. Design strategies for multimedia information systems.

CIS 280. PROGRAMMING LANGUAGE CONCEPTS (3-0-3)

Prerequisite: CIS 114.

Conceptual study of programming language syntax, semantics, and implementation. Course covers language definition structure, data types and structures, control structures and data flow, run-time consideration, and interpretative languages.

CIS 332. PRINCIPLES OF OPERATING SYSTEMS (3-0-3)

Prerequisite: CIS 114.

Organization of operating systems covering structure, process management, and scheduling; interaction of concurrent processes; interrupts; I/O, device handling; memory and virtual memory management; and file management.

CIS 333. INTRODUCTION TO UNIX OPERATING SYSTEMS (3-0-3)

Prerequisites: CIS 332 or equivalent, and knowledge of C language.

Covers the UNIX system kernel, including initialization, scheduling, context switching, process management, memory management, device management, and the file system. The course also includes the organization of shells, editors, utilities, and programming tools of the UNIX operating system.

CIS 335. DATA STRUCTURES AND ALGORITHM DESIGN (3-0-3)

Prerequisites: CIS 113 or completion of a required 100-level GUR course in CIS, plus an approved CIS 105. Degree credit not given for both this course and either CIS 114 or CIS 505.

Advanced programming topics dealing with logical structures of data, their hardware representation, and the design and analysis of computer algorithms operating on the structures. Concentrates on data structures, including primitive types, stacks, queues, arrays, sets, linked lists, trees, and graphs; basic operations using data structures including sorting, searching, and memory management.

CIS 341. INTRODUCTION TO LOGIC AND AUTOMATA (3-0-3)

Prerequisites: Completion of a 100-level GUR course in CIS; Math 226.

Introduction to logic and formal grammars. Theoretical models such as finite state machines, push-down stack machines, and Turing machines are developed and related to issues in programming language theory.

CIS 350. COMPUTERS AND SOCIETY (3-0-3)

Prerequisites: Completion of a 100-level GUR course in CIS; one SS course; HSS 101.

Examines the historical evolution of computer and information systems and explores their implications in the home, business, government, medicine, and education. Topics include automation and job impact, privacy, and legal and ethical issues.

CIS 352. PARALLEL COMPUTERS AND PROGRAMMING (3-0-3)

Prerequisites: CIS 251 or CoE 252, CIS 332.

Introduction to parallel computers and parallel programming. General structures and design techniques of parallel computers are described. Programming paradigms and algorithm design considerations for parallel processors also are discussed.

CIS 353. ADVANCED COMPUTER ORGANIZATION (3-0-3)

Prerequisite: CIS 251 or instructor-approved equivalent.

Emphasis on the basic design principles of various components in a computer, as well as how the components are organized to build a computer. Topics include design methodology, arithmetic and logic unit design, control unit design, memory hierarchy, memory system design, input and output devices, peripheral devices, and interfacing computers using software. A software simulation package is used to help the learning process. Students build a simulated computer.

CIS 365. FILE STRUCTURES AND MANAGEMENT (3-0-3)

Prerequisites: CIS 280, or CIS 114 and knowledge of COBOL.

Design and implementation of commercial application software systems. Concepts of organization and management of data and files, including file operations and organization of sequential access, relative access, indexed sequential access, virtual storage access, and multi-key access methods. COBOL language is used to illustrate these concepts and to implement application systems.

CIS 370. INTRODUCTION TO ARTIFICIAL INTELLIGENCE (3-0-3)

Prerequisites: CIS 114, Math 226.

Exploration of concepts, approaches, and techniques of artificial intelligence. Emphasizes both underlying theory and applications. Topics include knowledge representation, parsing language, search, logic, abduction, uncertainty, and learning. LISP and Prolog programming languages used extensively. Programming assignments and term project; review of case studies.

CIS 375. APPLICATIONS DEVELOPMENT FOR THE WORLD WIDE WEB (3-0-3)

Prerequisite: CIS 114.

A state-of-the-art computer programming language/environment, such as Java and related tools, is studied and used as a vehicle to build applications that involve graphical user-interfaces, simple graphics, multithreading, images, animation, audio, database connectivity, remote objects, and networking.

CIS 381. OBJECT-ORIENTED SOFTWARE SYSTEMS DESIGN (3-0-3)

Prerequisite: CIS 280.

Object-oriented methodology for software development. Analysis, design, and implementation of object-orientation software systems in the context of software engineering. Software projects developed using object-oriented programming language (e.g., C++, Smalltalk).

CIS 390. REQUIREMENTS ANALYSIS AND SYSTEMS DESIGN (3-0-3)

Prerequisite: CIS 114.

Study of the information systems development lifecycle, from the initial stages of information requirements analysis and determination to the ultimate activities involving systems design. Theory, methodologies, and strategies for information requirements analysis, including the assessment of transactions and decisions, fact-finding methodologies, structured analysis development tools, strategies of prototype development, and an overview of computer-aided software engineering (CASE) tools. Theory, methodologies, and strategies for systems design, including design of user-interfaces, particularly menu-driven and keyword dialogue strategies, and issues in the proper design of computer output.

CIS 408. CRYPTOGRAPHY AND INTERNET SECURITY (3-0-3)

Prerequisite: Math 226.

Security requirements for telecommunication over the Internet and other communication networks, various conventional and public-key encryption protocols, digital encryption standard, RSA and ElGamal cryptographic systems, digital signature algorithm and analysis of its cryptoimmunity, and access-sharing schemes.

CIS 421. NUMERICAL ALGORITHMS (3-0-3)

Prerequisite: Completion of a 100-level GUR course in CIS. *Corequisite:* Math 222.

Fundamentals of numerical methods, including discussion of errors, interpolation and approximation, linear systems of equations, solution of nonlinear equations, and numerical solution of ordinary differential equations. Algorithmic approach and efficient use of computers emphasized.

