Graduate School–Newark Catalog 2002–2004

Contents

Important Notice:

Please note that only the printed version of this catalog is the official document of Rutgers, The State University of New Jersey. While Rutgers offers its catalogs on the Internet as a convenience, the university's online catalogs are unofficial, as is academic information offered at other Rutgers web sites.

The university reserves the right for any reason to cancel or modify any course or program listed herein. In addition, individual course offerings and programs may vary from year to year as circumstances dictate.

Cover Illustration

Three People with Sun Spiral
Bob Commander / The Stock Illustration Source

Academic Calendars

Dates are subject to change.

These calendars do not apply to students in the Ph.D. in management program.

2002–2003

September		
3	Tuesday	Fall term begins.
November		
26	Tuesday	Thursday classes meet.
27	Wednesday	Friday classes meet.
28	Thursday	Thanksgiving recess begins.
December		
1	Sunday	Thanksgiving recess ends.
11	Wednesday	Regular classes end.
12	Thursday	Reading period.
13	Friday	Reading period.
16	Monday	Fall exams begin.
23	Monday	Fall exams end.
24	Tuesday	Winter recess begins.
January		
20	Monday	Winter recess ends.
21	Tuesday	Spring term begins.
March		
16	Sunday	Spring recess begins.
23	Sunday	Spring recess ends.
May		
5	Monday	Regular classes end.
6	Tuesday	Reading period.
7	Wednesday	Reading period.
8	Thursday	Spring exams begin.
14	Wednesday	Spring exams end.
22	Thursday	University commencement.

2003–2004

September		
2	Tuesday	Fall term begins.
November		
25	Tuesday	Thursday classes meet.
26	Wednesday	Friday classes meet.
27	Thursday	Thanksgiving recess begins.
30	Sunday	Thanksgiving recess ends.
December		
10	Wednesday	Regular classes end.
11	Thursday	Reading period.
12	Friday	Reading period.
15	Monday	Fall exams begin.
22	Monday	Fall exams end.
23	Tuesday	Winter recess begins.
January		
19	Monday	Winter recess ends.
20	Tuesday	Spring term begins.
March		
13	Sunday	Spring recess begins.
21	Sunday	Spring recess ends.
May		
3	Monday	Regular classes end.
4	Tuesday	Reading period.
5	Wednesday	Reading period.
6	Thursday	Spring exams begin.
12	Wednesday	Spring exams end.
20	Thursday	University commencement.

About the University

Rutgers, The State University of New Jersey, with more than 48,000 students on campuses in Camden, Newark, and New Brunswick, is one of the nation's major state university systems. The university comprises twenty-nine degree-granting divisions: twelve undergraduate colleges, eleven graduate schools, and six schools offering both undergraduate and graduate degrees. Five are located in Camden, eight in Newark, and sixteen in New Brunswick.

Rutgers has a unique history as a colonial college, a land-grant institution, and a state university. Chartered in 1766 as Queen's College, it was the eighth institution of higher learning to be founded in the colonies. The school opened its doors in New Brunswick in 1771 with one instructor, one sophomore, and a handful of first-year students. During this early period, the college developed as a classical liberal arts institution. In 1825, the name of the college was changed to Rutgers to honor a former trustee and Revolutionary War veteran, Colonel Henry Rutgers.

Rutgers College became the land-grant college of New Jersey in 1864, resulting in the establishment of the Rutgers Scientific School with departments of agriculture, engineering, and chemistry. Further expansion in the sciences came with the founding of the New Jersey Agricultural Experiment Station in 1880, the College of Engineering in 1914 (now the School of Engineering), and the College of Agriculture (now Cook College) in 1921. The precursors to several other Rutgers divisions also date from this period: the College of Pharmacy (now the Ernest Mario School of Pharmacy) in 1892, the New Jersey College for Women (now Douglass College) in 1918, and the School of Education (now a graduate school) in 1924.

Rutgers College became a university in 1924. The legislature passed laws in 1945 and 1956 designating all divisions of Rutgers as the state university of New Jersey. During these years, the university expanded dramatically. An evening division, University College, opened in 1934. The University of Newark joined the system in 1946, and the College of South Jersey at Camden was added in 1950.

Since the 1950s, Rutgers has continued to expand, especially in graduate education. The Graduate School–New Brunswick, the Graduate School–Newark, and the Graduate School–Camden serve their respective campuses. In addition, the university has established professional schools in applied and professional psychology; communication, information, and library studies; criminal justice; the fine arts; management; and social work. Several of these schools offer undergraduate programs as well. In 1969, the university founded Livingston College to provide undergraduate degrees to a diverse community of students.

Today, Rutgers continues to grow, both in its facilities and in the variety and depth of its educational and research programs. The university's goals for the future include the continued provision of the highest quality undergraduate and graduate education along with increased support for outstanding research to meet the needs of society and to fulfill Rutgers' role as the State University of New Jersey.

Institutional and Specialized Accreditation

Rutgers, The State University of New Jersey, is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools (http://www.msache.org/), 3624 Market Street, Philadelphia, PA 19104-2680 (215 / 662-5606). The Commission on Higher Education of the Middle States Association of Colleges and Schools is an institutional accrediting agency recognized by the U.S. secretary of education and the Council for Higher Education Accreditation. That accreditation was renewed and endorsed in 1998. Documents describing the institution's accreditation may be downloaded from the university's web site at http://oirap.rutgers.edu/reports/MSA/index.html. They may be reviewed during regular office hours by contacting the Office of Institutional Research and Academic Planning, Rutgers, The State University of New Jersey, 85 Somerset Street, New Brunswick, NJ 08901-1281 (732 / 932-7956).

Certain undergraduate programs on the Camden, Newark, and New Brunswick campuses of Rutgers are subject to specialized accreditation. For further information about specialized accreditation, including the names of associations that accredit university programs, contact the Office of Institutional Research and Academic Planning.

Licensure

Rutgers, The State University of New Jersey, is licensed by the New Jersey Commission on Higher Education. For more information, contact its Office of Programs and Services at 609 / 292-2955.

Graduate Study at the University

GRADUATE SCHOOL–NEWARK

The Graduate School–Newark is dedicated to the advancement of knowledge in an environment that encourages scholarly inquiry and intellectual growth. The school expects its graduate students to obtain a thorough understanding of their chosen academic disciplines and to acquire the analytical and creative skills required for original scholarship, research, and problem solving.

The Graduate School–Newark, with its own faculty and dean, was established in December 1975, but the history of graduate study in Newark goes back much further. Before 1975, the Graduate School–New Brunswick administered graduate programs in the arts and sciences on the Newark campus. In the 1950s, the university added master's and doctoral programs in psychology in Newark. Between 1965 and 1972, the Newark campus started master's level programs in economics, English, geological sciences, history, and political science.

The growth became even more dramatic after the graduate education in Newark became an independent entity. The Graduate School–Newark now offers master's programs in liberal studies, jazz history and research, nursing, public administration, biology, chemistry, global studies, international studies, applied physics, and public health. The school has Ph.D. programs in chemistry, criminal justice, biology, behavioral and neural sciences, management, nursing, mathematical sciences, applied physics, and public administration.

Several degrees are offered jointly with other institutions. Working with New Jersey Institute of Technology, the Graduate School–Newark confers M.A. and M.A.T. degrees in history, an M.S. and a Ph.D. degree in biology, an M.S. in computational biology, M.S. and Ph.D. degrees in environmental science, an M.S. and Ph.D. in applied physics, and a Ph.D. in mathematical sciences. The Graduate School–Newark and the University of Medicine and Dentistry of New Jersey–New Jersey Medical School (UMDNJ–NJMS) offer an M.D./Ph.D. dual degree. In collaboration with the Public Health Research Institute, the Graduate School–Newark, UMDNJ–School of Public Health, and New Jersey Institute of Technology offer a master of public health degree. Finally, a Ph.D. in urban systems is offered jointly by New Jersey Institute of Technology; Rutgers, The State University of New Jersey–Newark; and the UMDNJ–Graduate School of Biomedical Sciences.

Administration of the School

Norman Samuels, Ph.D., Dean of the Graduate School–Newark and Provost
Gary Roth, Dr. rer.pol., Associate Dean of the Graduate School–Newark
Claire G. Bautista, Assistant Dean of the Graduate School–Newark
Adriana Afonso, Departmental Administrator

Degree Programs Available

Advanced degrees in the subjects listed below are conferred by the university upon recommendation of the faculty of the Graduate School–Newark. Detailed information about areas of specialization is provided under general subject headings in the program section of this catalog.

Biology (M.S., Ph.D.)
Chemistry (M.S., Ph.D.)
Computational Biology (M.S.)
Criminal Justice (Ph.D.) *
English (M.A.)
Environmental Geology (M.S.)
Environmental Science (M.S., Ph.D.)
Global Affairs (Ph.D.)
History (M.A., M.A.T.)
Integrative Neuroscience (Ph.D.)
Jazz History and Research (M.A.)
Liberal Studies (M.A.L.S.)
Management (Ph.D.) †
Mathematical Sciences (Ph.D.)
Nursing (M.S., Ph.D.)
Physics, Applied (M.S., Ph.D.)
Political Science (M.A.)
Psychology (Ph.D.)
Public Administration (M.P.A., Ph.D.)
Public Health (M.P.H.)
Urban Systems (Ph.D.)

M.D./Ph.D. Dual-Degree Program with UMDNJ–NJMS

This dual-degree program leads to the doctor of medicine degree from UMDNJ–NJMS and the doctor of philosophy degree from Rutgers–Newark. The program enables highly qualified students to complete the requirements for the two degrees within seven years.

Students in the program complete four years of study in the medical program at UMDNJ–NJMS and three years of graduate work in an accelerated program at Rutgers–Newark. This structure gives all M.D./Ph.D. students a unified, broadly based biomedical science curriculum while they are completing course requirements for the Ph.D. During the first two years, students take basic medical school courses at UMDNJ–NJMS, while the next three years involve course work, research, and dissertation research at Rutgers–Newark. For their sixth and seventh years, students in the program return to UMDNJ–NJMS for clinical training. The resident institution provides each student with a salary and tuition remission for the entire seven years.

Master of Public Health Degree Program (M.P.H.)

The Newark Public Health Program at Science Park (NPHPSP) is a joint-degree program leading to a Master of Public Health degree. The Graduate School–Newark, UMDNJ–NJMS, and New Jersey Institute of Technology offer the degree, in collaboration with the Public Health Research Institute.

The NPHPSP requires students to complete successfully 45 credits in core courses, take several electives, do field work, and write a thesis. All students must take five introductory core courses in the following areas: epidemiology,

* The M.A. in criminal justice is offered through the School of Criminal Justice.
† The M.B.A. is offered through the Graduate School of Management.

biostatistics, urban and environmental health, health-care systems and policy, health education and public health issues. After completing the core courses, students specialize in one of the following tracks: urban and environmental health, quantitative methods, or health policy and administration.

For information or a program application, contact Yvette Holding-Ford, administrative director, at 973/972-8039, or write to UMDNJ–School of Public Health, Newark Campus M.P.H. Program, ADMC 1616, 30 Bergen Street, Newark, NJ 07107-3000. Interested students also may contact Professor Evan Stark, Rutgers program director and adviser at Room 701, Hill Hall, by telephone at 973/353-5093, ext. 22, or by e-mail at EDS203@JUNO.com.

OTHER GRADUATE STUDY AT THE UNIVERSITY

In addition to degree programs offered by the Graduate School–Newark, the following divisions of the university offer a variety of postbaccalaureate programs:

1. In Newark: the Graduate School of Management, the School of Criminal Justice, and the School of Law–Newark.
2. In New Brunswick: the Graduate School–New Brunswick; the Graduate School of Applied and Professional Psychology; the Graduate School of Education; the School of Communication, Information and Library Studies; the School of Social Work; the Edward J. Bloustein School of Planning and Public Policy; the School of Management and Labor Relations; and Mason Gross School of the Arts.
3. In Camden: the Graduate School–Camden and the School of Law–Camden.

The Graduate School of Management offers an M.B.A. program in New Brunswick as well as in Newark. All of the above divisions publish individual catalogs, which are available upon request.

An evening, part-time Master in Social Work (M.S.W.) program is offered by the School of Social Work on the Newark campus. Information on this program can be obtained by telephoning 973/353-5092.

Women's and Gender Studies, Graduate Concentration

Because of its interdisciplinary methodologies, women or gender studies gives a central place to the liberal arts or "human sciences." Students who opt to focus part of their graduate work in women's and gender studies receive outstanding instruction, mentoring, and research opportunities while working with faculty members of the highest rank. In this concentration, students complete four courses, two from within their program and two sponsored by the women's studies program. The latter two courses are History and Theory of Women's/Gender Studies and Feminist Research and Methods. Students in master's programs in history, liberal studies, public administration, global affairs, English, and political science are eligible to pursue a concentration in women's or gender studies.

Minority Biomedical Research Support (MBRS) Program

The Minority Biomedical Research Support (MBRS) program provides financial support and laboratory research training for minority students in the biomedical sciences. Funded by the National Institutes of Health, the program supports graduate and undergraduate students, who are supervised by faculty members from the Center for Molecular and Behavioral Neuroscience; the College of Nursing; and the departments of biology, chemistry, and psychology.

MBRS, in its seventeenth year of continuous funding, helps alleviate the shortage of minority men and women in the U.S. in biomedical careers. It provides students with an intensive laboratory experience that includes designing and carrying out research projects and presenting the results of this research to students and faculty members at weekly MBRS seminars and workshops. In addition, students in the program discuss their research at professional scientific conferences and have their work published under their names in professional scientific journals.

Students are required to work a minimum of fifteen hours a week under supervision of a faculty mentor. They participate in biweekly meetings at which they present their research findings and listen to presentations by visiting minority biomedical scientists.

There have been more than 100 graduates of the MBRS program, including fifteen recipients of Ph.D. degrees. Following their work in the program, students have continued their graduate studies at such graduate and medical schools as Johns Hopkins University, Yale University, the University of Medicine and Dentistry of New Jersey, and Boston University. As recipients of research grants, doctoral graduates of the program have continued their studies at such institutions as Rockefeller University, the Mayo Clinic, Yale University, and the Albert Einstein College of Medicine. Others have taken tenure-track faculty positions at the University of Puerto Rico.

CENTERS

Graduate Center at Newark

The Newark campus of Rutgers University, New Jersey Institute of Technology (NJIT), and the University of Medicine and Dentistry of New Jersey have joined forces to create the Graduate Center at Newark. The Graduate Center strives to further the quality of graduate education and to attract more high-level graduate students and postdoctoral fellows to the city of Newark. The high level of collaboration between the three institutions has positioned Newark as one of the nation's largest academic communities.

The three participating universities, which have a student population of more than 20,000, attract about $100 million in external funding. Together, Rutgers–Newark, NJIT, and UMDNJ offer more than a dozen collaborative degree programs and produce more than 100 research doctorates annually. As leaders in the effort to prepare individuals for a world that is demanding cross-disciplinary and advanced technical skills, the three universities bring complementary strengths to the center. Their efforts bear fruit in the biological sciences and bioengineering; computer and information sciences; private and public management; the health-related professions; and such application-oriented sciences as physics, mathematics, and the environmental and social

sciences. Graduate students enrolled in one institution are able to take courses and use the research facilities at the other campuses. Researchers and faculty members from the sponsoring institutions often collaborate in joint-research projects.

Students at the center, which is located in the University Heights section of Newark, conduct research in such diverse areas as language-based learning disorders, robotics and intelligent manufacturing, the molecular and immunopathologic mechanics of cancer, public health, environmental engineering, global affairs, urban epidemiology, infrastructure planning and assessment, and urban school performance.

The joint project has led to numerous impressive developments in recent years, including:

- University Heights Science Park, a joint venture of Rutgers–Newark, NJIT, UMDNJ, Essex County College, and private industry. The park's mission is to convert university research into commercial uses.
- A $78 million International Center for Public Health at Science Park, which anchors the biosciences and biotechnology cluster.
- The relocation of the Public Health Research Institute from Manhattan to Newark's International Center for Public Health. The institute, an independent research organization, focuses on infectious diseases and public health needs.

Anticipated developments in the University Heights area include graduate student housing, multimedia research facilities, and seminar and conference rooms. The partnership between Rutgers–Newark, NJIT, and UMDNJ offers researchers, students, private industry, and government a range of resources that would be beyond the reach of any one university.

A major beneficiary of this effort has been the city of Newark. Included in the more than $100 million in external research funding that the effort brings into the city each year are funds from federal, state, and local governments; private foundations; and corporate sources. In addition, the development of Science Park and the International Center for Public Health is providing new jobs to the community.

Joseph C. Cornwall Center for Metropolitan Studies

The Joseph C. Cornwall Center for Metropolitan Studies was established to shed light on the complex factors that shape the quality of life in metropolitan areas. An integral part of the faculty of arts and sciences in Newark, the Cornwall Center brings together students and faculty members from Rutgers–Newark and allied institutions of higher education. In addition, the center draws upon the talents of people in government, business, foundations, and public service organizations in northern New Jersey. Through its research, policy-analysis, public-education, and outreach efforts, the center strives to raise public understanding of urban issues and to improve the quality of the public's decision making.

Center for Global Change and Governance

See Global Affairs.

Center for Molecular and Behavioral Neuroscience (CMBN)

See Integrative Neuroscience.

National Center for Public Productivity

See Public Administration.

GRADUATE CERTIFICATES

Conflict Management

The graduate certificate in conflict management is designed to meet the needs of those who seek introductory training in this rapidly expanding and challenging field. The demand for experts in conflict management has grown with the recognition of its importance in corporate, legal, community, and personal relationships. The program attempts to expose students to a broad array of alternative dispute-resolution methods and to develop their skills in employing the techniques they learn.

Courses emphasize active learning through role-playing, simulations, small-group discussions, and video illustrations. The program is open to all Rutgers students currently enrolled in graduate or professional degree programs (i.e., law, management, nursing, psychology, public administration, and social work) and to postbaccalaureate students with an interest in conflict management. Certificate candidates include many current Rutgers graduate and professional degree students, as well as practicing professionals from fields as diverse as education, human resources, and mental health.

Nonprofit Management

See Public Administration.

Advanced Professional Training in Public Administration

See Public Administration.

WICE/TEFL

The graduate program in teaching English as a foreign language (TEFL) is sponsored by the Graduate School–Newark in conjunction with the master's program in liberal studies. The certificate program is cosponsored by the Women's Institute of Continuing Education (WICE) in Paris, France, where the program is offered. WICE is a nonprofit organization that sponsors a variety of educational and cultural programs.

At the conclusion of the teaching English as a foreign language program, students receive a certificate from Rutgers–Newark marking their successful completion of the course and granting them continuing education credits. Students may choose the extensive, 150-hour program, which meets twice a week during the academic year, or the intensive, 100-hour program, which meets from 9:30 A.M. to 4:30 P.M. for five days a week in the summer.

Their studies focus on three areas: preparing lessons and presenting them to students who are learning English, critiquing their own presentations and those of their classmates, and learning the theory and practice of how people acquire language. Besides planning lessons, students'

homework assignments include readings in literature of the profession, preparing audiotapes and videotapes of their teaching techniques, and keeping a daily journal of their experiences in the program.

The course covers lesson planning, classroom management, presentation and practice techniques, error analysis and correction, pronunciation, vocabulary, video, testing, course design, and language awareness and listening. The units are organized according to teachers' and learners' roles, learning styles and strategies, task-based and content-based approaches, alternative methods, and one-to-one teaching.

Trainee teachers come from a wide variety of backgrounds and teach in many contexts. While most seek employment in France, many have gone on to teach in Poland, Italy, Turkey, China, Japan, the Czech Republic, England, and the U.S.

Admission

REQUIREMENTS

A bachelor's degree or its equivalent from a recognized institution of higher education is required of applicants to the Graduate School–Newark. In general, the school expects applicants to have an average of B or better in their previous academic work. Students should show additional evidence of their potential for graduate study by enclosing letters of recommendation and through their scores on the Graduate Record Examination.

Applicants should refer to the current application form to learn about requirements set by the program of their choice. Admission to the school is competitive, and some applicants who meet or exceed minimum requirements may be denied acceptance. Admission is recommended by officials in the graduate program that the student chooses, but final approval comes from the dean of the Graduate School–Newark or a representative. Some programs, particularly the sciences, require prerequisites.

PROCEDURES

Application forms are available from the Office of Graduate and Professional Admissions, Rutgers, The State University of New Jersey, 249 University Avenue, Newark, NJ 07102-1896 (973/353-5205). In addition, students may obtain applications by visiting the Rutgers graduate admissions web site at http://gradstudy.rutgers.edu. A complete application consists of the application form, letters of recommendation, the application fee, official transcripts of previous academic work, a personal statement or essay, and test scores. Detailed instructions accompany the application forms.

Deadlines

Applicants should refer to the application form for deadlines, which vary according to each program's requirements. The deadline for consideration for assistantships and fellowships is March 1, but some programs have established different financial aid deadlines, which they indicate in their application instructions. International students applying from abroad must submit application materials by November 1 for a spring term admission, and by April 1 for a fall term admission. Programs reserve the right to close admission prior to stated deadlines or to extend deadline dates if sufficient time exists to make decisions. Individuals should apply for admission and financial assistance as early as possible.

The university may withdraw applications from students whose applications are incomplete at the deadlines.

Tests

All programs except management, jazz history and research, and liberal studies require applicants to take and submit results of the General Test of the Graduate Record Examination (GRE). The management program requires scores for the Graduate Management Admission Test

(GMAT). Applicants need not take any tests to gain entry to the liberal studies and jazz history and research programs. Some programs require or recommend that students take the Subject Test of the Graduate Record Examination in addition to the General Test. The GRE institution code for Rutgers–Newark is 2512.

Rutgers does not question on grounds of age scores from tests taken within three years before an application is submitted.

Graduate schools and programs may require that test scores more than three years old be validated by evidence of continued work in the field or by a reexamination.

For application forms and other information, candidates should contact the Educational Testing Service (ETS), Princeton, NJ 08541, at 609/921-9000, or online at http://www.gre.org. Candidates may pick up applications at the Rutgers–Newark Office of Graduate and Professional Admissions weekdays from 8:30 A.M. to 4:30 P.M.

Application for Financial Aid

The deadline for applying for most forms of financial assistance is March 15. Some programs, however, may have earlier deadlines. The school does not act on applications for aid until a student has been admitted. Nonimmigrant visa holders are not eligible for federal and state financial aid, but they may qualify for assistantships and certain fellowships. See the Financial Aid chapter for further information.

International Applicants

Satisfactory English proficiency is a prerequisite for graduate study at Rutgers. Admitted students may be required to take a test of English proficiency soon after they arrive at the university, and they may have to take course work in English as a Second Language (ESL).

International applicants are required to take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) if English is not their native language. For further information about the test, visit http://www.toefl.org or write to TOEFL/TSE Services, P.O. Box 6151, Princeton, NJ 08541-6151. The telephone number is 609/771-7100. To learn more about the IELTS, visit the web site at http://www.ielts.org.

New international students appointed as teaching assistants are required to take an oral proficiency test regardless of their TOEFL scores. Nonimmigrant students also must present evidence that they have adequate financial resources to meet their educational and living expenses. The university may deny admission to international applicants who lack proficiency in English.

Program in American Language Studies

The Program in American Language Studies (PALS) is the English as a Second Language (ESL) curriculum at Rutgers. It provides nonnative speakers with the English skills they need for academic work in the U.S. In August, international teaching assistants receive two weeks of classes in communications skills and teaching techniques. PALS also offers the following courses in the fall and spring terms:

Advanced Pronunciation
Grammar and Composition
Graduate ESL Seminar

Class sizes are limited, which permits teachers to give students individualized attention. Students must register to attend PALS courses, and the results of a diagnostic test determine where they are placed in classes. Supplemental assistance is available through computer and audio labs. The PALS office is located at 232 Smith Hall. To contact PALS for more information, telephone 973/353-5013, or send an email to pals@andromeda.rutgers.edu.

NOTIFICATION

Candidates who are admitted to the Graduate School–Newark are notified by the Office of Graduate and Professional Admissions. The school may cancel a student's registration, however, if he or she fails to satisfy the conditions of admission.

Unless admission is deferred, candidates are expected to register for the term for which they were admitted. Those who fail to do so may be required to submit a second application and fee to be reconsidered for admission at a later date. In addition, they may have to provide a transcript or transcripts of any intervening college work.

Admission to the Graduate School–Newark does not constitute admission to candidacy for an advanced degree. Students must submit application for such candidacy to the dean of the Graduate School–Newark and follow the procedures set forth in the Degree Requirements chapter.

NONDEGREE GRADUATE STUDENT PROGRAM

To the extent that resources permit, the faculty considers admitting qualified students to courses without making them enroll in a degree program. For information on which programs offer nondegree study, students should telephone the admissions office at 973/353-5205. Students who complete successfully courses under the nondegree program may receive as many as 12 graduate degree credits. To exercise this option, students must seek the credit within five years of taking the courses. In addition, they must apply and win admission to a graduate degree program appropriate to the courses completed. Students are expected to maintain at least a B average in their course work.

READMISSION

The Office of the Dean of the Graduate School–Newark, not the admissions office, handles all applications by former students who are seeking readmission to the school. The readmission procedure is required of all students who:

1. have withdrawn officially from school;
2. did not receive a degree in the program for which they were enrolled;
3. failed to maintain continuous registration through course work or matriculation continued status.

The following deadlines apply to students seeking admisson:

Term	Date
Fall	August 1
Spring	December 1
Summer	May 1

A student who wishes to pursue the Ph.D. degree must apply again for admission if he or she has received a master's degree from the Graduate School–Newark and has allowed more than one year to elapse after graduation. The application procedure for a student seeking admission under these circumstances follows the rules and deadlines for admission outlined earlier in this chapter.

Tuition and Fees

FEE SCHEDULE

2001–2002 Academic Year

Note: The university reserves the right to alter the amounts indicated on the following schedule at any time before the first day of classes of a term.

Application Fee, nonrefundable	$ 50.00
Tuition *	
Full-time New Jersey resident, per term	3,736.00
Full-time non-New Jersey resident, per term	5,478.00
Part-time New Jersey resident, per credit	308.00
Part-time non-New Jersey resident, per credit	454.50
Student Fee, per term	
Full time (12 or more credits)	348.00
Part time (11 or fewer credits)	107.00
Matriculation continued or 1 credit of research	7.00
NJPIRG Fee, per term	
Full-time students only; optional fee	8.75
Meal Plan, per term	
Newark Scarlet plan (150 meals + $100)	1,422.00
Newark Raider plan (125 meals + $150)	1,415.00
Newark board plan (19 meals weekly + $50)	1,430.00
Newark total plan (15 meals weekly + $100)	1,421.00
Newark retail plan (10 meals weekly + $200)	1,412.00
Newark debit plan ($350 min. + $50 admin. fee)	400.00
Housing, per term†	
University apartments:	
Academic year, including breaks	2,392.00
Calendar year	2,872.00
Miscellaneous Fees	
Computer fee (full time)	100.00
Computer fee (based on credit hours $20.00–$47.00)	20.00+
Basic health insurance program, part-time students per term (optional)‡	95.16
Major medical insurance plan, per year§	152.50
Spouse, per year	152.50
Each child, per year	152.50
Late registration fee	50.00
Late payment fee	125.00
Returned check fee	50.00
Returned check processing fee	10.00
Partial payment fee	25.00
Late payment fee for partial payments	25.00
Microfilming of doctoral dissertation	55.00
Binding fee	16.50
StudentIDfee	5.00

Note: All breakage and damage to university property is charged for in full. The university is not responsible for loss by fire or theft of private property in its buildings.

* For an explanation of New Jersey residency status, see Student Residency for Tuition Purposes in the Academic Policies and Procedures chapter.
† Housing rates may be slightly higher or lower depending on location or whether housing is single or double occupancy.
‡ Required for international students.
§ This insurance is optional.

STUDENT FEE AND OTHER CHARGES

The student fee covers student use of the student centers and the health centers, membership in the Graduate Student Association, and certain administrative services. The relatively low fee charged to graduate students does not include the fee for intercollegiate athletics, which entitles undergraduates to discounted prices for tickets.

	Full Time	Part Time
General university fee	$ 11.96	$ 7.52
Student activities		
Regular	11.00	6.00
Special	10.25	4.85
Club sports recreation	10.00	8.00
Student health service	95.16	–
Student / recreation centers	106.00	36.00
Debt service		
Building system student center	58.00	14.50
Student center operations	5.00	5.00
Career services	7.38	6.13
Student center activity	2.00	1.00
Newark facilities fee	6.25	3.00
Cultural and educational	3.00	1.00
Recreation center operations	22.00	14.00
Totals	$348.00	$107.00

CASHIER'S OFFICE

The cashier's office for student business transactions is located in Blumenthal Hall at 249 University Avenue, Newark, NJ 07102-1896. The telephone number is 973 / 353-5423. Inquiries concerning financial obligations to the university should be directed to this office.

TERM BILLS

Instructions for registration and payment of term bills are sent by mail to the student's home address for the first and second terms with the due dates indicated.

It is the student's responsibility to obtain, complete, and return the term bills on time. Students who fail to do so are charged a late payment fee of $125. Graduate students enrolled for 6 or more credits may pay their bill according to the partial payment plan outlined below. In addition, for all balances not paid in full when due, the student is responsible for all costs incurred by the university to collect such debt. This may include, but is not limited to, collection costs, litigation / attorneys fees, and court costs.

Payment of the term bill may be made in person or by mail to the Cashier's Office, Blumenthal Hall, Rutgers, The State University of New Jersey, 249 University Avenue, Newark, NJ 07102-1896. Checks or money orders are preferred and should be made payable to Rutgers, The State University of New Jersey. Cash should not be sent through the mail.

Payment also can be made by Visa, MasterCard, or Discover Card. Transactions which are declined by the bank are considered unpaid and are returned to the student. Refunds of credit card payments will be processed with a check issued by Rutgers University to the student.

Returned Checks

A service charge of $10 is assessed if a check presented in payment of fees is returned to the university as uncollectible. If collectible payment is not made before late payment deadlines, the applicable late payment fees are also charged.

PARTIAL PAYMENT PLAN

Graduate students enrolled in 6 or more credits who are unable to pay their term bill in full may arrange with the local cashier's office to pay their bill, if it indicates a net balance due of $200 or more, in three installments under the partial payment plan, as follows:

1. First payment: 50 percent of the net balance due plus a $25 nonrefundable partial payment fee payable on or before the due date indicated on the term bill.
2. Second payment: 25 percent of the net balance due on or before September 15 for the fall term and on or before February 1 for the spring term.
3. Third payment: net balance due on or before October 14 for the fall term and on or before March 1 for the spring term.

Any student submitting a term bill after classes have begun for the term must make payment according to the following schedule:

1. First payment: 50 percent of net balance due plus a $25 nonrefundable partial payment fee.
2. Second payment: net balance due on or before October 14 for fall term and on or before March 1 for spring term.

Any subsequent installment not paid on time incurs an initial late fee of $25. The university reserves the right to increase the partial payment plan fee if deemed necessary.

REGISTRATION

Activation of Registration

A student's registration is activated through the proper submission of a term bill, accompanied by payment, or through an appropriate claim of financial aid. Activation of registration will not take place if there are "holds" placed on a student's records because of failure to meet outstanding obligations.

Termination of Registration

The university exercises the right to terminate the registration of any student who has an outstanding financial obligation to the university, after sufficient notice has been given to the student. The university reserves the right to "hold" transcripts and diplomas as a result of nonpayment of obligations and to forward delinquent accounts to collection agencies and to levy collection fees. "Holds" are removed upon satisfaction of the outstanding obligation. The terminated student may petition for reinstatement by satisfying the indebtedness to the university and paying a $50 reinstatement fee.

Cancellation of Registration

To cancel registration and obtain a full refund of tuition and fees, students must notify the registrar in writing prior to the first day of classes. A student whose registration is canceled by the registrar will receive a full refund of tuition and fees, and prorated charges for room and board, if applicable. Notification of cancellation received on or after the first day of classes is treated, for billing purposes, as a withdrawal, and a refund will be made based on the general refund policy.

GENERAL REFUND POLICY

A student who voluntarily withdraws from all courses during the first six weeks of the term will receive a partial reduction of tuition (and charges for room and board, if applicable) according to the week of withdrawal as follows:

First and second week:	80%
Third and fourth week:	60%
Fifth and sixth week:	40%

No reduction will be granted after the sixth week of the term. The effective date of withdrawal is the date on which a written statement of withdrawal is received by the registrar. Student fees are not refundable. No reduction will be granted after the tenth day of classes to a student who withdraws from one or more courses but remains registered in others. No adjustment from full-time to part-time status is made after the tenth day of classes. If withdrawal from one or more courses amounts to complete withdrawal from a program, the provision for full withdrawal applies.

Failure to attend classes is not equivalent to a withdrawal, and a student will not receive an adjustment of charges unless a formal withdrawal is filed with and approved by the registrar, regardless of whether the student actually attended classes or took examinations.

Refund Policies for Title IV Funds Recipients

For recipients of Title IV funds, there are two additional refund schedules that differ from the general refund policy. First-time Title IV funds recipients who withdraw completely from Rutgers are provided with a separate schedule under the Pro-Rata Refund policy. Title IV funds recipients who are not first-time attendees are provided a schedule of refunds via the Appendix A Refund Policy.

For further information, contact the Office of Financial Aid.

Financial Aid

Tuition at Rutgers covers only a small portion of the cost of educating each student. In order to enable students of limited means to attend college, the university makes every effort to help these students find ways to finance their educations. A majority of full-time graduate students at the university receive some financial aid. The amount of support each student receives depends, in part, upon the availability of funds. The level of support often is dependent upon the specific graduate program and the student's degree status. Aid ranges from loans to grants covering tuition charges to awards sufficient to pay all educational and most living expenses. The sources of support include university funds, federal and state government funds, corporate and individual bequests to the university, and grants from educational and scientific foundations.

Limited funds are available to students at the school from scholarships, fellowships, assistantships, grants, low-interest loans, and part-time employment. To apply for grants, loans, and employment, students must complete the Free Application for Federal Students Aid (FAFSA), which is available from most college and university financial aid offices. At Rutgers, contact the Office of Financial Aid, Rutgers, The State University of New Jersey, 249 University Avenue, Newark, NJ 07102. Applicants who file by March 15 can expect a reply by June 1.

Information about fellowships and assistantships can be found under the heading Sources of Financial Aid. Fellowships and assistantships are awarded by the school and by individual academic departments. As a result, students do not have to file a FAFSA to apply for them. In all cases, applicants are considered for all forms of aid for which they are eligible.

How to Apply

All applicants must complete the Free Application for Federal Student Aid (FAFSA) annually and submit it to the federal processor at the address listed on the form's envelope. Students should submit their aid applications by March 15 if they are seeking aid for the following academic year. The forms are available at all Rutgers financial aid offices. To ensure full consideration for funds, students should file their FAFSA at the time they submit their admission application, but no later than March 15.

Letters announcing financial aid decisions are mailed to all students as soon as possible after admission. Awards are based on financial need and are limited by the March 15 priority filing date. Thus, there is a definite advantage to submitting an early, accurate, and complete application.

Counseling is available at the financial aid office to all students regardless of whether they qualify for financial aid. When comparing aid offers from Rutgers with those from other institutions, students should remember that costs often differ significantly from school to school. Therefore, the important thing to weigh is not the dollar value of a financial aid offer, but the difference between the total value of the financial aid package awarded by the institution and the cost of attending that institution.

Part-Time Students

Since financial need is determined by comparing a student's resources with the cost of attending school, most part-time students who have jobs do not demonstrate financial need.

The university has extremely limited financial aid funds for part-time students. All application procedures and deadlines applicable to full-time students apply to part-time students.

SOURCES OF FINANCIAL AID

Fellowships, Scholarships, and Grants

Ralph Johnson Bunche Distinguished Graduate Award. Established in 1979, this distinguished graduate award is named after Ralph Johnson Bunche, the black American statesman, Nobel Peace Laureate, and recipient of an honorary Doctor of Laws from Rutgers in 1949. Bunche fellowships provide $13,000 plus tuition remission to exceptional, new, full-time students with backgrounds of substantial educational or cultural disadvantage. To apply, check the appropriate box on the graduate and professional school application form. Only those applicants receiving awards will be notified. The award is contingent upon acceptance to a graduate and professional school program and upon full-time enrollment. The application deadline for fall term awards is March 1, unless the program to which the student is applying has an earlier deadline.

Diversity Advancement Program in Teaching and Research. Trustees' Minority Graduate Fellowships in the Humanities and Social Sciences. DAP excellence and Trustees' Minority Graduate Fellowship awards support African-American, Hispanic, or American Indian students who are seeking a Ph.D. Applications should be made to the director of the graduate program in which the student is enrolled. Students should have their applications in before March 1 for awards for the ensuing academic year, and before December 1 for vacancies that might occur in the spring term.

Educational Opportunity Fund (EOF). New Jersey residents who are full-time students and who can demonstrate backgrounds of financial and academic hardship are eligible for EOF grants ranging from $200 to $2,650. Students who received EOF grants as undergraduates are presumed eligible if they fall below the maximum income parameters required for all recipients of this state grant. Graduate students who did not receive EOF grants as undergraduates, but feel that they come from backgrounds of financial hardship and wish to be considered, should write to the financial aid office for consideration. The grants are renewable for the duration of a student's degree work. The student must demonstrate continued eligibility and provide evidence of satisfactory academic progress. In addition, students must complete the FAFSA form to be considered.

Inge Gambe Graduate Scholarship. Academic excellence and service to the Rutgers–Newark community are the criteria for this scholarship of $500 or more. For more information, contact the Office of the Dean, Graduate School–Newark, Rutgers, The State University of New Jersey, Newark, NJ 07102.

Graduate and Professional Scholar Awards. Outstanding students in the graduate and professional schools are eligible for merit scholarships of $2,200 per year for full-time study for as many as two academic years. To apply, check the appropriate box on the graduate and professional school application form. Students should submit in duplicate any statements that provide evidence of academic or artistic achievement, significant life work, or extracurricular activities.

The award is contingent upon acceptance to a graduate or professional school program, and only those applicants receiving awards will be notified. The application deadline for fall term awards is March 1, or sooner if a specific program has set an earlier deadline. In any case, students must submit their application forms to the appropriate admissions office by the program deadline date.

Daniel S. Lehrman Fellowship. Outstanding students in the graduate programs in the Institute of Animal Behavior in Newark are eligible for the Daniel S. Lehrman Fellowship. The award, made by the dean of the school, is for a minimum of $14,000 plus tuition remission, and it may be renewed.

Minority Biomedical Research Fellowships. The Minority Biomedical Research Support Program, which is funded by the National Institutes of Health, provides fellowships, including tuition remission, for minority students who plan to have research careers in the biomedical sciences. For information, write the Director, MBRS Program, Rutgers, The State University of New Jersey, 404 Hill Hall, Newark, NJ 07102, or call 973/353-5772.

New Jersey State Grant. Full-time graduate students, who are classified as New Jersey residents for tuition purposes and who demonstrate financial need, are eligible to receive a New Jersey State Grant. Amounts vary from $200 to $2,650 per year. The money is dependent upon funds being available, and grants are renewable. EOF grant recipients are not eligible.

Russell Scholarships. Walter C. Russell Graduate Scholarships provide for the cost of tuition. A student seeking these scholarships should apply to the director of his or her graduate program. Applications should be in by March 1 for those students seeking consideration for awards in the ensuing academic year. The deadline is December 1 for vacancies that might occur in the succeeding spring term.

Rutgers Excellence Dissertation Fellowship Awards. This award is issued by departments of the university through the Graduate School–Newark on the basis of exceptional academic merit, as evidenced by scholarly promise. The award is for $14,000 plus tuition remission. These awards usually are supplemented by the graduate program for three additional years of support, usually as teaching assistantships.

Nonuniversity Fellowships. Some graduate students at the university are supported by fellowships funded by sources outside the university. A major source of funding is the National Science Foundation, which offers talented graduate students in the sciences significant funding to pursue their academic programs. Special awards are given to minority students, who traditionally have been underrepresented in the sciences. Information and applications are available from the Fellowship Office, National Research Council, 2101 Constitution Avenue NW, Washington, DC 20418.

Other sources of prestigious fellowships are the Jacob K. Javits Fellows Program, funded through the U.S. Department of Education; the Mellon Fellowships in the Humanities, administered by the Woodrow Wilson National Fellowship Foundation; and the National Defense Science and Engineering Fellowships, sponsored by the Department of Defense.

Students may wish to consult standard reference material for other sources of nonuniversity fellowships. Many national, state, and regional associations make special awards. Students should contact clubs; fraternal, religious, and national professional organizations; and local interest groups for possible aid through stipends and tuition credits. A student who receives any of these awards, however, is required to notify the Office of Financial Aid.

Other Nonuniversity Awards. In addition to opportunities for financial assistance through the university, there are other sources from which qualified graduate students may receive financial aid.

Each department continually is seeking funds from outside agencies to help defray student expenses. Grants and awards of this nature will vary each year. Inquiries regarding the availability of such monies can be made through program advisers.