CIS 431. DATABASE SYSTEM DESIGN AND MANAGEMENT (3-0-3)

Prerequisite: CIS 114 or equivalent.

Database system architecture; data modeling using the semantic object and entity-relationship model; storage of databases; the hierarchical, network, and relational data models; formal and commercial query languages; functional dependencies and normalization for relational database design; relation decomposition; concurrency control and transactions management. Use of DBMS package.

CIS 432. ADVANCED OPERATING SYSTEMS (3-0-3)

Prerequisites: CIS 251, CIS 332.

Survey of the design and implementation of distributed operating systems, both by introducing basic concepts and considering examples of current systems. Topics include communication, synchronization, processor allocation, and distributed file systems.

CIS 435. ADVANCED DATA STRUCTURES AND ALGORITHM DESIGN (3-0-3)

Prerequisite: CIS 114 or CIS 335, and Math 226 (or equivalent).

Advanced topics in data structures and algorithms, including mathematical induction, analysis and complexity of algorithms, and algorithms involving sequences, sets, and graphs such as searching, sorting, order statistics, sequence comparisons, and graph traversals. Optional topics include geometric, algebraic, and numeric algorithms.

CIS 438. INTERACTIVE COMPUTER GRAPHICS (3-0-3)

Prerequisites: Completion of a 100-level course in CIS; knowledge of Pascal or C.

Introduces fundamental concepts of interactive graphics oriented toward computer-aided design systems used in engineering, architecture, and manufacturing. Topics include computer data structures for representation of two- and three-dimensional objects and algorithms for definition, modification, and display of these objects in applications. Discussion of special topics in interactive graphics.

CIS 447. HUMAN-COMPUTER INTERFACES (3-0-3)

Prerequisite: CIS 390.

Design and evaluation of the human-computer interface in interactive computer systems. Topics include approaches to interface design such as menus, commands, direct manipulation; screen layout strategies; metaphor models; models of human information process; evaluation approaches such as protocol for analysis, interactive monitoring, use of surveys; and requirements for documentation and help.

CIS 451. DATA COMMUNICATIONS AND NETWORKS (3-0-3)

Prerequisite: CIS 114.

Fundamental concepts in data communications. Topics include circuit and packet switching, layered network architecture, ISO Network protocols, performance analysis of data communication systems, flow control and alternate routing strategies and algorithms, various types of networks and their interconnections, network security and privacy.

CIS 453. MICROCOMPUTERS AND APPLICATIONS (3-0-3)

Prerequisite: CIS 231.

Basic principles of microprocessors and their support modules: memory, serial, and parallel interfaces. Focus on software system design for control by microcomputers. Instructor-assigned exercises and one student-designed project.

CIS 455. COMPUTER SYSTEMS MANAGEMENT (3-0-3)

Prerequisite: Completion of a 100-level GUR course in CIS.

Overview of computing centers and their organization for accomplishing specific objectives. Includes a classification of systems, analysis of cost and size, layout of equipment, methods of accessing computer facilities, equipment selection, and facilities evaluation.

CIS 456. OPEN SYSTEMS NETWORKING (3-0-3)

Prerequisite: CIS 114.

Introduction to inter-networking, including in-depth study of the architecture of network interconnections, the Internet services, and the protocols needed to provide these services. Topics include architecture of interconnected networks, Internet addresses and the address resolution problem, Internet protocols, the domain name system, the socket interface, the client-server model of interaction, the OSI transport and application support protocols, and the TCP/IP application protocols.

CIS 461. SYSTEMS SIMULATION (3-0-3)

Prerequisites: Completion of a 100-level GUR course in CIS; Math 333.

Introduction to computer simulation as an algorithmic problem-solving technique. Includes discrete simulation models, elementary theory, stochastic processes, use of simulation languages, random number generators, simulation of probabilistic processes, design of simulation experiments, validation of models, queuing systems, and applications to the design and analysis of operational systems. The GPSS language is studied in detail.

CIS 465. ADVANCED INFORMATION SYSTEMS (3-0-3)

Prerequisite: CIS 431.

Design and programming concepts for automation of management information systems. Organization of files and techniques for processing information based upon organizational requirements and available hardware and software. Case studies. Advanced design strategies for information systems. Proposal for information systems project, including its functional specifications and preliminary design, required.

**CIS 475. EVALUATION OF COMPUTER APPLICATIONS (3-0-3)
(PENDING APPROVAL)**

Prerequisite: Course in probability and statistics, or social science research methods.

Methods for identifying usability problems and for testing the relative merits of alternative designs for interactive systems. Following a review of usability heuristics, read about and practice five different methods: semistructured interviews, protocol analysis, cognitive walkthroughs, user surveys, and controlled experiments.

CIS 477. INTERACTIVE PROGRAMMING IN WINDOWED ENVIRONMENTS (3-0-3)

Prerequisites: Proficiency in C (or C++), exposure to C++.

Concepts and techniques of programming for graphical user interfaces (GUI's). Interactive program development and numerous examples from, and projects in, the MS Windows environment. Topics include review of major GUI environments, fundamentals of interaction and user interfaces, standard user interface elements, displaying and printing text and vector graphics, event-driven programming, interactive program structure and design methodology, and detailed case studies. Special topics may include dynamic link libraries (DLL's), multiple window applications, dynamic data exchange (DDE), object linking and embedding (OLE), application frameworks, code generators and CASE tools, multiplatform development, and others. Prerequisite examination the first day of class at the instructor's discretion.

CIS 478. SOFTWARE TOOLS FOR SOLVING PROBLEMS (3-0-3)

Prerequisites: Junior or senior standing, permission of instructor.

Students interact directly with industry and solve actual problems using various information-systems software tools. Company representatives present actual problems they are facing, and the students work in groups to develop a solution, which they present at the end of the term. Presentation skills, working in groups, and using software tools for problem solving are stressed.

CIS 480. THEORY OF LANGUAGES (3-0-3)

Prerequisites: CIS 280, CIS 341.

Formal treatment of programming language translation and compiler design concepts. Emphasis on theoretical aspects of parsing context-free languages, translation specifications, and machine-independent code optimization. Programming project required.

CIS 485. SPECIAL TOPICS IN COMPUTER SCIENCE I (3)

Prerequisites: Junior standing and/or departmental approval.

The study of new and/or advanced topics in an area of computer science not regularly covered in any other CIS course. The precise topics to be covered, along with prerequisites, are announced in the semester prior to the offering of the course. A student may register for no more than two semesters of special topics courses.

CIS 486. SPECIAL TOPICS IN COMPUTER SCIENCE II (3)

Prerequisites: Same as for CIS 485.

A continuation of CIS 485.

CIS 490. GUIDED DESIGN IN SOFTWARE ENGINEERING (3-0-3)

Prerequisite: Senior standing or departmental approval.

Focus on the methodology for developing software systems. Methods and techniques for functional requirements analysis and specifications, design, coding, testing and proving, integration, and maintenance discussed.

CIS 491. COMPUTER SCIENCE PROJECT (3-0-3)

Prerequisites: CIS 490, senior standing, and project proposal approval.

Integration of knowledge and skills gained in previous computer science work into an individual research project. To register, students must have a written project proposal approved by the department. The project investigates current literature and computer implementation of a part of a large system or the whole of a small system, consonant with the student's direction of study. The proposal must be submitted and approved in the prior term, usually the third week of November or April.

CIS 492. INFORMATION SYSTEMS PROJECT (3-0-3)

Prerequisites: CIS 465, senior standing, and, in a prior term, project proposal approved by the faculty adviser.

Integration of knowledge and skills gained in previous information systems courses into an individual research project. The project entails investigation of current literature and the design, implementation, and evaluation of an information system.

Environmental Sciences (NJIT)

Offered by the Department of Civil and Environmental Engineering and the Department of Engineering Technology. See also under Science, Technology, and Society for the following courses: STS 313, STS 360, STS 362, and STS 382.

SET 303. PHOTOGRAMMETRY AND AERIAL PHOTO INTERPRETATION (3-3-4)

Prerequisite: Junior standing.

Principles of photography, including the physical science of optics as related to the use of aerial photos, to engineering, and land surveying projects. Mathematics of photogrammetry and the process of designing and establishing the required data for proper acquisition of photogrammetric information.

SET 307. BOUNDARIES AND ADJACENT PROPERTIES (3-3-4)

Prerequisite: Junior standing.

Legal principles regarding boundaries and the constructive solutions of the problems of boundary surveying by a consideration of deed descriptions and examples of their application to surveying.

CE 341. SOIL MECHANICS (3-0-3)

Prerequisites: Mech 237 and Mech 237A, or equivalent. Corequisite: CE 341A.

A study of soil types and properties is made with the objective of developing a basic understanding of soil behavior. The methods of subsurface investigation and compaction are presented. Fundamentals pertaining to permeability, seepage, consolidation, and shear strength are introduced; settlement analysis presented.

CE 341A SOIL MECHANICS LABORATORY (0-3-1)

Corequisite: CE 341.

Students perform basic experiments in soil mechanics.

ENE 262. INTRODUCTION TO ENVIRONMENTAL ENGINEERING (3-0-3)

Prerequisites: Chem 126, Math 112, and Phys 121.

Introduction to the integrated engineering, design, and management concepts of environmental facilities. Topics include environmental regulations and standards, environmental parameters, mass balance and natural systems, water quality management, water and wastewater treatment, air pollution, noise pollution, and solid and hazardous waste management. Presentations of written reports required.

ENE 360. ENVIRONMENTAL ENGINEERING (3-0-3)

Prerequisites: EnE 262 and junior standing.

Training in the methods used for water pollution control. Topics include the chemical, physical, and biological processes that occur in waste-treatment design and in receiving waters; modeling schemes to determine allowable loadings in various bodies of water; and waste-treatment processes used for water pollution control.

ENE 361. ENVIRONMENTAL PROBLEMS (3-0-3)

Prerequisites: EnE 262 and junior standing.

Exposure to the area of air pollution control and solid- and radioactive-waste disposal. Topics include the chemistry of contaminated atmospheres, how pollutants influence meteorological conditions, abatement processes used to control emissions, classification and nature of solid waste, related health effects, and solid- and radioactive-waste disposal.

SET 407. BOUNDARY LINE ANALYSIS (3-3-4)

Prerequisite: SET 307.

Develops the analytical synthesis of real-property law, land-surveying procedures, and scenario development compatible with current case law decisions for the development of most probable scenarios of boundary location for the court's consideration.

SET 420. LAND INFORMATION SYSTEMS (2-2-3)

Prerequisites: Course in CADD, SET 407, or permission of instructor.

Topics include the function and design of multipurpose cadastre systems, the components of a digital Geographical/Land Information System (GIS/LIS), and an overview on design, implementation, and evaluation problems of LIS.

Geoscience Engineering (NJIT)

Offered by the Department of Civil and Environmental Engineering.

FED 101C. FUNDAMENTALS OF ENGINEERING DESIGN, COMPUTER AIDED DESIGN/GRAPHICS COMPONENT (0-2.25-1)

Corequisite: HSS 100 (spring) or HSS 101 (fall).

Technical graphics and the computer as a technical drawing tool. Introduces projections and multiview drawings and visualization. Discuss geometry commonly used in engineering design graphics, orthographic projections, dimensioning techniques, and tolerancing introduction to auxiliary and sectional views. Apply software program pro/ENGINEER to various problems. Interdisciplinary course coordinated by the Office of the Dean, First-Year Studies, and the Office of the Dean, Newark College of Engineering.