Many national, state, and regional associations make special awards. Students should contact clubs; fraternal, religious, and national professional organizations; and local interest groups for possible aid through stipends and tuition credits. A student who receives any of these awards is required to notify the Office of Financial Aid.

Loans

Federal Perkins Loan (formerly National Direct Student Loan–NDSL). Federal Perkins Loans are available to students who are enrolled in a minimum of 6 credits per term, who are citizens or permanent residents of the United States, and who demonstrate need through the FAFSA. The maximum amount a graduate student can borrow under this program at Rutgers is $3,000 per academic year, with maximum aggregate loan amount not to exceed $40,000 (including undergraduate NDSL and Perkins loan total).

Interest at the rate of 5 percent simple begins nine months after the borrower ceases to enroll in a minimum of 6 credits per term. It extends over a maximum repayment period of ten years. Monthly payments depend on the size of the debt and the length of the repayment period. Repayment may be deferred or the loan itself canceled for students who enter certain forms of public service.

Consistent with federal regulations, all first-time Federal Perkins Loan borrowers at Rutgers are required to attend an entrance interview to learn about their rights under the loan. In addition, Perkins Loan recipients must attend an exit interview before they graduate or withdraw from school. Rutgers sends each of its students details about repayment of the Federal Perkins Loan. The student loan office, part of the Division of Student Financial Services, is located at 65 Davidson Road, Room 310, Piscataway, NJ 08854-8093.

William D. Ford Federal Direct Loans. Federal Direct Student Loans (Direct Loans) are available to students from the federal government to pay for educational costs. These loans eliminate the need for an outside lender, such as a bank. To be considered for a Direct Loan, students must complete the FAFSA. Subsequently, the award letter issued by Rutgers will list eligibility for the program. Money awarded to students will be credited directly to their accounts. Because Rutgers has chosen to participate in direct lending, the university cannot accept any Federal Stafford applications from students or their lenders. Since the U.S. Department of Education is the lender for the Federal Direct Loan Program, borrowers will send all loan repayments to the department, rather than to several lenders.

In general, to be eligible for a Direct Loan, a student must:

- have a high school diploma or a General Education Development (GED) certificate or meet other standards set by the U.S. Department of Education,
- provide evidence of U.S. citizenship or be an eligible noncitizen,
- be enrolled at least half time per term and be making satisfactory academic progress,
- have a Social Security number,
- sign a statement of educational purpose,
- not be in default on prior loans or owe refunds to a federal grant program, and
- register with the U.S. Selective Service Administration, if required.

In addition to these requirements, all first-time Federal Direct Loan borrowers must attend an entrance interview in order to learn about their rights and responsibilities regarding the loan.

The aggregate limit for Federal Direct Loans, including both subsidized and unsubsidized amounts, is $138,500 for a graduate or professional student (including loans for undergraduate study).

Federal Direct Subsidized Loan. This loan is based on financial need. The government pays the interest on the loan while the student is attending school. The variable interest rate is adjusted each year. Effective July 1, 2001, the maximum rate for the Federal Direct Loan was 5.99 percent. Additionally, borrowers are charged an origination fee of 1.5 percent. Graduate students may borrow $8,500 per year. The total debt may not exceed $65,500, including loans for undergraduate years.

Federal Direct Unsubsidized Loan. This loan is not based on financial need, and all interest charges must be paid by the student. The interest rate is the same as that of the Federal Direct Subsidized Loan. Students may borrow as much as $18,500 per year, less any amount from the subsidized loan program. The total debt permitted for all subsidized and unsubsidized Direct Loans is $138,500.

Emergency Loans. Students having a financial emergency may apply for a university loan of as much as $500. The interest rate is 3 percent simple, and the loan must be repaid within the same term. Students must demonstrate that they have an emergency, and funds must be available.

Students should contact their local financial aid office for more information. If they are seeking more than the maximum amount, they should make an appointment with a counselor to discuss long-term assistance. Students need not be recipients of financial aid or have filed a financial aid application to be considered for emergency loans. Several graduate schools offer low-interest or interest-free, short-term loans to students in their programs. Students should request additional information from the various deans or directors of each program.

Employment

Assistantships Awarded by the University. The beginning salary for teaching and graduate assistantships is $14,300 (2002–2003) for an academic year.

Applications for assistantships are due on or before March 1, although awards occasionally are available at later dates. Prospective graduate students may apply for assistantships when they receive an application form for admission.

Applicants completing the appropriate section of the admission application are considered for those financial awards granted by the university for which they may be eligible. In most cases, the letters of recommendation required for admission also serve as letters of recommendation for assistantships. Should a separate application be required for a newly established program, students will receive notice of this with their admissions packets. A graduate student already enrolled at the university who wishes to apply for an assistantship should inquire at the office of the director of his or her graduate program.

Federal Work-Study Program (FWSP). Federal Work-Study employment may be offered to students with financial need as a self-help portion of the financial aid award. To apply for this program, students must file the FAFSA.

On-campus jobs are available in almost all departments of the university. Students are assigned jobs based on their skills, job availability, university needs, and student preference. No job assignments are made until all paperwork required for the acceptance of the aid has been completed.

Students may work up to twenty hours weekly during the academic year. In the case of summer assignments, students may work up to thirty-five hours per week. Once a job is assigned, it is anticipated that the student will continue in that position through the entire academic year. Any change in work-study jobs must be made through the Office of Financial Aid.

Off-campus employment also is available through the Federal Work-Study Program. These jobs are paid community service positions in nonprofit agencies.

For more information about Federal Work-Study jobs on and off campus, contact the Office of Financial Aid, 249 University Avenue, Blumenthal Hall, Room 302, Newark, NJ 07102.

Employment with Any Administrative Office Not Listed with the Student Employment Office. Any graduate student enrolled at the university may check directly with the individual academic or administrative offices for available openings. Students receiving financial aid must be cleared by the Office of Financial Aid before taking employment.

Veterans Benefits

The United States Veterans Administration operates various education assistance programs for eligible veterans, war orphans, spouses or children of veterans killed while on duty with the Armed Forces, disabled veterans, dependents of a veteran with service-related total disability, and certain members of the selected reserve. Inquiries concerning eligibility may be directed to the Veterans Administration office in Newark, NJ (telephone 800/827-1000); the New Jersey Department of Military and Veterans Affairs in New Brunswick, NJ (732/937-6347); or to the veterans coordinator on each campus. For New Brunswick, the number is 732/445-3557.

Initially, veterans and others mentioned above who plan to use veterans' education benefits should present the Veterans Administration Certificate of Eligibility Form(s) and/or discharge papers (certified copy of the DD214) when registering for courses. If applying for other financial aid with the university, veterans must report to the Office of Financial Aid that they will receive veterans' education benefits.

Veterans planning to train under Chapter 32 VEAP, Chapter 30 of the New (Montgomery) GI Bill of 1984, or Chapter 106 for Reservists, are required by the university to pay cash for tuition, fees, books, and supplies, when due. Veterans, in turn, receive an allowance for each month of schooling based upon credit hours and the number of dependents.

No veteran may officially withdraw from a course (or courses) without prior approval from the academic services and/or dean of students offices. All withdrawals must be submitted in writing. The date of official withdrawal will be the determining date for changes in benefits. Failure to comply with the official school withdrawal procedure may affect both past and future benefits. Any change in schedule also must be reported to the campus Office of Veterans Affairs.

RESTRICTIONS ON FINANCIAL AID AND EMPLOYMENT

Ordinarily, graduate students may not accept two different financial awards from the university simultaneously. Students who have been offered two different awards should inquire at the dean's office of the school of matriculation before accepting either. Students who hold fellowships, assistantships, internships, or Russell Scholarships should advise their graduate director before accepting other employment.

Graduate students who have received aid administered by the Office of Financial Aid must report to that office any change in income, such as scholarships, loans, gifts, assistantships, or other employment received subsequent to the original aid award.

Student Services

LIBRARIES

The academic programs of the Newark campus are supported by the John Cotton Dana Library and by the print and electronic resources provided by the Rutgers University library system. The Dana Library, which is located in the center of the campus plaza, has a collection of nearly 700,000 volumes. This figure includes approximately 337,197 books, 122,819 bound periodicals, and 239,597 federal and state publications. The library, which also has 841,448 pieces of microform and 17,047 audiovisual items, subscribes to more than 3,038 periodicals.

The library's regular hours during the fall and spring terms are Monday through Thursday, 8:00 A.M. to midnight; Friday, 8:00 A.M. to 7:00 P.M.; Saturday, 10:00 A.M. to 6:00 P.M.; and Sunday, noon to 10:00 P.M.

Changes in these hours are announced in the Observer (the student newspaper) and are posted in the library and elsewhere on campus. Dana Library's Media Services unit is housed in a modern media complex that has a growing collection of videotapes, audio recordings, cassettes, and other nonprint materials. The Media and Digital Services complex, which is adjacent to the Institute of Jazz Studies on the library's fourth floor, includes media / group study rooms, booths, and carrels; a multipurpose room for film and video viewing; computer presentations; and an exhibition gallery. There is a new media retrieval system that distributes audio and video information throughout the space. Available technologies enable students to create and edit streaming video from analog sources, create digitized audio, and scan images.

Through the Rutgers University Libraries' online information system, the Dana Library provides access to a wide variety of databases and full-text electronic journals and other resources. The Dana librarians meet with classes in a state-of-the art electronic / multimedia classroom to provide instruction in the use of the new information technologies and in library research strategies. These librarians also provide assistance to students on a one-to-one basis in the use of appropriate bibliographic tools and information services. For a fee, the library provides computer-assisted bibliographic search services.

Other libraries on the Newark campus include the Criminal Justice / NCCD Collection, a branch of the Dana Library located at 15 Washington Street, and the School of Law Library, which is located in the new Center for Law and Justice building.

The Institute of Jazz Studies, a branch of the Dana Library that is located within the Dana facility, houses collections of more than 149,036 recordings in all formats; 8,238 books on jazz and related subjects; a comprehensive collection of jazz periodicals, photographs, sheet music, and big band arrangements; and memorabilia.

Newark students and faculty members have direct borrowing privileges at all Rutgers University Libraries on the Camden, Newark, and New Brunswick campuses. (See the Divisions of the University chapter for a complete list of university libraries.) The total holdings of the Rutgers libraries include nearly 3.3 million volumes, more than 4.3 million microform units, and 22,686 current serial subscriptions.

Information about the holdings of library materials in all of the Rutgers libraries is available in IRIS, the libraries' online catalog. Rutgers also is a member of several local, regional, and national resource-sharing networks, such as the Research Libraries Group, INFOLINK, the Eastern New Jersey Regional Library Cooperative, and the New York Metropolitan Reference and Research Library Agency. Upon request, Dana will obtain a loan or photocopy of items held by other libraries, both within and outside Rutgers.

The Rutgers University Libraries' web page provides links to the catalogs of library holdings of neighboring institutions, such as the University of Medicine and Dentistry of New Jersey, New Jersey Institute of Technology, and the Newark Public Library. Upon presentation of a valid Rutgers identification card, students and faculty members have borrowing privileges at these three libraries, as well as at the library of Essex County College. Other available library facilities in Newark include libraries at the Newark Museum and the New Jersey Historical Society. Requests for borrowing privileges at the Newark Public Library should be directed to Dana's circulation department.

COMPUTER SERVICES

Newark Computing Services (NCS) provides computing, networking, and information services in support of the university's instructional, research, and administrative activities. All NCS facilities and Coordinated Instructional Facilities (CIF) are fully networked and are available to the Rutgers community. Each matriculated student can obtain a computing account to access communication, computing, and information services. Some of the services include access to electronic mail, the Internet, and online library catalogs, including Rutgers' own IRIS catalog. In addition, students get access to the Campus Wide Information Service, word processing, spreadsheets, desktop publishing, graphics, and national and local electronic discussion groups. All of these services are available through more than 400 PCs and Macs at NCS and CIF facilities, or students can access these services remotely through dial-up telephone lines.

TEACHING EXCELLENCE CENTER

The Teaching Excellence Center, located at 206 Blumenthal Hall, provides support to faculty members, departments, and schools and colleges that seek to improve teaching and learning activities on the Newark campus. Throughout the year, the center conducts workshop seminars and programs, provides instructional development services, and offers grants for faculty members and teaching assistants. The center also features a confidential consultation service for departmental self-study and instructional review. The center's library has numerous resources on teaching, including books, reprints, and audio- and videotapes. Individual confidential consultation ranges from videotaping of teaching techniques and classroom observation to help in developing a teaching portfolio, and a review of instructional materials. Individuals can obtain more information on the services and activities offered by visiting the center or by calling 973 / 353-1534.

HOUSING

The university's Talbott Apartments complex consists of two- and four-bedroom units, with each unit housing four students. Talbott offers twenty-four-hour security, on-site laundry facilities, and a modern fire and smoke detector system in each apartment and public area. The apartments are centrally located, giving students easy access to campus facilities. For students willing to pay an additional charge, a limited number of parking spaces is reserved nearby.

A full-time professional resident director lives in Talbott, and student resident assistants are on each floor. The staff works with students to provide a full range of educational, social, and recreational activities. Staff members also encourage students, as individuals and in groups, to take advantage of the unique cultural and educational opportunities of the Newark-New York metropolitan area.

For more information on housing and related services on the Newark campus, contact the Office of Housing and Residence Life, 91 Bleeker Street, Newark, NJ 07102, or call 973/353-1037.

DINING SERVICES

Breakfast, lunch, and dinner are available on a cash basis in the Robeson Campus Center whenever classes are in session. Each day, the dining area offers a wide variety of hot entrees, a salad bar, homemade soups, and a grill and deli for those who want sandwiches. Sandwiches, soups, salads, and Pizza Hut pizza are available in the food court located in the student lounge. The University Club is an upscale buffet luncheon facility that may be reserved for private functions as well. R Place, a coffeehouse, offers a place to meet, relax, and get a cup of espresso or cappuccino. The dining service also provides catering for student, faculty, staff, and alumni events in the Robeson Center and throughout the campus.

Stonsby Commons, opened with Woodward Hall in 1990, offers an alternative style of service for resident students, commuters, and other members of the Rutgers community. All meals in this attractive facility are served on an all-you-can-eat basis. Although residents of Woodward are required to obtain a meal plan, students living at Talbott and all other students have the option of purchasing one. All members of the Rutgers–Newark community also have the option of paying a cash equivalent charge for each meal served.

For further information regarding these dining services and meal plan options available, call the dining services manager at 973/353-5999.

RUTGERS STUDENT HEALTH SERVICE

All full-time students can receive medical services at the Rutgers Student Health Service, located in Room 104 of Blumenthal Hall at 249 University Avenue on the Newark campus. Part-time students can become eligible by paying the student health service and insurance fee to the Office of Student Health Service in Newark or to the Office of Student Health Insurance, Hurtado Health Center, Rutgers, The State University of New Jersey, 11 Bishop Place, New Brunswick, NJ 08901-1180.

The health center is staffed by physicians, nurse practitioners, registered nurses, health educators, and other professionals. It provides a wide range of services, including general primary care, gynecology, health education, alcohol and other drug counseling, mental health services, immunizations, treatment to reduce the effect of allergies, laboratory tests, physical examinations, and referrals to other providers. Surgical and critical medical conditions are referred to the student's personal physician, the proper specialist, or an outside hospital for treatment.

Students are urged to use the health center for medical treatment, health education, and preventive medicine. Services are rendered confidentially. Some health services provided by outside consultants and facilities are the financial responsibility of the student.

The health center is open from 8:30 A.M. to 5:00 P.M., Monday through Friday. To reduce waiting time, students should schedule appointments. The phone number is 973/353-5231.

The Newark Health Center Pharmacy, located in Room 104, Blumenthal Hall, is open daily from 11:30 A.M. to 3:30 P.M., Monday through Friday. Students can phone in, drop off, fax, or send their prescriptions by campus mail and pick them up the next day. The phone number is 973/353-5201, ext. 235. The pharmacy also carries over-the-counter medications, vitamins, homeopathic medications, and many other medical aids.

STUDENT HEALTH INSURANCE

All full-time students, by paying the student fee, and those part-time students who elect to pay the student health service and insurance fee, are insured for up to $5,000 in medical expenses brought about by illness or accident. This policy provides excess coverage over other group insurance plans. Students have the option to purchase a major medical policy sponsored by the university that provides more extensive coverage. Students also may purchase coverage for their spouses, sole domestic partners, and children at additional cost. Any student not covered by individual or family policies, particularly international students, should consider this coverage. Information and applications are available from the Office of Student Health Insurance, Hurtado Health Center, Rutgers, The State University of New Jersey, 11 Bishop Place, New Brunswick, NJ 08901-1180 (732/932-8285).

Compulsory International Student Insurance Fee

All students in F or J immigration status whose visa documents are issued by Rutgers are required to have both the basic and the major medical insurance coverages. The costs for insurance are charged to such students on their term bills. All accompanying family members (spouse and children) also must be insured. Insurance coverage for spouses and children must be purchased through the international health insurance adviser, located at the Center for International Faculty and Student Services, Rutgers, The State University of New Jersey, 180 College Avenue, New Brunswick, NJ 08901-8537 (732/932-7015).

COUNSELING SERVICES

Counseling Center

A staff of clinical psychologists and other mental health professionals is available to work confidentially with students who have personal problems or who are having difficulties coping with university life. Students seeking help should call 973/353-5805 to make an appointment to see a counselor in Blumenthal Hall.

International Student Services

The Office of International Student Services helps nonimmigrant international students with issues of special concern to them. It also serves these students as a referral source to other university offices, academic departments, and outside agencies. The office provides direct support with employment, immigration, personal, and other matters. In addition, it sponsors a variety of programs throughout the year.

Advice on immigration includes both general information on students' rights and responsibilities as well as assistance with special problems, procedures, and documents. The office can help students with paperwork required to transfer between schools, get extensions of stay, obtain work permits, and acquire practical training experience. Staff members also provide support and advice on such matters as adjustment to life in the United States, cross-cultural differences, family concerns, health care and insurance, and other personal issues. The office is located at Smith Hall, Room 235. For additional information, call 973/353-1427.

Counseling for Disabled Students

Students who wish to obtain assistance because of a disability should contact the adviser for disabled students in Room 234 of the Paul Robeson Campus Center. Special counseling and direct assistance are available to make all programs of the university accessible to any student. Call 973/353-5300 for information and assistance. For deaf and hearing-impaired students, the TDDY number is 800/855-1155. On-campus housing for disabled students is available through the Office of Housing and Residence Life, 91 Bleeker Street. Call 973/353-1037 for further information.

Veterans Services

Veterans and their dependents can obtain counseling services in the Paul Robeson Campus Center, Room 234. Staff members provide assistance on GI benefits, admission, financial aid, work-study programs, tutoring, and employment opportunities. The staff keeps veterans informed of current state and national legislation that affects them. Both personal and group counseling for veterans can be arranged through this office. For further information, call 973/353-5300. Certification of a veteran's status as a full-time student is done at the Office of the Registrar, 249 University Avenue.

Career Counseling and Placement Service

The Career Development Center, located in Rooms 309 and 313 of Hill Hall, offers a variety of services to students and alumni. Professional career counselors are available to help students determine appropriate educational goals and career choices. The staff provides individual career counseling, group workshops, vocational testing, internship information, and special programs. Staff members also help with job search strategies, building résumés, and interviewing techniques. A small career library at the center has texts on selecting a career, job leads, graduate and professional study, and standardized testing.

The center posts on the Internet employer leads; part-time, seasonal, and entry-level employment opportunities; and openings for experienced professionals. Prospective employers conduct on-campus interviews with students during the fall and spring recruitment periods. Annual career fair events are held in September, November, and April. To provide answers on succinct questions, the center maintains convenient walk-in periods. For an appointment with a professional counselor to obtain more detailed help, call 973/353-5311. For more information on the center and its activities, visit the center's web site at http://rutgers-newark.rutgers.edu/cdcrun.

DAY-CARE CENTERS

The Mt. Carmel Guild Children Center is available to the children of Rutgers–Newark faculty and staff members and to students. It is a professional learning center for young children ages one-and-one-half to six (kindergarten) years. Certified personnel staff the center, which is adjacent to the Newark campus at 39 Bleeker Street. For further information, contact Paula Johnson, the center's director, at 973/643-4956.

The Rutgers CHEN School, located at 32 Central Avenue, is available to children of economically eligible students, faculty, and staff members at Rutgers–Newark, and community residents. Staffed by certified personnel, the Rutgers CHEN School is a professional learning center for young children ages three months to six years. For further information, contact Dolores Towe, the director, at 973/624-1681.

PARKING AND TRANSPORTATION SERVICES

Blumenthal Hall, Room 105
249 University Avenue

Students may park at Parking Deck I, 200 University Avenue, Monday through Friday from 7:00 A.M. to midnight and on Saturday to 7:00 P.M. The hours at Parking Deck II, 166 Washington Street, are Monday through Friday from 7:00 A.M. to midnight, and parking is available at Lot #508, adjacent to Bradley Hall, after 4:00 P.M. on weekdays. Student deck permits can be purchased at the photo ID/permit sales window on the third floor of Blumenthal Hall. The current cost of the permit, which is valid for the entire academic year, is $25. In addition to the $25 fee, permit holders pay daily rates of $2.75 at each facility. Owners of vehicles without a valid Rutgers permit pay $4.50 per day.

Students residing at Talbott or Woodward halls may purchase reserved twenty-four-hour resident parking permits in Deck I. A limited number of reserved spaces are available, however, and permits are sold on a first-come, first-served basis. Residents may opt to purchase an annual contract (September 1–August 31) for $745, an academic-year contract (September 1–May 31) for $625, or a single-term permit for $325. A permit for the summer costs $205. Partial payment contracts are available. For further information and the fee structure, call 973/353-5873.

Vehicle registration materials, including registration forms and payment instructions, are mailed to students during the summer. To avoid waiting in line on the first day of class, use the return envelope accompanying these materials to register by mail. Vehicle registration materials also are made available by the admissions office at new student, in-person registrations. The university assumes no responsibility for the security of vehicles or their contents while they are parked at university facilities.

Shuttle Van Service

Throughout the academic year, a free shuttle van service is available for the exclusive use of Rutgers and New Jersey Institute of Technology faculty and staff members, students, and their guests. To board the van, students must present a valid photo ID card. The shuttle's designated stops include key locations around the main campus, NJIT, Newark's Broad Street and Penn stations, Kearny, and Harrison. Schedules are available online at http://nwkparking.rutgers.edu/. Schedules also are available at the University Police Headquarters (973/353-5581) or from shuttle drivers.

Railroad Discounts

Full-time students who travel by train are eligible for the New Jersey Transit System Student Discount Program. To get a discount on the purchase of a monthly commutation ticket, students must obtain a railroad discount form at the train station. They then present this form to the registrar's office for authorization before purchasing a monthly ticket. For help in planning a visit or commute to the campus, contact Rutgers Information at 732/932-INFO (4636).

PHOTO IDENTIFICATION CARDS

Students will need a Rutgers photo ID card to purchase a parking permit, borrow library books, use sports facilities, and qualify for student discounts. The Photo ID/Permit Sales Office is located at 249 University Avenue on the third floor. It provides the following services: ID processing, motor-vehicle registration, and sale of parking permits. Anyone who requires parking must purchase a parking permit valid for use in a student-designated parking facility. To obtain a permit, present a valid photo ID card, complete the motor-vehicle registration form, and follow the instructions provided by the Photo ID/Permit Sales Office.

Regular office hours are Monday, Tuesday, Thursday, and Friday from 8:30 A.M. to 4:30 P.M., and Wednesdays from 8:30 A.M. to 6:30 P.M. During the first two weeks of class each term, office hours are extended to 6:30 P.M. In June, July, and August, the hours are 8:30 A.M. to 4:30 P.M., Monday through Friday. For questions, telephone the Photo ID/Permit Sales Office at 973/353-5873.

CAMPUS CENTER

The Robeson Campus Center, located at 350 Dr. Martin Luther King, Jr. Boulevard, is the focal point for student activities and a place for gatherings of all kinds by the Rutgers–Newark community. Open to all students, faculty and staff members, and alumni, the campus center features meeting and conference rooms; student lounges; and a game room for table tennis, pocket billiards, chess, and other table games. In addition, the center provides offices and mailboxes for student organizations, a multipurpose room capable of holding functions for more than 600 people, and additional meeting and activities spaces. The center has three dining facilities: a dining hall that accommodates 300 people, the University Club for fine buffet luncheons, and a food court adjacent to the new student lounge. Finally, the center houses a gift shop and the R Place, a coffeehouse and social gathering spot.

The Robeson Campus Center is open Monday through Friday from 7:30 A.M. to 10:00 P.M., and Saturday and Sunday from 11:00 A.M. to 7:00 P.M. The Gift Shop hours are Monday through Thursday from 8:00 A.M. to 6:00 P.M., and Friday from 8:00 A.M. to 3:00 P.M. The R Place is open Monday through Thursday from 8:30 A.M. to 6:00 P.M. To reserve space in Robeson Campus Center facilities, contact the administrative office in Room 219, or call 973/353-5568.

STUDENT ACTIVITIES

To broaden the overall educational development of its students, Rutgers maintains a quality out-of-classroom program. The Office of Student Activities and the Rutgers–Newark Program Board plan an extensive activity program that enriches the educational, cultural, and social experiences of all students who participate. The Office of Student Activities is responsible for developing specific programs and activities for a diverse student community. It advises minority students and their organizations on all aspects of campus activities that supplement their regular university curricula.

Musicians, featuring both classical and contemporary styles, appear regularly on campus. The Rutgers–Newark string orchestra, concert band, and university chorus provide outlets for student musical talent, and art exhibits are a frequent feature at the campus center. Professional and student groups perform at the theater, and several student organizations promote frequent trips to New York theaters. The Observer, the student newspaper; the Encore, the university's yearbook; WRNU, the student radio station; and several other organizations provide valuable experience for students interested in communication and the media.

Nearly one hundred on-campus undergraduate organizations related to academic interests, contemporary problems, the arts, religion, and the professions encourage students to participate in their regularly scheduled meetings and special events. Both social and honorary fraternities and sororities are available to students who wish to identify with small service, social, or professional groups.

GRADUATE STUDENT GOVERNMENT

The primary mission of the Graduate Student Government (GSG) is to ensure that the interests of all graduate students are recognized and represented. The GSG has an executive board that includes a president, vice president, treasurer, secretary, and senator, and one voting representative from each of the graduate programs. The GSG works to ensure that funds from student fees are distributed to participating programs in a way that encourages quality activities and helps to enhance the campus environment for all students.

In addition, the GSG sponsors an annual reception for the graduate school after graduation. At this event, it distributes awards for excellence in academics, teaching, and research. For further information on the GSG, contact the graduate dean's office.

ATHLETIC FACILITIES

The Golden Dome Athletic Center, the Golden Dome Tennis Complex, and Alumni Field serve as home territory for all Rutgers–Newark varsity teams and help support various recreational and community service projects.

The Golden Dome Athletic Center, located at the southeast corner of the campus, is the main athletic facility at Rutgers–Newark. Known for its unique geodesic, gold-colored roof, the Golden Dome Athletic Center is a multipurpose facility that is used for intercollegiate athletics and recreation. The center includes the 2,000-seat Golden Dome Arena; an eight-lane, twenty-five-yard swimming pool; four racquetball courts; a plush student lounge; conference rooms; and a large, two-bay gymnasium.

The Dome also features an expanded fitness center, with free weights and a Nautilus room, and a multipurpose aerobics and exercise room. The latter is equipped with state-of-the-art fitness machines, including stairmasters, life steps, lifecycles, treadmills, Nordic Tracks, and Lido circuit training equipment.

Behind the Athletic Center is the Golden Dome Tennis Complex with five outdoor-lighted courts that serve the Raider tennis teams and provide recreation to the Rutgers community.

Directly across from the main campus is Alumni Field. This lighted facility is the scene of Rutgers–Newark men's soccer games in the fall and baseball and softball contests in the spring. It has a running track for recreational use all year.

ALUMNI

Alumni Relations

The university seeks the full support of its alumni and, in return, offers them several services and programs. The Department of Alumni Relations works with the university's entire alumni body, now numbering more than 300,000. The department has two main objectives. First, it maintains contact with Rutgers alumni, informing them of the university's programs so that they might assist Rutgers in fulfilling its educational goals. Second, the department encourages alumni to continue their university friendships after graduation through social, educational, and reunion activities.

Several graduate programs at the university have their own alumni associations that maintain active membership through payment of regular alumni dues. Each alumni association is represented in the Rutgers University Alumni Federation, which sponsors universitywide programs, such as homecoming, distinguished alumni awards, legislative receptions, group travel, and insurance.

The Department of Alumni Relations provides guidance and administrative services to each of the college associations, as well as to the network of regional alumni clubs throughout the country.

The university publishes a magazine for alumni and friends of the university.

The department's Newark office is located at Hill Hall, Room 323, 360 Dr. Martin Luther King, Jr. Boulevard, Newark, NJ 07102 (973/353-5242).

Rutgers University Foundation

The Rutgers University Foundation is the fund-raising arm of Rutgers, The State University of New Jersey. The Rutgers Foundation was incorporated in 1973 to support the university in obtaining private funds to meet important needs for which adequate monies may not be available from state, federal, or other sources. Scholarship and fellowship support for undergraduate and graduate students is essential, and academic programs seek the extra margin of excellence that only private giving can provide.

The professional staff of the Rutgers Foundation has helped the university's faculty, administration, and staff raise well over a half-billion dollars since its incorporation twenty-nine years ago. Private fund-raising in the 2000-2001 fiscal year totaled $123,302,686, an all-time yearly high.

Rutgers is now embarked on a major university-wide campaign to raise $500 million by June 2004 and is well on its way toward reaching that goal. "The Rutgers Campaign: Creating the Future Today" is designed to advance Rutgers' academic growth as one of the nation's top public universities. The purposes of the campaign include attracting and supporting the best students, ensuring a superior academic program, advancing the quest for knowledge, recruiting and retaining top faculty, enriching the campus and community environment, and providing outstanding facilities and equipment.

The Rutgers Foundation staff provides information about the full range of giving opportunities to donors and prospective donors, including individuals, corporations, and foundations. The staff also cultivates donors and potential donors through a variety of activities, helps donors make sound choices on how to give and the designation choices available to them, and ensures that they are properly thanked for their gifts. Fund-raising officers are also based in many of the university's schools and colleges and work very closely with the foundation.

Persons interested in making contributions to any unit of the university or to Rutgers as a whole may do so by writing a check payable to the Rutgers University Foundation. The check should be accompanied by a brief note stating the designation of the donation and whom the gift is from. Checks should be mailed to: Accounting Department, Rutgers University Foundation, 7 College Ave., New Brunswick, New Jersey 08901-1261.

More information about private giving to Rutgers may be obtained from the Rutgers University Foundation, Winants Hall, 7 College Avenue, New Brunswick, NJ 08901-1261; 732/932-7777.

Academic Policies and Procedures

STUDENT RESPONSIBILITY TO KEEP INFORMED

This catalog provides a summary of the rules governing graduate work at the university. Students are expected to keep their copy as a reference handbook and to familiarize themselves with the principal rules and regulations contained in it. All academic and other regulations established by the faculty and the administration of the Graduate School–Newark and the Board of Governors of the university are subject to amendment at any time. Any significant changes made after the publication of this catalog will be circulated to registered students through their graduate program offices.

In general, students should address their questions to their graduate program directors. Questions related to general graduate student rules under the jurisdiction of the Graduate School–Newark also may be directed to the Office of the Dean, Hill Hall, Room 401.

REGISTRATION AND COURSE INFORMATION

Before the start of the fall and spring terms, each newly admitted student receives a prepared registration form from the university. Official registration and billing forms should be received by the student well before the first day of class. It is the responsibility of the student to remain in communication with the Office of the Graduate Director. Newly admitted students who have not received registration materials before the first day of classes should contact the Office of Admissions. Readmitted students who have not received materials before the first day of classes should contact the Office of the Dean.

Registration forms must be submitted by the student to the Office of the Registrar and must be received at that location by the announced deadlines. Overdue forms may require subsequent correspondence, entail additional fees, and necessitate reregistration. Forms may be returned by mail, but students should allow as many as ten days for campus mail delivery, and it is prudent to deliver them by hand. Students can add courses during the first eight calendar days of the term and drop them for the first seven calendar days. Individuals can confirm their registration via the Rutgers Touchtone Registration System or on the web at http://registrar.rutgers.edu. It also is possible to get a printout of one's registration choices at the registrar's office. Advising arrangements vary according to the needs of particular graduate offices.

A student admitted into a degree program of the Graduate School–Newark is expected to remain registered in every fall and spring term thereafter until completing the program and earning the degree. Normally a student registers for courses or research, and, if necessary, may register for matriculation continued (leave of absence).

A student who fails to maintain continuous registration may not resume formal graduate study or register again in the Graduate School–Newark without first applying through the Office of the Dean for readmission.

Matriculation Continued

Students who are obliged to interrupt their studies may, with the approval of their graduate director, register for matriculation continued. There is no tuition fee for this registration, although a student fee of $27 is charged. This category of registration is available only to students not present on campus and not using faculty time and university research facilities. Students who are away from campus but working on their theses or dissertations and are in contact with their committees should register for 1 or more credits of research.

Summer Registration

The Graduate School–Newark requires that its students remain in continuous registration from the time they are admitted until their degrees are earned. The policy applies only to the regular academic year, not Summer Session. To enroll in courses offered in the summer, students must submit a Summer Session application, available in the Summer Session Office, and register as specified in the Summer Session Catalog. This catalog is available after March 15 from the Office of the Registrar, Room 309, Blumenthal Hall, 249 University Avenue, Newark, NJ 07102.

Change of Registration and Withdrawals

The schedule of withdrawals without academic penalty is as follows:

1. Adding courses: from registration through the eighth calendar day of the term.
2. Dropping courses: from registration through the ninth week of classes. Courses dropped during the first week of the term are deleted from the student's record. Courses dropped from the eighth calendar day of the term through the ninth week result in a W grade.

Withdrawal from College. Students may withdraw from college through the twelfth week of classes, but they must get the signature of the dean to do so. A student who drops a course without notifying the registrar automatically receives a grade of F in that course. A student who withdraws from school without notifying the registrar automatically receives a grade of F in all courses. No withdrawals of any sort are permitted during the last two weeks of classes. Students who leave the university during this period are still considered officially enrolled and receive final grades for the term.

Change of Program

Students who wish to change their field or degree program within the Graduate School–Newark must obtain the form for transferring from one graduate program to another from the Office of the Dean. They submit this form to the graduate program directors for approval and return it to the dean's office for final authorization by the dean. Deadline for the fall term is July 1; for the spring term, it is December 1.

Intra-Institutional Registration

Graduate Courses

Students in the Graduate School–Newark may take courses offered by another graduate division of the university. First, they must consult with their graduate program director. Then they enter the necessary registration transaction through the Rutgers Touchtone Registration System, on the web, or in person at the registrar's office. Once the graduate program director authorizes the intra-institutional graduate course, no additional permission is required by the Graduate School–Newark.

Undergraduate Courses

With the approval of their program director, graduate students may enroll in advanced 300- and 400-level undergraduate courses. This move may be taken as part of the regular graduate program or to remedy a deficiency in the preparation for graduate work.

Courses numbered 500 or above are designed for graduate students and normally carry credit toward a graduate degree. When a student is either permitted or required to take a course numbered below 500, a credit prefix must be entered in person at the registrar's office. The credit prefix appears on the permanent record as follows:

E. The undergraduate course is excluded from credit in the graduate program.
G. The undergraduate course has been approved for graduate credit.

No more than 12 credits numbered below 500 may be used to fulfill requirements for an advanced degree. The only exception to this rule is the M.A.T. program.

Exchange Registration

Matriculated graduate students may be eligible to take graduate courses at the New Jersey Institute of Technology or the University of Medicine and Dentistry of New Jersey. Those wishing to exercise this option must:

1. receive approval from their graduate program director,
2. complete the exchange form obtained from the graduate program office or the Office of the Dean.

For NJIT courses, students must report to Rutgers' registrar. For UMDNJ courses, they should follow the registration procedure required by UMDNJ's registrar and supply Rutgers' registrar with a copy of the exchange form.

Courses Taken "Not-for-Credit"

With advance approval of their graduate program director, students may enroll without receiving credit in a graduate course or a 100- through 400-level undergraduate course. When they register, they must indicate that they are seeking not-for-credit status by entering the symbol N. They must pay the normal tuition fee for the course and fulfill the same requirements as all other students during the term, including the execution of any written assignments. At the end of the term, however, they may not take the final examination, and they receive a grade of S (satisfactory) or U (unsatisfactory). The course and the letter grade are included on each student's record, but the student earns no credit from the course toward a degree.

Auditing Courses without Registration

In addition to taking not-for-credit courses, full-time students may audit courses without registration. This is a more informal procedure in which no official record of the audited course is kept, and the student receives no academic credit. Space must be available for a student to audit a course, and he or she must obtain permission from the course instructor.

Undergraduate Enrollment in Graduate Courses

Qualified undergraduate students in the university are welcome to take courses offered by the graduate faculty. To do this, they must obtain approval of the instructor or the director of the program offering the course, from the undergraduate dean's office, and from their undergraduate major adviser. Students can register on the web, over the touchtone registration system, or in person at the registrar's office.

Transfer of Credit

The university accepts for credit graduate courses completed at other institutions, but students may apply for transfer credit only after they have completed at least 12 credits with a grade of B or better at the Graduate School–Newark. The school will consider applications for transfer of courses if the following stipulations apply:

1. The student must have earned a B or better in the course being transferred, and neither Pass nor Satisfactory is acceptable.
2. The course may not include work for a thesis, independent study, or research.
3. Normally, any course being transferred must form a part of the student's program in his or her field of concentration.
4. As a rule, the course must have been taken during the immediate six-year period before the student's qualifying examination.

Students may transfer as many as 30 graded credits from other graduate degree-granting institutions. The number of courses transferable is limited, however, in the following ways and is subject to the recommendation of the program faculty:

Master's: A maximum of 40 percent of the minimum required number of credits for the degree may be transferred. Subject to the recommendation of the program concerned and the approval of the dean, a student with a prior graduate degree may use as many as 12 of these credits to fulfill requirements for a subsequent master's degree.

Ph.D.: A maximum of 40 percent of the required courses is eligible for transfer, but in no case can the number of credits exceed 30.

The faculty of a graduate program also may recommend transfer of credit earned in a graduate professional school toward a student's Ph.D. in the Graduate School–Newark. The maximum number of such credits acceptable is 50 percent of the total number of required course credits, up to a maximum of 24 credits. No credits may be transferred for research.

In applying for transfer of credit, a student must obtain an official transcript of the grades to be transferred and complete a transfer of credit form. The transfer of credit

form and the official transcript should be submitted to the student's program director for approval. The graduate director then submits both documents to the dean for review and final authorization. When the transfer is approved, the registrar's office records the transfer of credits on the student's transcript.

Minimum and Maximum Programs

A full-time academic load is defined as 12 or more credits, and a normal credit load is 15. One credit is defined as one class hour a week through a fifteen-week term. A load of 18 credits or more requires the approval of the dean of the Graduate School–Newark.

The following students must register for a full-time program of 12 or more credits: graduate fellows, research interns (some credits must be associated with degree-related research), and graduate and teaching assistants. Fellows, interns, and assistants must register their appointments according to the appropriate designations in the Schedule of Classes.

Full- and Part-Time Students

The designation of students as full- or part-time is necessary for the regulations governing tuition charges, student fees, statistical records, time limits for degrees, residence requirements, and any other issues affected by such status. For most purposes, a student who has registered for 12 or more credits has full-time status, and a student registered for 11 or fewer credits has part-time status.

In addition to regular course work, the following also are included in the calculation of credits: research courses, regular courses taken not-for-credit, and graduate and teaching assistantships (usually 6 credits each). Graduate and teaching assistants must remain in good standing in their own programs. In addition to their half-time academic appointments, assistants are required to register for a minimum of 6 credits of course work or research, which qualifies them for full-time status.

CLASS SCHEDULES AND HOURS

Starting and closing dates for each term, scheduled holidays, and other important scheduling information are listed in the academic calendar. All class periods are 160 minutes in length, meeting once a week, unless otherwise specified. There will be fifteen weeks of instructional activity for each course.

Attendance

Each instructor is required to maintain an accurate record of attendance of each class or section of which he or she is in charge. Students are expected to be present at each meeting of their classes. Exceptions to this rule may be made in the case of illness and in such other instances as seem justified to the instructor. University examinations will not be scheduled on Saturdays except in those courses which regularly meet on Saturday.

Absence Due to Religious Observance

It is the policy of the university to excuse without penalty students who are absent because of religious observances and to allow these students to make up work missed because of such absences. Examinations and special required out-of-class activities ordinarily will not be scheduled on those days when such students refrain from participating in secular activities. Absences for reasons of religious obligation are not counted for reporting purposes. A student absent from an examination because of required religious observance will be given an opportunity to make up the examination without penalty.

Cancellation of Classes

It is the general policy of the university not to cancel classes because of inclement weather. There are instances, however, in which especially adverse and hazardous weather conditions make it impossible to travel and to conduct academic activities at the campus. On those infrequent occasions, appropriate announcements are made over the following local radio stations: WABC, WCBS, WMCA, WOR, WMTR, WDHA, WERA, WBGO, and WCTC. In these cases, individual instructors will announce arrangements for making up work.