FED 101D. FUNDAMENTALS OF ENGINEERING DESIGN, DESIGN COMPONENT (0-2.25-1)

Corequisite: HSS 100 (spring) or HSS 101 (fall).

Interdisciplinary teams work on open-ended engineering projects. Modules introduce real engineering problems from chemical, civil, electrical, industrial, mechanical, environmental, biomedical, manufacturing engineering, and optical science and engineering. Covers product design and development, processes, manufacturing, measurements. Interdisciplinary course coordinated by the Office of the Dean, Freshman Studies, and the Office of the Dean, Newark College of Engineering.

Mech 235. STATICS (3-0-3)

Prerequisites: Phys 111, Math 112.

Provides an understanding of equilibrium of particles and rigid bodies subject to concentrated and distributed forces.

Mech 236. DYNAMICS (2-0-2)

Prerequisites: Mech 235 (or Mech 234 for EE, CoE, IE, ME majors).

Provides an understanding of the mathematics of the motion of particles and rigid bodies, and of the relation of forces and motion of particles.

Mech 237. STRENGTH OF MATERIALS (3-0-3)

Prerequisites: Mech 235, Math 112, or equivalents, and a working knowledge of statics with emphasis on force equilibrium and free body diagrams.

Provides an understanding of the kinds of stress and deformation and how to determine them in a wide range of simple, practical structural problems, and an understanding of the mechanical behavior of materials under various load conditions.

Mech 237A. STRENGTH OF MATERIALS LABORATORY (0-3-1)

Corequisite: Mech 237. Required for, and open only to, civil engineering majors.

Basic experiments in strength of materials.

CE 200B. SURVEYING LABORATORY (0-3-1)

For geoscience engineering majors.

Field exercises using survey instruments, including tapes, levels, theodolites, and total stations. Covers principles of topographic mapping, traverses, triangulation, and computer data reduction.

CE 311. CO-OP WORK EXPERIENCE I (3 ADDITIVE CREDITS)

Prerequisites: Completion of the sophomore year, departmental approval, and permission of the Office of Cooperative Education and Internships.

Students gain major-related work experience and reinforcement of their academic program. Work assignments facilitated and approved by the co-op office. Mandatory participation in seminars and completion of a report.

CE 320. FLUID MECHANICS (4-0-4)

Prerequisites: Math 211. Corequisite: Mech 235, Mech 236.

Fundamental laws relating to the static and dynamic behavior of fluids. Emphasis on applications dealing with the flow of water and other incompressible fluids, which includes flow in pipe systems and natural channels.

CE 321. WATER RESOURCES ENGINEERING (3-0-3)

Prerequisites: CE 200, CE 200A, CE 260. Corequisite: Math 225.

Methods of developing water supplies and the means to treat said supplies for consumptive use. Hydrologic techniques such as surface and groundwater yield, hydrograph and routing analyses, and probabilistic methods related to hydrologic studies explored.

CE 322. HYDRAULIC ENGINEERING (3-0-3)

Prerequisites: CE 320, CE 321.

Provides the tools required to design water distribution systems, storm drains, and sanitary sewers. Various hydrologic and hydraulic techniques examined.

CE 332. STRUCTURAL ANALYSIS (3-0-3)

Prerequisites: Mech 237, Mech 237A, CE 260.

Free body diagrams, equilibrium conditions for force systems and moments. Methods of analyzing determinate and indeterminate beams, frames, and trusses encountered in practice.

CE 341. SOIL MECHANICS (3-0-3)

Prerequisites: Mech 237 and Mech 237A, or equivalent. Corequisite: CE 341A.

Study of soil types and properties, to develop a basic understanding of soil behavior. Methods of subsurface investigation and compaction presented. Fundamentals pertaining to permeability, seepage, consolidation, and shear strength introduced. Settlement analysis also is presented.

CE 341A. SOIL MECHANICS LABORATORY (0-3-1)

Corequisite: CE 341.

Students perform basic experiments in soil mechanics.

CE 443. FOUNDATION DESIGN (3-0-3)

Prerequisites: CE 341, CE 341A.

Site investigation, selection of foundation types and basis for design, allowable loads, and permissible settlements of shallow and deep foundations. Computations of earth pressure and design of retaining walls.

CE 494. CIVIL ENGINEERING DESIGN I (3-0-3)

Prerequisite: Senior standing in civil engineering.

Simulates the submission and acceptance process normally associated with the initial design phases for a civil engineering project. Preparation of sketch plats, preliminary engineering design, and a related environmental assessment. Written and oral presentations in defense of the project.

CE 495. CIVIL ENGINEERING DESIGN II (3-0-3)

Prerequisite: Senior standing in civil engineering.

Provides students with the type of design experience they would receive if engaged in civil and environmental engineering design practice. Students can select from the following design areas: structures, geotechnical engineering, transportation and planning, and sanitary and environmental engineering.

OPSE 301. INTRODUCTION TO OPTICAL SCIENCE AND ENGINEERING (3-0-3)

Prerequisite: Phys 121.

Laboratory and lecture. For applied physics, engineering, computer science, or biology majors. Introduces optics and photonics principles with their elementary applications. Topics include speed of light, reflection, refraction, geometric optics, interference and interferometry, polarization, dispersion, birefringence, fiber optics, diffraction, introduction to spectroscopy and ray tracing.

OPSE 310. VIRTUAL INSTRUMENTATION (2-3-3)

Prerequisites: 3-credit 100-level CIS programming course (preferably C or C++).