GRADES AND RECORDS

Graduate students are graded in each course at the end of each term as follows:

Grade	Definition	Numerical Equivalent
A	Outstanding	4.0
B+		3.5
B	Good	3.0
C+		2.5
C	Satisfactory	2.0
F	Failure	0.0

Conditional Grades and Other Symbols

IN (Incomplete). May be assigned at the discretion of an instructor who believes that an extension of time is warranted for a student whose work is incomplete at the end of the term.

NG (No Grade). The NG grade is assigned by the Office of the Registrar. It is used when either the faculty member has left the grade blank or the student is credited with a blank grade because of a computer error. If a student who receives an NG grade fails to clear up the problem within the following term, the NG grade will convert to an F, and the student's cumulative grade-point average will be recalculated accordingly.

P/NC (Pass/No Credit). Graduate programs may offer courses on a Pass / No Credit basis. A nonnumerical grade of Pass or No Credit is assigned to any student who has registered for his or her course on this basis.

S/U (Satisfactory/Unsatisfactory). Used for 700-level courses of research carrying credit or in regular courses taken not-for-credit.

Time Limits for Incompletes. Work must be completed and a change of grade submitted within twelve months after the end of the course. After a year, no change may be made, and the Incomplete will remain on the student's permanent record. If a graduate student in the Graduate School–Newark has 12 or more credits of course work incomplete (IN), he or she will not be permitted to register for further courses unless the dean grants a waiver.

W (Withdrawal). Used when a student has withdrawn with permission of the proper authority.

Credit Prefixes

The number of credits appearing on the permanent record may be preceded by a letter prefix as follows:

E. The course is excluded from credit toward a degree.

F. The course was failed; no credit earned.

G. A 300- or 400-level undergraduate course for which graduate credit has been approved.

N. A course is taken not-for-credit, an examination is not required, and a final grade of S (satisfactory) or U (unsatisfactory) is assigned.

Transcripts

Official transcripts are issued by the Office of the Registrar, Rutgers, The State University of New Jersey, 249 University Avenue, Newark, NJ 07102. Requests may be made in person by completing the proper form or in writing if the following information is provided: student name, address, and student ID number; division of Rutgers attended (Graduate School–Newark) with dates of attendance; and complete name and address of recipient of transcript.

The request must be received at least ten working days prior to the date the transcript is needed. In accordance with university procedures, no student or former student may obtain a transcript of his or her academic record if he or she is under any financial obligation to the university. Active students may request unofficial transcripts through the touchtone telephone system, or they may download them from the web at http://registrar.rutgers.edu.

Holds

The privileges of registration, advance registration, receipt of a diploma at commencement, and receipt of transcripts of record are barred to students having outstanding obligations to the university. Obligations may take the form of unpaid monies, unreturned or damaged books and equipment, parking fines, other charges for which a student may become legally indebted to the university, and failure to comply with disciplinary sanctions or administrative actions. University departments and offices may place holds on registration, diplomas, and transcripts for any students having an outstanding obligation.

Student Complaints about Grades

When possible, the Graduate School–Newark tries to handle all student complaints about grades within the graduate degree program.

First, a student with a complaint should confer informally with the instructor who recorded the grade in question. This conference shall take place within ten school days of official notification of the grade. If the instructor and student fail to resolve the dispute, the issue becomes dead unless the student takes further action within ten school days of meeting with the instructor. A student wishing to pursue a grade complaint must request in writing, within that ten-day period, that the director or a designate review the complaint or attempt to mediate the issue. The director or the designate has ten school days from receiving the student's written request to consult with all parties and propose a resolution.

If this is unsuccessful, the matter shall be referred to a faculty committee, as designated in the bylaws of the program. This committee shall render a decision within fifteen school days. In arriving at a decision, the committee may consult with anyone it chooses. In extraordinary cases, it may ask third parties chosen from among the faculty to review the grade in question.

Any appeal by the student from the program faculty's decision must be made by the student in writing to the dean of the Graduate School–Newark. The student has ten days from receiving the program faculty's decision to submit an appeal and lay out the grounds for this action. The grounds for appeal are (1) technical error, (2) new information, or (3) extenuating circumstances.

The dean will render a decision within ten school days of the receipt of the appeal. For purposes of this procedure, a school day is any day classes are in session, excluding Summer Session. The decision of the dean is final.

SCHOLASTIC STANDING

Candidates for the master's and doctor's degrees are expected to earn grades of B or better in their course work. No more than 9 credits with a grade of C or C+ may be used in meeting the requirements for a master's degree. No more than 12 credits with a grade of C or C+ may be used in meeting the requirements for the Ph.D. degree.

An overall B average is required for graduation from a graduate school program. If a student's academic performance falls below the expected standard, the program or the school may review the record and make recommendations concerning that student's future registration in the Graduate School–Newark.

Procedures for Granting or Denying Graduate Degrees

Each graduate program that requires a comprehensive examination and/or a thesis has developed its own procedures for granting or denying the degree. These procedures take into consideration the following points:

1. The composition of examination committees and procedures for evaluating performance on comprehensive or qualifying examinations, both written and oral.
2. Policies and procedures governing reexaminations for students who do not pass the first time.
3. For programs that offer degrees at both the master's and doctoral levels, policies and procedures for determining admission to the doctoral program after completion of the master's program.
4. Indicators of minimal expectations for progress on degrees and a well-defined mechanism for communicating to each student his or her relative progress.
5. For degree programs requiring a thesis or dissertation, procedures for selection of a thesis director, topic, and committee; removal or resignation of members from a

committee; substitution of a new director if the original director leaves the university; submission and approval of a written thesis; and procedures for oral defense, including the number or percentage of committee members who must approve the thesis.
6. A statement of the involvement of the student in the discussion of his or her course work, performance in examinations, dissertation or thesis activity, or other work, including whether the student will be allowed to participate in meetings called for this purpose.

Each graduate program has developed a written statement of procedures for guaranteeing students due process. These are available from each graduate program director. The procedures include:

1. Timely notification of examination results.
2. A requirement that students who fail a comprehensive examination or thesis defense be provided with an explanation of the reasons for the negative decision.
3. An appeals mechanism to consider cases in which the procedures outlined in the written statement of policies and procedures may not have been followed.

Termination of Studies

Students may be required to terminate their graduate studies and withdraw from the Graduate School–Newark if they fail to meet the minimum requirements of the program or the school. Each student must satisfy conditional requirements established at the time of his or her admission. Failure to make continuous progress toward the attainment of the degree may constitute a basis for termination. In addition, nonadherence to the schedule of "Time Limits for Degrees" may constitute a basis for termination. (See the Degree Requirements chapter.)

When such problems occur, the program notifies the student in writing of the program's concern about his or her performance. Such a warning specifies the source of concern, the applicable program or graduate school rules at issue, and proposed actions to resolve the problem. Warnings specify when and on what basis the faculty is considering a recommendation for academic dismissal. A probationary period of one term would be normal.

Following the probationary period, a student who fails to meet the provisions of the warning should be considered by the program faculty for dismissal. The student may be asked or may request to speak on his or her behalf at a meeting of the program faculty for that purpose. A member of the university community may assist the student in preparing his or her presentation. If the program faculty decides to dismiss the student, this decision must be issued in writing and must spell out the reasons for the decision and list all warnings communicated to the student.

Appeal

A student may appeal a dismissal notice to the dean of the Graduate School–Newark. Anyone wishing to appeal a dismissal must submit that appeal in writing within ten school days of receipt of the program faculty's decision. That appeal must state the basis for the appeal. The grounds for appeal are (1) technical error, (2) new information, or (3) extenuating circumstances. The dean, whose decision is final, shall render a decision within ten school days of receiving the appeal. For purposes of this procedure, a school day is any day that classes are in session, excluding Summer Session.

POLICY ON ACADEMIC INTEGRITY SUMMARY

"Academic freedom is a fundamental right in any institution of higher learning. Honesty and integrity are necessary preconditions to this freedom. Academic integrity requires that all academic work be wholly the product of an identified individual or individuals. Joint efforts are legitimate only when the assistance of others is explicitly acknowledged. Ethical conduct is the obligation of every member of the university community, and breaches of academic integrity constitute serious offenses" (Academic Integrity Policy, p. 1).

The principles of academic integrity entail simple standards of honesty and truth. Each member of the university has a responsibility to uphold the standards of the community and to take action when others violate them.

Faculty members have an obligation to educate students to the standards of academic integrity and to report violations of these standards to the appropriate deans.

Students are responsible for knowing what the standards are and for adhering to them. Students also should bring any violations of which they are aware to the attention of their instructors.

Violations of Academic Integrity

Any involvement with cheating, the fabrication or invention of information used in an academic exercise, plagiarism, facilitating academic dishonesty, or denying others access to information or material may result in disciplinary action being taken at either the college or university level. Breaches of academic integrity can result in serious consequences ranging from reprimand to expulsion.

Violations of academic integrity are classified into four categories based on the level of seriousness of the behaviors. Brief descriptions are provided below. This is a general description and is not to be considered as all-inclusive.

Level One Violations

These violations may occur because of ignorance or inexperience on the part of the person(s) committing the violation and ordinarily involve a very minor portion of the course work. These violations are considered on academic merit and not as disciplinary offenses.

Examples: Improper footnoting or unauthorized assistance on academic work.

Recommended Sanctions: Makeup assignment.

Level Two Violations

Level two violations involve incidents of a more serious nature and affect a more significant aspect or portion of the course.

Examples: Quoting directly or paraphrasing without proper acknowledgment on a moderate portion of the assignment; failure to acknowledge all sources of information and contributors who helped with an assignment.

Recommended Sanctions: Probation, a failing grade on the assignment, or a failing grade in the course.

Level Three Violations

Level three offenses involve dishonesty on a significant portion of course work, such as a major paper, an hourly, or a final examination. Violations that are premeditated or involve repeat offenses of level one or level two are considered level three violations.

Examples: Copying from or giving others assistance on an hourly or final examination, plagiarizing major portions of an assignment, using forbidden material on an hourly or final examination, using a purchased term paper, presenting the work of another as one's own, altering a graded examination for the purposes of regrading.

Recommended Sanctions: Suspension from the university for one or more terms, with a notation of "academic disciplinary suspension" placed on a student's transcript for the period of suspension, and a failing grade in the course.

Level Four Violations

Level four violations are the most serious breaches of academic integrity. They include repeat offenses of level three violations.

Examples: Forgery of grade change forms; theft of examinations; having a substitute take an examination; dishonesty relating to senior thesis, master's thesis, or doctoral dissertation; sabotaging another's work; the violation of the ethical code of a profession; or all infractions committed after return from suspension for a previous violation.

Recommended Sanctions: Expulsion from the university and a permanent notation on the student's transcript.

Faculty members who believe that violations have occurred should immediately contact the Office of the Dean. Students who suspect that other students are involved in actions of academic dishonesty should speak to the instructor of the course. Questions on reporting procedures may be directed to the Office of the Dean.

UNIVERSITY CODE OF STUDENT CONDUCT SUMMARY

> A university in a free society must be devoted to the pursuit of truth and knowledge through reason and open communication among its members. Its rules should be conceived for the purpose of furthering and protecting the rights of all members of the university community in achieving these ends.
>
> All members of the Rutgers University community are expected to behave in an ethical and moral fashion, respecting the human dignity of all members of the community and resisting behavior that may cause danger or harm to others through violence, theft, or bigotry. All members of the Rutgers University community are expected to adhere to the civil and criminal laws of the local community, state, and nation, and to regulations promulgated by the university. All members of the Rutgers University community are expected to observe established standards of scholarship and academic freedom by respecting the intellectual property of others and by honoring the right of all students to pursue their education in an environment free from harassment and intimidation.
>
> Preamble
> University Code of Student Conduct

Overview

Communities establish standards in order to ensure that they are able to fulfill their mission and keep their members from harm. The University Code of Student Conduct (referred to as "the code" in the remainder of this summary) defines those kinds of behavior that violate the standards of the Rutgers University community and also provides the mechanism for addressing alleged violations. In doing so, the code protects the rights of those accused of offenses (referred to as "respondents" in the remainder of this summary) by providing due process while also protecting victims of those offenses and the university community as a whole.

Process

The following summary presents key aspects of the code. Students should consult the code itself for complete information on each point.

Filing a Complaint

Any individual may file a complaint against a student suspected of violating the code by notifying the dean of students (or equivalent) of the respondent's college or school, or the director of judicial affairs in the Division of Student Affairs.

Preliminary Review

Upon receipt of a complaint, a preliminary review is conducted by the dean of students (or equivalent) or his or her designee to assess the evidence and determine if it is sufficient to proceed to a hearing. The dean conducting this review also assesses the seriousness of the charges. The most serious charges can, upon a finding of responsibility, result in separation from the university (suspension or expulsion). These serious cases are decided at university hearings. Less serious offenses (nonseparable offenses) are heard according to procedures in place at the student's college or school.

Separable Offenses

The following offenses are deemed serious enough to result potentially in separation from the university should a student be found responsible at a hearing:

1. violations of academic integrity
2. forgery, unauthorized alteration or unauthorized use of any university documents or records or any instrument or form of identification
3. intentionally furnishing false information to the university or intentionally initiating or causing to be initiated any false report, warning, or threat of fire, explosion, or other emergency
4. use of force against any person or property or the threat of such force
5. sexual assault or nonconsensual sexual contact
6. hazing
7. violation of the university's Student Life Policy against Verbal Assault, Defamation, and Harassment (Copies are available from the judicial affairs office or dean of students' office.)
8. unauthorized entry into, unauthorized use of, or misuse of university property, including computers and data and voice communication networks
9. intentionally or recklessly endangering the welfare of any individual or intentionally or recklessly interfering with any university activity or university sponsored activity

10. use, possession, or storage of any weapon, dangerous chemical, fireworks, or explosive, whether or not a federal or state license to possess the same has been issued to the possessor
11. the distribution of alcohol, narcotics, or dangerous drugs on university property or among members of the university community, if such distribution is illegal, or the possession of a sufficiently large quantity as to indicate an intention to distribute illegally
12. theft of university services or theft of, or intentional or reckless damage to, university property or property in the possession of, or owned by, a member of the university community, including the knowing possession of stolen property (Intentional or reckless misuse of fire safety equipment is regarded as damage under this section of the code.)
13. the violation of the ethical code of one's intended profession either by graduate students enrolled in any of the university's professional or graduate schools or by undergraduate students in clinical courses or settings related to their intended profession
14. violations of federal, state, or local law where such violations have an adverse effect on the educational mission of the university
15. failure to comply with the lawful directions of university officials, including campus police officers acting in performance of their duties
16. knowingly providing false testimony or evidence; disruption or interference with the orderly conduct of a disciplinary conference or hearing; violating the terms of any disciplinary sanction imposed in accordance with this code, or any other abuse of the university's disciplinary procedures.

Campus Advisers

Both complainants and respondents may select a campus adviser to assist them during the disciplinary process. Campus advisers may fully represent students, including speaking on their behalf. The Office of the Vice President for Student Affairs maintains a list of trained campus advisers for this purpose. Students are free to select any members of the university community to serve as their advisers, whether they are on the list or not.

Attorneys

Complainants and respondents also may, at their own expense, seek the advice of an attorney in addition to that of a campus adviser. Attorneys are free to advise students, to assist in the preparation of their cases, and to attend hearings, but may not speak on behalf of their clients or question witnesses at a hearing.

University Hearings

University hearings are presided over by a hearing officer and heard by a hearing board usually composed of three students and two faculty members. It is the hearing board's responsibility to determine whether the accused student is responsible or not responsible for violating the code. If the hearing board determines a student to be responsible by the standard of clear and convincing evidence, it also recommends a sanction for the offense to the vice president for student affairs. The vice president for student affairs considers the hearing board's recommendation and determines the sanction.

Appeals

A student found responsible for violating the code may appeal the finding, the sanction, or both. Appeals are filed through the Office of the Vice President for Student Affairs, which forwards them to the Appeals Committee of the appropriate campus (Camden, Newark, New Brunswick).

Authority for Student Discipline

Ultimate authority for student discipline is vested with the Board of Governors of Rutgers, The State University of New Jersey. This authority has been delegated to university administrators, faculty, students, committees, and organizations as set forth in the University Code of Student Conduct. The above summary is intended to present some key facts of the code. Copies of the code are available from all dean of students' offices and have been placed at the reference desks of all university libraries. In addition, the director of judicial affairs in the Division of Student Affairs will provide copies of the code upon request and is available to answer any questions about the code or related judicial matters.

UNIVERSITY SAFETY AND SECURITY

Providing a safe and secure environment for all members of the university community is the highest priority of the university's public safety staff. The staff is comprised of commissioned police officers with full investigative and arrest authority, trained emergency medical technicians, fire inspectors, security officers, dispatchers, and students employed as community services and student safety officers. Members of the public safety staff patrol each campus and respond to emergencies and requests for assistance 24 hours a day, 365 days a year.

Rutgers' public safety employees are part of the university-wide crime prevention team that includes all members of the university community. It is everyone's duty to maintain actively a safe environment and to be careful while complying with all local, state, and university regulations.

The executive director for public safety is responsible for safety and security services on the New Brunswick/Piscataway campus. On the Camden and Newark campuses, these responsibilities reside in the Office of the Provost.

Information regarding public safety at Rutgers is available from the campus police departments. Safety Matters, a brochure outlining public safety statistics, services, and programs on each of Rutgers' regional campuses, is published annually and distributed free of charge. To receive a copy of Safety Matters, call the appropriate Rutgers Police Department office at one of the following numbers:

Camden: 856/225-6009
Newark: 973/353-5547
New Brunswick: 732/932-8407

ADMINISTRATIVE PROCEDURES FOR RESPONDING TO DISRUPTIONS

An academic community, where people assemble to inquire, to learn, to teach, and to reason together, must be protected for those purposes. While all members of the community are encouraged to register their dissent from any decision on any issue and to demonstrate that dissent by orderly means, and while the university commits itself to a continual examination of its policies and practices to ensure that causes of disruption are eliminated, the university cannot tolerate demonstrations that unduly interfere with the freedom of other members of the academic community.

With this in mind, the following administrative procedures have been formulated to guide the implementation of university policy:

1. The president of the university and the vice president for academic affairs will have the authority throughout the university to declare a particular activity to be disruptive. In the two geographic areas of Camden and Newark, the respective provost will have the same authority. In New Brunswick, the senior vice president and treasurer will have the same authority.
2. Broadly defined, a disruption is any action that significantly or substantially interferes with the rights of members of the academic community to go about their normal business or that otherwise unreasonably interrupts the activities of the university.
3. A statement will be read by the appropriate officers as specified in (1) or by such officers as they may designate for the purpose of such reading and will constitute the official warning that the activity is in violation of university policy, that it must cease within a specified time limit, and where appropriate, that no commitments made by university officials will be honored if those commitments are made under duress.
4. If the activity continues beyond the specified time limit as determined by the official in authority, the authorized officers as specified in (1) will have the discretion to call upon the university police to contain the disruption. Ordinarily, the president of the university alone, or in his or her absence the vice president for academic affairs, will have the authority to decide that civil authorities beyond the campus are to be called upon to contain those disruptions that the university police are unable to handle. In extraordinary circumstances, where neither the president nor the vice president for academic affairs is available to make such a decision, the senior vice president and treasurer in New Brunswick and the provosts on the Camden and Newark campuses have the same authority.
5. The deans of students are the chief representatives of the deans of the colleges in all matters of student life. Members of the university community who are aware of potentially disruptive situations are to report this to the deans of students on their respective campuses. In a disruption, the deans of students and their staff members have a twofold responsibility: to protect against personal injury and to aid in providing for the order of the university. In the latter case, the deans of students, as well as other university personnel, may be called upon to coordinate or assist members of the academic community in ending the disruption, directing it to legitimate channels for solution, or identifying those who have violated the rights of others.

POLICY PROHIBITING HARASSMENT

The university prohibits harassment based on race, religion, color, national origin, ancestry, age, sex, sexual orientation, disability, marital status, or veteran status. Harassment is a kind of discrimination that violates state and federal civil rights laws. It is defined for purposes of those laws and the university's policy as any behavior that:

1. is unwelcome,
2. targets a person because he or she has one or more of the protected characteristics,
3. is engaged in by a person employed by or doing business with the university, and
4. is sufficiently severe or pervasive to alter negatively that person's or a group member's living, educational, or working environment.

Sexual harassment can take the form of unwelcome sexual advances; requests for sexual favors; or other unwelcome written, verbal, electronic, telephonic, or physical conduct of a sexual nature. Hostile environment harassment on the basis of sex, race, religion, color, national origin, ancestry, age, sexual orientation, disability, or marital or veteran status is severe or persistent behavior that has the purpose or effect of unreasonably interfering with a person's work or academic performance or creating a hostile environment.

If you think you have been harassed on the basis of any of the protected categories listed above, have observed harassing behavior, or need more information, you are encouraged to contact the Office of University Harassment Compliance, Rutgers, The State University of New Jersey, 3 Bartlett Street, New Brunswick, NJ 08901-1190, by telephone at 732/932-3122, or by email at uhr@rci.rutgers.edu. You may obtain copies of the Policy Prohibiting Harassment and the Harassment Complaint Process on our web page (http://www.rci.rutgers.edu/~uhc).

POLICY AGAINST VERBAL ASSAULT, DEFAMATION, AND HARASSMENT

Statement of Principles

Intolerance and bigotry are antithetical to the values of the university and unacceptable within the Rutgers community. One of the ways the university seeks to effect this principle is through a policy of nondiscrimination, which prohibits discrimination on the basis of race, religion, color, sex, age, sexual orientation, national origin, ancestry, disability, marital status, or veteran status in university programs. In order to reinforce institutional goals of nondiscrimination, tolerance, and civility, the following policy against verbal assault, defamation, and harassment makes clear that such behavior toward others violates acceptable standards of conduct within the university. (This policy is not intended to supersede the university's policy against harassment.)

Verbal assault, defamation, or harassment interferes with the mission of the university. Each member of this community is expected to be sufficiently tolerant of others so that all students are free to pursue their goals in an open environment, able to participate in the free exchange of ideas, and able to share equally in the benefits of our educational opportunities. Beyond that, each member of the

community is encouraged to do all that she or he can to ensure that the university is fair, humane, and responsible to all students.

A community establishes standards in order to be able to fulfill its mission. The policy against verbal assault, defamation, and harassment seeks to guarantee certain minimum standards. Free speech and the open discussion of ideas are an integral part of the university community and are fully encouraged, but acts that restrict the rights and opportunities of others through violence, intimidation, the destruction of property, or verbal assault, even if communicative in nature, are not protected speech and are to be condemned.

Prohibited Conduct

Any of the following acts, even if communicative in nature, are prohibited "separation offenses" (charges that could lead to suspension or expulsion from the university) under the provisions of the University Code of Student Conduct:

1. Use of force against the person or property of any member of the university community or against the person or property of anyone on university premises, or the threat of such physical abuse. (Verbal assault may be prosecuted as a "threat of . . . physical abuse.")
2. Theft of, or intentional damage to, university property, or property in the possession of, or owned by, a member of the university. (Acts of graffiti or other vandalism may be prosecuted as "intentional damage to . . . property.")
3. Harassment, which is statutorily defined by New Jersey law to mean, and here means, purposefully making or causing to be made a communication or communications anonymously or at extremely inconvenient hours, or in offensively coarse language, or in any other manner likely to cause annoyance or alarm, or subjecting or threatening to subject another to striking, kicking, shoving, or other offensive touching, or engaging in any other course of conduct or of repeatedly committed acts with purpose to alarm or seriously annoy any other person. Harassment is considered a separation offense under the University Code of Student Conduct.
4. Defamation, which is judicially defined to mean, and here means, the unprivileged oral or written publication of a false statement of fact that exposes the person about whom it is made to hatred, contempt, or ridicule, or subjects that person to loss of the goodwill and confidence of others, or so harms that person's reputation as to deter others from associating with her or him. Defamation is considered a separation offense under the University Code of Student Conduct.

While any of the four categories of acts listed above is a separation offense that, if proven, could lead to a sanction of expulsion or suspension from the university under the provisions of the University Code of Student Conduct, clearly minor instances of such prohibited behavior should be resolved at the college level and not be treated as separation offenses requiring a university-level hearing. The initial judgment of whether a particular act is of a separable or nonseparable nature is made by the appropriate college official.

Students who believe themselves to be victims of verbal assault, harassment, or defamation should report such incidents to the dean or the dean of students of their college or school. In addition, the following individuals have been identified to handle complaints:

Brian Rose, director of compliance and student policy concerns, 3 Bartlett Street, College Avenue campus, 732/932-7312;

Cheryl Clarke, director of diverse community affairs and lesbian/gay concerns, Bishop House, Room 105, College Avenue campus, 732/932-1711;

Rory P. Maradonna, associate provost for student life, Armitage Hall, Room 248, Camden campus, 856/225-6050;

Raymond T. Smith, associate provost for student affairs, Center for Law and Justice, Newark campus, 973/353-5541.

Some complaints can and should be resolved by informal methods, while others will require the implementation of formal procedures. All complaints are treated confidentially; complainants are encouraged to report incidents even if they do not wish to pursue the matter beyond the reporting stage.

NONDISCRIMINATION POLICY

It is the policy of Rutgers, The State University of New Jersey, to make the benefits and services of its educational programs available to students without discrimination on the basis of race, religion, color, national origin, ancestry, age, sex (except Douglass College, which is entitled under the law to remain a single-sex institution), sexual orientation, disability, marital status, or veteran status. The university complies with Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and the Americans with Disabilities Act of 1990. Questions about these laws, or allegations of student rights violations, should be directed to the Director of Compliance and Student Policy Concerns and Designated Employee for Student Rights Compliance, Rutgers, The State University of New Jersey, 3 Bartlett Street, New Brunswick, NJ 08901-1190 (732/932-7312).

EQUITY IN ATHLETICS DISCLOSURE ACT REPORTS

In compliance with the Equity in Athletics Disclosure Act, Rutgers provides information on men's and women's athletic programs (http://athletics.rutgers.edu/), including the number of participants by gender for each varsity team, operating expenses, recruiting expenditures, athletically related student aid, and revenues. The first report was issued in October 1996 with annual updates thereafter. The reports are available at the reference desks of the main branches of the university library system (Alexander Library, Library of Science and Medicine, Robeson Library, and Dana Library), and at the intercollegiate athletics offices.

STUDENT RECORDS AND PRIVACY RIGHTS

Rutgers, The State University of New Jersey, complies with the Family Educational Rights and Privacy Act of 1974 (FERPA) and makes public announcement of the law. FERPA was designed to protect the confidentiality of student records, guarantee student access to certain records, regulate disclosure of information from student files, provide

opportunities for students to correct or amend records and add explanatory statements, and provide opportunities for students to file complaints with the U.S. Department of Education alleging infractions of the law.

The confidentiality of student educational records is protected by FERPA. FERPA permits the university to provide directory information without the student's consent unless the student requests that such information be kept confidential. Rutgers defines directory information as name, campus mailing address and telephone number, campus email address, RUCS user name, permanent address and telephone number, school of attendance, major field of study, class year, dates of attendance, current credit load, credit hours earned, degree(s) received, date(s) of degree(s), weight and height of intercollegiate athletes, and most recent previous school attended.

The most common ways by which the university releases student directory information are:

- through the verifications division of the Office of the Registrar or similar offices that have access to student records. (The office is called upon to verify that a student is enrolled at the university by potential employers and credit agencies, among others.)
- through the Rutgers online directory, a database of Rutgers students, faculty, and staff that is available through the Rutgers homepage (http://www.rutgers.edu) and accessible worldwide via the Internet.

Students control the information that appears in the Rutgers online directory and may display or hide any of the information listed by visiting the directory homepage and following the posted instructions. Students also may request that all directory information be kept confidential by obtaining a form for this purpose from their dean's office or from the registrar's office. Students should be aware that requesting confidentiality of directory information makes this information unavailable to all, including prospective employers, credit agencies, and others to whom they might want this information known or verified. Thus, it is recommended that students carefully consider whether personal privacy concerns outweigh the possible inconvenience and detriments of having directory information withheld. Subsequent to filing the request, directory information remains confidential while a student is enrolled or until a written request that this restriction be lifted is received from the student by the registrar's office. As with all confidential records, Rutgers will release a student's confidential directory information only with the student's written consent or if otherwise required by law.

The university uses a student's Social Security number as a student identification number. While this number is not released as directory information and its confidentiality is protected in the same manner as are other educational records as defined by FERPA, the university offers students the opportunity to acquire a substitute student number. Students wishing to have a substitute number assigned should fill out the appropriate forms in the registrar's office.

Further information on the law and Rutgers' policy and procedures on compliance with FERPA is available from the director of compliance and student policy concerns (732/932-7312). All official notices regarding FERPA are archived at http://www.rci.rutgers.edu/~polcomp.

STUDENT RESIDENCY FOR TUITION PURPOSES

A determination of residency status for the purpose of tuition assessment is made by the university based on information provided by the applicant in accordance with the procedure outlined in the policy. A copy of the policy may be secured from the registrar's office or the admissions office.

Procedure

The Initial Determination

At the time an individual initially applies for admission into any graduate or undergraduate college or division of the university, the respective admissions office determines an admitted applicant's resident status for tuition assessment.

The determination made at this time shall prevail for each term unless a change is authorized as provided hereinafter.

After the Initial Determination

The status of residency for tuition purposes of students continuing in a college or division of the university is determined by the registrar of the respective college or division. The determination made by the registrar either conforms to the initial determination of the admissions office or reflects a change as provided hereinafter.

Request for a Change of Status

Requests for a change in residency status are accepted no later than the last week of the term for which changed status is sought. All supporting affidavits, deemed appropriate by the adjudicating official pursuant to New Jersey Administrative Code, Volume 9, Section 5 et seq., must be filed by the petitioner in accordance with the time limit specified in the preceding sentence. In no case may supporting affidavits be filed later than four weeks from the conclusion of the term for which the residency assessment is requested. Failure to comply with this provision, unless judged otherwise by the adjudicating official, voids the petition for the term in question. If, based on the information submitted in the request, the student qualifies for resident tuition assessment, such change relates only to the current and subsequent terms. No adjustments in tuition assessments are made and no refund vouchers are processed for any prior term.

Appeals

Appeals from the initial determination and any determination made after a request by a student for a change in residency status are accepted no later than three months after the date of notification of any such determination. Unresolved appeals are forwarded to either the university director of graduate admissions or the university registrar. These officers respond to the student within thirty working days of the receipt of the appeal in the appropriate office. Appeals from this determination should be submitted to the vice president for university budgeting by the student within two weeks after the director of admissions or the university registrar has issued a determination. The decision of the vice president for university budgeting is final.

Students' Responsibilities

Students are responsible for providing relevant information upon which a residency determination can be made. The burden of proving his or her residency status lies solely upon the student. Moreover, it is considered the obligation of the student to seek advice when in doubt regarding eligibility for in-state tuition assessment. If the student neglects to question his or her eligibility status beyond the period specified above, that student forfeits his or her right to a residency assessment to which he or she might have been deemed to be eligible had he or she filed an appeal at the appropriate time.

Penalties

If a student has obtained or seeks to obtain resident classification by deliberate concealment of facts or misrepresentation of facts or if he or she fails to come forward with notification upon becoming a nonresident, he or she is subject to disciplinary action.

RESEARCH POLICY AND RESEARCH CENTERS

Research at the university, apart from that conducted by students in connection with their academic course work, is in general intended to lead to publication in some form so that its results are available to interested persons everywhere. All university-conducted research must be available for public scrutiny and use. The university does not accept grants from or enter into contracts with governmental agencies or any other sponsors for research projects of which the results may not be made publicly accessible.

Most research projects at the university are carried on by faculty members and students within the facilities offered by their own departments. For on-campus research that cannot be conducted in department facilities, laboratories, or the library, the university has provided a number of cooperative research centers and bureaus. A list of the university's research centers may be found in the Divisions of the University chapter.

Many members of these organizations are active in graduate instruction. Information about their programs and activities may be found in Research at Rutgers, a handbook and bibliography published by the Research Council, the university agency that sponsors and coordinates faculty research.

PATENT POLICY

All students are governed by the university's patent policy, which is described in a statement available in the Office of Research and Sponsored Programs and the offices of all deans and department chairpersons.

POLICY REGARDING SOLICITATIONS

The university does not permit personal or mail solicitations or requests for contributions for charitable or other purposes, including the sale of chances, lottery tickets, and raffle tickets or the sale of magazines, Christmas cards, and similar items. Exceptions are made for the United Fund Drive and the Annual Hospitals Appeal.

The issuance or distribution of products or samples of products or leaflets or other printed materials and the posting of signs or advertisements in any building of the university requires the approval and permission of the vice president and treasurer or of the appropriate business manager.

Degree Requirements

This section outlines the minimum requirements of the Graduate School–Newark for each of the advanced degrees under its jurisdiction. In addition to these requirements, the faculty in charge of each program may impose other requirements. The program descriptions in the Programs, Faculty, and Courses chapter contain the most significant of these additional requirements.

DOCTOR OF PHILOSOPHY

The degree of doctor of philosophy, introduced to this country by Yale in 1861, is the highest degree offered in American education. It is conferred in recognition of, first, marked ability and scholarship in a broad field of learning and, second, distinguished critical or creative achievement within a special area of the general field. The special area forms the subject of the student's doctoral dissertation.

General Requirements

Doctoral programs normally are arranged in two phases. In the preliminary phase, the student usually pursues courses of study. This phase is completed when the qualifying examination is passed. In the second part, the student usually pursues courses of research. It is concluded when the dissertation has been accepted and the defense of it approved.

Between admission to the Graduate School–Newark and the conferral of the Ph.D. degree, the student must (1) satisfy the course and other preliminary requirements of the particular graduate program in which he or she is enrolled, (2) pass the comprehensive qualifying examination (a student becomes a formal candidate for the doctorate only after he or she completes successfully the qualifying examination), (3) present the results of the special research in an acceptable dissertation, and (4) pass a final examination related to the subject of the dissertation.

Specific credit requirements include the following:

1. The minimum total credits required by the Graduate School–Newark for the doctorate is 72. The criminal justice program requires 84.
2. A minimum of 24 credits in research must be taken toward the degree.
3. The minimum total requirement in nonresearch courses is normally 48 credits. The criminal justice program requires 60 credits. Each student should consult his or her program director.
4. No more than 12 credits with a grade of C or C+ are allowed.
5. No more than 12 credits of advanced undergraduate courses may be taken for the degree.
6. No more than 50 percent of a student's formal course work, up to a maximum of 24 credits, may be taken in professional courses. This limit does not apply to the criminal justice, management, nursing, and public administration programs.
7. Up to 30 graded credits of course work may be transferred from other graduate degree-granting institutions. With the program's approval, students may apply to the doctorate the courses they took to satisfy the requirements for the master's degree.

For further information on the transfer of credit from other degree programs and other institutions, see Transfer of Credit in the Academic Policies and Procedures chapter.

While the standard of work required is left largely in the hands of the student's program faculty, satisfactory progress toward the degree, as determined by the faculty, is required at all times. Students who fail to make satisfactory progress are informed of their problem by their department or committee chairperson or by the school dean.

Residence requirements for advanced degrees are determined separately by the faculty of each program. Students should consult their graduate directors for information about minimum performance expectations in their particular programs.

Admission to Candidacy: The Qualifying Examination

The purpose of the qualifying examination is to determine whether a student has acquired sufficient mastery of his or her field of concentration to warrant admission to candidacy for the Ph.D. degree. Students should take this examination as soon as they have completed the major portion of their course requirements. It should be taken no later than six years after the student first registered in the Graduate School–Newark and no later than two terms before the student expects to take the final post-thesis examination. Certain programs specify that students take their qualifying examinations at stated times to meet this condition.

The examination is conducted by a committee of at least four members or adjunct members of the graduate faculty, and the chairperson must be a full member. Designed as a comprehensive measure of a student's knowledge, the examination may be written or oral or both.

The student is responsible for obtaining an application for admission to candidacy for the degree of doctor of philosophy and submitting it to the committee chairperson at the time of the examination. He or she should make sure that this form is signed properly by members of the committee and by the graduate director and return it to the dean's office. Once the student has passed the examination, he or she must remain registered (for courses, research, or matriculation continued) in order to maintain status as a candidate.

Dissertation and Dissertation Committee

Working under faculty direction, each candidate for the doctorate will pursue an original investigation of a problem or problems within his or her area of concentration and present the results of this investigation in a dissertation. The dissertation topic must be approved by a faculty committee of at least four members, who are appointed by the graduate program director. The committee chairperson, who supervises the investigation, must be a member of the graduate faculty and must have been approved for supervising doctoral research. One committee member should be from outside the student's degree program.

The student works with the advice of the dissertation director to develop preliminary guidelines for a dissertation. Once this is done, the committee should meet to discuss the student's dissertation proposal. If possible, this meeting should include the outside committee member. As work on the dissertation progresses, the student is advised to consult regularly with members of his or her committee.

The candidate is expected to keep the committee informed of progress in his or her work and to allow the panel to assist in developing the dissertation. The committee agrees to give ample and early warning of any reservations it might have about the student's progress and must specify in writing the changes that it requires to accept the dissertation.

The final draft of the dissertation should be prepared in strict accordance with the instructions given in the pamphlet Thesis and Dissertation Form, which is available at the Office of the Dean of the Graduate School–Newark. After the committee has accepted the dissertation, the student must file the original and one copy with the Office of the Dean of the Graduate School no later than the announced deadlines for completion of degree requirements.

With the dissertation, the candidate is required to submit an abstract, not exceeding 350 words, which describes the principal finding of his or her research. As with the dissertation, the professor in charge of the work for the dissertation also must approve the abstract, and other members of the student's committee must accept it.

Final Examination

A final public examination is held under the auspices of the committee in charge of the candidate's course of study. At this examination, the candidate must defend the dissertation and otherwise satisfy the committee and other faculty members in attendance that he or she is qualified to receive the degree of doctor of philosophy.

At the time of the final examination, the student is responsible for obtaining from the Office of the Dean the candidacy application upon which the result of the qualifying examination is recorded. The committee members complete this application at the final examination and sign the title page of the dissertation to signify their acceptance of it.

Once the program director certifies that all program requirements have been completed for the degree of doctor of philosophy, the candidate must return the candidacy application to the Office of the Dean. Additional materials to be submitted at this time include one original and one photocopy of the dissertation on 100 percent cotton-content bond paper, two copies of the title page and abstract, the receipted payment form for microfilming, the microfilming agreement form, and additional survey forms as required. All of the above materials must be submitted to the Office of the Dean no later than the announced deadlines for completing degree requirements. The names of those failing to meet these deadlines are removed automatically from the commencement list for that degree date.

Application for the Conferral of the Degree

The candidate must file a diploma application according to announced deadlines in order to receive a diploma at commencement. For further information regarding the application procedure, see Graduation later in this chapter. Upon request, the school issues a certification of completion so that students can prove before they are awarded their degree in May that they completed the program.

Publication of Dissertation and Academic Data

After it grants the doctorate, the Graduate School–Newark has the dissertation microfilmed. The dissertation must therefore be prepared for this purpose with the same care as if it were to appear in printed form. The abstract that must accompany the dissertation also must be ready for publication when it is submitted to the dean, as it will be published in Dissertation Abstracts.

University Microfilms of Ann Arbor, MI, microfilms the dissertation and publishes the abstract. Information on how to prepare the dissertation and abstract and the agreement with University Microfilms, which the candidate must sign, are available in the Office of the Dean. The fee for microfilming the dissertation and publishing the abstract is $55. Registration of copyright also is available for a fee of $35.

MASTER'S DEGREES

General Requirements

Master of Arts, Master of Arts in Liberal Studies, and Master of Science

Candidates for the M.A., M.A.L.S., or M.S. degree must satisfy the requirements of the Graduate School–Newark, as well as those of the program in which they are enrolled. The Graduate School–Newark requires that students:

1. Earn a minimum of 30 credits of successful graduate study. Two exceptions are the programs in nursing and psychology, each of which requires 36 credits.
2. If required by the program, complete successfully a final comprehensive examination in the student's field of concentration.
3. Satisfy a writing requirement by submitting a master's thesis or by demonstrating to the faculty the ability to write a creditable expository or critical essay. Students who do not submit a thesis may fulfill the writing requirement as part of a regular course, in a seminar, or through a special assignment designed for this purpose.
4. Pass a foreign language examination if required by the program.
5. Complete at least 60 percent of their degree programs in graduate level courses that are under the jurisdiction of the Graduate School–Newark.

In addition, the school has three other requirements that limit the number of credits that will be accepted below a grade of B that can consist of transferred credits and that can be earned in undergraduate courses. Specifically, these requirements state that:

1. No more than 40 percent of a student's program may consist of transferred graduate graded course work. In the public administration program, this includes professional credit.
2. No more than 9 credits can have a grade as low as C or C+.
3. No more than 12 credits of advanced Rutgers undergraduate course work (numbered 300 or 400) may be approved by the graduate program.

With the approval of the graduate program director, however, students may select courses from a single program or from several related programs. All programs of study are subject to review by the dean of the Graduate School–Newark and to the approval of the candidate's program faculty. Specific program requirements are noted in the Programs, Faculty, and Courses chapter.

Master of Arts for Teachers

Programs leading to the degree of Master of Arts for Teachers are offered to secondary school teachers who wish to further their studies. These programs do not lead to teacher certification although they may fulfill certification requirements through additional studies. Inquiries concerning teacher certification should be directed to the Graduate School of Education, Rutgers, The State University of New Jersey, 10 Seminary Place, New Brunswick, NJ 08901-1183.

The degree requirements for the M.A.T. differ from those of the M.A. and M.S. For the M.A.T., there is no limit on the advanced undergraduate courses that a student may take. All programs consist primarily of work in regular courses of study, and no program requires a thesis. All other requirements governing the M.A.T. degree may be found in the preceding section on M.A., M.A.L.S., and M.S. degrees.

Master of Public Administration

Candidates for the Master of Public Administration (M.P.A.) must satisfy the requirements of the Graduate School–Newark and those of the program in public administration. Requirements of this program are as follows:

1. A minimum of 42 credits of successful graduate study comprised of:
   a. a core of ten courses (30 credits), including 26:834:501 Introduction to Public Administration;
   b. four courses (12 credits) in an area of specialization (public management, health care administration, public financial management, urban systems and problems, or human resources administration).
2. A writing requirement (as outlined under M.A. and M.S. degrees) as part of the comprehensive examination.

Each candidate completes these requirements under the supervision of the graduate program director. Candidates without three or more years of work experience in a public or nonprofit agency or hospital must serve an internship. Internship placement is arranged by the M.P.A. staff according to:

1. the career development needs and interests of the student,
2. the interest and ability of the sponsor to provide pertinent learning experiences,
3. the student's preferences on the functional field, level of government, and geographic location. When possible, interns may receive stipends.

In lieu of course work, the school may grant credit for past or present public service at the professional level. Students wishing to apply for professional credit must prepare a document of credentials for review and recommendation by the graduate program director. In addition, students may transfer previously earned graduate credits (taken within the past six years) that are pertinent to the M.P.A. The limit on the combination of transfer and experiential credits is 12.

Committees and Advisers

When a student's program includes a thesis, a committee oversees the course of study, research for the thesis, and the conduct of the final examination. This panel is made up of at least three members who are selected in consultation with the director of the graduate program. Each committee consists of members or adjunct members of the graduate faculty.

If the student's program does not include a thesis, the committee is appointed shortly before the final examination. This panel is made up of at least three members who are selected in consultation with the director of the graduate program. Each committee consists of members or adjunct members of the graduate faculty.

In either case, the student is encouraged to seek advice during the course of study from the graduate director, committee chairperson, and professor supervising his or her courses. No graduate student should regard a program of study as the mere accumulation of numerical credits and meeting of formal requirements. Progress in mastering a discipline depends largely upon the interested guidance of the professors in charge and the student's own initiative.

Submission of the Thesis

For a student whose program includes a thesis, the thesis must be approved by the professor in charge and accepted by the other members of the student's committee. The final draft of the thesis should be prepared in strict accordance with the instructions given in the pamphlet Thesis and Dissertation Form, which is available at the Office of the Dean. After the thesis has been accepted by the committee, one original copy and one photocopy, both on 100 percent cotton-content bond paper, are to be filed with the dean of the Graduate School–Newark. The student must take this step by the announced deadlines for completion of degree requirements.

Master's Examination

An application for the master's degree must be submitted to the dean of the Graduate School–Newark at least two months before the student takes the final examination. If a student expects to take the final examination at the end of Summer Session or at the beginning of the fall term, the application must be filed before Summer Session begins. Forms for this purpose are available at the Office of the Dean. The responsibility for making the application lies with the student.

The final comprehensive examination may be written, oral, or a combination. At the time it is to be taken, the candidate must obtain from the Office of the Dean the previously filed master's degree application and submit it to the chairperson of the committee. The chairperson records the result of the final examination on this form. It is the responsibility of the candidate to return the form, properly signed by his or her committee, to the Office of the Dean. It should be returned soon after the examination, and in no case later than the announced deadlines.

Qualifying Examination for the Doctorate Used for the Master's Degree

In place of the final master's examination, a student who plans to pursue a Ph.D. degree may elect to take the qualifying examination for the doctorate instead. In this case, the following stipulations apply:

1. All other requirements for the master's degree, except the final examination, must be satisfied.
2. Approval must be obtained from the program faculty.
3. Both master's examination and diploma application forms must be filed in accordance with the directions given above.

After passing the qualifying examination, the student may be recommended for the appropriate master's degree. This use of the qualifying examination does not invalidate the status of a student as a candidate for the doctoral degree.

TIME LIMITS FOR DEGREES

The minimum and maximum time required to complete a degree is determined by a student's full-time or part-time status and the number of credits required for the degree. These times are as follows:

Degree	Total Credits	Full or Part Time	Time in Years		
			Minimum	Average	Maximum
M.A., M.S.,	30	Full	1	1 1/2	3
M.A.L.S., M.A.T.		Part	1	2 1/2	5
M.P.A.	48	Full	1	2	4
		Part	2 1/2	3	5
M.S. (Nursing)	36	Full	1 1/2	3	5
		Part	3	4	5
Ph.D.	72	Full	3	5	7
		Part	4	6	8

GRADUATION

When entering their final term, candidates who anticipate faculty recommendation for conferral of the degree are required to follow the procedures listed below.

1. Ensure that all academic requirements have been or will be completed.
2. Make certain that related fees and any outstanding debts to the university are paid.
3. Submit an application for admission to candidacy.
4. Submit a diploma application. The degree cannot be conferred as scheduled and graduation will be delayed if this form is filed after the deadline. If the deadline passes, students will have to refile this form.

Deadline Dates

All forms are available at the Office of the Dean of the Graduate School–Newark and must be submitted by the dates listed below.

Diploma Date	Diploma Application Deadline	Degree Requirements Deadline
October	October 2	October 2
January	January 2	January 2
May / June	April 2	May 2

It is the responsibility of the student to complete all requirements for graduation by the scheduled dates listed. Each student should consult with the graduate director of his or her program and with the Office of the Dean of the Graduate School–Newark with respect to the completion of the requirements for graduation. Conferral of degrees and diplomas occurs once a year at the annual spring commencement. Students who file the applications and complete all other requirements for the degree by the announced October or January dates will have a diploma dated for the respective month, although they will not receive it until the following spring. To provide proof that they have earned a degree before commencement, students may file a written request for a temporary certificate of completion with the Office of the Dean of the Graduate School–Newark. The school withholds diplomas from any student who is under financial obligation to the university.

Programs, Faculty, and Courses

The following graduate programs, listed generally in alphabetical order, are offered by the Graduate School–Newark. The numbers indicate the curriculum code for each program.

120 Biology
160 Chemistry
197 Computational Biology
202 Criminal Justice
350 English
375 Environmental Science
380 Environmental Geology
478 Global Affairs
510 History
546 Integrative Neuroscience
561 Jazz History and Research
606 Liberal Studies
620 Management
645 Mathematical Sciences
705 Nursing
755 Physics, Applied
790 Political Science
830 Psychology
832 Public Health
834 Public Administration
977 Urban Systems

Located under each program are the degree or degrees offered, the name and campus address of the program director, a list of the members of the graduate faculty in charge of the program and their adjunct members, a description of the program's special purposes and requirements, and a list of courses.

COURSE INFORMATION

Courses numbered in the 500s and 600s are offerings of the graduate faculty for graduate students in advanced-degree programs. Undergraduate or nonmatriculated graduate students and students from the university's professional schools are admitted to these courses according to rules printed elsewhere. Students can obtain information about special prerequisites for some courses from graduate program offices and from instructors at initial class meetings. Courses numbered in the 700s ordinarily are intended for students preparing individual research theses for advanced degrees.

Advanced undergraduate courses (numbered in the 300s and 400s) are offered in several colleges of the university. These courses do not appear in this catalog, but many of them may serve as useful prerequisites to particular graduate courses. Under certain conditions, some of these undergraduate courses may be accepted for credit toward graduate degrees.

Within the limits described under the Degree Requirements and Academic Policies and Procedures section of this catalog, a student in the Graduate School–Newark may register for an undergraduate course with the approval of his or her graduate director. Students seeking information about undergraduate course offerings should look in the appropriate undergraduate catalogs and separate class schedules. Information about graduate-level courses offered at the University of Medicine and Dentistry of New Jersey, the Rutgers professional schools, New Jersey Institute of Technology, and Princeton University can be found in the catalogs of those schools.

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 relevant for Graduate School–Newark students:

16 Graduate School–New Brunswick
21 Newark College of Arts and Sciences
22 Faculty of Management
23 School of Law–Newark
25 College of Nursing
26 Graduate School–Newark
27 School of Criminal Justice
62 University College–Newark

Subject Codes

A subject code indicates the subject matter of a particular course. The following subject codes are used in this catalog. This enumeration, however, does not constitute a list of degree programs.

010 Accounting
120 Biology
135 Business Administration
160 Chemistry
202 Criminal Justice
220 Economics
223 Applied Economics
350 English
352 English, American Literature
375 Environmental Science
380 Environmental Geology
390 Finance
478 Global Affairs
510 History
545 Industrial Relations and Human Resources
546 Integrative Neuroscience
561 Jazz History and Research
606 Liberal Studies
620 Management
630 Marketing
645 Mathematical Sciences
705 Nursing
711 Operations Management
755 Physics, Applied
790 Political Science
830 Psychology
834 Public Administration
920 Sociology
960 Statistics

Course Codes

Two course codes separated by a comma indicates that each term course may be taken independently of the other (example: 26:160:601,602). Two course codes separated by a hyphen indicates that satisfactory completion of the first-term course is prerequisite to the second term (example: 26:350:529-530). The first term may be taken for credit without taking the second, unless a statement is added to indicate that both term courses must be completed in order to receive credit.

Other Course Notations

Courses noted (F) and (S) indicate the fall and spring anticipated schedules. Not all courses are offered every term or year.

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

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

Abbreviations

The following abbreviations are used in the faculty listings:

CMBN	Center for Molecular and Behavioral Neuroscience
CN	College of Nursing
FAS–N	Faculty of Arts and Sciences–Newark
FAS–NB	Faculty of Arts and Sciences–New Brunswick
GSE	Graduate School of Education
IAB	Institute of Animal Behavior
NCAS	Newark College of Arts and Sciences
NJIT	New Jersey Institute of Technology
SB–C	School of Business–Camden
RBS	Rutgers Business School
SCJ	School of Criminal Justice
SL–N	School of Law–Newark
SMLR	School of Management and Labor Relations
SSW	School of Social Work
UC–N	University College–Newark
UMDNJ	University of Medicine and Dentistry of New Jersey

BIOLOGY 120

Degree Programs Offered: Master of Science, Doctor of Philosophy
Director of Graduate Programs: Professor Doina Ganea
Room 135, Smith Hall (973 / 353-1235)

Members of the Graduate Faculty

Professors:

Elizabeth D. Abercrombie, CMBN; Ph.D., Princeton
Central monoaminergic systems

György Buzsaki, CMBN; M.D., Pecs (Hungary); Ph.D., Budapest
Neuronal plasticity and memory

Ann Cali, FAS–N; Ph.D., Ohio State
Protozoology/ultrastructure

Ian Creese, CMBN; Ph.D., Cambridge
Neuropharmacology and behavior

Harvey H. Feder, FAS–N; Ph.D., Oregon Medical
Behavioral endocrinology

Gerald D. Frenkel, FAS–N; Ph.D., Harvard
Biochemistry

Doina Ganea, FAS–N; Ph.D., Illinois Medical
Molecular immunology

Israel Moisevich Gel'fand, FAS–N; Ph.D., Moscow State
Cell biology and neurophysiology

Ronald P. Hart, FAS–N; Ph.D., Michigan
Molecular neuroimmunology

G. Miller Jonakait, FAS–N; Ph.D., Cornell Medical
Developmental neuroscience

Frank Jordan, FAS–N; Ph.D., Pennsylvania
Enzyme mechanisms; protein NMR

David Kafkewitz, FAS–N; Ph.D., Cornell
Microbiology

Edward G. Kirby, FAS–N; Ph.D., Florida
Developmental physiology of plants

Barry Richard Komisaruk, FAS–N; Ph.D., Rutgers
Neurophysiology and behavior

Richard Mendelsohn, FAS–N; Ph.D., Massachusetts Institute of Technology
Biophysical chemistry; spectroscopy of biological membranes

Joan I. Morrell, CMBN; Ph.D., Rochester Medical
Neuroanatomy

Daniel E. Murnick, FAS–N; Ph.D., Massachusetts Institute of Technology
Laser-based cell manipulation

Earl D. Shaw, FAS–N; Ph.D., California (Berkeley)
Laser systems to measure proteins

James M. Tepper, CMBN; Ph.D., Colorado
Neurobiology of monoamines

Judith Shulman Weis, FAS–N; Ph.D., New York
Marine biology

Associate Professors:

Edward M. Bonder, FAS–N; Ph.D., Pennsylvania
Cell biology

Andrew E. Kasper, FAS–N; Ph.D., Connecticut
Paleobotany

Douglas Wildes Morrison, FAS–N; Ph.D., Cornell
Behavioral ecology

Farzan Nadim, NJIT; Ph.D., Boston
Neuroscience and computational biology

Michael Recce, NJIT; Ph.D., University College (London)
Neurophysiology

Ralph Siegel, CMBN; Ph.D., McGill
Psychophysics and computational theory of vision

Assistant Professors:

Wilma J. Friedman, FAS–N; Ph.D., The Rockefeller University
Molecular neurobiology

Dittmar Hahn, NJIT; Ph.D., Wageningen Agricultural (Netherlands)
Microbial ecology

Eric Hamerlynck, FAS–N; Ph.D., Kansas
Plant ecology

Eric B. Knox, FAS–N; Ph.D., Michigan
Molecular systematics; evolutionary biology

Adjunct Members of the Graduate Faculty

Ann Aguanno, FAS–N; Ph.D., SUNY–Buffalo
Molecular and developmental biology

Francisco J. Artigas, CIMIC; Ph.D., Ohio
Environmental science

Rosalyn Blumental, GSCC; Ph.D., CUNY
Biomedical science

Amitabha Bose, NJIT; Ph.D., Brown
Applied mathematics

Errol DeSouza, Hoechst Marion Roussel; Ph.D., Toronto
Endocrinology; neuropharmacology

Jorge Golowasch, FAS–N; Ph.D., Brandeis
Neuroscience

Treena Livingston, NJIT; Ph.D., Pennsylvania
Biomedical engineering

Thomas W. Lysz, UMDNJ–SOM; Ph.D., Connecticut
Neurochemistry

Emily Russell, Research Associate Professor, GS–N; Ph.D., Rutgers
Environmental botany

Peter Tolias, PHRI; Ph.D., McGill
Molecular and developmental biology

Programs

The Rutgers–Newark / NJIT Federated Department of Biological Sciences offers programs leading to the master of science and the doctor of philosophy degrees.

The master of science in biology is designed to provide students with advanced knowledge of both plant and animal biology and microbiology. The program requires a minimum of 30 credits. These must include at least one 3-credit course in each of four of the following five areas: cell biology and biochemistry, molecular biology, physiology, ecology and evolution, and plant biology.

The program includes a research component that students meet either by writing a thesis on an experimental laboratory or field project or by submitting a written paper based on current literature in the field. The student and his or her major adviser select jointly the topic of the thesis or the written paper. Students electing to write a thesis must complete a minimum of 24 credits of course work and 6 credits of research (26:120:701,702). In addition, they must pass an oral defense of the thesis they have submitted.

Students choosing the written-paper option are required to take 30 credits of course work, pass a written comprehensive examination, and complete a written paper.

The Ph.D. curriculum in biology is divided into three tracks. Students may select the cell / molecular / biochemical track, the ecology / evolution track, or the computational biology track. Each of the three options requires 36 credits of course work, including three core courses, and a minimum of 36 credits of research. The following are the requirements for each of the three tracks:

1. Cell / molecular / biochemical track: (a) 26:120:571 Biochemistry, (b) 26:120:515 Molecular Biology of Eukaryotes, and (c) 21:120:455 Molecular Cell Biology.
2. Ecology / evolution track: one course from each of three areas: (a) landscape, ecosystem, and community ecology (either 26:120:587 Systems Ecology, 26:120:586 Landscape Ecology, or 16:215:565 Community Dynamics); (b) organismal ecology (either 26:120:593 Physiological Ecology, 16:215:533 The Behavior of Animal Populations, or 16:215:590 Population Ecology), and (c) evolution and systematics (either 26:120:503 Plant Morphology, 26:120:532 Evolution, or 26:120:594 Animal Systematics).
3. Computational biology: (a) 26:120:502 or BIOL601 (NJIT) Foundations of Computational Biology and (b) 6 credits of graduate-level biology courses pertinent to the fields of specialization.

Students must earn at least a grade of B to receive credit for these courses, which provide a formal foundation in research fields covered in each track. The balance of a student's course work is chosen with permission of the graduate program director and in consultation between the student's adviser and the Standards Committee. During the first two years, each doctoral student undertakes rotations through at least two departmental research laboratories.

After completing all core course requirements and the two required laboratory rotations, students in each track take the qualifying examination. For students in the cell / molecular / biochemical track, the first phase of this examination involves a written report and oral presentation of the laboratory rotations. Once this is done, these students need only pass an oral examination for formal admission to candidacy. The ecology / evolution track requires a written review paper, an oral presentation, and an oral examination. Students in the computational biology track must complete two rotations, submit a written proposal in the format of a National Institutes of Health training grant, and orally present and defend the proposal. After completing successfully the qualifying examination in his or her chosen track, the student is admitted to candidacy for the doctoral degree.

Once a student has attained candidacy status, he or she chooses an adviser, begins research for the thesis, and forms a dissertation committee. The dissertation committee for all students is composed of the student's thesis adviser and at least three other members of the graduate faculty. One member must be from outside the program. The dissertation committee administers at least one dissertation prospectus meeting and also meets for the final defense of the dissertation. In between the two required meetings, the dissertation committee members may meet with the student once every six months to assess his or her progress. The graduate school has a seven-year limit (for full-time students) for attaining a doctoral degree.

In addition, please see computational biology 197 (joint computational biology M.S. program with NJIT).

Bridge Courses

Students who hold baccalaureate degrees in an academic discipline that differs markedly from the programs offered by the Federated Department of Biological Sciences may be required to take additional courses to remedy any gap in preparation for graduate work. These courses must be completed before 12 credits of graduate degree courses are earned. Bridge courses are not counted as degree credits. They do count, however, in the graduate GPA calculations if the course is numbered 500 or above.

Undergraduate Courses

With approval from the program director, students may enroll in upper-level undergraduate biology courses (at the 300 and 400 levels). These courses may form a regular part of the graduate program, or they may serve to remedy a deficiency in preparation for graduate work. No more than 9 credits numbered below 500 may be used in fulfillment of course requirements for an advanced degree in biology.

Departmental Facilities

The department's microscope facility is second to none in the state of New Jersey. It is equipped with scanning and transmission-electron microscopes, a confocal microscope, and five image-processing stations. In addition, the department has an oligo synthesizer, an automated DNA sequencer, ultracentrifuges, a phosphor-imager, scintillation and gamma counters, FPLC, an AAALAC-approved animal facility, and a greenhouse. Individual research laboratories house tissue culture facilities, electrophysiological equipment, fluorescence microscopes, and thermal cyclers. A student also can take advantage of additional facilities that are available at neighboring institutions. The Graduate School–Newark maintains affiliations with the University of Medicine and Dentistry of New Jersey, New Jersey Institute of Technology, and various industrial research laboratories.

Graduate Courses

26:120:501. NEUROANATOMY (3)
Equivalent to 26:546:501.
Overview of the neuroanatomical systems of the mammalian nervous system.

26:120:502. FOUNDATIONS OF COMPUTATIONAL BIOLOGY (3)
Prerequisite: Linear algebra or permission of instructor.
Introduction to use of mathematical techniques to solve problems in biology. Models discussed fall into three categories: discrete, continuous, and spatially distributed. Biological topics discussed range from subcellular molecular systems and cellular behavior to physiological problems, population biology, and developmental biology.

26:120:503. PLANT MORPHOLOGY (3)
Prerequisite: Undergraduate ecology or botany, or permission of instructor.
Study of the major groups of vascular plants: lycopods, ferns, gymnosperms, and angiosperms. Emphasis on their morphology, anatomy, and reproductive biology, with discussion of evolutionary trends and occurrence in the fossil record.

26:120:504. PLANT PHYSIOLOGY (3)
Prerequisites: 26:120:503, organic chemistry, and physics; or permission of instructor.
Survey of modern aspects of plant physiology with emphasis on recent literature. Topics include photosynthesis, nitrogen metabolism, transport, development, and physiological genetics.

26:120:505. BIOSTATISTICS AND COMPUTER METHODOLOGY (3)
Prerequisite: College algebra.
Advanced introduction to computer programming and biometry, with some use of common mathematical procedures useful to the biologist.

26:120:506. QUANTITATIVE PLANT ECOLOGY (3)
Prerequisite: 26:120:503 or permission of instructor.
Survey of plant autecology, synecology, plant geography, and analytical techniques and methods useful in studying the relationships between plants and their environment.

26:120:509,510. ADVANCED PROBLEMS IN BIOLOGY (BA,BA)
Advanced studies to meet the needs of individual students.

26:120:512. MAMMALIAN PHYSIOLOGY (3)
Prerequisites: Introductory courses in anatomy, physiology, and biochemistry; or permission of instructor.
Function, regulation, and interrelationships of the different organs and organ systems of mammals, particularly the nervous, cardiovascular, respiratory, excretory, and digestive systems.

26:120:514. PROTOZOOLOGY (3)
Prerequisite: Parasitology or permission of instructor.
Study of single-celled organisms that provide a bridge between the prokaryotes and eukaryotes, the unicellular and the multicellular, and the plants and animals. Selected groups studied to demonstrate these relationships and the relationships among all living things. Includes free-living and symbiotic forms as examples of diversity.

26:120:515. MOLECULAR BIOLOGY OF EUKARYOTES (3)
Prerequisite: Molecular biology and biochemistry.
First-year graduate course providing an accelerated review of eukaryotic molecular biology. Introduces critical reading and discussion of current journal articles. Nucleic acid biochemistry, molecular technology, transcription, RNA processing, chromosomal structure, molecular anatomy of the genome, genomic rearrangements, gene control signals, DNA-protein binding, carcinogenesis, and oncogenes.

26:120:516. MICROBIAL ECOLOGY (3)
Prerequisite: Microbiology.
Lectures and problem sets on interactions between microorganisms and the environment; their role in element cycling in pristine and contaminated terrestrial and aquatic habitats.

26:120:517. DEVELOPMENTAL NEUROBIOLOGY (3)
Prerequisite: 21:120:342.
Developmental processes in vertebrate nervous systems, with a critical analysis of current theories.

26:120:519. MICROBIAL METABOLISM (3)
Prerequisites: Biochemistry.
Biology of prokaryotic organisms. Emphasis on those physiological, biochemical, and ecological aspects that are unique to bacteria.

26:120:520. ANALYTICAL AND COMPUTATIONAL NEUROSCIENCE (3)
Prerequisite: Calculus III or permission of instructor.
Mathematical and computational introduction to biophysical mechanisms that underlie physiological functions of single neurons and synapses. Topics covered include voltage-dependent channel-gating, mechanisms, the Hodgkin-Huxley model for membrane excitability, repetitive and burst firing, nerve impulse propagation in axons and dendrites, single- and multicompartmental modeling, synaptic transmission, calcium-handling dynamics, and calcium-dependent current and processes.

26:120:523. BIOGEOGRAPHY (3)
Prerequisite: Permission of instructor.
Historical and ecological factors determining the geographical distribution of animals as exemplified by vertebrates.

26:120:526. CELL BIOLOGY (3)
Prerequisites: Upper-level undergraduate courses in biochemistry, genetics, and cell structure and function.
Detailed study of the structure and function of cells and their organelles; composition, organization, and functioning of various membrane systems; investigative techniques.

26:120:528. CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASE (3)
Prerequisites: Undergraduate microbiology and biochemistry. Open to graduate nurses only.
Clinically-oriented intermediate level treatment of topics relevant to the immune system and infectious diseases in acutely ill adult patients. Students will gain an understanding of the biology of microbial pathogens and the mechanisms by which they cause disease and learn the signs and symptoms of major infectious diseases. Where relevant, the socio-cultural aspects of acquiring and managing infections will be addressed.

26:120:530. BIOPHYSICAL MEMBRANE PHYSIOLOGY (4)
Prerequisites: Differential and integral calculus, physical chemistry, or permission of instructor.
Basic biophysical principles as applied to membrane transport in animals, plants, and microbes. Special emphasis on compartmental ion flux analyses, thermodynamics of irreversible processes, and electrophysiology.

26:120:532. EVOLUTION (3)
Prerequisite: Genetics.
Critical examination of theories and mechanisms of evolution of animal groups. Emphasis on gene pool dynamics, models of speciation, and adaptive radiations. Consideration of evolutionary relationships of major invertebrate and vertebrate groups.

26:120:536. MULTIVARIATE BIOSTATISTICS (3)
Prerequisite: Biostatistics.
Covers a variety of statistical techniques useful in ecological and behavioral research. Includes sampling methods, multiple regression, discriminant analysis, weighted regression, and multidimensional chi-square. Emphasis on a conceptual understanding of the uses, assumptions, and limitations of each technique.

26:120:538. TOPICS IN MOLECULAR GENETICS (3)
Prerequisites: Microbiology and biochemistry.
Review of current journal literature in the field of mechanisms of gene expression, recombinant DNA methods, and current application.

26:120:539. ADVANCED HUMAN PHYSIOLOGY AND PATHOPHYSIOLOGY I (3)
Prerequisite: Open to graduate nurses only or by permission of department.
This is the first component in a series of two courses that will focus on the underlying physiological causes of disease states in the acute and critically ill adult client. Using a body systems approach content will address the major pathological alterations managed in the acute and critical care setting for clients who are hemodynamically unstable and technologically dependent. Mastery of course content provides the student with the pathophysiological base required for the diagnostic and therapeutic decision making fundamental to the management of disease states, especially seen in culturally diverse and vulnerable populations.

26:120:540. ADVANCED HUMAN PHYSIOLOGY AND PATHOPHYSIOLOGY II (3)
Prerequisite: Open to graduate nurses only or by permission of department.
This is the second component in a series of two courses that will continue to focus on the underlying physiological causes of disease states in the acute and critically ill adult client, addressing content not covered in Advanced Human Physiology and Pathophysiology I. Again using a body systems approach, content will address the major pathological alterations managed in the acute and critical care setting for clients who are hemodynamically unstable and technologically dependent. Mastery of course content provides the student with the pathophysiological base required for the diagnostic and therapeutic decision making fundamental to the management of disease states, especially seen in culturally diverse and vulnerable populations.

26:120:547. PATHOPHYSIOLOGY (3)
Prerequisites: Anatomy, physiology, and biochemistry; or permission of instructor. Open to graduate nurses only.
Examines the pathogenesis of major conditions affecting human beings across the life span, from birth through aging, and their clinical management. Laboratory and diagnostic data, as well as client assessments.

26:120:548. BIOLOGY OF CANCER (3)
Prerequisite: Biology background.
Examination of the mechanisms by which cancer cells arise, develop into tumors, and metastasize. Topics include chemical, biological, and physical risk factors associated with cancer.

26:120:551. BIOLOGY OF POLLUTION (3)
Prerequisite: Ecology or permission of instructor.
Survey of major environmental pollutants, their occurrence in the environment, their effect on biota at the cellular and physiological levels, as well as their effects at the population, community, and ecosystem levels. Emphasis on aquatic pollution.

26:120:552. PALEOBOTANY (4)
Prerequisite: Plant biology 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.

26:120:561. QUANTITATIVE AND ANALYTICAL LIGHT MICROSCOPY (4)
Prerequisites: Cell biology and physics.
Laboratory intensive course with lectures and discussion covering the physical principles governing eukaryotic cell function. Emphasis placed on electrical properties of excitable cells and model membrane systems. Introduction to the principles underlying light and electron microscopy.

26:120:563. DEVELOPMENTAL PLANT PHYSIOLOGY (3)
Prerequisite: 26:120:504 or permission of instructor.
Analysis of physiological and environmental factors controlling growth and differentiation in vascular plants, with emphasis on recent advances in the biochemistry of plant growth regulators.

26:120:564. TECHNIQUES IN DEVELOPMENTAL BOTANY (2)
Prerequisite: Permission of instructor.
Presentation of the major procedures used in plant tissue culture, including suspension culture, callus culture, organ culture, and protoplast isolation and culture. Emphasis on independent study.

26:120:565. MEDICAL MYCOLOGY (3)
Prerequisite: 26:120:503 or permission of instructor.
Taxonomy, morphology, and symptomatology of pathogenic fungi. Emphasis on common mycoses, fungi as allergens, toxic fungi, and recent progress in medical mycology.

26:120:566. NEUROPHYSIOLOGY AND BEHAVIOR (3)
Lec. 2 hrs., rec. 1 hr. Prerequisites: Comparative or mammalian anatomy and organic chemistry.
Aspects of the nervous system and the endocrine system as they relate to the organization of behavior and the physiological analysis of such phenomena as hunger and thirst and learning.

26:120:568. (S) NEUROENDOCRINOLOGY AND BEHAVIOR LABORATORY (3)
Lab. 6 hrs. Prerequisite: Permission of instructor.
Gross stimulation of nervous system; brain lesions and their effects; hormone implants. Recording of brain activity.

26:120:571. BIOCHEMISTRY (4)
Prerequisite: One year of organic chemistry.
Examination of the structures, properties, and functions of proteins; quantitative application of kinetic and thermodynamic principles to understanding biological interactions, structures, and functions; pathways and integration of carbohydrate and nitrogen metabolism.

26:120:584. PLANT RESPONSES TO THE ENVIRONMENT (3)
Prerequisites: Ecology and plant physiology.
Examination of the anatomical, morphological, and physiological responses of plants to environmental variability and stress; utilization of current instrumentation; physiological mechanisms underlying higher-scale ecological processes.

26:120:585. BEHAVIORAL ECOLOGY (3)
Lectures, student seminars. Prerequisite: Ecology or animal behavior.
Behavior of vertebrates and insects in their natural environments; sociobiology and the evolution of communication, foraging, and mating systems.

26:120:586. LANDSCAPE ECOLOGY (3)
Prerequisites: One ecology course and one course in statistics.
Study of how spatial and spatiotemporal configurations of resources, influences, and constraints shape ecological patterns and processes at local, regional, and global scales.

26:120:587. SYSTEMS ECOLOGY: ECOSYSTEMS IN THE LANDSCAPE (3)
Prerequisites: One ecology course and permission of instructor.
Ecological energetics; soil-plant-atmosphere continuum; effect of spatial pattern on ecological process; landscape ecology.

26:120:588. TOPICS IN ADVANCED ECOLOGY (3)
Prerequisite: Graduate course(s) in ecology.
Discussion of selected topics in advanced ecology. Current literature and newly developing approaches and theories stressed.

26:120:593. PHYSIOLOGICAL ECOLOGY (3)
Prerequisites: Ecology and physiology.
Physiological and ecological factors that permit and facilitate the adaption of animal populations to diverse environments.

26:120:594. SYSTEMATICS (3)
Prerequisites: Genetics, vertebrate or invertebrate zoology, and permission of instructor.
Present theory of the nature of the Mendelian species: theories of species origin, polytypic species content; isolating mechanisms; the reduction of interspecific competition and mechanisms of evolution above the species level.

26:120:601. HUMAN MOLECULAR GENETICS (3)
Prerequisites: Undergraduate genetics and molecular biology, or permission of instructor.
In-depth introduction to the study of human molecular genetics, with emphasis on the methods and strategies used to identify genetic defects associated with illness. Classical and molecular genetics. Laboratory techniques in current use. Examples of different types of known genetic defects, with particular attention to the experimental strategies used in each example.

26:120:604. MICROBIOLOGY: PRINCIPLES AND APPLICATIONS (3)
Restricted to NJIT students only.
Introduction to microorganisms for graduate students in environmental sciences or chemical engineering. Emphasis is on the growth, physiology, and environmental effects of bacteria.

26:120:616. TOPICS IN BIOLOGY (BA)
Discussion of advanced topics in the biological sciences. Current literature and newly developing approaches and theories stressed.

26:120:640. TOPICS IN IMMUNOLOGY (3)
Prerequisite: 21:120:443 or permission of instructor.
Discussion of selected, up-to-date topics in immunology. Current literature, student discussions, and presentations stressed.

26:120:651,652. BIOLOGY COLLOQUIUM (1,1)
Open to all graduate students in good standing in the biology graduate program and by permission to students in other graduate programs. All Ph.D. students must participate.
Various biological topics of current interest discussed by a series of experts in the field.

26:120:697. (F) NEUROENDOCRINOLOGY (3)
Equivalent to 26:112:567. Prerequisite: Permission of instructor.
Central nervous system effects on the endocrine system, including neural pathways in pituitary control and behavioral effects; endocrine control mechanisms and the effects of hormones on the nervous system.

26:120:701,702. RESEARCH IN BIOLOGY (BA,BA)
Research for M.S. thesis or Ph.D. dissertation.

CHEMISTRY 160

Degree Programs Offered: Master of Science, Doctor of Philosophy
Director of Graduate Programs: Professor W.P. Huskey, Room 232, Olson Laboratories (973 / 353-5741)
Coordinator of Graduate Programs: Associate Professor Piotr Piotrowiak, Room 020, Olson Laboratories (973 / 353-5318)

Members of the Graduate Faculty

Professors:

Stan S. Hall, FAS–N; Ph.D., Massachusetts Institute of Technology
Synthetic methods; total synthesis; tandem reactions; (*h*3-allyl)palladium chemistry

Frank Jordan, FAS–N; Ph.D., Pennsylvania
Bioorganic chemistry; enzyme mechanisms; protein NMR

Roger A. Lalancette, FAS–N; Ph.D., Fordham
X-ray diffraction and the structure of solids; synthesis and characterization of nitrogen and sulfur complexes; hydrogen bonding in keto-carboxylic acids

Richard Mendelsohn, FAS–N; Ph.D., Massachusetts Institute of Technology
Biophysical chemistry; lipid-protein interactions in biological membranes; phospholipid phase transitions; development of new FT-IR experiments; biomedical applications of FT-IR

Daniel E. Murnick, FAS–N; Ph.D., Massachusetts Institute of Technology
Laser spectroscopy and applied physics

James M. Schlegel, FAS–N; Ph.D., Iowa State
Electroanalytical chemistry; kinetics and mechanism of electrode reactions

Hugh W. Thompson, FAS–N; Ph.D., Massachusetts Institute of Technology
Mechanisms and stereochemical courses of organic reactions; compounds of unusual symmetry and stereochemistry; impacted-orbital systems; solid-state H-bonding patterns

Associate Professors:

W. Phillip Huskey, FAS–N; Ph.D., Kansas
Physical organic chemistry; mechanistic enzymology; isotope effects

Piotr Piotrowiak, FAS–N; Ph.D., Chicago
Photoinduced charge and excitation transfer; excited-state dynamics; transient laser spectroscopy; electrolyte dynamics

Susanne Raynor, FAS–N; Ph.D., Georgetown
Quantum mechanics of molecular solids and clusters; collision dynamics

John B. Sheridan, FAS–N; Ph.D., Bristol (England)
Transition-metal organometallic chemistry; synthesis, structure, and mechanism; applications to organic synthesis

Assistant Professors:

Elena Galoppini, FAS–N; Ph.D., Chicago
Synthesis and properties of novel hydrocarbon cage compounds and rigid, extended 3-D organic networks

Frieder Jäkle, FAS–N; Ph.D., Technical University of Munich
Inorganic polymer chemistry

Professors Emeriti:

Ernst U. Monse, FAS–N; Ph.D., Max Planck Institute (Mainz)
Isotope effects and their applications to theoretical chemistry

Gilbert S. Panson, Ph.D., Columbia
Molecular interactions in liquids; hydrogen bonding; mechanisms of aryl substitution in nonpolar media

Programs and Facilities

The Department of Chemistry is located in the Carl A. Olson Laboratories, a modern facility housing state-of-the-art instrumentation. Major items of equipment include NMR spectrometers (500 MHz and 400 MHz multinuclear NMR); MALDI-TOF and GC-MS mass spectrometers; a circular dichroism spectrophotometer; an X-ray diffractometer; a stopped-flow spectrometer; high-performance liquid chromatographs and gas chromatographs; electrochemistry units; and several CW and pulsed lasers. Other equipment used to support a biotechnology laboratory includes an automatic peptide synthesizer, a GC-mass spectrometer, ultracentrifuges, a pilot-scale fermenter, a scintillation counter, and a transmission electron microscope.

The department has numerous PCs and Macs and three Silicon Graphics workstations with peripherals at numerous locations. Major workstation software includes Gaussian, Sybyl, Spartan, and Biosym programs. Departmental computers are connected to the Rutgers fiber-optic network, which includes hundreds of computers throughout the university and provides access to the Internet.

Cooperative arrangements with the neighboring New Jersey Institute of Technology permit cross-registration for NJIT courses. The department's fourteen faculty members provide research opportunities in many fields of specialization, including biophysical and bioorganic, synthetic organic, organometallic, and inorganic chemistry; biological membranes; laser spectroscopy; materials chemistry; and X-ray crystallography.

A total of 30 credits is required for the master's degree, and no more than 6 of these credits may be in research. The Ph.D. degree requires 72 credits, of which 24 must be in course work.

Each month, the department schedules written cumulative examinations, which are graded on a basis of 2, 1, or 0 points. Students in the master's program must score 3 points, whereas those studying for the Ph.D. must get 10 points. Students generally meet this requirement within their first five terms.

Students enrolled in the Ph.D. program typically finish course work in the second year. At the end of their second year or early in the third year, Ph.D. candidates prepare an original research proposal that they defend in an oral examination. Fulfillment of these requirements completes a student's candidacy for the Ph.D. program.

The most important part of the Ph.D. program is a doctoral dissertation. This thesis describes the results of original research that the student performs under supervision of a faculty member of the department. Students are required to select an adviser by the end of their first term in the program.

Graduate Courses

26:160:503. MODERN SYNTHETIC ORGANIC CHEMISTRY (3)
Hall. Prerequisite: Advanced organic chemistry.
Survey of selected preparative methods used in modern organic chemistry, with attention to the mechanisms by which they operate, their stereochemical characteristics, and their application to the synthesis of complex molecules.

26:160:504. RECENT ADVANCES IN ORGANIC CHEMISTRY (3)
Galoppini, Hall, Thompson. Prerequisite: Advanced course in organic chemistry.
Selected topics of recent interest and importance presented at an advanced level.

26:160:505. THE CHEMISTRY OF NATURAL PRODUCTS (3)
Prerequisite: Advanced organic chemistry course.
Isolation, structure elucidation, synthesis, and biosynthesis of selected natural products derived from mevalonic acid (isoprenoids and steroids), amino acids (alkaloids), fatty acids, shikimic acid (phenolics), and polyketides (carboaromatics).

26:160:511. ADVANCED ORGANIC CHEMISTRY (3)
Galoppini. Prerequisite: Elementary organic chemistry course.
Advanced survey of organic chemistry topics: carbanions, organometallic reagents and their application to C-C bond formation, radicals, photochemical reactions, protective groups, and examples of multistep syntheses.

26:160:512. SPECIAL TOPICS IN ORGANIC CHEMISTRY (3)
Prerequisite: B.S. in chemistry.
Advanced topics of current interest.

26:160:515. CHEMICAL STRUCTURE DETERMINATION (3)
Jordan, Lalancette, Thompson. Prerequisite: B.S. in chemistry.
Physical methods, mechanistic origins, and interpretation of infrared, ultraviolet, mass, ^{1}H nuclear magnetic resonance, and ^{13}C NMR spectra, concentrating on deduction of organic structures. Some discussion of X-ray structure determination included.

26:160:519. PHYSICAL ORGANIC CHEMISTRY (3)
Huskey, Piotrowiak. Prerequisites: One year each of organic and physical chemistry.
Physical basis underlying principles of structure and reactivity in organic chemistry. Emphasis placed on determination of reaction mechanisms and on computational approaches to questions about organic molecules. Includes an introduction to the use of modern electronic-structure calculations.

26:160:520. ADVANCED MATHEMATICS FOR CHEMISTS (3)
Raynor. Prerequisites: Elementary courses in calculus and physical chemistry.
Review of infinite series, introduction to differential equations, matrix algebra, and group theory, and special functions as applied to chemistry.

26:160:521. ATOMIC AND MOLECULAR STRUCTURE (3)
Piotrowiak. Prerequisite: Elementary physical chemistry.
Introduction to basic concepts of quantum mechanics and their application in chemistry. Designed primarily as a first-year graduate course; requires little or no prior knowledge of quantum chemistry.

26:160:529. SPECIAL TOPICS IN PHYSICAL CHEMISTRY (3)
Prerequisite: One year of physical chemistry.
Advanced topics of current interest.

26:160:532. MOLECULAR QUANTUM MECHANICS (3)
Piotrowiak, Raynor. Prerequisite: Physical chemistry.
Basic principles and methods of quantum mechanics, with emphasis on their application to atoms and molecules.