For engineering, computer science, and science majors. Covers the basics of virtual instrumentation, including use of Institute of Electrical and Electronics Engineers (IEEE) GPIB, RS232 interfaces, and data acquisition boards. Interface a computer to various instruments for data acquisition and instrument control using a state-of-the-art software platform such as National Instrument's LABVIEW. Emphasis is on the practical aspects of interfacing a computer to various instruments, including timing issues, real-time data acquisition and instrument control, instrument status, and acquisition speed.

OPSE 402. HIGH POWER LASER AND PHOTONICS APPLICATIONS (3-0-3)

Prerequisite: Phys 121.

Advanced laboratory and lecture for engineering, computer science, and science majors with junior or senior standing. Photonics and higher power laser applications. Topics include Maxwell's equations, principles of lasers, electro-optics, nonlinear optics, absorption and transmission of light, bio-optics, fiber-optic communications, chemiluminescence, scattering from periodic surfaces and colloids, sensors. Topics and experiments change on a term basis depending on interests of enrolled students.

Philosophy (NJIT)

Offered by the Department of Humanities and Social Sciences.

Phil 331. PROBLEMS IN PHILOSOPHY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

An examination of problems of a social, ethical, aesthetic, religious, and scientific nature, and a study of the related principles and methods of philosophy. Readings are chosen from a wide range of periods and schools from the Greeks to the present, with some application of philosophical analysis to individual and societal problems.

Phil 333. MORAL PHILOSOPHY (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

A critical discussion of the history and fundamental elements of ethical thought. Examines topics such as the basic ethical theories, the nature of right and wrong, the significance of moral choice, the structure of the moral life, and the place of reason in ethics. Readings from both classical and modern philosophers.

Phil 334. ENGINEERING ETHICS AND TECHNOLOGICAL PRACTICE: PHILOSOPHICAL PERSPECTIVES ON ENGINEERING (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

A philosophical examination of the nature of engineering practice and applied technology. Considers such questions as: "How do the societal functions of engineers and the practical application of technologies relate to basic moral and intellectual values?" "What moral obligations are implied by the uses of technology?" "What are the ethical duties of engineers in the practice of their careers?" "How are technological practice and engineering related to questions about knowledge and reality?"

Phil 337. WORLD RELIGIONS (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

An introduction to five world religions that make strong claims to be in some sense universal: Hinduism, Judaism, Buddhism, Christianity, and Islam, with special attention to their impact on contemporary politics, gender, economics, and culture. Study of selected scriptures, major customs, representative figures, and one or two works of art from each religious tradition.

Phil 350. REPRESENTATIVE PHILOSOPHIES (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

The ideas of a few great thinkers, from a variety of historical periods. Shows at first hand how these philosophers accelerated intellectual progress and how their work may contribute to the solution of modern problems.

Phil 355. THE PHILOSOPHY OF SCIENCE (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

An investigation into the foundations and implications of modern science, with special emphasis on the influence of philosophy on scientific thought, and on philosophic questions.

Physics (NJIT)

Offered by the physics departments of NJIT and Rutgers–Newark.

Phys 202. INTRODUCTORY ASTRONOMY AND COSMOLOGY (3-0-3)

A nonmathematical presentation of contemporary views of the origin, evolution, and structure of the solar system, stars, galaxies, and the universe. Special topics include neutron stars, black holes, gravitationally strange objects, and the "Big Bang."

Phys 202A. ASTRONOMY AND COSMOLOGY LABORATORY (0-2-1)

Corequisite: Phys 202.

Demonstration of physical principles applicable to astronomy. Use of telescope for lunar, solar, and planetary observations.

Phys 203. THE EARTH IN SPACE (3-0-3)

Introduces fundamental phenomena, such as plate tectonics, erosion, volcanism, and glaciation. Studies interaction between the earth's four major reservoirs: atmosphere, hydrosphere, biosphere, and solid earth. Investigates the dependence of the earth on the sun and the effect of the moon on the earth. Extends study of earth to other planets in solar system.

Phys 203A. THE EARTH IN SPACE LABORATORY (0-2-1)

Corequisite: Phys 203.

Optional laboratory course associated with Phys 203.

Phys 234. PHYSICS III (3-0-3)

Prerequisite: Phys 121 or Phys 121H.

Elements of simple harmonic motion, wave motion, and geometric and physical optics considered. The wave and particle duality of nature emphasized. Examination of important experiments and theories that led to modern concepts of matter and radiation. Conservation laws broadened to include the equivalence of mass and energy.

Phys 310. INTRODUCTION TO ATOMIC AND NUCLEAR PHYSICS (3-0-3)

Prerequisites: Physics III, Math 222.

Selected topics in atomic physics including the Pauli Exclusion Principle and the Atomic Shell Model. In nuclear physics, the two-body problem, nuclear models, and alpha, beta, and gamma radiation studied. Accelerators and nuclear detectors also studied.

Phys 320. ASTRONOMY AND ASTROPHYSICS I (3-0-3)

Prerequisite: Phys 103 or Phys 121 or Phys 121H.

Quantitative introduction to the astronomy of the sun, earth, and solar system, with emphasis on the physical principles involved. Includes celestial mechanics, planetary atmospheres, and the physics of comets, asteroids, and meteorites.

Phys 321. ASTRONOMY AND ASTROPHYSICS II (3-0-3)

Prerequisite: Phys 320 or permission of instructor.

Quantitative introduction to the astronomy of the stars, the galaxy, and cosmology, with emphasis on the physical principles involved. Includes stellar interiors, stellar evolution, galactic dynamics, large-scale structure and early history of the universe.

Phys 322. OBSERVATIONAL ASTRONOMY (3-0-3)

Prerequisite: Phys 320 or permission of instructor.

Observations of the sun, moon, planets, stars, stellar clusters, and galaxies. Experimental projects include charting the skies, astrophotography (film and CCD), measuring masses of planets, rotational period of the sun, topography of the moon, and H-R diagrams of stellar clusters.

Phys 335. INTRODUCTORY THERMODYNAMICS (3-0-3)

Prerequisite: Physics III.

Introductory thermodynamics, kinetic theory, statistical physics. Topics include equations of state, the three laws of thermodynamics, reversible and irreversible processes.

Phys 430. CLASSICAL MECHANICS I (3-0-3)

Prerequisites: Phys 233 or Phys 234 or Phys 235 or Phys 231H; Math 222.

Newtonian mechanics of particles and systems. Lagrange's and Hamilton's approaches. Continuous systems.

Phys 431. CLASSICAL MECHANICS II (3-0-3)

Prerequisite: Phys 430.

Continuation of Phys 430. Theory of small oscillations and mechanical waves. Rigid bodies. Topics include stability, linearization methods, forced vibrators and perturbation theory, fluids, and mechanics of continuous media.

Phys 432. ELECTROMAGNETISM I (3-0-3)

Prerequisites: Physics III, Math 222.

Electrostatics and magnetostatics, Maxwell's equations with applications, and electrodynamics.

Phys 433. ELECTROMAGNETISM II (3-0-3)

Prerequisite: Phys 432.

Continuation of Phys 432. Maxwell's equations with applications and electrodynamics.

Phys 441. MODERN PHYSICS (3-0-3)

Prerequisites: Physics III, Math 222.

Brief review of classical physics and kinetic theory followed by study of nuclear and atomic structure. Topics include wave-particle duality; wave mechanics; two-state quantum systems; the motion of an electron in periodic lattice; the band theory of solids; electrical, thermal, and magnetic properties of solids; and a semiquantitative description of plasmas and superfluid systems.

Phys 442. INTRODUCTION TO QUANTUM MECHANICS (3-0-3)

Prerequisites: Physics III, Math 222.

Wave-particle duality, the Schrodinger and Heisenberg formulations of quantum mechanics. The hydrogen atom, perturbation theory, and concepts of degeneracy, composite states, and general properties of eigenfunctions.

Phys 443. MODERN OPTICS (3-0-3)

Prerequisites: Physics III, Math 222.

Electromagnetic theory of light, interference, diffraction, polarization, absorption, double refraction, scattering, dispersion, aberration, and an introduction to quantum optics. Other topics include holography, lasers, information retrieval, spatial filtering, and character recognition.

Phys 444. FLUID AND PLASMA DYNAMICS (3-0-3)

Prerequisites: Physics III, Math 222.

Basics of plasma physics; plasma parameters, single particle motions, plasma as fluid, waves, diffusion and resistivity, equilibrium and instability, kinetic theory, nonlinear effects. Applications in three areas: controlled fusion, astrophysics, and interaction between light and plasma.

Phys 446. SOLID STATE PHYSICS (3-0-3)

Corequisite: Phys 441 or Phys 442.

Introduction to modern concepts of the solid state. Topics include crystal structure and diffraction, crystal binding and elastic properties, thermal properties, dielectric phenomena, band theory of solids and Fermi surfaces, electrical conductors, semiconductors, magnetism, and superconductivity.

Phys 450. ADVANCED PHYSICS LABORATORY (0-4-2)

Prerequisite: Permission of instructor.

Introduction to electrical measurements; instrumentation; theoretical and applied electronics, solid state electronics, and digital circuitry; computer design; and experiments in modern physics.

Phys 452. ATOMIC AND NUCLEAR PHYSICS (3-0-3)

Prerequisites: Physics III, Math 222.

Topics include atomic spectra, atomic structure, and nuclear physics.

Phys 461. MATHEMATICAL METHODS OF THEORETICAL PHYSICS (3-0-3)

Prerequisites: Phys 430, Phys 432, Phys 433.

Topics include vector and tensor analysis, matrix methods, complex variables, Sturm-Liouville theory, special functions, Fourier series and integrals, integral equations, and numerical solutions of differential equations.

Phys 481. APPLIED SOLID STATE PHYSICS: MICROELECTRONICS I (3-0-3)

Prerequisite: Phys 446 or Phys 456. Not to be taken if EE 463 has been taken.

Topics include physics of bipolar and field effect devices and Phonon and optical spectra, unipolar devices, thermal and high field properties of semiconductor devices.

Phys 482. APPLIED SOLID STATE PHYSICS: MICROELECTRONICS II (3-0-3)

Prerequisite: Phys 446 or Phys 456. Not to be taken if EE 463 has been taken.

Topics include large-scale integrated circuits, device characteristics, charge-coupled devices, LED and semiconductor lasers, photo-detectors, and electrical and optical properties of materials.

Phys 485. COMPUTER MODELING OF APPLIED PHYSICS PROBLEMS (3-0-3)

Prerequisites: Physics III, Math 222.

General computer programming modeling methods and techniques. Numerical solutions to integro-differential equations. Eigenvalues problems. Application of computer-aided design and other packages.

Science, Technology, and Society (NJIT)

NCAS students with a major or minor in science, technology, and society will find a complete listing of courses in the 1997–2000 NJIT Undergraduate Catalog (pages 134-137) and at <http://www.njit.edu/catalog/>. Rutgers–Newark students should consult the program coordinator for additional information about these courses.

Theater and Dramatic Literature (NJIT)

Offered by the Department of Humanities and Social Sciences.

Thtr 311. LIVING THEATER (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Using the resources of the NJIT and Rutgers theaters, students receive instruction in the elements of stage presentation: acting, design, theater history, and lighting and other technologies.

Lit 360. DRAMA (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Follows the development of play structure from folkloric origins to contemporary theater. Emphasis on text, history of text development, and the changing purpose of theatrical presentations.