26:160:534. THERMODYNAMICS AND KINETICS (3)
Schlegel. Prerequisite: Physical chemistry.
Topics include mathematical methods; thermodynamic laws; free energy, enthalpy, and entropy; equilibria; standard and reference states; theories of chemical reaction rates; kinetics of simple and complex systems; experimental techniques and methods of mechanistic investigation.

26:160:535. CRYSTAL AND MOLECULAR STRUCTURE (3)
Lalancette. Prerequisite: Elementary physical chemistry.
Symmetry of crystals: point groups, space lattices, and space groups. Determination of crystal structure by X-ray diffraction, including modern techniques; neutron diffraction and other methods for determining molecular structure.

26:160:539. MOLECULAR VIBRATIONS (3)
Mendelsohn, Prerequisite: Physical chemistry.
Theory of molecular vibrations of polyatomic molecules, including Wilson's F-G matrix method; quantum mechanical and group theoretical aspects of molecular symmetry leading to the infrared and Raman selection rules.

26:160:546. CHEMICAL SEPARATIONS (3)
Prerequisite: Elementary analytical chemistry.
Principles of chemical separations by diverse methods, with emphasis on the theory and application of modern chromatographic separations, including GLC, HPLC, and ion exchange.

26:160:547. ANALYTICAL SPECTROSCOPY (3)
Jordan, Mendelsohn. Prerequisites: Elementary courses in analytical, organic, and physical chemistry.
Theoretical principles of spectroscopy: emission, infrared, Raman fluorescence, 1D and 2D multinuclear NMR, X-ray, and Fourier transformation techniques. Applications illustrating the various methods will be chosen from physical and organic chemistry.

26:160:548. SPECIAL TOPICS IN ANALYTICAL CHEMISTRY (3)
Prerequisite: Elementary analytical chemistry.
Advanced topics of current interest.

26:160:549. ELECTROANALYTICAL CHEMISTRY (3)
Schlegel. Prerequisites: Analytical chemistry and a physical chemistry laboratory.
Application of electrochemical principles, with emphasis on analytical areas. Topics include selective-ion electrodes, pulse polarography, cyclic voltammetry, and coulometry.

26:160:571. INORGANIC CHEMISTRY (3)
Jäkle, Sheridan. Prerequisites: Elementary courses in organic, inorganic, and physical chemistry.
Discussion of the structure (including symmetry) and reactivity (including mechanism) of both main-group and transition-metal compounds, and an introduction to transition-metal organometallic chemistry.

26:160:572. ADVANCED INORGANIC CHEMISTRY (3)
Jäkle, Sheridan. Prerequisites: Elementary courses in organic, inorganic, and physical chemistry.
Advanced treatment of modern inorganic chemistry.

26:160:579. SPECIAL TOPICS IN INORGANIC CHEMISTRY (3)
Prerequisite: 26:160:571 or equivalent.
Advanced topics of current interest.

26:160:581. BIOCHEMISTRY I (4)
Jordan, Mendelsohn. Prerequisite: One year of organic chemistry.
Recommended: Introductory courses in physical chemistry and biology.
Examination of the structures, properties, and functions of proteins, lipids, nucleic acids, and carbohydrates used by biological systems; quantitative application of kinetic and thermodynamic principles to understanding biological interactions, structures, and functions. Metabolism of lipids, carbohydrates, and amino acids.

26:160:583. CELLULAR AND MOLECULAR BIOPHYSICS I (4)
Jordan. Prerequisites: One year of elementary organic chemistry, physical chemistry, and biology; permission of instructor.
Introduction to current methodologies for determining biomolecular structure and dynamics. Topics include use of NMR and of IR, UV-visible, and fluorescence spectroscopies with conventional and laser light sources for studying the structure and dynamics of proteins, membranes, and nucleic acids, as well as steady-state and presteady-state enzyme kinetics.

26:160:584. ENZYME KINETICS AND MECHANISM (3)
Huskey. Prerequisites: Organic chemistry, introductory physical chemistry, and biochemistry.
Examination of methods, primarily kinetic, used to study the mechanisms of enzyme-catalyzed reactions. Illustrative examples taken from the biochemical literature.

26:160:585. PHYSICAL BIOCHEMISTRY (3)
Jordan, Mendelsohn. Prerequisites: Organic and physical chemistry.
Recommended: Biochemistry.
Principles of physical chemistry as applied to the study of macromolecules of biochemical importance; physical principles relating to the structure and function of proteins; hydrodynamic, spectroscopic, and chemical methods in the study of the structure and function of biomolecules.

26:160:586. ANALYTICAL BIOCHEMISTRY (3)
Prerequisite: Elementary course in analytical chemistry.
Discussion of current methodology in the analysis of biologically important molecules; HPLC of amino acids, peptides, proteins, and nucleic acids; sequencing of proteins and nucleic acids; microchemical techniques to detect ultramicroscale quantities of biologically relevant substances.

26:160:601,602. SEMINAR IN ADVANCED TOPICS IN CHEMISTRY (2,2)
Research topics currently under investigation. Seminars presented by faculty, distinguished outside speakers, and advanced-level students.

26:160:612. COLLOQUIUM IN CELLULAR AND MOLECULAR BIODYNAMICS (1)
Jordan. Prerequisite: Permission of instructor.

26:160:701,702. RESEARCH IN CHEMISTRY (BA,BA)

COMPUTATIONAL BIOLOGY 197
(Joint M.S. Program with NJIT)

Degree Program Offered: Master of Science
For information contact: Professor Michael Recce, New Jersey Institute of Technology, GITC 3800 (973 / 596-3483) or Professor Doina Ganea, Rutgers, The State University of New Jersey, Room 135, Smith Hall (973 / 353-1235)

Program

The master's program in computational biology is sponsored jointly with NJIT. It provides professionals with the educational background they need to win jobs with leading pharmaceutical corporations, biotechnology firms, and academic research centers that are translating the latest genetic data into practical, life-enhancing applications.

The twenty-first century will see an unprecedented revolution in the life sciences, as the human genome yields its secrets. Recent breakthroughs in the biological sciences and advanced computing and mathematics techniques are launching a new age of discovery that is leading to new strategies to prevent, diagnose, and cure disease.

Huge amounts of scientific information generated over recent years call for sophisticated mathematical models to solve research problems in the life sciences. Thus, at the forefront of this effort will be professionals who have the expertise to apply state-of-the-art computing, mathematical, and statistical methods to deal with problems in biology and the health sciences.

The master of science in computational biology is designed to complement a background in biology, physics, chemistry, mathematics, or computer science. The program offers two different bridge plans that are tailored to a student's background. The first is for people with a background in biological sciences. The other is geared to the needs of those with prior training in mathematics, computer science, and / or physics. After students complete the bridge program and a group of core courses required of all students, they take the remaining credits in an area of computational biology that interests them.

Prerequisites

Introductory course in biology
Introductory course in organic chemistry
Computer programming (at least one term, equivalent to CIS 113)
Cellular biology (one course)
Genetics (one course)
Molecular biology (one course)
Calculus (two terms or the equivalent)
Physics (one year)

Students who lack the necessary prerequisites may be admitted conditionally to the program, but to remedy any deficiencies, they must complete course work beyond the regular graduate requirements of the program. Depending on an incoming student's background, the program may require that person, as a condition of acceptance, to take additional bridge courses.

Areas of Specialization

All students in the program take a set of core courses that provides an understanding of computational biology. They then fill out the required credits by taking specialized courses in an area of their choice.

Curriculum

A minimum of 30 credits is required for the degree, excluding bridge courses. The graduate curriculum consists of core courses, a research project or the equivalent, and electives.

Core Courses

1. R120:502 or Biol 601 Foundations of Computational Biology
2. Biol 602 Current Trends in Computational Biology
3. CIS 505 Programming, Data Structures, and Algorithms
4. CIS 610 Data Structures and Algorithms
5. CIS 631 Data Management System Design
6. Biol 701 Master's Thesis or Project. The research project course involves a master's thesis or an equivalent project / course of study for a total of 6 credits. The prerequisite is matriculation for a master's degree and departmental approval.

Electives

In addition to the core courses, students take two elective courses from the following list. Other courses may be substituted with permission of the program adviser.

1. BINF 5030 Visualization in Biomedical Sciences
2. BINF 5220 Principles and Applications of Molecular Modeling / Drug Design
3. BINF 5230 Principles and Application of Bioinformatics / Sequence Analysis
4. BINF 7550 Medical Image Processing and Visualization
5. BINF 7580 Human Genome: Mapping, Sequencing, and Techniques
6. BINF 7590 Genetic Engineering, Protein Modeling, and Structure-Based Drug Design
7. BME 669 Engineering Physiology
8. Chem 601 Introduction to Medicinal Chemistry
9. Chem 602 Molecular Modeling and Drug Discovery
10. Chem 658 Advanced Physical Chemistry
11. Chem 673 Biochemistry
12. CIS 632 Advanced Database System Design
13. CIS 786 Pattern Recognition
14. Math 611 Numerical Methods
15. R120:520 or Math 635 Analytical and Computational Neuroscience
16. Math 636 Computational Systems Neuroscience
17. Math 644 Regression Analysis
18. Math 661 Applied Statistics
19. R112:501 Neuroanatomy
20. R112:565,566 Foundations of Neuroscience
21. R112:629 Human Neuroanatomy
22. R120:443 Immunology
23. R120:515 Molecular Biology of Eukaryotes
24. R120:526 Cell Biology
25. R120:548 Biology of Cancer
26. R120:640 Topics in Immunology

For further information about the master of science program in computational biology, students should contact the Department of Biological Sciences at Rutgers (973 / 353-1235; email: biosci@newark.rutgers.edu) or the life sciences program at NJIT (973 / 596-3483; email: lifesciences@njit.edu; web site: http://njit.edu/els/).

CRIMINAL JUSTICE 202

Doctoral Degree Program Offered: Doctor of Philosophy
Master's Degree Programs: For information about programs leading to the Master of Arts, students should obtain the catalog of the School of Criminal Justice from Suite 110, Center for Law and Justice, 123 Washington Street, Newark, NJ 07102 (973 / 353-3029).
Director of Graduate Program: Dean Leslie Kennedy, School of Criminal Justice, Center for Law and Justice (973 / 353-5870)
Graduate Program Coordinator: Associate Dean Bonita Veysey, School of Criminal Justice, Center for Law and Justice (973 / 353-3029)

Members of the Graduate Faculty

Professors:

Freda Adler, SCJ; Ph.D., Pennsylvania
Criminological theory; social control; maritime crime

Ronald V. Clarke, SCJ; Ph.D., London
Rational choice in criminological theory; situational crime prevention

Marcus Felson, SCJ; Ph.D., Michigan
Criminology; routine activity and crime

James O. Finckenauer, SCJ; Ph.D., New York
Juvenile justice; organized crime; crime and justice in the former Soviet Union

Clayton A. Hartjen, SCJ/FAS–N; Ph.D., New York
International and comparative criminology; special emphasis on juvenile delinquency/justice in India; corrections; control

George L. Kelling, SCJ; Ph.D., Wisconsin
Police; evolution of policing strategies and tactics; relationship among fear, crime, and disorder; community crime control

Leslie W. Kennedy, SCJ; Ph.D., Toronto
Violence, victimization; crime mapping

Michael G. Maxfield, SCJ; Ph.D., Northwestern
Research methods; policing; public policy; victimology; frugal evaluation

Gerhard O.W. Mueller, SCJ; J.D., Chicago; LL.M., Columbia
Law and criminal justice; constitutional issues and the criminal justice system; maritime crime

Nathaniel J. Pallone, SCJ; Ph.D., New York
Personality and criminal behavior; clinical treatment of criminal offenders

Associate Professors:

Edem F. Avakame, SCJ; Ph.D., Rutgers (School of Criminal Justice); Ph.D., Alberta
Social stratification and crime; child development; life-course criminology; quantitative methods; macrosociology

Ko-lin Chin, SCJ; Ph.D., Pennsylvania
Street gangs; organized crime; drug use and trafficking; illegal immigration

Candace McCoy, SCJ; J.D., Cincinnati; Ph.D., California (Berkeley)
Plea bargaining; prosecution; sentencing; criminal justice ethics

Mercer L. Sullivan, SCJ; Ph.D., Columbia
Neighborhood and community influences on crime; qualitative research methods; crime and the life course

Assistant Professors:

Travis Pratt, SCJ; Ph.D., Cincinnati
Institutional and community corrections policy; macro-level criminological theory; quantitative methods

Bonita M. Veysey, SCJ; Ph.D., SUNY (Albany)
Mental health and justice; corrections; violence against women

Program

For detailed program information, refer to the Graduate School–Newark doctoral program section, the Degree Requirements chapter in this catalog, and the corresponding chapters in the School of Criminal Justice catalog.

The program of study for the degree of doctor of philosophy is under the jurisdiction of the Graduate School–Newark. Both full- and part-time enrollment are permitted. In addition to the general requirements listed in the Degree Requirements chapter, criminal justice doctoral candidates must meet several specific program requirements.

The elements of the normal course of study are listed below, but it should be understood that such a listing does not indicate necessarily the expected sequence of events. Indeed, students will be encouraged to initiate their dissertation research as soon as they have attained the necessary competence. Thus, course work and dissertation research may be undertaken during the same time period. The main elements of the program and its requirements are as follows:

1. Acceptance into the program and by the Graduate School–Newark.
2. Completion of required and elective course work.
3. Satisfactory performance on the qualifying examination, core area examination, prospectus defense, course work, and dissertation defense.
4. The minimum total requirement is normally 60 credits. In addition, the student must take a minimum of 24 credits in dissertation research toward the degree.
5. Ph.D. required courses (18 credits) are taught at an advanced level. Students with no previous exposure in an area are advised to take overview courses. These courses are indicated in parentheses in the listing that follows.

Research Courses	**Credits**
Research Methods and Statistics	
27:202:543 Intermediate Statistics (Overview: 27:202:542 Introductory Statistics)	3
27:202:640 Advanced Research Methods (Overview: 27:202:540 Research Methods in Criminal Justice)	3
Crime and Criminology	
27:202:511 Theories of Crime and Criminality (Overview: 27:202:510 Criminology)	3
27:202:512 Measurement and Correlates of Crime (Overview: 27:202:510 Criminology)	3
Law and Criminal Justice	
27:202:521 Law in the Criminal Justice System (Overview: 27:202:520 The Criminal Justice System)	3
27:202:522 Criminal Justice Policy, Planning, and Evaluation (Overview: 27:202:520 The Criminal Justice System)	3
Subtotal	18
Additional Course Work	42
Dissertation Research	
26:202:701,702,703,704 Dissertation Research in Criminal Justice	24
Minimum Credit Requirement	84

Only graduate courses are accepted to fill out the remaining credits, and the additional course work is to be distributed among the university's offerings. No more than 30 of these credits may be earned in institutions outside Rutgers.

During the term in which a student completes the qualifying examination, the Core Area Committee works with that student to establish a core area plan of subsequent course work that he or she must complete. This plan is filed with the Ph.D. committee. After the student has completed successfully the core area examination and formed a dissertation committee, that committee is responsible for evaluating the dissertation plan and recommending any additional requirements. The final phase consists of the following five steps:

1. Acceptance and defense of the dissertation plan and approval of the course of study.
2. Completion of the approved course of study and meeting scholarship requirements.
3. Meeting the total credit requirement of 84 credits.
4. Approval of the dissertation.
5. Successful dissertation defense.

Admission to Candidacy: Required Examinations

Admission to the program does not ensure that the student will be accepted as a candidate for the degree of doctor of philosophy. Each student becomes a formal candidate for this degree only after he or she completes successfully the examinations listed below. These examinations are described in detail in the Criminal Justice Doctoral Program document.

Qualifying Examination. In the third term, the student is tested in the three areas that comprise the curriculum: (1) Research Methods and Statistics, (2) Crime and Criminology, and (3) Law and Criminal Justice. This essay-type examination is designed to test a student's basic familiarity with concepts in the field of criminal justice.

Core Area Examination. During the third year, the student is tested on command of material in the core area in criminal justice on which he or she has decided to focus. The format is an eight-hour examination composed on a word processor. After completing this written examination, the student meets with his or her Core Area Committee for an evaluation. As part of this process, the student may be asked to clarify aspects of his or her written answers.

Prospectus Defense and Admission to Candidacy. At the end of the third year, the student presents a prospectus for dissertation study and receives advice from faculty members and students in an open, public meeting. Following the successful defense of the prospectus, the student may apply to the Dean of the Graduate School–Newark for admission to candidacy for the degree of doctor of philosophy.

Transfer of Credit

Graduate courses completed at other institutions and at units within Rutgers may be accepted for credit toward this degree if normally they would form a part of the student's program in criminal justice. To receive credit, however, the student must have been registered in these courses during the six-year period preceding his or her qualifying examination and have earned grades of B or better in each. The limit to the number of courses for which transfer of credit may be granted is 30 academic degree credits. No credit may be transferred for a master's thesis or related research.

Students are not granted transfer of credit until they have completed at least 12 credits of course work toward the Ph.D. degree with grades of B or better. The responsibility for requesting advanced credit lies with the student. A form for this purpose is available at the program director's office. A student seeking to transfer credits should submit this form to the program director, together with an official transcript of the graduate work for which credit is requested.

Academic Advisers

All doctoral degree students are advised during their first year by the associate dean, who reviews and discusses each first-year student's course selection during the fall and spring registration periods. Before registering for courses each term, each first-year student must have his or her registration card reviewed by the associate dean. After their first year in the program, Ph.D. students may use telephone registration.

The associate dean will continue to serve as a doctoral student's academic adviser until the student forms a Core Area Examination Committee. At that time, the core committee's chairperson takes over as the student's academic adviser, and the student should consult with the chairperson before enrolling each term. If a different faculty member later becomes the dissertation committee's chairperson, that faculty member advises the student academically.

Scholastic Standing

Candidates for the doctorate must show evidence of distinction in their course work. That means students are expected to earn grades of A in at least half of their formal course work. Grades of B or better are expected for all courses, and no more than 3 credits bearing the grade of C will be allowed in meeting the requirements for the degree.

Academic Probation, Termination of Studies, Appeal, and Student Grade Complaints

A detailed discussion of the current policies and procedures for academic probation, termination of studies, appeal, and student grade complaints appears in the Criminal Justice Doctoral Program document. This publication is available in the Office of Academic Programs at the School of Criminal Justice. Students also can find information on these topics in the chapter on Academic Policies and Procedures of this catalog.

Matriculation Continued

Students who have to interrupt their studies may register for matriculation continued if they get approval of the associate dean. There is no tuition fee for this registration, although a student fee of $7 plus a computer fee of $20 are charged. This category of registration is available only to students not present on campus and not using faculty time and university research facilities. Students who are away from campus but working on their dissertations and in contact with their committees should register for dissertation research.

Time Limitation

All requirements for the degree of doctor of philosophy should be completed within eight years of the first matriculation in the criminal justice Ph.D. program.

Graduate Courses

27:202:510. CRIMINOLOGY (3)
Provides an overview of the nature and scope of delinquency and crime problems; considers problems of the assessment and measurement of delinquency and crime; surveys available theoretical formulations concerning criminal and delinquent behavior.

27:202:511. THEORIES OF CRIME AND CRIMINALITY (3)
Wide survey of criminological theories using original sources. Included are theories that derive from biological, psychological, sociological, geographic, economic, and political perspectives. Development of criminological theory reviewed; fundamental distinctions between classical and positivist theories and between theories of crime and criminality discussed. Relationship between theory and policy considered along with the prospects for developing a true general theory.

27:202:512. MEASUREMENT AND CORRELATES OF CRIME (3)
Prerequisites: 27:202:510, 540, 542.
Review and critique of major sources of data for measuring crime and victimization: official records, surveys of crime victimization in households and individuals, and self-report methods. Data collection procedures and sources for each data source analyzed, and sources of measurement error identified. Analysis of procedures for aggregating and reporting data and for measuring crime rates. Review of patterns and trends over time in specific forms of crime; identifying geographic and demographic correlates according to each data source. Factors influencing disparities and convergence between data sets analyzed. Crime rates compared for U.S. and international data, as well as for specific regions within the U.S.

27:202:513. CURRENT ISSUES IN CRIMINAL JUSTICE (3)
Theory and research analyzed on the basis of selected topics, depending upon student interest and current issues.

27:202:514. DRUGS, ALCOHOL, AND CRIME (3)
Prerequisites: 27:202:510, 522, 540.
Seminar providing review of contemporary knowledge on the many drug-crime relationships. Survey of articles that represent dominant views and consideration of alternative perspectives; criticism of empirical research and theory. Survey of the literature examines theory, research, intervention strategies, and crime control policies. Both adolescent and adult behaviors examined, and varieties of licit and illicit drugs associated with crime and delinquency considered.

27:202:515. PSYCHOLOGICAL ANALYSIS OF CRIMINAL BEHAVIOR (3)
(Formerly Personality Factors in Delinquency and Crime)
Prerequisite: Undergraduate or graduate background in psychology or permission of instructor.
Analyzes psychological variables in relation to criminal behavior, with an emphasis on neurobiology, neurochemistry, personality, and social learning. Reviews principal methods of inquiry in scientific psychology in the study of the engines of behavior. Examines current conceptual formulations on personality and criminal behavior in relation to principal categories of crime, emphasizing crimes of aggression.

27:202:516. Offender Rehabilitation (3)
Prerequisites: Adequate clinical background and permission of instructor.
Analysis of research evidence on the effectiveness of clinical treatment in outpatient settings and at correctional facilities in rehabilitating offenders. Topics include definition of target and criterion behaviors in offender rehabilitation; legal constraints and judicial requirements in the inpatient treatment of offenders; individual and group psychotherapy; behavior modification; educational methods; and multimodal approaches in the treatment of offenders in jails, reformatories, prisons, and outpatient settings.

27:202:517. Violent Crime (3)
Prerequisites: 27:202:510, 540, 542.
Investigates and analyzes aggression and violence as forms of individual, group, and societal behavior. Includes an assessment of anthropological, biological, philosophical, political, and sociological theories. Combines student presentations and projects with lectures and tutorials.

27:202:518. Advanced Criminological Theory (3)
Prerequisite: 27:202:510.
Contemporary criminological theories analyzed and evaluated. Assessments of theoretical advances, including theory integration and general theories of crime.

27:202:519. Analysis of Theory (3)
(Formerly: 27:202:650)
Prerequisites: 27:202:510,511.
Functions of theory building and testing reviewed as fundamental to the application of the scientific method to criminology and criminal justice. Fundamental issues in the philosophy of science and the nature of scientific theories discussed. Selected theories examined and evaluated from sociological, psychological, and biological perspectives. Each student presents and defends a detailed outline of a theory.

27:202:520. Criminal Justice System (3)
Provides a foundation and overview of the criminal justice system and process. Focuses on critical decisions, with an emphasis on contemporary issues, controversies, and trends.

27:202:521. Law in the Criminal Justice System (3)
Provides an overview of criminal law and procedure. Introduces statutory and case law reasoning, as well as empirical information. Uses the area of the criminal law dealing with the insanity defense, the definitional elements of common law crimes, and the aims of the criminal law and procedure.

27:202:522. Criminal Justice Policy Planning and Evaluation (3)
Prerequisites: 27:202:520, 521, 540, 542; basic knowledge of research methods/ statistics. Recommended: 27:202:530.
Focus on policy planning, program development, and program evaluation in criminal justice. Fundamentals in each of these three areas (as derived from applications in business, human services, and social welfare) are reviewed and then fit to criminal justice. Comprehensive policy planning proposal developed to deal with a carefully defined criminal justice problem or need.

27:202:530. Organizational Behavior in Criminal Justice (3)
Analyzes within the context of the entire criminal justice system the structures, functions, and operations of criminal justice agencies, including the police, the courts, and corrections (jail, probation, prison, and parole).

27:202:531. Probation, Parole, and Intermediate Sanctions (3)
An analysis of the theory and practice of probation, parole, and intermediate sanctions. Emphasis on understanding functions of probation, parole, and intermediate sanctions as human-service organizations. Special attention given to policy developments in the field.

27:202:532. Adult Incarceration (3)
Traces the historical development of institutions for confinement and analyzes present trends in correctional practice. Reviews characteristics of various correctional policies, and analyzes prison life. Special emphasis on current trends and controversies.

27:202:533. Policing (3)
Examines the police role and law enforcement policy. Looks at police organization, personnel issues, management, and operations, as well as coordination and consolidation of police service, police integrity, and community relations.

27:202:534. Prosecution and the Courts (3)
(Formerly 27:202:631)
Reviews functions and practices of prosecutors, with special preference to analyzing the interrelationships among charging, conviction, and sentencing. Also examines these issues in relation to the functions of police and probation staff members. Provides an overview of court goals, functions, and the potential for system reform.

27:202:535. Juvenile Justice (3)
(Formerly 27:202:534)
Focus on history and philosophy of juvenile justice, landmark court cases, police handling of juveniles, the juvenile court, and juvenile corrections and rehabilitation.

27:202:536. Comparative Criminal Justice Systems (3)
(Formerly 27:202:512)
Examines world crime and criminal justice surveys of the United Nations; analyzes the relationship between crime rates and different criminal justice systems, as well as socioeconomic development indicators. In-depth analysis of different approaches to law enforcement, criminal procedure and criminal law, and juvenile justice and corrections worldwide.

27:202:540. Research Methods in Criminal Justice (3)
Corequisite: 27:202:542.
Provides an introduction to research design as applied to problems in crime and criminal justice. Includes an introduction to the scientific method, basic research designs, and data collection techniques.

27:202:541. Foundations of Scholarship (3)
Prerequisites: 27:202:540, 542.
Develops rudimentary tools needed for conducting research and for writing reports and scholarly papers in the field of criminal justice. Explores approaches to writing a research paper, report writing, forms of documentation, library resources, data sources, presentation techniques, legal research, and computer usage.

27:202:542. Introductory Statistics (3)
(Formerly 27:202:544)
Corequisite: 27:202:540.
Provides an introduction to elementary statistical methods as applied to problems in crime and criminal justice. Includes introduction to problems of data description, data analysis, hypothesis testing and inference, and introduction to the use of computers.

27:202:543. Intermediate Statistics (3)
(Formerly 27:202:667)
Prerequisites: 27:202:540, 542.
Provides students with sufficient theoretical background and practical experience to enable them to analyze multivariate interval and ratio-level data.

27:202:550. Master's Essay (3)
(Formerly 27:202:542)
Continuation of 27:202:541.
Culminates in the completion of the master's essay for those students electing the essay option.

27:202:555. J.D./M.A. Degree Essay (6)
(Formerly 27:202:545)
The 6-credit paper is the heart of the joint-degree program. It is intended to ensure that the cross-fertilization of disciplines actually occurs.

27:202:556. Fieldwork in Criminal Justice (3)
Prerequisite: 12 credits of course work completed prior to enrollment. Interested students should meet with their adviser for further information.
Firsthand experience in the day-to-day operation of a criminal justice program under the guidance and supervision of a faculty member and a practitioner in field placement.

27:202:610. Crime Control Theory and Research (3)
Prerequisites: 27:202:510, 540, 542.
Seminar in which students analyze theory and research on crime control. Topics reviewed include theories of deterrence and social control, their applications in crime control strategies, and the impacts of crime control strategies, based on general and specific deterrence and on incapacitation strategies. Reviews and critiques research on the effects of criminal and civil legal sanctions and problems in implementing effective sanctions. Methodological issues in research on crime control assessed. Research on applications of crime control theory to specific crime problems reviewed.

27:202:611. Psychobiology of Criminal Aggression (3)
Prerequisites: 27:202:515, or the equivalent, and permission of instructor. Some classes meet off-campus.
Seminar that examines contributions of neuropsychobiology to understanding the dynamics of aggressive criminal behavior. Methods of investigation in contemporary neurosciences, with focus on brain-imaging techniques; scientific issues in reasoning through analogy and in the assessment of interspecies evidence. Effects of brain morphology and dysmorphology, neurochemical and neurohormonal dysfunction, and neurotoxicity associated with controlled and noncontrolled substances in the elicitation of aggressive behavior across animal species. Particular focus on studies of relative incidence of neuropathology among aggressive criminal offenders. Interaction between neuropathology and sociocultural and demographic factors in eliciting and sustaining patterns of aggressive behavior. Modern methods of criminal sanctions and the control of criminally aggressive behavior issuing from the knowledge explosion in the neurosciences; examines these techniques as alternatives to traditional modes of punishment and incapacitation.

27:202:612. White Collar Crime (3)
(Formerly 27:202:655)
Surveys the history and scope of study of white collar crime. Discusses issues of definition, examines empirical evidence, and reviews the contributions of white collar crime studies.

27:202:614. Communities and Crime (3)
(Formerly 27:202:527)
Prerequisites: 27:202:510, 540, 542.
Surveys and analyzes literature on the demography and ecology of crime. Includes reviews of research and theories that address the influences of economics, demography, social organization, and political economy on crimes within cities and neighborhoods. Combines student presentations of published articles with lectures, tutorials, and student projects.

27:202:615. Maritime Crime and Its Prevention (3)
(Formerly 27:202:653)
Prerequisite: 27:202:521.
Seminar that focuses on crime and crime prevention on the oceans and waterways that carry the bulk of the world's commerce. Analysis of the resurgence of piracy and barratry, seaborne narcotics smuggling, terrorism at sea, and thefts of boats and vessels. Also examines and analyzes marine insurance fraud, fisheries offenses, ocean pollution, and common criminality at sea. Capacity of existing law enforcement agencies to confront these problems and prospects for international cooperation to deal with criminality at sea evaluated.

27:202:616. Environmental Crime Prevention (3)
(Formerly 27:202:537)
Theoretical background to an opportunity-reducing approach to crime fighting. Examines key concepts of rational choice and displacement. Looks at impact of environmental design, defensible space, and problem-oriented policing on preventing crime. Case studies illustrate the practical and policy difficulties of situational prevention.

27:202:619. Organized Crime (3)
(Formerly 27:202:656)
Defines organized crime, looks at its history, and examines criminological theories that seek to explain it. Covers nontraditional or so-called emergent organized crime groups, such as urban street gangs, motorcycle gangs, and prison gangs. Examines various investigation, prosecution, and sentencing policies, and considers the policy implications for the future.

27:202:621. Sentencing (3)
(Formerly 27:202:632)
Prerequisite: 27:202:521. Recommended for students interested in the theoretical issues posed by sentencing.
Deals with the aims of sentencing convicted adult offenders. Discusses criticisms of the traditional rehabilitation-oriented view of sentencing and considers alternative sentencing theories, including incapacitative, deterrence, and "just deserts" models. Also examines techniques for limiting sentencing discretion, including mandatory minimum sentences, presumptive sentences, sentencing guidelines, and noncustodial penalties.

27:202:624. Criminal Procedure and the Constitution (3)
(Formerly 27:202:612)
Advanced seminar on institutions, phases, and procedural rules of the criminal justice process. Emphasizes critical evaluation of assumptions, realities, purpose, and effects.

27:202:625. Law and Society (3)
Sociology of law; some emphasis also on jurisprudential thought and the political analysis of legal institutions. Exploration of the sources of law and functions and dysfunctions of law in action. Review of institutional roles of courts, legislatures, and administrative agencies. Includes topics of particular current interest, such as alternative dispute resolution, how the law can help or impede social change, whether Americans have become too litigious, and race and gender issues in achieving justice.

27:202:626. Religion and Crime (3)
(Formerly 27:202:557)
Examination of the ways that the institutions and practices of religion intersect with the justice system. Specific topics include theology and legal philosophy, religion and justice reform movements, religion and crime / delinquency, religion in the prison, and the politics of religion and crime.

27:202:631. Politics in Criminal Justice (3)
(Formerly 27:202:516)
Deals with crime as a political issue and examines how conflicting political philosophies influence criminal justice policy.

27:202:632. Punishment and Treatment of the Juvenile Offender (3)
Prerequisite: 27:202:535.
Focus on postadjudicatory handling of juvenile offenders. Examines "get tough" policies directed at chronic, habitual, serious, and / or violent offenders versus rehabilitation-oriented treatment policies. A range of program models and case examples for dealing with young offenders in both institutional and community settings discussed.

27:202:634. PERSONNEL PRACTICES IN CRIMINAL JUSTICE (3)
(Formerly 27:202:525)
Prerequisite: 27:202:530.
Covers major personnel issues in criminal justice organizations: recruitment and selection, staff training and development, personnel appraisal, and general supervision. Special attention paid to innovative methods of management.

27:202:635. CRIMINAL JUSTICE IN DECISION MAKING (3)
(Formerly 27:202:654)
Prerequisite: Multivariate statistics.
Decisions made throughout the criminal justice system, including that of a victim to report a crime, examined critically. Also takes a critical look at decisions made by police, magistrates, prosecutors, judges, correctional agency personnel, and parole boards. Emphasis on empirical studies of these decisions and on the goals, information needs, and alternatives available for both individual case and policy decisions.

27:202:640. ADVANCED RESEARCH METHODS (3)
Prerequisites: 27:202:540, 542; basic knowledge of research design in the social sciences.
Analyzes research strategies and methods for research in criminal justice and criminology. Includes analysis of links between theories and methods. Provides detailed review of quantitative and qualitative methods, including research design, sampling, measurement, data collection, and ethical concerns.

27:202:641. ADVANCED STATISTICAL METHODS (3)
Prerequisites: 27:202:540, 542.
Covers theoretical foundations of general statistical approaches, such as least squares analysis, maximum likelihood estimation, and Bayesian estimation; examines mathematical foundations for statistics (e.g., matrix algebra and probability theory) and looks at such selected advanced statistical or mathematical techniques for the analysis of criminal justice research problems as log-linear analysis, failure-rate analysis, and network analysis.

27:202:642. TIME-SERIES ANALYSIS (3)
(Formerly 27:202:614)
Prerequisites: 27:202:540, 542, 543.
Covers statistical techniques of ARIMA time-series modeling. Presents basic approaches to intervention analysis, forecasting, and multiple time-series analysis.

27:202:644. CLASSIFICATION AND PREDICTION METHODS (3)
Prerequisites: 27:202:540, 542. Recommended: Multivariate statistics.
Critical review of theoretical and practical implications of classification and prediction methods in relation to criminal justice problems. Includes an assessment of a number of taxonomic and predictive techniques and of clinical and statistical prediction methods. Evaluation of classification and prediction methods in various decision-making contexts in the criminal justice system emphasized.

27:202:645. ADVANCED SCHOLARSHIP (3)
Prerequisite: 27:202:541 or enrollment in the doctoral program.
Preparation of a paper for submission to a peer-reviewed journal. All aspects of paper presentation addressed, and the differences between a paper for publication in a journal and other forms of professional writing, such as proposal and report writing, explored. May include synthesis of literature to prepare core area plan.

27:202:648. QUALITATIVE RESEARCH METHODS (3)
Prerequisites: 27:202:510, 540, 542.
Ethnographic and qualitative field methods and their application to problems of crime and criminal justice. Includes definition of appropriate research problems, data collection and interviewing, and participant observation; also examines ethical issues of protection of human subjects, coding and analysis of qualitative data, inductive theory construction, presentation of findings, and coordinating qualitative with quantitative methods. Requires collection and analysis of some original data. Includes microcomputer-based qualitative data analysis techniques.

27:202:650. INDEPENDENT STUDY (3)
(Formerly 27:202:610)
Prerequisite: 12 credits of course work completed prior to enrollment. Interested students should meet with their advisers for further information.
Study under the supervision and guidance of a faculty member.

27:202:651. TEACHING PRACTICUM IN CRIMINAL JUSTICE (3)
Under faculty supervision, doctoral students are assigned to instruct undergraduate criminal justice courses within county, private, and state colleges, and in divisions of the university. Placements are made by the supervising faculty member and the cooperating institution. Instructional placements are not guaranteed.

26:202:701,702,703,704. DISSERTATION RESEARCH IN CRIMINAL JUSTICE (3,3,3,BA)
Required of all students involved in preparation, data collection, and writing of the Ph.D. doctoral thesis.

27:202:800. MATRICULATION CONTINUED: PH.D. (E1)

27:202:877. TEACHING ASSISTANTSHIP (E-BA)
Students who hold teaching assistantships are required to enroll in this course for 3 or 6 E credits per term.

ENGLISH 350 (Includes American Literature 352)

Degree Program Offered: Master of Arts
Director of Graduate Program: Professor Janet Larson, Room 529, Hill Hall (973 / 353-5279, ext. 529; email: engma@andromeda.rutgers.edu)

Members of the Graduate Faculty

Professors:

Nina daVinci-Nichols, FAS–N; Ph.D., New York
Classical myth; Shakespearean and world drama; nineteenth-century fiction; film
Barbara Foley, FAS–N; Ph.D., Chicago
American literature; Marxist theory; theory of the novel; Afro-American literature
H. Bruce Franklin, FAS–N; Ph.D., Stanford
Literature and the third world; science fiction, utopian and anti-utopian literature, American literature; literature and technology; literature and crime; literature and revolution
Rachel Hadas, FAS–N; Ph.D., Princeton
Creative writing (poetry); twentieth-century American and English poetry; classics in translation
Carol F. Heffernan, FAS–N; Ph.D., New York
Medieval and Renaissance medical views of melancholy; the poetry of Chaucer and Shakespeare
Michael C. Jaye, FAS–N; Ph.D., New York
Poetry; romantic literature and art
Gabriel Miller, FAS–N; Ph.D., Brown
Modern drama; film; modern American fiction
Virginia Tiger, FAS–N; Ph.D., British Columbia
Narratology; gendered genres; feminist literary theory; twentieth-century British literature

Associate Professors:

David Baker, FAS–N; Ph.D., Columbia
Renaissance nondramatic literature
Frances Bartkowski, FAS–N; Ph.D., Iowa
Feminist theory and cultural studies
Nancy G. Diaz, FAS–N; Ph.D., Rutgers
Comparative literature; Latin American narrative
Belinda Edmondson, FAS–N; Ph.D., Northwestern
Caribbean literature; Afro-American literature; literary theory
Heyward Bruce Ehrlich, FAS–N; Ph.D., New York
James Joyce and modernism; Edgar Allen Poe; Melville; Lowell; literary computing
Stuart Hirschberg, FAS–N; Ph.D., New York
Twentieth-century contemporary British/Irish poetry
David Hoddeson, FAS–N; Ph.D., New York
The semiotics of voices in speech and written texts and their metacritical implications; English modernism and Ford Madox Ford; psychoanalytic approaches to literary criticism and interpretation; the relations among fact, history, journalism, the nonfiction novel, and imaginative literature

Malcolm Kiniry, FAS–N; Ph.D., Rutgers
The teaching of writing; writing-across-the-curriculum
Janet L. Larson, FAS–N; Ph.D., Northwestern
Narrative theory; religion and literature; women's studies; Victorian literature and culture
Asela Rodriguez de Laguna, FAS-N; Ph.D., Illinois
Anglo-Hispanic literary relations; Spanish and Latin American theater; Puerto Rican literature; Columbus in literature
Charles Russell, FAS–N; Ph.D., Cornell
History and theory of the avant-garde, modernism and postmodernism; contemporary American fiction

Assistant Professors:

Sterling Bland, FAS–N; Ph.D., New York
Afro-American literature
Jack Lynch, FAS–N; Ph.D., Pennsylvania
Eighteenth-century literature; the history of criticism, satire, and humanities; computing
S. Shankar, FAS–N; Ph.D., Texas
Postcolonial literature and literary theory

Programs

The graduate English programs cover all areas of English and American literature (including world Anglophone literature) and also offers a writing track and a concentration in women's and gender studies.

The program is flexible. Students may take courses on a full-time or a part-time basis. They may enter the program on a nonmatriculated basis and later, upon admission, count all earned credits toward the master's degree.

The literature program requires 30 credits for the degree. Students can meet this requirement by taking ten 3-credit courses, or they can take eight 3-credit courses and offer an additional 6 credits for a master's thesis. In addition, students must pass a foreign language exam and meet the following distribution requirements:

- completion of 26:350:503 Introduction to Graduate Literary Study (3),
- two courses in literature prior to 1800 (6),
- one course in American literature (3).

Finally, students must pass a comprehensive written exam, based on a core reading list, in order to obtain the degree.

Literature track students who choose a concentration in women's and gender studies take this area's two core courses: History and Theory of Women's / Gender Studies and Feminist Research and Methods. In addition, they take two courses in the English master's degree program designated for this purpose and meet all other literature track requirements.

Admission to the English program is separate from acceptance into the writing track. Students who wish to be considered for this track must submit a writing sample to the program director. Like their counterparts in literature, students in the writing track must earn 30 credits for the degree. This requirement consists of five 3-credit courses in literature and five 3-credit courses in writing. One of the literature courses must be in literary theory. No foreign language or exam is required. As an exit requirement, students must submit a portfolio of their best written work, along with a publication plan.

Certain genre-based courses satisfy requirements for both the literature and writing tracks. These include 26:350:523 The Nonfiction Novel (3), 26:350:524 Poetry for Poets (3), and 26:350:527 Biography, Autobiography, Memoir.

Designated courses in the M.S. in professional and technical communication at New Jersey Institute for Technology may be taken by cross-registration if the student gets permission from the directors of both master's programs. Literature and writing track students may count two of these courses toward the degree requirements for an M.A. in English.

Graduate Courses (350)

26:350:501,502. READINGS IN BRITISH AND AMERICAN LITERATURE (3,3)
Prerequisite: Permission of instructor.
Independent study course in directed readings available only by special arrangement.

26:350:503. INTRODUCTION TO GRADUATE LITERARY STUDY (3)
Studies in textual scholarship; literary research and bibliography; critical theories; various methods of literary study; issues in the discipline.

26:350:506. RHETORICAL THEORY AND THE TEACHING OF WRITING (3)
Hoddeson, Kiniry
Examination of the application of classical and modern theories of rhetoric and literary criticism to the teaching of writing.

26:350:507. STUDIES IN FICTION (3)
Survey of kinds of narrative and evolution of main forms, with attention to theory of fiction in the writings of Booth, Frye, narratologists, and others.

26:350:508. CRITICAL THEORIES (3)
Study of twentieth-century critical theories and debates in America and Europe. Course includes, but is not limited to, New Criticism, Marxist theory, feminism, structuralism, and deconstruction.

26:350:509. STUDIES IN DRAMATIC FORM (3)
daVinci-Nichols
Comedy, tragedy, masque, history play, mystery, and morality plays, with emphasis on English dramatists.

26:350:511. POETS AND POETRY (3)
Hadas, Hirschberg
Intensive readings in selected poetry in English in the twentieth century. Investigation of a range of traditions and critical responses.

26:350:513. HISTORY OF THE ENGLISH LANGUAGE (3)
Focus on the history of the English language from Anglo-Saxon times to the present, with some consideration of theories of language, history of philology, and modern linguistics.

26:350:514. RESEARCH SOURCES AND DATA TECHNIQUES (3)
In-depth study of ways and means to find information. Examination of all aspects of information science: conventional and esoteric, traditional and contemporary. Students share problems, discuss solutions, and exchange discoveries as they explore a subject of their choice. Consideration of both the academic and the practical advantages of competent information management.

26:350:517. CREATIVE WRITING: PROSE (3)
Literary knowledge of and practice in the basic elements of fiction writing, such as character, setting, point of view, tone, and theme. Students may work in a variety of literary prose genres. Writing is read and discussed in class workshops and in individual conferences with the instructor. Regular written criticism provided.

26:350:518. CREATIVE WRITING: PROSE (3)
Prerequisite: 26:350:517 or permission of the instructor.
Continued study of the basic elements of fiction writing, with more attention to plotting and scene development. Students may also work in a variety of literary prose genres. Writing is read and discussed in class and in individual conferences with the instructor. Regular written criticism provided.

26:350:519,520. CREATIVE WRITING: POETRY (3,3)
Hadas
Experiment with a variety of poetic techniques, including forms such as the sonnet, sestina, and villanelle. Students read one another's work and receive critical evaluations from the instructor.

26:350:521. TOPICS IN LITERATURE (3)
Consideration of certain authors, periods, literary backgrounds, problems, and approaches. For specific subject matter in a given term, consult the Schedule of Classes.

26:350:522. INDEPENDENT STUDY (BA)
Written permission from faculty member concerned and program director must be secured in preceding term.
Individual study directed by a faculty member arranged for qualified students.

26:350:523. NONFICTIONS (3)
Hoddeson
The course focuses on factual materials in fictional forms. It is designed both for the literary track and the writing track. Students on the literary track read works from a core list (or other individually approved readings) and write theoretical / critical papers. Students on the writing track write works of their own in the nonfictional form(s) they prefer. The conventions and practices of the old and new journalisms and the increasingly blurred distinctions between fact and fiction will be intrinsic to the subject matter. This course counts toward both the literature and the writing tracks.

26:350:524. POETRY FOR POETS (3)
Hadas
Stresses the elements of poetry (notably prosody and figurative language), with emphasis on both critical analysis and poetic technique. This course counts toward both the writing and literature tracks.

26:350:525. FICTION FOR FICTION WRITERS (3)
The nuts and bolts of constructing both longer and shorter narratives, with emphasis on critical analysis and writing techniques. This course counts toward both the writing and literature tracks.

26:350:526. SCREENWRITING (3)*
Learning and practice in elements of scripting such as research, treatments, description of action (gesture, movement), visual narrative development, voiceover narrative, character development and dialogue, relations between visual track and audio track, the use of documentary, scenic development and structure, visual and auditory metaphors, rewrites. Writing assignments will include a series of exercises typically leading to a single script project, subject to workshop critique and further revisions.

26:350:527. BIOGRAPHY, AUTOBIOGRAPHY AND MEMOIR (3)*
A course that retraces the evolution of what today is collectively known as life-writing. The course format is designed for students on the literature track who wish to study these highly popular and critically much-contested written forms in order to write essays on the readings and for students on the writing track who wish to research and write their own memoir or autobiography. Course readings range from classical times (Suetoious, Plutarch, Augustine) to the present, but the chief focus is modern and postmodern biography—i.e., current modes of pathography, autobiography and memoir. Student writings from both tracks are intrinsic to course readings and class discussion.

26:350:529-530. OLD ENGLISH (3,3)
First term: a study of Old English grammar; reading of selected short pieces in prose and poetry. Second term: a close study of Beowulf.

26:350:531. INTRODUCTION TO PUBLISHING AND EDITING (3)
Introduction to a range of editorial and production procedures involved in the publication of a literary or academic journal.

26:350:533,534. CHAUCER (3,3)
Heffernan
Close study of Chaucer's poetry, especially the Canterbury Tales and Troilus and Criseyde.

26:350:535. MEDIEVAL LITERATURE (3)
Heffernan
Major works in medieval English literature, excluding Chaucer, with emphasis on Piers Plowman and the Gawain-Poet.

26:350:537,538. WRITING FOR BUSINESS AND THE PROFESSIONS (3,3)
Advanced course designed to refine skills in writing (exposition, argument, description) and critical, analytical reading in various fields.

26:350:539. INTRODUCTION TO RENAISSANCE STUDIES (3)
Baker
Selected readings from Dante to Spenser.

26:350:541,542. THE SIXTEENTH CENTURY (3,3)
Study of the major poets and prose writers of the Tudor and Elizabethan periods, including Wyatt, Surrey, Spenser, Sidney, More, Browne, and Hooker.

26:350:543. ELIZABETHAN DRAMA (3)
daVinci-Nichols
Sixteenth- and seventeenth-century drama, excluding Shakespeare, with emphasis on Marlowe and Jonson.

26:350:544. STUDIES IN THE RENAISSANCE EPIC (3)
New consideration of the Renaissance epic as a literary form. Special attention given to the Renaissance conception and practice of mimesis, the literary imitation of reality, and of allegory. Critical readings of selections from Dante's Divine Comedy, Tasso's Jerusalem Delivered, Spenser's Faerie Queene, and several minor Renaissance epics.

26:350:545,546. SHAKESPEARE (3,3)
daVinci-Nichols
Intensive study of several plays with concern for scholarship and criticism and the seventeenth-century background.

26:350:547. MIMESIS AND POETRY (3)
Studies in the Renaissance theory and practice of artistic "imitation" in works of Dante, Spenser, Milton, and Donne, with stress upon poetic structures. Close analysis made of corresponding iconography in poetry, prose, cosmographical designs, architecture, and painting.

26:350:548. PUBLISHING AND EDITING INTERNSHIP (3)
Prerequisite: 26:350:531.
Internship with selected literary or academic journals published at Rutgers or independently in the metropolitan area.

26:350:549,550. THE SEVENTEENTH CENTURY (3,3)
Critical readings in the "metaphysical" verse of Donne and his "school"; of the neoclassical poetry of Jonson and his circle; and of prose selections by Hobbes, Bacon, Browne, and others. Literary works studied in the light of seventeenth-century political, religious, and intellectual problems and with attention to recent scholarly and critical commentary.

26:350:551. TOPICS: PSYCHOANALYSIS, LITERATURE, CULTURE*
One hundred years after Sigmund Freud invented psychoanalysis, Freudian / post-Freudian theory and practice remain among the most controversial and influential fields in contemporary literary cultural studies. All literary works are paired with relevant psychoanalytic texts that begin but do not end with Freud.

26:350:553. SCIENCE FICTION (3)
Franklin
Introduction to the history, cultural significance, and artistic achievement of science fiction.

26:350:554. MILTON (3)
Fresh look at Milton as artist and cultural reformer. Milton's attitudes toward the "new science"; religious and political problems; new theories of education and art; and questions of individual, civil, and domestic liberties. Emphasis on an original critical appreciation of Milton's literary artistry.

* Pending approval by the courses of study committee.

26:350:555. STUDIES IN FILM (3)
Miller
Attempts to define and isolate the central characteristics of various popular Hollywood genres. Each genre's evolution traced chronologically, studying the films' variations against the genre's preordained, value-laden narrative system. In alternating terms, the course covers the gangster / detective film, the Western melodrama, and screwball comedy.

26:350:556. STUDIES IN SATIRE (3)
Lynch
Intensive readings of selected masterworks of satire, primarily by English and American authors, but with some attention to classical satirists (Horace, Juvenal, Lucian), satirists of the Renaissance (Erasmus, Rabelais, Jonson), and twentieth-century theorists of satire. Included among the last group are Mark Twain, Shaw, Huxley, Heller, Nabokov, Giraudoux. A major satirist, such as Swift, is read at greater length.

26:350:558. URBAN LITERATURE (3)
Foley
Studies in literature, primarily after 1900, in which the American city plays some role. Investigation of the "literary city" versus country, the model city, and the real city. Readings from the works of Dreiser, Lewis, O'Hara, O'Neill, Selby, F.L. Wright, and others.

26:350:559,560. THE EIGHTEENTH CENTURY (3,3)
Lynch
Readings in Defoe, Addison, Steele, Shaftesbury, Mandeville, Swift, Pope, Thomson, Gray, and in Johnson, Boswell, and their circle.

26:350:561. LITERATURE AND FILM OF THE THIRD WORLD (3)
Franklin
Introduction to the literature and film of the oppressed and revolutionary peoples and nations of the modern world. Works from Africa, Asia, Latin America, and the Caribbean.

26:350:562. THE POLITICAL NOVEL (3)
Tiger
Intensive examination of late nineteenth- and twentieth-century American and English political novels, works of fiction where political ideas (reactionary, reformist, radical) play a dominant role. Exploration of the representation of anarchism, terrorism, and utopianism by such novelists as Joseph Conrad, George Orwell, and Doris Lessing.

26:350:563. WOMEN IN LITERATURE (3)
Larson, Tiger
Detailed examination of women novelists representative of historical periods. Readings from Mary Wollstonecraft, Fanny Burney, Maria Edgeworth, Jane Austen, George Eliot, Elizabeth Gaskell, Virginia Woolf, Doris Lessing, Margaret Drabble, Jean Rhys, and Barbara Pym.

26:350:564. WOMEN'S LITERATURES (3)
Larson, Tiger
Readings from feminist literary theory and criticism and the application by way of detailed analysis and discussion of selected British novelists representative of three historical periods. Issues of gender and the problematics of gendered narrative genres structure the course's investigations.

26:350:565. THE NOVEL TO JANE AUSTEN (3)
Lynch
Rise of the novel as a social and psychological mirror of man; studies in such authors as Defoe, Richardson, Fielding, Smollett, Sterne, Godwin, and Austen.

26:350:568. LITERARY TOPICS IN WOMEN'S AND GENDER STUDIES (3)
From a literary, historical and / or cultural perspective this course will allow students to bring a dimension to their graduate work in gender studies that draws upon the vast body of feminist scholarship in the humanities, particularly the fields of language and literary studies. It may focus on women writers, the representations of men and women in particular literary genres; it may focus on feminist and gender-related questions that have been investigated most thoroughly through the techniques of narrative and literary study. This course, while taught from a perspective informed by literary methods will engage a dialogue with feminist issues that emerge from fields such as political science, history, psychology, urban studies, and American studies.

26:350:569,570. THE ROMANTIC PERIOD (3,3)
Jaye
Prose and poetry of English Romanticism. First term: concentration on Blake, Wordsworth, and Coleridge. Second term: concentration on Shelley, Keats, and Byron.

26:350:571,572. VICTORIAN LITERATURE (3,3)
Larson
Studies of the poets, novelists, autobiographers, and essayists of the period in their cultural contexts, beginning with Carlyle and including Tennyson, the Brownings, the Rossettis, Hopkins, Wilde, Arnold, Mill, Nightingale, Ruskin, Morris, Pater, Dickens, the Brontës, Mrs. Gaskell, Eliot, Carroll, Gissing, sensation fiction, and working-class poetry and autobiography.

26:350:577. THE BIBLE AND ITS LITERARY INFLUENCES (3)
Larson
Historical review of the influence of the biblical tradition in Western literature and theory. Selected parts of the Bible read as literary texts. Biblical passages studied side by side with fiction, plays, and poems that draw upon scripture for archetype, symbol, character type, paradigmatic plot, and narrative strategy, poetic and prophetic imagery, literary allusion, biblical parody, and theme.

26:350:578. THE NATURE OF COMEDY (3)
daVinci-Nichols
Major theories and forms of comedy in the Western tradition, from Aristophanes's "Old Comedy" through romance, satire, and farce, to fantasy and modern absurdism. Emphasis falls on developing critical positions.

26:350:589. TWENTIETH-CENTURY BRITISH NOVEL (3)
Tiger
Study of representative works by important innovators of the period. Primary emphasis on the radical shifts in theme and technique resulting from the novelist's changing conceptions of male and female roles in society. Central to the examination of each novel is the "Condition of England" question and its various manifestations in each of the novels under discussion.

26:350:590. MODERN BRITISH DRAMA (3)
daVinci-Nichols, Tiger
Study of representative works by the important dramatists of the period. Such dramatists as Bernard Shaw, Samuel Beckett, Harold Pinter, and Tom Stoppard read in light of historical shifts in theme and technique.

26:350:591. MODERN BRITISH POETRY (3)*
Major British poets of the twentieth century, including Hardy, Yeats, Thomas Larkin, Hughes, and others.

26:350:617. ADVANCED FICTION WRITING (3)
For writing track students; others by instructor's permission only. Emphasis on the revising process with the advanced student's ongoing work. The writing is read and discussed in the class and in individual conferences with the instructor. Students and instructor both provide written commentary on the work submitted.

* Pending approval by the courses of study committee.

26:350:618. PROBLEMS IN ADVANCED WRITING (3)
For writing track students; others by instructor's permission only. Methods and approaches for writing in various genres, as determined by the instructor. Discussion of readings and advanced students' writing in workshop formats as well as in conferences with the instructor. Students and instructor both provide written commentary on the work submitted.

26:350:696,697. MASTER'S THESIS (BA,BA)
Arranged for qualified students only and with the permission of the faculty members concerned. Program director's permission must be secured in the preceding term.
Thesis supervised by two faculty members, one directing the project.

26:350:698. READINGS IN LITERATURE (3)
Readings in critical relations among 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, and the effects of literary works on society.

26:350:699. ADVANCED READINGS IN LITERATURE (3)
Intensive readings in the life and works of one or more major authors. Possible offerings include Joyce, Faulkner, Woolf, Yeats, Hawthorne, and Langston Hughes.

Graduate Courses (352)

26:352:509,510. STUDIES IN AMERICAN LITERATURE (3,3)
Ehrlich, Foley, Russell
Readings and criticisms with a focus, each term, on an individual author, a thematic element, or a special problem in American literature.

26:352:511,512. AMERICAN LITERATURE TO 1900 (3,3)
Ehrlich
Recent approaches to major American authors, chiefly of the nineteenth century, including Emerson, Thoreau, Whitman, Poe, Hawthorne, Melville, James, Twain, and Dickinson.

26:352:513. STUDIES IN AMERICAN FICTION (3)
Novels and short stories from a range of nineteenth- and twentieth-century American fiction.

26:352:514. STUDIES IN AMERICAN DRAMA (3)*
Miller
Major American dramatists, including O'Neill, Odets, Williams, Albee, and others.

26:352:515. STUDIES IN MODERN AMERICAN POETRY (3)
Hadas
Examines the span of important American poetry, 1900–2000: Frost, Stevens, Eliot, Pound, Williams, Moore, Hughes, Bishop, Jarrell, Lowell, Plath, and many others. Not, however, a survey course.

26:352:523,524. AMERICAN LITERATURE SINCE 1900 (3,3)
Foley
Selected literary themes based on readings drawn from the works of Eliot, Hemingway, O'Neill, Cummings, Faulkner, Miller, Dos Passos, Williams, Wright, Anderson, and others.

26:352:526. AMERICAN PROLETARIAN WRITERS (3)
Foley
Examination of leftist writers associated with the so-called proletarian school of the depression-era United States. Study of fiction, poetry, reportage, and drama by writers such as Agnes Smedley, John Steinbeck, Josephine Herbst, Clifford Odets, John Dos Passos, Richard Wright, Jack Conroy, Myra Page, and Langston Hughes. Writers placed in the context of social and political debates of the time, but course also addresses a range of theoretical questions about the relation of politics to literary discourse.

26:352:531. ETHNICITY IN AMERICAN LITERATURE (3)
Foley
Weekly lectures by experts who explain the contributions of ethnic writers to the body of American literature.

26:352:537,538. CONTEMPORARY AMERICAN LITERATURE (3,3)
Franklin, Russell
Survey of the significant literature of the U.S. during the post–World War II era. Focus on the contribution to the national literature of various regional and multicultural perspectives which have recently emerged.

ENVIRONMENTAL SCIENCE 375

(Administered by New Jersey Institute of Technology [NJIT] departments of chemical engineering, chemistry, and environmental science. Participating departments at Rutgers–Newark are biological sciences and geological sciences.)

Degree Programs Offered: Master of Science, Doctor of Philosophy (Both degrees are offered jointly by NJIT and Rutgers–Newark.)
Director of Graduate Program and Adviser (NJIT):
Professor Barbara B. Kebbekus, Room 358, Tiernan Hall
(973 / 596-3587; email: barbara.b.kebbekus@njit.edu)
Graduate Program Coordinator and Adviser (Rutgers–Newark):
Professor Alexander Gates, Room 411, Boyden Hall
(973 / 353-5034; email: agates@andromeda.rutgers.edu)

Members of the Graduate Faculty

Environmental Science Division (NJIT):

Distinguished Professors:

Joseph W. Bozzelli;† Ph.D., Princeton
Gordon A. Lewandowski; D.Eng.Sci., Columbia
Robert Pfeffer; Ph.D., NYU
Kamalesh K. Sirkar;‡ Ph.D., Illinois (Urbana)

Professors:

Piero Armenante; Ph.D., Virginia
Basil C. Baltzis; Ph.D., Minnesota
Barbara B. Kebbekus; Ph.D., Pennsylvania State
Lev N. Krasnoperov; D.Sci., Moscow; Ph.D., Novosibirsk
Howard D. Perlmutter; Ph.D., NYU
Angelo J. Perna; Ph.D., Connecticut
John S. Schuring; Ph.D., Stevens Institute of Technology
Environmental and geoenvironmental engineering
Sam S. Sofer; Ph.D., Texas (Austin)
Richard Trattner; Ph.D., CUNY

Associate Professors:

Robert B. Barat; Ph.D., Massachusetts Institute of Technology
Nancy Jackson; Ph.D., Rutgers
Dana E. Knox; Ph.D., Rensselaer Polytechnic Institute
Somenath Mitra; Ph.D., Southern Illinois

Assistant Professors:

Lisa Axe; Ph.D., Illinois Institute of Technology
Environmental and geoenvironmental engineering
Dittmar Hahn;** Ph.D., Wageningen Agricultural (Netherlands)
Environmental ecology; molecular biology

Research Professor:

Henry Shaw; Ph.D., Rutgers

Rutgers–Newark:

Professors:

Alexander E. Gates; Ph.D., Virginia Polytechnic Institute
Structural geology; tectonics; radon
David Kafkewitz; Ph.D., Cornell
Microbiology
Judith Shulman Weis; Ph.D., New York
Marine biology

* Pending approval by the courses of study committee.
† Ada C. Fritz Professor of Environmental Engineering and Science
‡ Sponsored chair
** Joint appointee with the Federated Department of Biological Sciences of NJIT and Rutgers–Newark

Assistant Professors:

Eric P. Hammerlynck; Ph.D., Kansas
Environmental ecology; plant biology

Victoria C. Hover; Ph.D., Michigan
Low-temperature geochemistry; environmental geology; soil and sediment geochemistry

Programs

The graduate program in environmental science is a joint effort among the departments of chemical engineering, chemistry, and environmental science at NJIT; biological sciences at Rutgers–NJIT; and geophysical sciences at Rutgers. Students may enter the program through Rutgers and earn an M.S. or a Ph.D., including special tracks in geological sciences and biological sciences. The program, however, is administered through NJIT.

Because the environmental science graduate programs are offered in all interdisciplinary departments, there are strong ties to chemistry, chemical engineering, and the program in occupational safety and industrial hygiene. The program's strong research focus is supported by major grants from federal and state agencies and industrial corporations.

Environmental science plays a large role in several NJIT research centers, including the Hazardous Substance Management Research Center, the Northeast Hazardous Substance Center, the Particle Technology Center, and the Center for Membrane Technologies. These centers involve collaborations with other universities, including the Massachusetts Institute of Technology, Princeton, Rutgers, Stevens, Tufts, and the University of Medicine and Dentistry of New Jersey.

M.S. in Environmental Science

This is an interdisciplinary program intended for individuals with backgrounds in science or engineering who want advanced education in the identification, management, treatment, and effects of hazardous and toxic materials in the environment. It may be taken on a part-time or full-time basis.

Admission Requirements

Applicants should have undergraduate degrees in geology, chemistry, biology, chemical engineering, environmental engineering, environmental science, or related fields. In addition, they should have taken a minimum of one year of college chemistry and mathematics through calculus. Students who lack an appropriate background may be considered for admission, but they could be required to take courses to remedy any deficiencies in preparation. Such a program, if required, should be designed in consultation with the graduate adviser. This program may include undergraduate courses that are not counted toward graduate degree credit.

Typically, a minimum undergraduate GPA of 3.0 on a 4.0 scale, or the equivalent, is required for admission. Those applying for financial support and those whose last prior degree came from outside the United States must submit GRE scores. International students also must achieve a minimum TOEFL score of 550.

Degree Requirements

A minimum of 30 degree credits is required for the degree. Candidates must consult with the graduate adviser (not the thesis adviser) in designing appropriate programs of study. Students must maintain a minimum overall GPA of 3.0 and a minimum GPA of 3.0 in the core courses listed below. In addition to the minimum 30 degree credits required, all students who receive departmental or research-based awards must enroll each term in EvSc 600 Environmental Science Seminar.

Core Courses (15 credits)

EM 631	Legal Aspects in Environmental Engineering (3)
EvSc 610	Environmental Chemical Science (3)
EvSc 612	Environmental Analysis (3)
EvSc 616	Toxicology for Engineers and Scientists (3)
26:120:604	Microbiology: Principles and Applications (3)

Thesis

A thesis is required of those receiving departmental or research-based support; others may choose 6 credits of course work instead of a thesis.

EvSc 701 or 26:375:701 Master's Thesis (6)

Electives

Courses are offered at NJIT and Rutgers–Newark and selected with the graduate adviser's (not the thesis adviser's) approval. Nine credits if completing a master's thesis and 15 credits if not completing a master's thesis are required from the following:

26:120:536	Multivariate Biostatistics
26:120:551	Biology of Pollution
26:120:616	Topics in Biology
26:380:511	Geologic Site Characterization in New Jersey
26:380:520	Structural Controls on the Environment
26:380:521	Analytical Methods in Urban Environmental Pollution
26:380:561	Environmental Soil Geochemistry
26:380:577	Seminar in Environmental Geology
26:380:606	Environmental Geophysics
CE 618	Applied Hydrogeology
ChE 685	Industrial Waste Control I
ChE 686	Industrial Waste Control II
ChE 687	Industrial Gas Cleaning
ChE 740	Biological Treatment of Hazardous Chemical Wastes
Chem 662	Air Pollution Analysis
Chem 664	Advanced Analytical Chemistry
EnE 660	Introduction to Solid Waste Problems
EnE 662	Site Remediation
EnE 664	Advanced Analytical Chemistry
EnE 665	Solid Waste Disposal Systems
EnE 668	Air Pollution Control
EnE 671	Environmental Impact Analysis
EPS 613	Environmental Politics and Policy
EPS 614	Environmental Economics
EPS 660	Ethics and Environmental Policy
EvSc 602	Special Topics in Environmental Science I
EvSc 611	Hazardous Waste Management
EvSc 613	Environmental Problem Solving
EvSc 614	Quantitative Environmental Risk Assessment
EvSc 615	Global Environmental Problems
EvSc 700	Master's Project
EvSc 702	Special Topics in Environmental Science II
EvSc 711	Advanced Environmental Analysis
EvSc 725	Independent Study I
EvSc 726	Independent Study II
IE 615	Industrial Hygiene and Occupational Health
ME 660	Noise Control
ME 661	Thermal Pollution of Water and Air
ME 662	Air Pollution Control and Design

Ph.D. in Environmental Science

This is a research-oriented degree intended for full-time students. Although courses may be taken on a part-time basis, a minimum of one year of full-time residency normally is required for completion of the doctoral dissertation.

Admission and Degree Requirements for Students Entering with a Master's Degree

A master's degree in geology, chemistry, biology, chemical engineering, environmental engineering, environmental science, or related fields usually is required. In some cases, highly qualified students with bachelor's degrees in these fields may be accepted directly into the doctoral program.

A minimum master's GPA of 3.5 on a 4.0 scale, or equivalent, typically is required for admission, and applicants must submit their GRE scores. International students must achieve a minimum TOEFL score of 550.

Specific degree requirements and dissertation topics are approved by the department on an individual basis. Among the requirements, students must:

1. maintain a minimum overall GPA of 3.0;
2. take a minimum of 36 credits of EvSc 790 or 26:375:790 Doctoral Dissertation;
3. register every term for either EvSc 600 or 26:375:600 Environmental Science Seminar. If a student should complete the required 36 credits of EvSc 790 or 26:375:790 before the final dissertation document is accepted, he or she must register for a minimum of 3 credits of EvSc 790 or 26:375:790 for each term until the dissertation has been submitted and accepted;
4. have completed at least 24 credits of course work beyond the master's degree. Of that total, at least 12 credits must be in 700-level courses that were chosen in consultation with the graduate adviser. No more than 6 credits may be in EvSc 725, 726 or 26:375:725, 726 Independent Study.

Admission and Degree Requirements for Students Entering with a Bachelor's Degree

Exceptional students with appropriate undergraduate degrees may apply directly for admission to the doctoral program. Applicants are evaluated on a case-by-case basis. Typically, a minimum undergraduate GPA of 3.5 on a 4.0 scale, or equivalent, is required for admission, and these students must submit their GRE scores. International students must achieve a minimum TOEFL score of 550.

Once admitted to the program, students must maintain a minimum GPA of 3.0 in the required courses (EvSc 610, 612, 616; EM 631; and 25:120:604), and a minimum overall GPA of 3.0.

Required Courses (51 credits)

EM 631	Legal Aspects in Environmental Engineering
EvSc 610	Environmental Chemical Science
EvSc 612	Environmental Analysis
EvSc 616	Toxicology for Engineers and Scientists
26:120:604	Microbiology: Principles and Applications

In addition, students are required to take a minimum of 36 credits of EvSc 790 or 26:375:790 Doctoral Dissertation and to register every term for EvSc 600 or 26:375:600 Environmental Science Seminar. Should a student complete the 36 credits of EvSc 790 or 26:375:790 before submitting his or her final dissertation document, this student must register each term for a minimum of 3 credits of EvSc 790 or 26:375:790 until the document has been submitted and accepted.

Electives (27 credits)

Twelve credits from 700-level courses are chosen in consultation with the graduate adviser. Doctoral tracks in geological sciences and biological sciences are available. No more than 6 credits may be taken in EvSc 725, 726 or 26:375:725, 726 Independent Study. The remaining 15 credits of electives may be chosen from any 600- to 700-level courses, including courses that are outside the department.

All Doctoral Students

Qualifying Examination. Within three terms of their admission to the program, doctoral students must take a qualifying examination, and they must pass this examination within two years after their admission. A student is allowed only two attempts to pass this examination.

Formation of Dissertation Committee. Within three months of passing the qualifying examination, doctoral students must form a dissertation committee that meets the approval of the graduate adviser (not the dissertation adviser) in environmental science. As a minimum, the committee must consist of the doctoral student's dissertation adviser, three additional faculty members from the program, and one outside adviser. The outside adviser should not be part of the program or a member of the departments of chemical engineering, chemistry, and environmental science.

Research Proposal. Within six months of forming the dissertation committee, each doctoral student must make a formal oral presentation on the scope of his or her proposed research to members of this committee and to other interested persons. Within three months of this presentation, the committee members must approve formally the dissertation proposal. This time frame ensures that students meet the doctoral requirement of having an approved dissertation committee formed and a dissertation proposal approved within one year of passing the qualifying examination.

Dissertation Defense. After submitting the final document to the dissertation committee, students are required to make an oral defense of their dissertations. To receive final approval, students must obtain signatures from all members of the dissertation committee. Any student who is unable to complete the requirements for the Ph.D. degree may become a candidate for the master of science in environmental science once he or she meets the requirements for that degree.

Courses

Rutgers–Newark Courses

Refer to the list of courses in Environmental Geology 380 and Biological Sciences 120.

NJIT Courses

EvSc 592. Graduate Work Experience (3)
Prerequisites: Permission of associate chairperson for environmental science and the Division of Career Development Services. Cannot be used for degree credit.
Provides on-the-job reinforcement of environmental science assignments. Projects developed by the co-op office in consultation with the associate chairperson for environmental science.

EvSc 600. Environmental Science Seminar (0)
Prerequisite: Graduate standing. Required every term for environmental science graduate students receiving departmental or research-based awards and for all doctoral students.
Current environmental topics of interest to the environmental professional presented.

EvSc 602. Special Topics in Environmental Science (3)
Prerequisite: Approval of graduate adviser in environmental science.
Topics of current interest in the environmental field.

EvSc 603. Hazardous Waste Operations and Emergency Response (3)
Explores safe operation of hazardous waste sites, as well as emergency responses to hazardous releases. Provides overview of OSHA regulations and NIOSH standards concerning toxicological hazards and medical surveillance requirements. Emphasis on recognition and monitoring of site hazards. Requires written health and safety plan and participation in a group problem involving simulated entry of a hazardous site, using actual protective equipment. Course satisfies the regulatory compliance mandates to meet 29 CFR 1910.120 for OSHA, with certification valid for one year.

EvSc 610. Environmental Chemical Science (3)
Prerequisite: Graduate standing.
Principles of physical, inorganic, and organic chemistry applied to understanding the origins of environmental pollutants: their transport, distribution, and decomposition pathways.

EvSc 611. Hazardous Waste Management (3)
Prerequisite: Graduate standing.
Overview of hazardous waste management; case histories; legislation and regulations; treatment, disposal, and cleanup technologies; sampling and analysis methodology; persistence and fate in the environment; and emergency response procedures.

EvSc 612. Environmental Analysis (3)
Prerequisite: Graduate standing.
Analysis of environmental samples studied from the acquisition of representative samples through sample handling, chain of custody, sample storage, analytical method selection, analysis, and data treatment.

EvSc 613. Environmental Problem Solving (3)
Prerequisite: Graduate standing.
Course designed to study solutions for current environmental problems. Students are asked to respond to an imaginary Request for Proposal (RFP) in writing and at an oral presentation before a team of technical experts. Solutions proposed in student RFPs must reflect knowledge of environmental science and technology in current use.

EvSc 614. Quantitative Environmental Risk Assessment (3)
Prerequisite: Graduate standing.
Applications of quantitative risk assessment concepts to the management of environmental problems.

EvSc 615. Global Environmental Problems (3)
Prerequisite: Graduate standing.
With an understanding that environmental problems are not restricted by geographical boundaries, students study relationships among the earth's temperature balance, global air circulation patterns, global energy needs, and control and remediation technologies.

EvSc 616. Toxicology for Engineers and Scientists (3)
Prerequisite: Graduate standing.
General principles of toxicology presented and applied to the assessment of acute, subacute, and chronic effects of hazardous and toxic chemicals. Qualitative and quantitative measures of toxicity and testing protocols addressed. Role of toxicology in risk assessment and risk management discussed.

EvSc 700. Master's Project (3)
Prerequisites: Graduate standing and approval of graduate adviser in environmental science. Registration must be approved by an adviser. Students must continue to register for 3 credits each term until completion and written report accepted. Only a total of 3 credits will count toward the degree.
Written report requiring experimental or theoretical research or an extensive literature analysis.

EvSc 701 or 26:375:701. Master's Thesis (6)
Prerequisites: Matriculation for a master's degree in environmental science. Approval to register the thesis must be obtained from the adviser. Original research under supervision of a designated faculty member. Final product must be a written thesis approved by three faculty members: the student's primary adviser, one from the program, and one other faculty member. Once registration for thesis has begun, the student must continue to register for a minimum of 3 credits per term until at least 6 credits have been completed and a written thesis has been approved. Only a total of 6 credits from this course counts toward the degree.

EvSc 702. Special Topics in Environmental Science II (3)
Prerequisite: Approval of graduate adviser in environmental science.
Topics of current interest in the environmental field.

EvSc 711. Advanced Environmental Analysis (3)
Prerequisite: EvSc 612 or equivalent.
Analysis of complex environmental samples studied, from the acquisition of representative samples through sample handling, chain of custody, sample storage, analytical method selection, analysis, and data handling. Collection and analysis of samples from air, water, soil, and biological systems discussed. Emphasis on the study of current literature.

EvSc 725 or 26:375:725. Independent Study I (3)
Prerequisites: Written permission from associate chairperson for environmental science plus courses prescribed by supervising faculty member (not the student's thesis adviser). Students may not register for this course more than once with the same supervising faculty member.
Covers areas of study in which one or more students may be interested, but which are not sufficiently broad to warrant a regular course offering.

EvSc 726 or 26:375:726. Independent Study II (3)
See description for EvSc 725.

EvSc 790 or 26:375:790. Doctoral Dissertation (BA)
Prerequisites: Required of all students working toward the degree of doctor of philosophy. A minimum of 36 credits are required. Approval of dissertation adviser necessary for registration. Candidates must register for at least 6 credits of dissertation per term until 36 credits are reached. They then register for 3 credits per term thereafter until a written dissertation is approved.

ENVIRONMENTAL GEOLOGY 380

Degree Program Offered: Master of Science
Director of Graduate Program: Professor Andreas Vassiliou, Boyden Hall (973 / 353-5109)

Members of the Graduate Faculty

Rutgers–Newark:

Professors:

Alexander E. Gates; Ph.D., Virginia Polytechnic Institute
Structural geology; tectonics; radon
Warren Manspeizer; Ph.D., Rutgers
Stratigraphy; plate tectonics
John H. Puffer; Ph.D., Stanford
Igneous petrology; geochemistry; environmental geology
Andreas H. Vassiliou; Ph.D., Columbia
Mineralogy; ore-genesis; X-ray crystallography

Assistant Professor:

Victoria C. Hover; Ph.D., Michigan
Low-temperature geochemistry; environmental geology; soil and sediment geochemistry

Adjunct Members of the Graduate Faculty:

Andrew E. Kasper; Ph.D., Connecticut
Paleobotany; palynology; plant morphology
Emily W.B. Russell; Ph.D., Rutgers
Paleoecology; palynology

Professor Emeritus:

George Theokritoff, FAS-N; Ph.D., London
Paleontology; biostratigraphy

Rutgers–New Brunswick:

Gail M. Ashley; Ph.D., British Columbia
Sedimentology; glacial geology; geomorphology; geoarchaeology
Michael J. Carr; Ph.D., Dartmouth
Volcanology; petrology; geochemistry
Jeremy S. Delaney; Ph.D., Queen's (Northern Ireland)
Microanalysis; meteoritics
Mark D. Feigenson; Ph.D., Princeton
Isotope geochemistry; petrology
Claude T. Herzberg; Ph.D., Edinburgh
High-pressure experimental petrology
Roger H. Hewins; Ph.D., Toronto
Mineralogy; meteoritics/planetology
Dennis V. Kent; Ph.D., Columbia
Paleomagnetism; paleogeography
George R. McGhee; Ph.D., Rochester
Paleontology; evolution; biostatistics
Kenneth G. Miller; Ph.D., Massachusetts Institute of Technology/ Woods Hole Oceanographic Institute
Paleoceanography; Cenozoic stratigraphy; micropaleontology
Peter A. Rona; Ph.D., Yale
Marine geology; geophysics
Roy W. Schlische; Ph.D., Columbia
Structural geology; tectonics
Robert E. Sheridan; Ph.D., Columbia
Geophysics
Robert M. Sherrell; Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institute
Marine geochemistry
Martha Withjack; Ph.D., Brown
Structural geology

Professors Emeriti:

Richard K. Olsson; Ph.D., Princeton
Micropaleontology; marine paleoecology
James Wright; Ph.D., Columbia
Paleography; stable isotope geochemistry

Civil and Environmental Engineering (NJIT):

Lisa Axe; Ph.D., Illinois Institute of Technology
Environmental and geoenvironmental engineering
Sima Bagheri; Ph.D., Wisconsin
Environmental remote sensing
Nancy Jackson; Ph.D., Rutgers
Coastal geomorphology
John S. Schuring; Ph.D., Stevens Institute of Technology
Environmental and geoenvironmental engineering

Programs

Rutgers–Newark offers the M.S. degree in environmental geology in collaboration with the Department of Geological Sciences at Rutgers–New Brunswick and the Department of Civil and Environmental Engineering at the New Jersey Institute of Technology (NJIT). For current and complete information about the program and regulations governing it, contact the director of the graduate program at 973 / 353-5109.

Students enrolled in the M.S. program in environmental geology at Rutgers–Newark choose between two plans. The thesis option involves 24 credits of course work and 6 credits of thesis research. Under the nonthesis option, students complete 36 credits of course work and take a final comprehensive written examination. In either case, students are required to take a minimum of 15 graduate credits at Rutgers–Newark from among graduate courses in environmental geology, analytical methods, hydrogeology, environmental geophysics, soil geochemistry, and geomorphology.

They choose the remaining credits from among all graduate courses offered by the Department of Geological Sciences at Rutgers–New Brunswick or from among selected graduate courses in remote sensing, GIS, and hydrology at the NJIT Department of Civil and Environmental Engineering. Thesis research is expected to involve environmental aspects in such geologic disciplines as geochemistry, geophysics, hydrogeology, geomorphology, structural geology, mineralogy-petrology, and sedimentation-stratigraphy.

A certificate in environmental geology at Rutgers–Newark will be offered to graduate students admitted to the Rutgers–New Brunswick graduate programs in geological sciences. Students admitted to the NJIT Department of Civil and Environmental Engineering graduate programs or to other NJIT environmental science or engineering graduate programs also are eligible for the certificate. Students seeking the certificate in environmental geology must complete successfully 9 credits from among graduate courses offered at Rutgers–Newark.

Graduate Courses

Environmental Geology Courses

26:380:510. Advanced Readings in Environmental Geology (3)
Prerequisites: Bachelor's degree in geology and permission of instructor.
Study of the literature pertaining to selected environmental geology topics; analysis of the epistemology used; preparation of critical written reports.

26:380:511. Geologic Site Characterization in New Jersey (3)
Prerequisite: Bachelor's degree in geology or environmental science.
Team-taught course focusing on the regional geologic characteristics of New Jersey and adjacent parts of Pennsylvania and New York for application at the environmental engineering site scale. Regional and site characterization provides understanding of geologic conditions that affect site suitability, design, and performance. It also offers the framework for evaluating groundwater hydrology and geochemical, engineering, and seismological characteristics of the site.

26:380:521. Analytical Methods in Urban Environmental Pollution (3)
Vassiliou. Prerequisites: Mineralogy, optical mineralogy, geochemistry, and/or hydrogeology, or permission of instructor.
Students collect and analyze solid and liquid samples representing rivers, estuaries, and air particulates in the Newark area to determine nature of environmental pollution and its probable sources. Employs such analytical methods as the petrographic microscope, X-ray diffraction and fluorescence, ion chromatography, and plasma emission spectrophotometry. Presentation of a final oral and written report on individual analytical data required.

26:380:522. Petroleum Geology (3)
Prerequisites: 21:460:314, 320, or equivalent.
Nature and occurrence of petroleum with emphasis on the geologic conditions favoring its accumulation.

26:380:561. Environmental Soil Geochemistry (3)
Hover. Prerequisites: Bachelor's degree in geology and permission of instructor.
Chemical principles applied to the study of the soil environment, including mineral-solution equilibria and solubility; adsorption / desorption behavior of soils toward natural constituents and anthropogenic contaminants; cation exchange and oxidation-reduction behavior; transport and fate of contaminants in soils.

26:380:570. (S) Marine Geology (3)
Geology and geophysics of the ocean floor; origin and development of submarine topographic features; diagenesis and fossil content of neritic and pelagic sediments; mineral resources of the sea; techniques of marine geologic studies.