Lit 361. TWENTIETH-CENTURY AMERICAN DRAMA (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Examines the development of twentieth-century American drama with emphasis on the ways, often experimental, in which playwrights reflect the spirit of the times.

Lit 362. NON-WESTERN DRAMA (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Explores classical and contemporary theater and drama in China, Japan, India, Africa, and the Middle East.

Lit 363. ETHNIC AND MINORITY DRAMA (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Using contemporary dramas as social, historical, and cultural artifacts, examines the experience of Latinos, Asian Americans, Native Americans, and African Americans.

Lit 364. MODERN CONTINENTAL AND BRITISH DRAMA (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

An examination of some of the dramas from the late nineteenth and twentieth centuries, with the purpose of gaining some understanding of how dramatists, in both subject matter and technique, reflect the spirit of the times. Representative playwrights include Ibsen, Shaw, Wilde, Strindberg, Synge, Chekhov, O'Casey, Pirandello, Anouilh, Brecht, Ionesco, and Pinter.

Lit 384. AMERICAN MUSICAL THEATER (3-0-3)

Prerequisites: HSS 101, HSS 202, or their equivalents; two from HSS 211, HSS 212, HSS 213, or their equivalents.

Experience a unique American theatrical tradition. Special attention paid to contemporary productions.

HSS 407. THEATER CAPSTONE SEMINAR (3-0-3)

Prerequisites: Completion of the general university requirements in English (3 credits), cultural history (6 credits), basic social science (6 credits), and either the Lit/Hist/Phil/STS (3 credits) or the open elective in humanities and social science (3 credits). The remaining 300-level course may be taken as a corequisite of the seminar.

Allows students the opportunity to work closely with an instructor in a specific area of the instructor's expertise. Students required to bring together interests and skills developed in previous courses, and make in-depth oral and written presentations. A list of capstone seminars is published each term in the course registration bulletin.

Distinguished Professor:

Michael Mostoller, *B.S., B.Arch., Rensselaer Polytechnic Institute; M.Arch., Harvard*

Professors:

Zeynep Celik, *B.Arch., Istanbul Technical; M.Arch., Rice; Ph.D., California*

Antonio de Souza Santos, *B.Arch., Cape Town; M.Arch., M.A., Pennsylvania*

Ezra Ehrenkrantz, *B.Arch., Massachusetts Institute of Technology;*

M.Arch., Liverpool

Karen A. Franck, *B.A., Bennington College; Ph.D., CUNY*

Urs P. Gauchat, *B.Arch., Sydney; M.Arch., Harvard*

Glenn Goldman, *B.A., Columbia; M.Arch., Harvard*

Sanford R. Greenfield, *B.Arch., M.Arch., Massachusetts Institute of Technology;*

Ed.M., Harvard

David L. Hawk, *B.Arch., Iowa State; M.Arch., M. City Planning,*

Ph.D., Pennsylvania

Peter Papdemetriou, *A.B., Princeton; M.Arch., Yale*

Leslie Weisman, *B.F.A., Wayne State; M.A., Detroit*

Associate Professors:

David Elwell, Jr., *B.S., Yale; B.A., Cambridge; M.F.A., Princeton*

Barry Jackson, *B.Arch., Rensselaer Polytechnic Institute; M.Arch.,*

California (Berkeley)

Sandra V. Moore, *B.A.Arch., Tuskegee Institute; M.Ed., Yale; Ed.D., Harvard*

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Donald Wall, *B.Arch., Manitoba; M.Arch., Cornell; D.Arch., Catholic*

Troy West, *B.Arch., M.Arch., Carnegie Institute of Technology*

NJIT FACULTY

New Jersey School of Architecture (NJIT)

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Associate Dean: James E. Dyer

Undergraduate Program Director: Donald Wall

Sponsored Chair: Ezra Ehrenkrantz

Computer and Information Science (NJIT)

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Murray Turoff (information systems division)

Vice Chairperson: Fadi P. Deek

Associate Chairpersons: Julian M. Scher, Frank Shih

Assistant Chairperson, Mount Laurel Programs: Catherine Campbell

Coordinator for Student Advisement: Andrew Hrechak

Undergraduate Adviser: Francesca C. Criscuolo

Coordinator for Distance Learning and Extension Programs: Robert Friedman

Assistant to the Chairperson: Carole Poth

Distinguished Professors:

Starr R. Hiltz, A.B., Vassar College; M.A., Ph.D., Columbia

Joseph Y. Leung, B.S., Southern Illinois (Carbondale); Ph.D., Pennsylvania State

Murray Turoff, B.A., California; Ph.D., Brandeis

Professors:

James Geller, Diploma Ing., Technische Universitaet Wien; M.S., Ph.D., SUNY (Buffalo)

James A.M. McHugh, A.B., Fordham; Ph.D., Courant Institute, New York

Yehoshua Perl, B.S., Bar-Ilan; M.S., Ph.D., Weizmann Institute of Science

Frank Yeong-Chyang Shih, B.S.E.E., National Cheng Kung; M.S.E.E., SUNY (Stony Brook); Ph.D., Purdue

Alexander Thomasian, Ph.D., California (Los Angeles)

Boris S. Verkhovsky, M.S., Odessa State (USSR); Ph.D., Latvia State (USSR)

Jason Wang, B.S., National Taiwan; M.S., Ph.D., New York

Associate Professors:

Michael A. Baltrush, B.S.E.E., Ph.D., Connecticut

Michael P. Bieber, B.A.S./B.S.E., M.A., Ph.D., Pennsylvania

John D. Carpinelli, B.E.E.E., Stevens Institute of Technology; M.E.E.E., Ph.D., Rensselaer Polytechnic Institute

Artur Czumaj, M.S., Warsaw; Ph.D., Paterborn (Germany)