26:380:576. Environmental Geology (3)
Prerequisites: Bachelor's degree in geology and permission of instructor.
Investigation of the processes and cycles that control the global composition and functioning of the atmosphere, hydrosphere, and surficial lithosphere. Topics address the interrelationships among the natural cycles and anthropogenic perturbations, including the fate of contaminants in various near-surface environments and methods of characterization and remediation.

26:380:577. (F) Seminar in Environmental Geology (3)
Human interaction with the geological environment. Case histories involving geological hazards to engineering works, transportation, land use, water, mineral and energy resources, disposal of wastes, and public health.

26:380:606. Environmental Geophysics (3)
Prerequisites: Applied geophysics and permission of instructor.
Application of geophysical methods in the characterization of near-surface features, with emphasis on environmental and engineering problems; utility of the various methods (seismic, potential field, electrical, and electromagnetic) in providing solution.

GLOBAL AFFAIRS 478

Degree Programs Offered: Master of Science, Doctor of Philosophy
Director of Graduate Program: Alexander J. Motyl, Center for Global Change and Governance, Center for Law and Justice (973 / 353-5585)

Participating Faculty

Nabil Adam, FOM; Ph.D., Columbia
Global electronic commerce; computer simulation and database systems
Lauren Benton, NJIT; Ph.D., Johns Hopkins
Global history; history of colonialism

Farok Contractor, FOM; M.B.A., Ph.D., Pennsylvania (Wharton School)
Development of global business
Jon Cowans, FAS–N; Ph.D., Stanford
Modern Europe; France; political culture
John Dunning, FOM; Ph.D., Southampton
Economics of international direct investment; innovation and productivity of scientists and engineers
Brian Ferguson, FAS–N; Ph.D., Columbia
Anthropology; sociology of warfare
Yale Ferguson, FAS–N; Ph.D., Columbia
Theories of global politics; international political economy; American foreign policy; Latin America
James Finckenauer, SCJ; Ph.D., New York
Juvenile justice; organized crime; crime and justice in the former Soviet Union
Frank Fischer, FAS–N; Ph.D., New York
Public policy and administration; American government; environmental politics; German politics
John Fousek, FAS–N; Ph.D., Cornell
American foreign policy
David Gold, FOM; Ph.D., CUNY
Economics of defense industries; international organizations
Peter Golden, FAS–N; Ph.D., Columbia
Medieval Eurasia; Turco-Byzantine and Turco-Slavic relations; history of Islam
Michael Greenberg, Edward J. Bloustein School of Planning and Public Policy; Ph.D., Columbia
Environmental and urban issues
Edwin Hartman, FOM; Ph.D., Princeton
Global business ethics
Alexander Hinton, FAS–N; Ph.D., Emory
Anthropology; transnationalism; genocide; political violence in Southeast Asia; Cambodia
Marc Holzer, FAS–N; Ph.D., Michigan
International public management
Warren Kimball, FAS–N; Ph.D., Georgetown
History of United States foreign policy; foreign policy of Franklin Roosevelt; U.S. history since 1945
Reynold Koslowski, FAS–N; Ph.D., Pennsylvania
International relations; global politics; international organizations; regional integration; European politics
Richard Langhorne, FAS–N; M.A., Cambridge
Processes of global change; global governance and institutions of diplomacy
Saul Mendlovitz, SL–N; J.D., Chicago
International law
Alexander J. Motyl, FAS–N; Ph.D., Columbia
Comparative politics; nationalism, empires, and revolutions; Russia and east-central Europe
Gerhard O.W. Mueller, SL–N; J.D., Chicago
Law and criminal justice; constitutional issues; maritime crime
William Newburry, SOM; Ph.D., New York
International business strategy; international environmental management
Seung Ho Park, SOM; Ph.D., Oregon
Strategic alliances; interorganizational networks; corporate diversification; Asian firms
James Paul, SL–N (Emeritus); J.D., Pennsylvania
International law
Said Samatar, FAS–N; Ph.D., Northwestern
Modern African history; African resistance movements; European imperialism
Michael Santoro, FOM; J.D., NYU; Ph.D., Harvard
Human rights and global business
Kurt Schock, FAS–N; Ph.D., Ohio State
Comparative political sociology; social movements
Karl W. Schweizer, NJIT; Ph.D., Cambridge
History of armaments
Mary Segers, FAS–N; Ph.D., Columbia
Political theory; gender politics; ethics and politics; religion and politics
Elizabeth Strom, FAS–N; Ph.D., CUNY
Urban studies and global cities; German politics
Olga Wagenheim, FAS–N; Ph.D., Rutgers
Latin American history
Virginia Walsh, FAS–N; Ph.D., Southern California
International relations; international political economy; methodology; global environmental issues
Odoric Wou, FAS–N; Ph.D., Columbia
Modern Chinese social and economic history

Center for Global Change and Governance

Degree Programs Offered: Master of Science, Doctor of Philosophy
Codirectors: Richard Langhorne and Yale Ferguson
Center for Global Change and Governance; Rutgers, The State University of New Jersey, 123 Washington Street, 5th Floor; Newark, NJ 07102-1895 (973 / 353-5585; fax: 973 / 353-5074; email: langhorn@andromeda.rutgers.edu or yhfergus@andromeda.rutgers.edu)
Deputy Director: Alexander J. Motyl
(email: ajmotyl@andromeda.rutgers.edu)
Associate Director: John Fousek
(email: jfousek@andromeda.rutgers.edu)
Administrative Assistant: Desiree Gordon
(email: desireeg@andromeda.rutgers.edu)
Web Site: http://newark.rutgers.edu/~cgcg/home.html

The Center for Global Change and Governance (CGCG) at Rutgers–Newark was established in 1995. It has three principal objectives: to administer graduate programs in global affairs, to conduct research on the causes and consequences of globalization, and to serve as the focus of the university's outreach to professional communities with global concerns.

The center's approach to global affairs is explicitly interdisciplinary, drawing on the research, teaching excellence, and expertise of a distinguished faculty. Faculty members involved with the center represent a variety of disciplines: anthropology, criminal justice, economics, history, law, management, political science, public administration, and sociology.

CGCG focuses its teaching, research, and outreach efforts on the complex interplay of global change and governance. It studies the relationship between the massive transformations brought about by globalization and the multiplicity of state and nonstate actors involved in creating order and disorder. Specifically, it looks at the worlds of international governmental and nongovernmental organizations, transnational corporations, and governments.

The center's graduate degree programs enable students to pursue careers in six areas requiring global expertise:

1. International institutions, such as the United Nations and its affiliated organizations.
2. Globally active nongovernmental organizations.
3. Government agencies in general and their foreign service and foreign affairs components in particular.
4. Transnational corporations and international financial institutions.
5. Think tanks and research institutions.
6. University departments and administrations.

Programs

Requirements

The Center for Global Change and Governance offers programs leading to the master of science in global affairs and the doctor of philosophy in global affairs. The center invites students with various academic and professional backgrounds to apply for graduate study. It suggests, however, that students discuss their individual concerns with CGCG faculty members before applying.

To be considered, applicants must possess a B.A. degree or its equivalent. As part of their application, students should submit their university or college transcripts, scores on the Graduate Record Examination, three letters of recommendation, and a personal statement. In addition, foreign students must submit scores from the Test of English as a Foreign Language (TOEFL) if English is not their native language. Rutgers requires that TOEFL scores be no lower than 213 on the computer test and no lower than 550 on the paper test. Application forms are available from the Office of Graduate and Professional Admissions, 249 University Avenue, Newark, NJ 07102-1896 (973 / 353-5205).

Application Deadlines

Prospective M.S. students can apply and be admitted for study at any time during the academic year. Prospective Ph.D. students, however, can apply only for study starting in the fall term of an academic year. Normally, candidates for the Ph.D. must submit complete applications by February 15 in order to qualify for teaching assistantships and / or fellowships. All other prospective Ph.D. candidates must submit complete applications by March 31.

Financial Support

The center offers Ph.D. students a small number of highly competitive teaching assistantships, which provide full tuition and health benefits. To qualify for teaching assistantships, incoming Ph.D. students must submit complete applications by February 15. Students already in the Ph.D. program must apply in writing to the CGCG fellowships subcommittee by March 7. Recipients of teaching assistantships may hold outside employment only with the approval of the CGCG graduate program director.

Transfer Credits

Upon approval of the CGCG graduate program director, a student can receive credit for graduate courses completed at other universities. The following restrictions apply:

1. No more then 12 credits of graduate-level course work may be applied to the M.S. degree.
2. No more than 30 credits may be applied to the Ph.D.
3. Transfer credits may not be applied to required core courses.
4. With the approval of the graduate program director, as many as 6 transfer credits may be acquired for significant and relevant professional experience. For those seeking the Ph.D., however, such credits may be applied only to the distribution requirement.
5. Students who complete the M.S. degree at the Center for Global Change and Governance may apply all credits earned for the lower degree to the Ph.D.

Independent Study

All M.S. and Ph.D. students may take as many as 9 credits of independent study courses. Anyone choosing this option must: (1) acquire a CGCG application for individual study from the center, (2) receive approval of his or her CGCG faculty adviser, (3) find a CGCG faculty member to supervise the research and grade the paper or project, (4) submit the application for individual study to the CGCG graduate program director, (5) register, and (6) complete the paper or project and submit it for a grade to the CGCG faculty member supervising the independent study course.

Faculty Advisers

All CGCG graduate students are assigned faculty advisers, who provide intellectual and academic guidance; approve internships and reports, independent study courses, dissertation topics, and preliminary dissertation proposals; and help with the formation of dissertation committees. Students may request a different faculty adviser who they believe is more compatible with their research interests. A student can make such a change, however, only after consulting with his or her current adviser and acquiring the approval of the CGCG graduate program director and the faculty member selected as new adviser.

Master of Science in Global Affairs

Requirements

Students seeking the master of science in global affairs accumulate 40 credits, including credits from the five core courses listed below that all students must take. Students may acquire the remaining credits they need from the additional courses, also listed below, or from independent study courses, the internship, or the master's thesis. No more than 9 credits of independent study courses, which must be must be approved by the student's CGCG faculty adviser, are permitted.

Students also have the option of acquiring a concentration in one of the following areas:

1. Comparative Policy and Public Administration
2. Environment
3. Human Rights
4. Identities: Gender, Ethnicity, Race, and Class
5. Information Technology
6. Political Economy
7. Political Violence

A concentration requires completion of 9 credits of course work based on: (1) courses dealing explicitly with the areas of concentration (see core courses and additional courses below), (2) independent study courses, (3) a master's thesis, and (4) other graduate-level courses, taken with the approval of the student's adviser. Students selecting the fourth option must complete and receive a grade of B+ or better on a paper that is oriented toward global affairs and address the topic of concentration.

Course work taken toward the concentration also may fulfill other degree requirements, but as of the publication date of this catalog, the concentration option was awaiting approval.

Core Courses (16 credits)		Credits
26:478:570, 571	Colloquia on Global Change and Governance	2,2*
26:478:572	The Evolution of the International System	3
26:790:537	Recent International Relations: Global Governance	3
26:790:538	Global Environmental Issues	3
26:790:541	International Political Economy	3

Additional Course Work

This is a master list of courses offered by the center. The courses actually available will vary from term to term.

Courses		Credits
27:202:536	Comparative Criminal Justice Systems	3
27:202:615	Maritime Crime and Its Prevention	3
27:202:619	Organized Crime	3
26:220:511	History of Economic Thought	3
26:220:518	International Economics I	3
26:220:519	International Economics II	3
22:223:641	International Economics	3
22:373:512	Global Strategy	3
22:373:534	Global Business	3
22:373:593	International Business Environment	3
22:373:605	International Business Law	3
22:373:612	International Business Policy	3
22:373:616	Human Rights in the Global Economy	3
22:373:619	Ethics in Business	3
22:373:659	Intellectual Property Law	3
22:390:606	International Finance	3
22:478:573,574	Colloquia on Global Change and Governance	2,2
26:510:520	Topics in the History of Technology	3
26:510:527	European Political and Diplomatic History I	3
26:510:528	European Political and Diplomatic History II	3
26:510:531	American Diplomatic History I	3
26:510:532	American Diplomatic History II	3
26:510:547	Comparative World Colonialism	3
26:510:559	Cities in Change I	3
26:510:560	Cities in Change II	3
26:553:501	Global Strategic Management	3
26:553:601	Theory of International Business	3
26:553:603	International Trade and Investment	3
26:553:605	National Innovation Policies and International Business	3

Courses		Credits
26:553:607	Governments, Competitiveness, and International Business	3
26:553:609	Global Business in Regulated and Developing Economies	3
26:561:507	Ethnomusicology	3
23:600:638	International Law and World Order	3
23:600:686	International Environmental Law and Sustainable Development	3
23:600:756	International Business Transactions	3
23:600:757	International Law and Genocide	3

* Colloquia are offered every year. Each 2-credit sequence consists of four colloquia held every term on a topic or geographical area of current significance. Colloquia are open events, but students may receive 2 credits per term. To get credit, however, students must attend all sessions and submit for a grade by the end of each term a report of the proceedings to their CGCG faculty advisers.

26:606:502	Faith, Love, and Reason	3
26:606:503	Revolutions and Counter-Revolutions	3
26:606:504	Science, Ideologies, and Social Values	3
26:606:505	The Modern Mind	3
26:620:677	Culture and Organizations	3
21:790:387	International Law	3
26:790:504	Comparative Public Policy	3
26:790:510	Public Policy Analysis	3
26:790:512	Ethical Issues in Public Policy and Administration	3
26:790:513	Ethics and Global Politics	3
26:790:521	Theories of Global Politics	3
26:790:529	Science, Technology, and Public Policy	3
26:790:530	Environmental Politics and Policy	3
26:790:542	Topics in Recent International Relations: Information Technology, Globalization and Governance	3
26:790:540	Gender and Global Politics	3
26:790:543	Problems of Comparative Politics	3
26:834:506	Urban Geography	3
EvSc 615	Global Environmental Problems (NJIT)	3

Internship

26:478:601,602 Internship or Research Seminar (3,3).
The CGCG director assigns internships to students. To receive credit for internships, each student must submit a report to his or her CGCG faculty adviser for approval. No grades are given for internships.

Master's Thesis

M.S. students may write a master's thesis for 3 or 6 credits (26:478:701, 702). Students choose their theses topics in consultation with their advisers. Theses should be approximately ninety pages, double-spaced (including notes, footnotes, and bibliography). Each student's CGCG faculty adviser and one other CGCG faculty member examine and approve the thesis before it is bound and deposited in the Rutgers library. A full-scale project, such as the production of a software program or a video, may serve in lieu of a master's thesis, if the student gets approval from his or her adviser and the CGCG graduate program director.

Language Proficiency

All students must prove that they have reading knowledge of at least one language other than English. A student may be asked at any time during his or her course of study at Rutgers–Newark to demonstrate this language ability. Reading proficiency examinations may be taken at accredited institutions or at examination sessions administered by Rutgers faculty members. Language courses do not count toward the credits necessary for an M.S.

Doctor of Philosophy in Global Affairs

Requirements

The doctor of philosophy in global affairs degree requires 73 credits. To reach that total, students must complete 46 credits of course work (including 16 credits of required core courses), take a 3-credit internship, and offer 24 credits of dissertation research. In addition, they must undergo a third-term review, pass a comprehensive examination, and write and successfully defend a dissertation. No more than 9 credits of independent study courses (26:478:697-698) may be used to fulfill the concentration and distribution requirements. All independent study credits applied to the concentration and distribution requirements must be approved by the student's CGCG faculty adviser.

All Ph.D. students undergo thorough annual reviews of their academic records by the graduate program committee. The first of these reviews takes place at the start of a student's third term. Students who complete successfully these reviews will be permitted to continue with their doctoral studies at Rutgers–Newark.

Courses (46 credits)

Required Core Courses (16 credits)		Credits
26:478:570,571	Colloquia on Global Change and Governance	2,2
26:478:572	The Evolution of the International System	3
26:790:537	Recent International Relations: Global Governance	3
26:790:538	Global Environmental Issues	3
26:790:541	International Political Economy	3

Concentration (15 credits)

Students must complete at least five graduate courses in any one of the following disciplines: anthropology, criminal justice, economics, history, law, management, political science, public administration, or sociology. Dissertations must be in the student's area of concentration.

Distribution Requirement (15 credits)

Students must complete at least five graduate courses in disciplines outside the concentration.

Comprehensive Examination

All students must complete a written comprehensive examination that tests their knowledge of global affairs issues covered in the core courses. The examination is taken after completion of all course requirements, but students have two chances to pass it. Any student who fails to pass the comprehensive examination on the second try will have to withdraw from the Ph.D. program.

Comprehensive examinations consist of eight questions. There are two apiece for each of the topics covered by the four core courses: international political economy, global governance, environmental politics, and the evolution of the international system. Students must answer one question in three of the four topics.

Comprehensive examinations are offered every term, in the week preceding the Thanksgiving holiday and in the week following spring recess. A student wishing to take a comprehensive examination must inform the graduate program director in writing of his or her decision by September 30 of the fall term or by February 15 of the spring term.

Dissertation Research (24 credits)

Students must complete 24 credits of Dissertation Research (26:478:701,702), amounting to 12 credits per sequence. As part of their dissertation research, students may take the Dissertation Seminar (26:478:703; 3 credits), a course specifically designed for advanced graduate students working on their dissertations. Students who opt for the Dissertation Seminar then take one sequence of Dissertation Research for 9 credits.

Dissertation Proposals and Dissertations

By the end of the second term at CGCG, each student must submit a draft dissertation proposal for approval by his or her adviser. Within one term after the student passes the comprehensive examination, a final version should be developed in consultation with the adviser and submitted to the CGCG graduate program committee for approval. Proposals should consist of five pages of text, presenting, clearly and concisely, the argument, case studies, and methodology planned. The bibliography and work plan should be included as an addendum.

Dissertations must be written in the discipline (such as political science, economics, or history) that serves as the student's concentration. Although there are no restrictions on the thematic focus of the dissertation, it must have a significant global and / or international component. Dissertations (text and notes, minus the bibliography) must be no fewer than 200 pages in length.

Dissertation Defense

A five-member faculty committee, consisting of the student's adviser, two faculty members from the student's concentration, and two other faculty members examine the completed dissertation at an oral defense. A dissertation committee must be formed within one term after the student wins approval for his or her proposal from the graduate program committee. The student's adviser is chairperson of his or her dissertation committee and works with the student to determine the composition of that committee. One member of the committee may come from another institution.

Internship (3 credits)

Students must complete a one-term internship at an international organization, nongovernment organization (NGO), government agency, transnational corporation, or other globally active institution. Internships must be relevant to the student's concentration, have approval of the student's adviser, and be performed in the student's last year of course work. Each intern must produce a research paper or report and submit it to his or her CGCG faculty adviser for approval. Students may be paid by the sponsoring agency for their work.

Language Requirement

At any time during their course of study at Rutgers–Newark, students must be prepared to demonstrate speaking, reading, and writing proficiency in one language other than English, or a reading knowledge of two languages other than English. Language proficiency examinations may be taken in accredited institutions or at sessions administered by Rutgers faculty members. Language courses do not count toward the credits necessary for a Ph.D. degree.

HISTORY 510

Degree Programs Offered: Master of Arts, Master of Arts for Teachers
Director of Graduate Programs: Professor Jan E. Lewis, Room 323, Conklin Hall (973 / 353-5411)

Members of the Graduate Faculty

Professors:

Norma Basch, FAS–N; Ph.D., New York
American legal history; American women's history; nineteenth-century U.S. history

Lauren Benton, NJIT; Ph.D., Johns Hopkins
Comparative economic development; world history; Latin America and Spain; history and anthropology

Peter B. Golden, FAS–N; Ph.D., Columbia
Medieval Eurasia; Turko-Byzantine and Turko-Slavic relations; history of Islam

David H. Hosford, FAS–N; Ph.D., Wisconsin
Tudor-Stuart England

Taras Hunczak, FAS–N; Ph.D., Vienna
Russian and East European history

Warren F. Kimball, FAS–N; Ph.D., Georgetown
History of United States foreign policy; foreign policy of Franklin Roosevelt; United States history since 1945

Jan E. Lewis, FAS–N; Ph.D., Michigan
American colonial history; early national period; history of women

Jonathan Lurie, FAS–N; Ph.D., Wisconsin
American legal history; late nineteenth-century American political history

Clement Alexander Price, FAS–N; Ph.D., Rutgers
Afro-American history; history of New Jersey: urban history; public history

Said S. Samatar, FAS–N; Ph.D., Northwestern
Modern African history; African resistance movements to European imperialism

Richard B. Sher, NJIT; Ph.D., Chicago
Enlightenment; technology; urban culture

Odoric Y.K. Wou, FAS–N; Ph.D., Columbia
Modern Chinese social and economic history

Associate Professors:

Susan Carruthers, FAS-N; Ph.D., Leeds
International history; U.S. foreign relations; cultural and media history

Jon Cowans, FAS–N; Ph.D., Stanford
Modern Europe; France; political culture

James Goodman, FAS–N; Ph.D., Princeton
Twentieth-century U.S.; race; politics, history, and fiction; narrative history

Frederick Russell, FAS–N; Ph.D., Johns Hopkins
Medieval Western European history; the Patristics; political theory; intellectual history

Beryl E. Satter, FAS–N; Ph.D., Yale
Twentieth-century U.S.; history of women; cultural history

Olga Wagenheim, FAS–N; Ph.D., Rutgers
Latin-American history

Assistant Professors:

Karen D. Caplan, FAS-N; Ph.D., Princeton
Latin American and Caribbean history; history of Mexico

Gary D. Farney, FAS–N; Ph.D., Bryn Mawr
Roman republican history; Roman historiography; Roman archaeology

Lisa Herschbach, NJIT; Ph.D., Harvard
Medicine; technology

Julie Livingston, NJIT; Ph.D., Emory; M.P.H., Boston
History of public health; African history

Neil Maher, NJIT; Ph.D., New York
American environmental history; twentieth-century U.S.; political and social history

Programs

The Federated Rutgers–Newark / NJIT Department of History offers programs leading to the master of arts (M.A.) and the master of arts for teachers (M.A.T.) degrees. Students may attend on a full-time or part-time basis. To accommodate those who are employed, the program normally schedules graduate courses in the late afternoon or evening. The department strives to provide a broad yet rigorous training in history that will prepare students for further graduate study; secondary school teaching; or history-related careers in government, business, or private research.

Requirements for the M.A. degree include the general requirements of the graduate school, a reading knowledge of a foreign language approved by the department, 30 credits of approved course work, and passing a comprehensive examination. As proof of scholarly competence, all students must submit a research paper or a thesis. Although a formal thesis is not required, it is recommended for those considering further graduate work. Students who elect to do a thesis may substitute this project for 6 credits of course work. The major fields of study are American history and world history.

The M.A.T. program is intended primarily for those preparing for careers in secondary school teaching. It is not designed to provide teacher certification, but M.A.T. students may take as many as 12 credits in the undergraduate education department to secure some of the courses they need for certification. Requirements for the M.A.T. degree include the general requirements of the Graduate School–Newark, 30 credits of course work, and passing a comprehensive examination. Usually, students do not write a thesis in this program, nor do they have to major in one area, although there are course distribution requirements. Additional descriptions of programs, regulations, and admission procedures are available from the graduate history office (973 / 353-5411). This material also can be found by visiting the department web site: http://andromeda.rutgers.edu/~history.

Graduate Courses

26:510:520. TOPICS IN THE HISTORY OF TECHNOLOGY (3)
Selected topics in the history of technology.

26:510:525. COLLOQUIUM IN THE HISTORY OF WOMEN (3)
Readings and discussion on the history of women in the United States and Western Europe.

26:510:526. PROBLEMS AND READINGS IN AFRO-AMERICAN HISTORY (3)
Introduction to the major historiographical problems and recent literature in the history of Afro-Americans in the U.S.

26:510:527,528. SELECTED TOPICS IN EUROPEAN POLITICAL AND DIPLOMATIC HISTORY (3,3)
Examination of issues and methods in European political and diplomatic history, with a consideration of some leading problems in the field.

26:510:529,530. Selected Topics in European Intellectual and Cultural History (3,3)
Examination of issues and methods in European intellectual and cultural history, with a consideration of some leading problems in the field.

26:510:531,532. Problems and Directed Readings in the History of U.S. Foreign Policy and Diplomacy (3,3)
Examination of issues and methods in American diplomatic history, with a consideration of some leading problems in the field.

26:510:533,534. Selected Topics in American Social and Economic History (3,3)
Examination of issues and methods in American social and economic history, with a consideration of some leading problems in the field.

26:510:537,538. Problems and Readings in the Ancient World (3,3)
Introduction to the major historiographical problems and recent literature of the ancient world.

26:510:539,540. Problems and Readings in Medieval History (3,3)
Introduction to the major historiographical problems and recent literature in medieval European history.

26:510:541,542. Problems and Readings in European History 1350–1650 (3,3)
Introduction to the major historiographical problems and recent literature in European history from 1350 to 1650.

26:510:545,546. Problems and Readings in European History since 1850 (3,3)
Introduction to the major historiographical problems and recent literature in European history since 1850.

26:510:547. Comparative World Colonialism (3)
Examines interactions of Europeans and non-Europeans after 1500. Emphasis on comparative analysis of the colonial experience in Asia, Africa, and Latin America.

26:510:548. Topics in the History of the American Environment (3)
Selected topics in the history of the interaction between humans and the environment in North America.

26:510:551,552. Selected Topics in American Intellectual and Cultural History (3,3)
Examination of issues and methods in American intellectual and cultural history, with a consideration of some leading problems in the field.

26:510:553,554. Selected Topics in American Political and Legal History (3,3)
Examination of issues and methods in American political and legal history, with a consideration of some leading problems in the field.

26:510:555,556. Selected Topics in American Urban and Ethnic History (3,3)
Examination of issues and methods in American urban and ethnic history, with a consideration of some leading problems in the field.

26:510:557. War, Technology, and Society (3)
Examines key themes in the interrelationship between warfare, technology, and society from the beginnings of modern warfare until World War I. Primary emphasis placed on the historical connections between violent conflict, the technical means by which it is carried out, and the socio-political environment within which wars take place. Topics include the effect of technology on war and the effect of war on technological change and development.

26:510:558. Selected Topics in European Social and Economic History (3)
Examination of issues and methods in European social and economic history, with a consideration of some leading problems in the field.

26:510:559. Cities in Change I (3)
The process of urbanization as seen in the growth of historic European and North American cities and in the underdeveloped world: the revival of towns in the Middle Ages, the royal capital as center of power, rise of an urban way of life, nineteenth-century industrial cities, changing city forms and functions of the twentieth century, urban values in politics, business, and material culture.

26:510:560. Cities in Change II (3)
The process of urbanization as seen in the growth, decline, and revival efforts of Newark, NJ. Examination of the economic, political, geographical, and social factors that helped shape Newark as New Jersey's most important city but also as one of the most troubled urban communities in the U.S. Attention to the origins of Newark's decline and its relationship with suburban communities in northern New Jersey. The settlement of European immigrants and rural Afro-Americans in the late nineteenth and twentieth centuries and recent efforts to revive the city's political, economic, and cultural life.

26:510:565. Public History (3)
Introduction to the principles and practices of public history.

26:510:566. Writing American History (3)
Exploration of the ways in which American history has been written and the issues that historians of America face when writing about its history.

26:510:567,568. Modern Russia (3,3)
Major themes of post-Petrine Imperial Russia and the Soviet Union.

26:510:569. American Legal History to 1860 (3)
Readings and discussion on the legacy of common law after the Revolution. The emergence of legal instrumentalism and the evolution of tort, contract, and damages in the context of industrialism and economic growth.

26:510:570. Topics in American Legal History (3)
Readings and discussion on the growth of legal formalism, the evolution of substantive due process, changes in legal education and the legal profession, and the evolution of private law.

26:510:571. Introduction to Historical Method (3)
Examines major theoretical approaches that have been used by historians and looks at some of the works that have employed those approaches.

26:510:572. Philosophy of History (3)
General survey of major trends in historiography and of leading issues in the philosophy of history.

26:510:573,574. Problems in Central European History (3,3)
Topics in the nineteenth- and twentieth-century political, social, and intellectual history of Germany. Also examines the Hapsburg monarchy and its successor states.

26:510:576. Problems and Readings in American History, 1492–1789 (3)
Introduction to the major historiographical problems and recent literature in American history from 1492 to 1789.

26:510:577. Problems and Readings in American History, 1789–1865 (3)
Introduction to the major historiographical problems and recent literature in American history from 1789 to 1865.

26:510:581. PROBLEMS AND READINGS IN AMERICAN HISTORY, 1865–1912 (3)
Introduction to the major historiographical problems and recent literature in American history from 1865 to 1912.

26:510:583. PROBLEMS AND READINGS IN AMERICAN HISTORY, 1912–1945 (3)
Introduction to the major historiographical problems and recent literature in American history from 1912 to 1945.

26:510:585. PROBLEMS AND READINGS IN AMERICAN HISTORY, 1945 TO PRESENT (3)
Introduction to the major historiographical problems and recent literature in American history since 1945.

26:510:589,590. PROBLEMS AND READINGS IN AFRICAN HISTORY (3,3)
Various problems in African history, from the ancient African civilizations to the present day. Topics vary from year to year; contact the instructor for current topics.

26:510:618. SEMINAR: TEACHING OF HISTORY (3)
Experience in the planning of a course, leading discussions, and lecturing under the supervision of the student's major professor. Critiques made by both the professor and the seminar participants.

26:510:619,620. INTERNSHIP IN PUBLIC HISTORY (3,3)
Professional training in various aspects of public history through on-site internships at local historical and cultural institutions, such as the New Jersey Historical Society and the Newark Museum. Students acquire skills in one or more of four areas: manuscripts curatorship, exhibitions and research, collections cataloging, and education and the public.

26:510:695. INDIVIDUAL STUDIES IN HISTORY (3)
Prerequisite: Permission of the director of graduate programs. Offered both terms.

26:510:696. ADVANCED INDIVIDUAL STUDIES IN HISTORY (3)
Prerequisite: Permission of the director of graduate programs. Offered both terms.

26:510:697,698. RESEARCH IN HISTORY (3,3)
Normally reserved for M.A. thesis credit.

INTEGRATIVE NEUROSCIENCE 546

Degree Program Offered: Doctor of Philosophy
Codirectors of Graduate Programs:
Professor Ian Creese, 316 Aidekman Research Center (973 / 353-1080, ext. 3300)
Professor Ellen Townes-Anderson, H-582, Medical Science Building (UMDNJ) (973 / 353-7392)

Members of the Graduate Faculty

Professors:

Elizabeth D. Abercrombie, CMBN; Ph.D., Princeton
Neurochemistry; plasticity in central monoaminergic systems; mechanism of action of psychotherapeutic drugs and drugs of abuse

György Buzsaki, CMBN; M.D., Pecs, Hungary; Ph.D., Budapest
Neural mechanisms of neuronal plasticity and memory and the function of the limbic system; temporal lobe epilepsy models; recovery of the damaged limbic system following brain tissue transplantation; significance of oscillation patterns to generalized epilepsy, Parkinsonian tremor, and mood disorders

Mei-Fang Cheng, FAS–N; Ph.D., Bryn Mawr
Neurobiology of vocal behavior/acoustic communication in the regulation of reproductive behavior in the ring dove

Ian Creese, CMBN; Ph.D., Cambridge
Experimental psychology, physiological psychology, neurochemistry, and neuropharmacology; CNS neurotransmitter and drug receptors: their regulatory mechanisms and role in psychiatric and neurologic diseases

Peter Dowling, UMDNJ; M.D., Vermont
Neurovirology and neuroimmunology

Doina Ganea, FAS–N; Ph.D., Illinois Medical School
Molecular immunology

Amjad Ilyas, UMDNJ; Ph.D., London
Guillain-Barré syndrome and multiple sclerosis

Nicholas Ingoglia, UMDNJ; Ph.D., New York
Axonal regeneration in the central nervous system

G. Miller Jonakait, NJIT; Ph.D., Cornell Medical School
Developmental neuroscience

Barry R. Komisaruk, FAS–N; Ph.D., Rutgers
Neurophysiological study of pain and neuropharmacological suppression mechanisms; reproductive behavior in mammals

Robert W. Ledeen, UMDNJ; Ph.D., Oregon
Neuronal differentiation

Barry E. Levin, UMDNJ; M.D., Emory Medical
Neuropharmacology

Joseph McArdle, UMDNJ; Ph.D., SUNY (Stonybrook)
Ion channels as drug targets and their role in disease

Joan I. Morrell, CMBN; Ph.D., Rochester
Neuroanatomy and neuroendocrinology, especially in relation to central nervous mechanisms regulating reproductive behavior in mammals

Benjamin H. Natelson, UMDNJ; M.D., Pennsylvania
Chronic fatigue syndrome

John Ottenweller, UMDNJ; Ph.D., Louisiana
Endocrinology of chronic stress

Andrew R. Pachner, UMDNJ; M.D., Yale
Neuroimmunology and neuroinfectious diseases

Howard Poizner, CMBN; Ph.D., Northeastern
Neuropsychology, neurological basis of language, cerebral specialization in the deaf; 3-D computer graphic analysis of motor and language processes in deaf signers and patients with disorders of motor control

Jay S. Rosenblatt, FAS–N; Ph.D., New York
Hormones and maternal behavior in mammals; mother-young interactions and behavioral development in mammals

Vanessa Routh, UMDNJ; Ph.D., California
Neuronal gluose sensing in health, obesity, and diabetes

Hreday Sapru, UMDNJ; Ph.D., Columbia
Neurosurgery

Allan Siegel, UMDNJ; Ph.D., SUNY (Buffalo)
Neurophysiological and neuroanatomical studies of aggressive behavior

Paula Tallal, CMBN; Ph.D., Cambridge
Experimental psychology; developmental neuropsychology; language development and disorders; psychoacoustics; speech synthesis and perception; neural bases of perception, memory, cognitive, and motor processes

James M. Tepper, CMBN; Ph.D., Colorado
Anatomy and physiology of basal ganglia and dopaminergic systems

Ellen Townes-Anderson, UMDNJ; Ph.D., Boston
Degeneration and regeneration of adult neurons, synaptic plasticity, synaptogenesis

Marco A. Zarbin, UMDNJ; Ph.D., M.D., Johns Hopkins
Retinal cell transplantation

Associate Professors:

Joshua Berlin, UMDNJ; Ph.D., Michigan
Mechanism of active electronic ion transport

Edward Bonder, GS–N; Ph.D., Pennsylvania
Cell biology

John DeLuca, UMDNJ; Ph.D., SUNY (Binghamton)
Cognitive neuroscience and behavioral neuropsychology

Alan Gilchrist, FAS–N; Ph.D., Rutgers
Vision

Mark A. Gluck, CMBN; Ph.D., Stanford
Theories of human learning and memory; the neurobiology of learning and memory; computational neuroscience; adaptive "neural" networks and their applications; animal learning theory

Andrew Harris, UMDNJ; Ph.D., Stanford
Channel-forming proteins

Richard D. Howells, UMDNJ; Ph.D., New York
Molecular mechanism of opioid tolerance and dependence

Michael Recce, NJIT; Ph.D., New Jersey Institute of Technology
Neurophysiological basis and computational modeling of spatial navigation, robot navigation

Christine Rohowsky-Kochan, UMDNJ; Ph.D., Columbia
T-cell regulation of immune responses; autoimmunity

Harold I. Siegel, FAS–N; Ph.D., Rutgers
Hormonal basis of maternal behavior in rodents

Ralph M. Siegel, CMBN; Ph.D., McGill
Neurophysiology, psychophysics, and computational theory of vision in primates; nonlinear dynamical theory; motion perception

Laszlo Zaborszky, CMBN; M.D., Ph.D., Semmelweis (Hungary)
Basal forebrain anatomy with special reference to transmitter interactions and pathophysiology of neurodegenerative diseases, such as Alzheimer's and Parkinson's disorders

Assistant Professors:

April A. Benasich, CMBN; Ph.D., New York
Developmental neuropsychology; language development and disorders, including familial genetic contributions to developmental trajectories; perceptual-cognitive abilities (habituation, recognition memory, auditory temporal processing) and language development in infants at risk for developmental delays; public policy focus on early intervention programs

Benjamin Martin Bly, FAS–N; Ph.D., Stanford
Cognitive neuroscience, mathematical modeling, and the brain basis of language

Stella Elkabes, UMDNJ; Ph.D., Weizman Institute (Israel)
The role of glia in neurodegenerative and autoimmune disorders

Andrew Kalnin, UMDNJ; M.D., New York
Neuroradiology

Gudrun Lange, UMDNJ, Ph.D., New York
Psychological, neuropsychological, and neural correlates of medically unexplained illnesses

Kristine Mosier, UMDNJ; D.M.D., Ph.D., Connecticut
Dental radiologist

Farzam Nadim, FAS–N; Ph.D., Boston
Neurophysiology and computational neuroscience

Andrea Sawczuk, UMDNJ; Ph.D., Washington
Neural control of orofacial motor systems

Richard Servatius, UMDNJ; Ph.D., UMDNJ
Chronic stress

Steven Zakman, UMDNJ; Ph.D., Ottawa
Psychoneuroimmunology

Program

The graduate program in integrative neuroscience, a joint effort between Rutgers–Newark and the University of Medicine and Dentistry of New Jersey, provides students with research-oriented training in current neuroscience. The Ph.D. program provides a multidisciplinary and integrative approach to the study of molecules, neural systems, the brain, behavior, and cognition.

In recent years, molecular, immunological, and neuroanatomical techniques have opened the way to innovative approaches in medicine. Technologies for imaging the human brain, such as the MRI, provide unprecedented opportunities for explaining the basic neuronal mechanisms that underlie adaptive behavior in animals and humans, including speech, language, and cognition. With these new opportunities, however, has come a need to develop new training initiatives, as an understanding of fundamental principles is required to integrate basic and clinical research.

Successful completion of the graduate program in integrative neuroscience culminates in the award of a Ph.D. The program does not offer a master's degree. The faculty of the integrated neuroscience graduate program is composed of members of the Center for Molecular and Behavioral Neuroscience, the departments of psychology and biological sciences at Rutgers–Newark, and faculty members of the nearby University of Medicine and Dentistry of New Jersey–New Jersey Medical School (UMDNJ–NJMS) and New Jersey Institute of Technology.

A student entering the program works closely with a faculty mentor, who follows the student's progress and provides guidance on courses, research rotations, and other issues. Once students have completed their two required research rotations, they pursue their dissertation research. They may proceed through the research phase under the supervision of any faculty member in the program who agrees to take on an advisory function.

The program trains students for scientific research careers in neuroscience and prepares them to take positions in academic, medical, and industrial research. The faculty focuses on training students across the various domains of neuroscience, utilizing the latest research techniques. Students learn to conduct independent research and to present and discuss their findings orally and in writing. They also gain experience in undergraduate and graduate teaching. All students receive stipends in the form of fellowships or research assistantships.

For more information, students can visit the graduate program's web site at http://www.ins-rutgers-umdnj.rutgers.edu. In addition, students can obtain additional information from their advisers after they are admitted to the program.

Course Requirements

In their first year, all students are required to take both terms of Foundations of Neuroscience (26:546:565,566), Molecular and Cellular Biology (26:485:520), and Critical Thinking in Neuroscience (26:546:651). Statistics in Neuroscience (26:546:509,510) and Research in Neuroscience (26:546:511,512), which also are required, may be taken in either the first or second year.

As students must earn a minimum grade of B in each of these courses, they will have to retake any course in which they failed to meet the minimum grade standard. In addition, students who fail to earn a grade of B or better in the first term of Foundations of Neuroscience will be placed on probation. To continue in the program, students must earn an overall grade-point average of 3.0 or better over both terms of Foundations of Neuroscience and in Molecular and Cellular Biology. An overall grade-point average of 3.0 is required to maintain university-based funding.

Prequalifying Students (First Two Years)

New students will choose their rotations at either institution during their first two years. A minimum of two rotations is required. For the first year, new students will be assigned to one of the institutions for administrative purposes only, but they may select a mentor from either institution. After a student selects a thesis mentor, the mentor's home institution will serve as the student's home school for purposes of future funding, financial aid, and other institutional issues.

Students are expected to complete their degrees within five years. The doctoral program requires a minimum of 42 nonresearch course credits plus 24 research course credits. All courses must be completed with a minimum grade of B to meet the requirements of the doctoral degree.

In addition to the required courses, students must take a minimum of three electives (with at least 2 credits apiece), and they are required to participate in journal clubs and seminar programs. Certain other relevant courses are offered by the departments of biological sciences, physics, chemistry, and the Rutgers graduate program in psychology (see the Graduate School of Applied and Professional Psychology Catalog). These and other courses offered at the nearby University of Medicine and Dentistry of New Jersey and New Jersey Institute of Technology may be taken to support the electives requirement, if they are approved by a director of the graduate program.

A comprehensive, credit-bearing teaching skills course and program will be designed for all students. This program will consist of instruction and placements that provide students with experience in the entire range of teaching duties, including assisting another instructor in a large lecture class, supervising lab or recitation sections, and teaching classes independently.

Students also must take Ethics in Research and Scholarship, a ten-week, 1-credit course sponsored by the UMDNJ Graduate School of Biomedical Sciences. In this course, students read papers, conduct discussions, and write on ethical issues. The course is taught by a cross section of the faculty.