Fadi P. Deek, B.S., M.S., Ph.D., New Jersey Institute of Technology

Elsa Gunter, B.A., Chicago; M.A., Ph.D., Wisconsin

Edwin Hou, B.S., Michigan; M.S., Stanford; Ph.D., Purdue

Daochuan Hung, B.S.E.E., Chung Yuan; M.S.E.E., National Tsing Hua; Ph.D., Purdue

C.N. Manikopoulos, P.E., B.S.E.E., Hamline; Ph.D., Princeton

Marvin Nakayama, B.A., California (San Diego); M.S., Ph.D., Stanford

David Nassimi, B.S.E.E., M.S.E.E., M.S., Ph.D., Minnesota

Michael Reyce, B.S., California (Santa Cruz); Ph.D., University College (London)

John W. Ryon III, B.S., Massachusetts Institute of Technology; M.S., Ph.D., Stevens Institute of Technology

Edward Sarian, B.S., Niagara; M.S., Michigan; Ph.D., Stevens Institute of Technology

Julian M. Scher, B.A., Brooklyn College; M.S., Ph.D., New York

Andrew Sohn, B.S., M.S., Ph.D., Southern California

Sotirios Zivavras, Dipl.-E.E., National Technical (Athens); M.S., Ohio; D.Sc., George Washington

Assistant Professors:

James M. Calvin, A.B., California (Berkeley); M.S., Ph.D., Stanford

Michael Yuguang Fang, B.S., M.S., Qufu Normal; Ph.D., Case Western Reserve; Ph.D., Boston

Alexandros Gerbessiotis, A.M., Ph.D., Harvard; M.S., Oxford

Il Im, B.A.A., M.B.A., Seoul National; Ph.D., expected Southern California

Qianhong Liu, B.Sc., Beijing; Ph.D., New Jersey Institute of Technology

Vincent Oria, M.S., Institut National Polytechnique (Ivory Coast); Ph.D., Ecole Nationale Supérieure des Telecommunications (Paris)

Richard B. Scherl, B.A., Columbia; M.A., Ph.D., Chicago; Ph.D., Illinois (Urbana-Champaign)

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Brian Whitworth, B.S., B.A., M.A., Auckland; Ph.D., Waikato (New Zealand)

Byoung-Kee Yi, B.S., M.S., Seoul National; Ph.D., Maryland (College Park)

Special Lecturers:

Firas Aljallad, B.S., M.S., Ph.D. candidate, New Jersey Institute of Technology

Sanat Basu, M.S., Banaras Hindu; Ph.D., Tata Institute of Fundamental Research

Maura Ann Deek, B.S., Cook College; M.S.C.S., New Jersey Institute of Technology

Arthur DuPré, A.B., Wofford College; M.S., George Washington; Ph.D., Maryland (College Park)

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Dennis Karvelas, B.S.E.E., National Technical; M.S., Ph.D., Toronto

Andrew Kreutzer, B.S., Polytechnic; M.A., City College of New York; Ph.D., Lehigh

Morty Kwestel, B.A., Yeshiva; M.S., New Jersey Institute of Technology

Mojgan Mohtashami, B.S., SUNY (Buffalo); Ph.D. candidate, Rutgers

Theodore Nicholson, B.A., New York; J.D., Syracuse (College of Law)

Wallace Rutkowski, B.S., M.S., Stevens Institute of Technology; Ph.D., Maryland (College Park)

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Program Administrator: Michele Collins

Department Administrator: Joyce Davis

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Eric Katz, B.A., Yale; M.A., Ph.D., Boston

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Nikki Stiller, B.A., Hunter College; Ph.D., CUNY

Norman Tobias, B.A., M.A., Ph.D., Rutgers

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Shin-Yi Chou, B.A., National Taiwan; Ph.D., Duke

Christopher Funkhouser, B.A., M.A., Virginia; Ph.D., Albany

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for Social Research; M.R.S., Hartford Seminary Foundation

Nina Pardi, A.B., Bucknell; M.A., Kean College

Richard Zdan II, B.S., B.S., Carnegie Mellon; M.A., Chicago

Professional/Instructional Staff:

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B.A., Rutgers; M.A., American; M.A., Kean College

John Coakley, Director, Freshman Composition and Intensive Studies. A.B., Iona College; M.A., Hunter College; A.M., Ph.D., Brown

Fred Ellerbusch, Becton Dickinson Research Associate, Center for Advanced

Technologies in Health. B.S., M.S., New Jersey Institute of Technology

William Gile, Producer and Creative Director of Theater, B.A., Boston;

M.F.A., Cornell

Michael Kerley, Coordinator of Teaching Assistant Instructional Program.

B.F.A., University of Georgia; M.F.A., North Carolina; Ed.D., Columbia

Jerome M. Paris, Director, English as a Second Language Program. B.A., Reed

College; M.A., Johns Hopkins; M.A., Teachers College, Columbia; Ph.D., Cornell

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M.F.A., Rutgers

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Anthony M. Johnson, *B.S., Polytechnic Institute of New York; Ph.D., CUNY (City College)*

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Gordon A. Thomas, *Sc.B., Brown; Ph.D., Rochester*

Research Professor/Special Lecturer:

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Physics (NJIT)

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William N. Carr, *B.S., M.S., Ph.D., Carnegie Mellon; M.S., Southern Methodist*

K. Ken Chin, *B.S., Peking Institute of Aeronautics; M.S., Georgia; Ph.D., Stanford*

Tobin Fink, *B.S., M.S., Colorado; Ph.D., Rutgers*

Nuggehalli M. Ravindra, *B.S., M.S., Bangalore (India); Ph.D., Roorkee (India)*

William Savin, *B.S., M.S., New Jersey Institute of Technology; Ph.D., Rutgers*

Haimin Wang, *B.S., Nanjing; Ph.D., California Polytechnic State*