The following is an outline of the first two years of the doctoral program:

First-Year Program

First Term

26:485:520. UMDNJ Core Course: Molecular and Cellular Biology (5)
This course, which is for graduate students but not medical students, focuses on the basic sciences and general principles. It runs for the first term and for half of the second term.

26:546:565. Foundations of Neuroscience I (4)
This core course integrates current molecular behavioral cognitive and clinical neuroscience with the UMDNJ core course. It is taken in the first two terms.

26:546:627. COLLOQUIUM IN NEUROSCIENCE I (1)
A mandatory seminar that is offered during the first and second years of a student's program. It includes student presentations and provides analyses of current research by visiting guests and seminar presenters. The seminars will alternate between campuses, with a joint seminar in April featuring multiple speakers. Offered during the first two years of a student's program, this course is open to more advanced students. Eight seminars are offered per year plus the joint seminar. A student receives 1 credit for each term taken, for a total of 2 credits.

26:546:705. METHODS IN NEUROSCIENCE (1)
This is designed as a roving course that students take in their first year. They move among all faculty laboratories to observe research methodologies. Students will write a research paper each term. The class is coordinated with graduate student rounds.

Electives

A minimum of three courses carrying at least 2 credits apiece is required for the doctoral degree.

Rotation (optional)

Second Term

26:485:520. UMDNJ CORE COURSE: MOLECULAR AND CELLULAR BIOLOGY (3)
This completes the course taken in the first term and runs for half the second term.

26:546:566. FOUNDATIONS OF NEUROSCIENCE II (4)
Continuation of the first term.

26:546:628. COLLOQUIUM IN NEUROSCIENCE II (1)
Continuation of the first term.

26:546:705. METHODS IN NEUROSCIENCE (1)
Continuation of the first term.

26:546:651. CRITICAL THINKING IN NEUROSCIENCE (2)
Intensive presentation, discussion, and written critiques on important neuroscience research papers.

Electives

A minimum of three courses carrying at least 2 credits apiece is required for the doctoral degree.

Rotation

Summer

Rotation

Second-Year Program

First Term

26:546:509. STATISTICS IN NEUROSCIENCE (3)
Offered by the Center for Molecular and Behavioral Neuroscience, this is a one-term core course. In addition to the required course, an advanced 3-credit course will be offered.

26:546:627. COLLOQUIUM IN NEUROSCIENCE I (1)

Rotation

Second Term

NEUR5001. ETHICS IN SCIENCE, RESEARCH, AND SCHOLARSHIP (1)
Students read papers, conduct discussions, and write on ethical issues and standards. A ten-week course, sponsored by the University of Medicine and Dentistry of New Jersey–Graduate School of Biomedical Sciences, is taught by a cross section of the school's faculty.

26:546:628. COLLOQUIUM IN NEUROSCIENCE II (1)

Rotation

Early Research Project

Before they can take the qualifying examination for the doctorate, students must complete an early research project. This independent piece of research is conducted under the oversight of a member of the integrative neuroscience faculty during one or more of a student's required rotations. As the resulting manuscript stems from research often conducted under time constraints, the program grants some latitude on the amount of data required and / or the success of experiments undertaken. Thus, a manuscript may not meet standards required for actual publication, although a majority of the manuscripts submitted to the committee have been published. Publication is not a requirement of the program, however.

Advancement to Candidacy

To advance to candidacy, students must complete satisfactorily the qualifying examination: (1) a daylong written examination in the broad areas of neuroscience, (2) a written paper focused on their early research project, and (3) an oral defense based on their research paper.

Qualifying Examination

All students must pass the qualifying examination in order to become candidates for the Ph.D. degree in integrative neuroscience. These examinations take place early in the fall term of the student's second and / or third year in the program, typically during the second or third week of September.

The examination is administered by a committee composed of six faculty members of the graduate program in integrative neuroscience. Three of those faculty members are drawn from Rutgers and three from UMDNJ. Faculty members serving on the qualifying examination committee are appointed to three-year terms by the director(s) of the graduate program. The director(s) also name a chairperson and vice chairperson of the committee. The chairperson serves a two-year term as chairperson and then rotates off the committee. At that point, the vice chairperson moves up to become chairperson, and a new vice chairperson is appointed.

Examination Formats

Qualifying

The qualifying examination is composed of both general knowledge and research components, which are administered on different days. Each student takes a written examination to test his or her knowledge of broad areas of neuroscience, submits a paper focused on his or her early research project, and makes an oral defense of his or her research paper.

Research Component: Written and Oral Defense

The written component of the research consists of a write-up of the early research project in a form suitable for publication. The student is free to pick the journal format (e.g., Journal of Neuroscience, Journal of Cognitive Neuroscience, or Journal of Neurochemistry) that he or she will follow. The style, however—including the title page, abstract, citations, reference list, figures, and other components of the manuscript—must adhere strictly to the format of the journal chosen.

Since this paper is used to evaluate the student's ability to prepare a scholarly work before being advanced to candidacy for the Ph.D. degree, it should represent primarily the work of the student. The conduct of experiments, analysis of the research data, and their interpretation can and should be discussed with the adviser. On the other hand, the manuscript itself must reflect primarily the organizational thinking and writing ability of the student and contain a minimum of input from the adviser.

The committee recognizes, however, that even some of the best manuscripts require revision before they can be published in a journal. Thus, the committee will accept certain manuscripts even if they need some revision and resubmission. Candidates must submit six copies of the manuscript to the committee chairperson no later than 5:00 P.M. on the first Friday in September of their third year in the program.

If the committee accepts the manuscript, the chairperson will schedule an oral examination and early defense of the manuscript. Typically, these oral examinations occur during the second or third week of September. The examination opens with an oral presentation of fifteen to twenty minutes by the student outlining the early research project. This is followed by questions from the committee, which may range from technical, methodological, and conceptual aspects of the research and manuscript to literature that relates to the project.

Manuscripts deemed unacceptable by the committee are returned to the student for revision, and the oral portion of the examination may be postponed. At this time, the student may solicit the adviser's advice in preparing a revised version. While the adviser may offer specific help on the organization, structure, style, and content of the manuscript, the actual writing is to be the student's. Again, the student submits six copies of the revised manuscript to the committee.

To pass the qualifying examination, the student needs affirmative votes from four of the six committee members. Since the purpose of the qualifying examination is to identify weaknesses or deficiencies that a student must rectify before graduation, the school encourages faculty advisers to attend their students' presentations and subsequent examinations as silent observers.

General Knowledge Component

The general knowledge component of the qualifying examination consists of essay-type questions. Each year, the qualifying examination committee solicits questions from each of the lecturers in Foundations of Neuroscience and the core course, Molecular and Cellular Biology, who taught the student in the first year in the program. From these questions, the committee selects fourteen on the subjects of molecular, cellular, systems, behavioral, and cognitive neuroscience to pose to the student.

The exam is held in three-hour periods over two nonconsecutive days, usually in the second or third week of September. Each of the two exams consists of seven questions, with the candidate required to pick any four to answer. Candidates have three hours to write their answers by computer and save those answers to a file. Each answer is graded by the author of the question, the committee chairperson, and at least one other appropriate faculty member selected by the chairperson. Grading is blind, with the answers identified only by student number. The code is not broken until the chairperson receives all grades from all the answers in the exam. To pass, a candidate must supply acceptable answers to at least three of the four questions posed on each day. To pass the qualifying examination, a candidate must garner at least a four-to-two affirmative vote from the qualifying examination committee.

Because one purpose of the qualifying examination is to identify weaknesses or deficiencies in the candidate that must be corrected, the school encourages faculty advisers to attend their students' presentations as silent observers.

No more than three weeks after completing the examination, the program notifies each candidate in writing of his or her results. This letter, which becomes part of the candidate's permanent record, also will detail strengths and weaknesses that were identified by the examination and suggest steps to remedy deficiencies.

Policies Governing Reexamination

The student must pass both the research and the general knowledge portions of the qualifying examination to be admitted to candidacy. If the student fails either or both portions of the examination, he or she will be permitted to retake the failed portions one time only. Thus, the reexamination may involve the oral presentation, manuscript defense, one or both sections of the general knowledge examination, or any combination of these. Working with the student's adviser, the qualifying examination committee sets the time for the reexamination. In no case should that date be later than December 20 of the year in which the initial examination was taken.

Terminal Master's Degree

If the student fails to pass all components of the qualifying examination on the second attempt, that student must leave the program. Upon recommendations by the qualifying examination committee and with the approval of the director(s) of the graduate program, however, such candidates may be awarded a terminal master of science degree. Conferral of this degree is contingent upon the student completing at least 30 credits of graduate courses, including at least 24 credits with a B average. In addition, each of these students must submit to the qualifying examination committee an acceptable write-up of the early research project.

Under exceptional circumstances, students leaving the program who have completed the course requirements but not the early research project and / or its written component may be assigned a final paper topic by the chairperson of the qualifying examination committee. If after reviewing this paper, the qualifying committee finds it acceptable, the master of science degree is awarded.

Doctoral Dissertations

Doctoral Dissertation Committee

As soon as possible after passing the qualifying examination, each student must establish a doctoral dissertation committee. The committee will consist of at least five members, who will serve as the examining committee at the student's oral defense of the dissertation. Four members of the committee must be members of the graduate program in integrative neuroscience. With approval from the program faculty, the committee may include faculty members from other Rutgers or UMDNJ units. At least one member of the committee should come from outside Rutgers and the University of Medicine and Dentistry of New Jersey and be a recognized expert in the candidate's research field.

In the early stages of forming a dissertation committee, the candidate, acting with approval of his or her dissertation adviser, should choose one member of the panel to serve as a coordinator. The coordinator, who should be someone other than the dissertation adviser, facilitates the closed sessions, introduces the candidate to the committee, and moderates the question and answer period of the proposal and the defense sessions.

Role of the Committee. All members of the committee must be present when the student makes the dissertation proposal. Following approval of the proposal, the student should meet with individual members of the committee as the research proceeds to discuss his or her work and to solicit their advice. At the conclusion of the data-gathering phase, the entire committee will meet to determine if the candidate has completed sufficient work on the project. If geographic restrictions make it difficult for the external member to attend this session, the other committee members should transmit written comments and questions to this member. The committee's decision on data gathering will determine whether the student is ready to begin the final analysis and writing phase of the research.

At least three months before the student is to defend his or her work, he or she should submit a draft of the manuscript to the committee. Although this document should be as complete as possible, the committee will allow the student a certain degree of latitude at this point. For example, the bibliography may not be complete or some of the figures in the document may not be in final form. With the possible exception of the external member, the entire committee meets again to ensure that work on the thesis is progressing satisfactorily and to make suggestions to the candidate. When the candidate makes his or her final defense, all committee members, including the external member, must be present.

Doctoral Dissertation Proposal

Time Frame. The candidate must prepare and present a dissertation proposal after passing the qualifying examination and no later than one year before the date of the dissertation defense.

This time frame is designed to ensure that the student gets a proposal ready and has full benefit of advice and guidance from the dissertation committee. For this reason, candidates should form their dissertation committees well in advance of the time they make their proposal presentations.

Written Proposal. The written dissertation proposal must be a scholarly writing that describes the experiments that have been completed for the dissertation and further experiments that are proposed. The proposal introduction gives the candidate a first chance to write a scholarly synthesis of the scientific literature related to the dissertation proposal. This introduction should be more comprehensive than the introduction to a single scientific experiment or publication.

The written proposal is not expected to describe a large number of completed dissertation experiments. Instead, the document should stress preliminary data that would illustrate the feasibility of the research direction of the proposal. In addition, the written proposal should demonstrate the appropriateness and feasibility of the experimental methods that will be used, and it should show that the candidate has the requisite working knowledge of these methods to proceed. In the case of proposed experiments, the paper should outline the expected results and their relationship to hypotheses and alternative hypotheses that are set forth in the introduction.

Oral Presentation and Examination. The oral presentation, which is open to the university community, is not expected to contain a large number of completed dissertation experiments. As with the written proposal, it should emphasize preliminary data that support the feasibility of the research direction the candidate plans to pursue. In addition to demonstrating the appropriateness and feasibility of the experimental methods that will be used, the candidate should show that he or she has a sufficient working knowledge of these methods to proceed with the research.

In the case of proposed experiments, which likely will constitute the majority of the seminar, the presentation should emphasize the rationale, hypotheses to be tested, methods to be used, and the expected results and their interpretation in relation to the hypothesis.

Thus, the presentation should include the salient aspects of the written dissertation proposal, but in an appropriate seminar style complete with visual aids. Slides are recommended highly. The seminar presentation is followed by a question-and-answer period at which the candidate takes questions from the university community.

The dissertation committee then will meet with the candidate in closed session to conduct a more detailed examination of the proposal and to determine the candidate's grasp of its scientific content. At this point, the panel may ask the candidate to revise any aspect of the proposal. The goal of an accepted dissertation proposal is for the candidate and the committee to reach consensus on the expected scientific content of the doctoral dissertation.

Doctoral Dissertation Format

The doctoral dissertation must be in one of two formats: the traditional format or the compendium of journal articles format.

Traditional Format. The traditional format consists of at least five sections: (1) introduction, (2) methods, (3) results, (4) discussion, and (5) literature cited. Other sections, such as acknowledgments and dedications, may be included at the candidate's discretion. The introduction is a qualifying review of literature that pertains to the dissertation. In acquainting the reader with relevant literature to the dissertation topics, the candidate is expected to discuss important inconsistencies in that body of literature and provide reasons for performing the dissertation research. The candidate should discuss specific problems with current hypotheses and outline hypotheses he or she plans to test with dissertation experiments.

The methods section provides a detailed look at the methods to be used to complete the dissertation research. It should include a justification of the methods chosen and a statistical analysis.

The results section describes in detail the results of the dissertation experiments and is supplemented by tables, graphs, drawings, and / or photographs.

In the discussion section, the author looks at the results in detail, particularly in relation to problems and hypotheses identified in the introduction. The candidate is expected to consider any negative or inconclusive results and give reasons for the failure of any experiments to yield usable data. The author also should point out future experiments that might be tried, based on the data collected.

The literature cited section contains a complete bibliography. It should be done in the format of the Journal of Neuroscience.

Because all doctoral dissertations are copyrighted and published by Bell and Howell, official copies submitted to the university and to Bell and Howell must contain only monochrome illustrations. Copies of the dissertation submitted to the doctoral dissertation committee, however, may contain color figures as long as those figures can be interpreted when reproduced in monochrome.

Compendium Option. In contrast to the traditional style, this option is a mixed format in which manuscripts submitted to the press or submitted for publication comprise a major portion of the dissertation. This format must include four sections: (1) introduction, (2) publications, (3) discussion, and (4) literature cited. The candidate may include other sections at his or her discretion.

Although each manuscript in a compendium will have its own introduction, the author is expected to provide an overall introduction to the dissertation in order to orient the reader and set the stage for the manuscripts to follow. The candidate should follow the guidelines for the introduction in the traditional format and avoid retracing information contained within each manuscript. The only exception to this rule is when some duplication is absolutely necessary to provide an integrated and continuous introduction to the manuscripts in the body of the dissertation.

The publications section consists of the actual manuscripts that make up the heart of the dissertation. At least three of those manuscripts must have been published already. In most cases, the candidates should be the first author of most of the papers used in this format. The doctoral dissertation committee must approve any exceptions to this rule. The paper presented should form a cohesive body of work that supports a theme or themes that were expressed clearly in the introduction.

The discussion section provides an overall discussion of all papers in the publications section. As in the traditional format, its purpose is to tie together and interpret the results of all experiments cited.

The final section, literature cited, is a complete bibliography of all literature mentioned in the introduction and discussion sections. It should be in the format of the Journal of Neuroscience.

Dissertation Defense

The dissertation defense is scheduled approximately one month after the candidate submits the complete dissertation to each of the committee members. The defense consists of a publicly announced, open colloquium. This is followed by a closed session with the dissertation committee. All members of the dissertation committee must be present for the final defense.

Teaching Requirements

In addition to all the other requirements, students must fulfill a three-term teaching assistantship.

Graduate Courses

26:546:501. NEUROANATOMY (3)
Morrell
Mammalian neuroanatomy, covering the gross anatomy of the brain, the ascending sensory systems, descending motor systems, cranial nerves, the higher motor systems, the thalamus, hypothalamus, and cerebral cortex. Includes dissection and slide viewing.

26:546:502. SEMINARS ON THE LIMBIC SYSTEM (4)
Buzsaki
Issues in limbic system research; the format and importance of scientific debate and practice presentation of scientific material to a strong, learned community stressed.

26:546:509,510. STATISTICS IN NEUROSCIENCE (3,3)
INS faculty
Introduction to statistics and data analysis. Fundamental statistical methods necessary for conducting research; analysis and interpretation of data using statistical computer software. Topics include hypothesis testing, correlation and regression, validity and reliability, research design, report writing, MANOVA, factor analysis, and metaanalysis.

26:546:511,512. RESEARCH IN NEUROSCIENCE (3,3)
INS faculty
Research rotation.

26:546:532. CELLULAR NEUROPHYSIOLOGY (3)
Tepper. Prerequisites: 26:546:565,566; or permission of instructor.
Advanced topics in cellular neurophysiology. Topics include membrane biophysics, synaptic transmission, and an overview of systems neurophysiology.

26:546:565,566. FOUNDATIONS OF NEUROSCIENCE I, II (4,4)
INS faculty
Broad overview of basic tenets, philosophy, history, techniques, and research advances in behavioral and neural sciences.

26:546:589. INTRODUCTION TO NEUROPHARMACOLOGY (3)
Abercrombie
Basic neurochemistry and neuropharmacology relating to synaptic transmission. Chemistry and pharmacology of neurotransmitters. Experimental approaches.

26:546:597. NEUROPHYSIOLOGY AND BEHAVIOR (3)
Komisaruk
Structure and function of the mammalian nervous system; neuroanatomy, neurophysiology, neuropharmacology; functions of spinal cord, autonomic nervous system, limbic system, higher brain mechanisms, reproductive behavior, pain modulation, sensorimotor and viscero-somatic integration.

26:546:610. NEURAL BASES OF COGNITIVE DEVELOPMENT (3)
Benasich
Broad overview of emerging field of developmental cognitive neuroscience. Behavioral and biological approaches to study of relations between early brain development and developing language and cognition. Major focus on neural bases of cognition in children (i.e., links between brain development and cognitive development). Research in cellular and animal literatures used to provide framework for understanding links between biological processes occurring during central nervous system (CNS) development and behavioral capacities in the mature organism. Weighs the contributions of processes intrinsic to CNS development against influences from such external sources as behavioral experience, trauma, nutrition, and hormonal states. Topics include historical and theoretical background for studying the developing brain, embryonic and fetal brain development, perceptual development, language and cognitive development, brain plasticity, and brain-based disorders of language and cognition.

26:546:619. PARKINSON'S DISEASE AND MOTOR CONTROL (3)
Poizner. Prerequisites 26:546:565,566; or permission of instructor.
Advanced seminar on Parkinson's disease and on human motor control. Topics include frames of reference for movement, motor learning, models of the pathophysiology of Parkinson's disease; nature of deficits in Parkinson's disease; and functions of the basal ganglia.

26:546:625. BASAL FOREBRAIN: AN ANATOMY TO FUNCTION (3)
Zaborszky. Prerequisites: 26:546:565,566; or permission of instructor.
Lectures on current ideas about the anatomy of the basal forebrain cholinergic system, as well as its involvement in different functions, such as sensory processing, attention, and learning and memory. Role of the basal forebrain in certain neurodegenerative diseases, such as Alzheimer's disease and Parkinson's disease.

26:546:626. BRAIN AND LANGUAGE (3)
Poizner
High-level cognitive functions subserving spoken and sign language and their neuronal substrates.

26:546:627,628. COLLOQUIUM IN NEUROSCIENCE (1,1)
INS faculty. Prerequisite: 26:546:651.
Neuroscience topics of current interest discussed by a series of experts in the field. Critical issues in modern neuroscience, including structure / function of ion channels, visual processing, storage and recall of memories, and brain activation studies covered in depth. Continues training in various advanced topics in neuroscience begun in 26:546:651.

26:546:629. HUMAN NEUROANATOMY (3)
Zaborszky. Prerequisite: Advanced training in psychology or neuroscience.
Human brain and spinal cord covered in detail. Development of the nervous system and brain dissection. Sensory and motor systems, including motor disorders. Overview of complex functions and special systems, including the basal forebrain cholinergic systems, the anatomical basis of neuroendocrine and central autonomic regulations. Anatomical organization of motivation, emotion, learning, and memory. Central nervous system vasculature and cerebrovascular diseases. Brain imaging techniques and the comparison of such images with brain sections.

26:546:631. NEURAL PLASTICITY (3)
Buzsaki. Prerequisites: 26:546:565,566; or permission of instructor.
Lectures on cellular and systems level neuronal mechanisms underlying learning and memory and recovery of function following neuronal injury.

26:546:632. SENSATION AND PERCEPTION (3)
R. Siegel
Basic processes of sensory and perceptual mechanisms as performed in subcortical and cortical structures beginning with the sensory epithelium and concluding with the associational cortices. Major topics are: (1) five senses, (2) subcortical processes, (3) analysis by early cortical processes, (4) cortical hierarchies, (5) specialization by secondary cortical regions, (6) integration in associational cortex, and (7) theoretical aspects.

26:546:633. LEARNING AND MEMORY (3)
Gluck. Prerequisite: Permission of instructor.
Cognitive neuroscience approaches to the study of human learning and memory. Major focus on the role of the hippocampal region in learning and memory, including discussion of human global amnesia, animal models of amnesia, stimulus representation, hippocampal function in specific learning tasks, and computational models of the hippocampus.

26:546:651. CRITICAL THINKING IN NEUROSCIENCE (2)
Buzsaki. Prerequisite: 21&62:830:484.
The ability to read and analyze research papers and seminars is critical to the development of a researcher in neuroscience. This course provides training in these skills, with specific focus on classical papers as well as more recent "breakthrough papers." The role of technical as well as conceptual developments discussed. Part of the course entails attendance and discussion of seminars presented by experts in various disciplines of neuroscience.

26:546:705. METHODS IN NEUROSCIENCE (3)
Zaborszky and other faculty members
A survey course encompassing all active research laboratories in the neurosciences department.

26:546:706,707. RESEARCH IN NEUROSCIENCE (BA,BA)
INS faculty

26:546:708,709. INDIVIDUAL STUDIES IN NEUROSCIENCE (BA,BA)
INS faculty

Reading, discussion, and papers supervised by faculty members of the graduate program for individual students. Students make arrangements with a faculty member before registering for this course.

26:546:800. MATRICULATION CONTINUED (E1)
Open only to students not on campus. By permission of the graduate program director only.

UMDNJ Courses

The following courses are offered by the University of Medicine and Dentistry of New Jersey. For complete course descriptions and prerequisites, see the UMDNJ catalog or visit the school's web site at http://www.umdnj.edu/gsbsweb.

Course		Instructor
26:485:520	Molecular and Cellular Biology (5,3)	Howells
NEUR5001	Ethics in Science, Research, and Scholarship (1)	Diamond
NEUR5950	Clinical Neurosciences (2)	Pachner
NEUR5030	Neural Substrates of Aggression (1)	A. Siegel
NEUR5080	Brain-Hormone Interactions (2)	Ottenweller
PHPY5020	Principles of Pharmacology (3)	Flynn
NEUR5150	Development and Regeneration of Nervous System (2)	Townes-Anderson
NEUR5140	Selected Topics in Neuroimmunology (1)	Rohowsky-Kochan
UMDNJ	Medical Neuroscience (4)	A. Siegel
UMDNJ	Research Rotations (1–2)	INS faculty
PHPY520A	Biophysical Approach to Neuropharmacology	McArdle
BIOC5200	Regulation of Gene Expression	Howells
NEURO5170	Neurobiology of Learning and Memory	Servatius
UMDNJ	Neurobiology of Stress	Zalcman
UMDNJ	Introduction of Neuropsychology	Lange
UMDNJ	Biophysical Principles: First Module in Physiology	Berlin

JAZZ HISTORY AND RESEARCH 561

Degree Program Offered: Master of Arts
Director of Graduate Program: Professor Lewis Porter, Department of Visual and Performing Arts, Bradley Hall 254 (973 / 353-5600, ext. 30; fax: 973 / 353-1392; email: lporter@andromeda.rutgers.edu)

Faculty

Professor:

Lewis Porter; Ph.D., Brandeis
All aspects of jazz history and research; piano performance

Associate Professor:

Henry Martin; Ph.D., Princeton
Theory; analysis; composition

Assistant Professor:

William Bauer; Ph.D., CUNY
Transcription; ethnomusicology; vocalists

Institute of Jazz Studies Staff:

Dan Morgenstern, Director
Ed Berger, Associate Director
Vince Pelote, Sound Recording Preservation Specialist
Tad Hershorn, Archivist

Program

This program, which is the only one of its kind, prepares students for research, publishing, and teaching. It also provides students with access to the renowned Institute of Jazz Studies, the largest public-access jazz library in the world.

Applicants to the program should have a bachelor's degree in any field, and basic competence in music reading and performing. In addition to standard application forms, applicants must submit one research or analysis paper (an undergraduate paper is acceptable), a short audio tape of their playing, and a page of sheet music that they have written or transcribed. The GRE is not required.

The M.A. degree requires a total of 36 credits. The twelve required courses in the program involve historiography, transcription of music from recordings, musical analysis, archival research, interviewing techniques, and detailed studies of particular artists or genres. There also is a list of required listening that students must complete. At the end of the course work, each student takes a comprehensive examination. Courses are scheduled in long blocks, generally two or three days a week, from 10 A.M. to 4 P.M. Following are the core courses in the program:

26:561:501,502 Jazz Historiography (6)
26:561:503 Transcription and Analysis (3)
26:561:504 Research Methods (3)
26:561:505,506 Topics courses (9)
26:561:507 Ethnomusicology (3)
26:561:509 Thesis I (3)
26:561:513,514 Jazz Theory and Analysis (6)

Students also are required to choose one course in a related field such as history, African-American studies, or anthropology. Typically, students carry a full-time load of 12 credits per term. In limited circumstances, however, individuals are permitted to enroll in courses on a part-time basis. After students have completed three terms, they spend the fourth term finishing the required listening and revising their theses. During the last term, usually around March 1, students take the comprehensive exam.

Private lessons or participation in the Mosaic jazz ensemble, led by Professor Bauer, are recommended highly for some students. There are no additional fees for these activities, which students may be mandated to take in addition to the regular 36 credit requirement.

The program gives credit for a maximum of 12 credits of work done toward a master's degree at another institution as long as that work fulfills any of the program requirements.

Courses

26:561:501,502. JAZZ HISTORIOGRAPHY (3,3)
Porter. Prerequisites: Must be taken in sequence. For students entering the program, the course should be taken first term. For other graduate students and advanced undergraduates, by permission.
Not a history of jazz, but an intensive examination of the way jazz history has been written and how statements became accepted as facts. Involves research and writing projects aimed at developing new approaches to jazz historiography.

26:561:503. TRANSCRIPTION AND ANALYSIS (3)
Bauer
Practical training in various ways of taking jazz off recordings, on instruments, on paper, and on computers. Students will transcribe improvised solos, as well as full scores of small groups. Addresses problems and limitations of each procedure.

26:561:504. RESEARCH METHODS (3)
Porter
Hands-on survey of a variety of research techniques used by biographers, historians, and journalists, but not yet in common use in the jazz field. Topics include government archives, genealogical research, web resources, Institute of Jazz Studies holdings, and newspaper research. Also provides practical experience in planning, conducting, preserving, and transcribing interviews.

26:561:505,506. GRADUATE TOPICS I,II (3,3)
Staff
Advanced topics of current interest to be announced. Usually the instructor devotes the term to an in-depth exploration of an individual artist, genre, locale, societal issue, or research problem. Topics include Charlie Parker, John Coltrane, stride piano, vocalists, and a players' workshop.

26:561:507. ETHNOMUSICOLOGY (3)
Bauer
A different approach to the musics of non-Western cultures and Western marginal cultures. Attempts reach a vantage point aligned with that of people living in those societies. This is accomplished by exploring why and how music of various cultures is made, what it is used for, how it is passed down to future generations, and how it is received and judged. Course also decodes our own cultural assumptions about music.

26:561:509,510. THESIS I,II (3,3)
26:561:510 not required for most students.
Graduate students complete a thesis comprised of original research and analysis, under faculty supervision.

26:561:511. INDIVIDUAL STUDIES (BA)

26:561:512. CHARLIE PARKER (3)
In following Parker's biography from his birth in Kansas City until his death in New York, we discuss the most significant events in his life and analyze both live and studio recordings of his music. In addition to the specific contributions of Parker, the class examines more general issues, such as the relationship of bebop to preceding jazz styles and how the emergence of bebop influenced modern conceptions of jazz.

26:561:513,514. JAZZ THEORY AND ANALYSIS I,II (3,3)
Martin
Reviews and strengthens students' knowledge of jazz music theory. Primary focus on music analysis, with particular attention to the different styles of jazz and how they can be understood in the context of their historical eras. While the focus is on the music as heard, jazz theory as it relates to performance will be discussed as well. Compares and contrasts various theories of tonal Western concert music with jazz theories.

26:561:515. STRIDE PIANO (3)
Stride Piano engages in an in-depth study of the important Harlem piano stylings of the 1920s. In addition to studying the pianists and their individual performance practices, the course examines such important issues as the development of early jazz out of ragtime, the comparative significance of New York versus New Orleans and Chicago, as a center of ragtime and early jazz, and the key issues of composition, improvisation, and arranging.

26:561:800. MATRICULATION CONTINUED (E1)

LIBERAL STUDIES 606

Degree Program Offered: Master of Arts
Director of Graduate Program: Professor Josephine Grieder, Room 401, Hill Hall (973 / 353-1045)

Participating Faculty

Colin Beer, FAS–N; D.Phil., Oxford
Conceptual and historical aspects of ethology, comparative psychologies
Ira Cohen, FAS–N; Ph.D., Wisconsin
Social theory; history of social thought; sociology of science
Nina daVinci-Nichols, FAS–N; Ph.D., New York
Myth, drama, contemporary fiction, film
Yale Ferguson, FAS–N; Ph.D., Columbia
Warfare and forms of social conflict, economic development and cultural change
Frank Fischer, FAS–N; Ph.D., New York
Bureaucracy; science and technology policy
H. Bruce Franklin, FAS–N; John Cotton Dana Professor, Ph.D., Stanford
Literature and the third world; science fiction; utopian and anti-utopian literature; American literature; literature and technology
Peter B. Golden, FAS–N; Ph.D., Columbia
Nomadic peoples of medieval Central Asia and the Near East
Josephine Grieder, FAS–N; Ph.D., New York
French and English intellectual, social, and literary history
Rachel Hadas, FAS–N; Ph.D., Princeton
Poetry, criticism, translations from the Greek classics
David Hosford, FAS–N; Ph.D., Wisconsin
Tudor-Stuart England; early modern Europe
Janet L. Larson, FAS–N; Ph.D., Rutgers
Narrative theory; religion and literature; women's studies in the Victorian period
Mary Clare Segers, FAS–N; Ph.D., Columbia
Political theory; women and politics; ethics and public policy; religion and politics
Janet Siskind, FAS–N; Ph.D., Columbia
Cultural anthropology; ethnography
Peter Widulski, FAS–N; Ph.D., Fordham
Philosophy, law, and society

Program

Graduate liberal studies is designed for adults who wish to create a coherent framework for their scholarly experience while deepening their understanding of the arts, humanities, sciences, and social sciences. Students are encouraged to pursue their own interests in a subject or topic through differing historical periods or across disciplinary boundaries. Prerequisites for admission include (1) a baccalaureate degree; (2) at least a B cumulative grade-point average in undergraduate studies; (3) a written essay; and (4) an interview in which the candidate's needs, achievements, and study goals are evaluated. No entrance examinations are required.

The master of arts in liberal studies program requires 30 credits. Of the total, 12 credits are earned in core courses, 12 credits are taken in electives, and 6 credits are awarded for a final project. Elective credits may represent a concentration of courses chosen from the graduate school's offerings to prepare students for the final project. At the discretion of the program director, students may transfer after matriculation a limited number of credits from undergraduate courses to meet the advanced-degree requirements. Study plans and final projects are designed in consultation with program faculty members. Nonmatriculated study also is available on a part-time basis, and all courses are open to graduate students in other programs.

The following core courses provide interdisciplinary perspectives on themes, topics, and enduring human issues that are typical of, but not confined to, four historical periods: classical Greek to early Christian, medieval and Renaissance, the seventeenth through the nineteenth centuries, and the twentieth century:

26:606:501 From Myth to History (3)
26:606:502 Faith, Love, and Reason (3)
26:606:503 Revolutions and Counterrevolutions (3)
26:606:504 Science, Ideologies, and Social Values (3)
26:606:505 The Modern Mind (3)

Core courses may be taken in any sequence, and topics may vary from term to term. At various times, courses other than those listed above may be designated core courses. For information regarding teacher certification for elementary (K–8) certificates and secondary (K–12) certificates in social studies, consult the FAS–N education program chairperson. Individually designed program tracks significantly increase teachers' opportunities for advancement in the profession. Unless otherwise specified, all courses meet once a week, beginning at 5:45 P.M.

Model Elective Concentrations

Students may concentrate their electives in one discipline, or may pursue a theme or topic across several disciplines, as the following models illustrate:

Science and Society

26:350:553 Science Fiction (3)
26:510:520 Topics in the History of Technology (3)
26:790:530 Environmental Politics and Policy (3)
21&62:880:331,332 Topics in Science, Technology, and Society (3,3)

Culture and the Arts

21&62:084:395 Issues in Arts Management I (3)
26:350:555 Studies in Film (3)
26:350:578 The Nature of Comedy (3)
26:510:559 Cities in Change I (3)

The American Experience

26:352:526 American Proletarian Writers (3)
26:352:531 Ethnicity in American Literature (3)
26:510:566 Writing American History (3)
26:790:608 American Political Thought (3)

The Social Sciences

21&62:070:363 Anthropology of Social Life (3)
26:790:512 Ethical Issues in Public Policy and Administration (3)
26:830:663 Evolution of Social Behavior (3)

Women's and Gender Studies

Students may pursue a graduate concentration in women's and gender studies through the liberal studies program. See page 5 of this catalog for a description.

Graduate Courses

26:606:501. FROM MYTH TO HISTORY (3)
Ancient legacies that shape our Western concepts of identity and heroism, authority and religion, the city and civilization, slavery and freedom, economic survival, and ancient warfare.

26:606:502. FAITH, LOVE, AND REASON (3)
Relations among faith, love, and reason; law and governance; the birth of modern science and of languages; migrations of people and ideas; the rise of the middle class.

26:606:503. REVOLUTIONS AND COUNTERREVOLUTIONS (3)
The range, scope, and dynamics of political, scientific, social, aesthetic revolutions, and interrelations among them, examined in view of traditional modes of thought and behavior.

26:606:504. SCIENCE, IDEOLOGIES, AND SOCIAL VALUES (3)
The rise and impact of modern bureaucracy and technocratic world views on work, politics, education, family, personality, art, and intellectual life; the proliferation of "isms" and "ologies" in contemporary society.

26:606:505. THE MODERN MIND (3)
The twin theses of self and society, freedom and servitude in nineteenth- and twentieth-century thinkers, from Darwin to Marx to Freud; the search for secular, rational, and scientific ways of seeing the world after the death of God.

26:606:508. SHAKESPEARE IN THE TWENTIETH CENTURY (3)
daVinci-Nichols
Recurring patterns, themes, and imagery in at least one play from each of the major genres: history, comedy, tragedy, problem drama; comparison of Renaissance intentions with those of modern filmmakers and theater producers.

26:606:510,511. TOPICS IN CONTEMPORARY CULTURE (3,3)
Usually offered by guest lecturers on subjects relating to contemporary life, thought, and art.

26:606:514. MYTH AND MYTHOLOGIES (3)
Examines ancient and modern mythic approaches to knowledge and art in tension with rational, scientific philosophies. Includes literature, psychology, and film.

26:606:521,522. TOPICS IN LIBERAL STUDIES (3,3)
Special topics in liberal studies designed by Rutgers and other faculty members. Topic announced each term as courses are offered.

26:606:523. LAW, LIFE, AND CULTURE (3)
Examination of the ways in which the law and legal disputes and contemporary social and cultural forces interact and mutually shape public awareness of legal, ethical, and cultural issues.

26:606:617. INDEPENDENT STUDY (3)
Conference or other nonclassroom study individually arranged with an instructor.

26:606:800. MATRICULATION CONTINUED (E1)
For students not registered for courses but wishing to maintain their admission status in the program.

Final Project Courses

26:606:715. PROJECT IN LIBERAL STUDIES I (3)
Supervised work on a project leading to the M.A. degree in liberal studies. Exit requirements include a description and progress report demonstrating the methods, bibliographies, and procedures pursued.

26:606:716. PROJECT IN LIBERAL STUDIES II (3)
Prerequisite: 26:606:715.
Supervised work on final project. Exit requirement: successful completion and defense of the final project according to guidelines established in 26:606:715 and approved by the program director.

MANAGEMENT 620

Degree Program Offered: Doctor of Philosophy
Director of Doctoral Program: Professor Nancy DiTomaso, Rutgers Business School (RBS), Room 309, Ackerson Hall (973 / 353-5371; email: phdinfo@phd-business.rutgers.edu; web site: http://www.phd-business.rutgers.edu)

The doctoral program in management is offered in cooperation with New Jersey Institute of Technology (NJIT). It is administered separately from the Rutgers M.B.A. program. For information about programs leading to the M.B.A. degree, visit the Graduate School of Management web site at http://www.business.rutgers.edu or the department at Room 115, Engelhard Hall, 190 University Avenue, Newark, NJ 07102-1813 (973 / 353-1234; fax: 973 / 353-1592; email: admit@business.rutgers.edu).

Members of the Graduate Faculty

For the Accounting Major and the Accounting Information Systems Major:

Professors:

Leonard Goodman, RBS; Ph.D., New York
Corporate taxation; history of taxation; international accounting
Bikki Jaggi, RBS; Ph.D., Free University of Berlin (Germany)
Financial accounting; cost accounting; environmental accounting; social accounting
Yaw M. Mensah, RBS; Ph.D., Illinois
Managerial accounting; efficiency evaluation; nonprofit institutions; financial accounting; information in capital markets
Paul J. Miranti, Jr., RBS; Ph.D., Johns Hopkins
American business history; government accounting; not-for-profit accounting
Glenn R. Shafer, RBS; Ph.D., Princeton
Audit judgment; causal modeling and uncertain reasoning; expert systems; information systems; statistical reasoning
Ephraim F. Sudit, RBS; Ph.D., New York
Cost management; pricing; productivity-based management; quality management
Miklos A. Vasarhelyi, RBS; Ph.D., California (Los Angeles)
Accounting systems; expert systems; e-commerce

Associate Professors:

Peter R. Gillett, RBS; Ph.D., Kansas
Auditing; information systems; uncertain reasoning; quantitative methodologies; philosophy
Alex Kogan, RBS; Ph.D., USSR Academy of Sciences
Internet technology and electronic commerce; knowledge-based decision support systems; accounting information systems; reasoning under uncertainty; productivity accounting and data analysis
Murugappa (Murgie) Krishnan, RBS; Ph.D., Pennsylvania
Accounting and information economics; asset pricing with private information; industrial organization; shopfloor productivity
Dan Palmon, RBS; Ph.D., New York
Corporate finance; financial reporting; general accounting theory
Alexander J. Sannella, RBS; Ph.D., New York
Accounting research; accounting theory

Michael P. Schoderbek, RBS; Ph.D., Indiana
Financial accounting; the use of accounting information by regulators; accounting history
Bin Srinidhi, RBS; Ph.D., Columbia
Cost and quality control; information economics; quality management; strategic cost management

Assistant Professors:

Sunita Ahlawat, RBS; Ph.D., Pennsylvania State
Decision making; offshore sourcing; cross-functional teams
Michael Gamini Alles, RBS; Ph.D., Stanford
Accounting
Asokan Anandarajan, NJIT School of Management; Ph.D., Drexel
Auditing; management accounting; neural networks; expert systems
Nandini Chandar, RBS; Ph.D., Case Western
Accounting
Elizabeth A. Gordon, RBS; Ph.D., Columbia
Accounting
David P. Mest, RBS; Ph.D., Texas
Investor use of financial accounting data; information in capital markets; analyst forecasts
Jay Soled, RBS; J.D., Michigan
Business taxation; charitable trusts; estate planning

For the Computer Information Systems Major:

Professors:

Roxanne Hiltz, NJIT Department of Computer and Information Science; Ph.D., Columbia
Collaborative systems; information systems evaluation; social impacts of computer and information systems; design of user-oriented interactive computer systems; computer-mediated communication
Joseph Leung, NJIT Department of Computer and Information Science; Ph.D., Pennsylvania State
Scheduling theory; real-time systems; operating systems; combinatorial optimization; computational complexity; design and analysis of algorithms
Murray Turoff, NJIT Department of Computer and Information Science; Ph.D., Brandeis
Information systems; computer-mediated communication systems delphi design; policy analysis; planning methodologies interface design; collaborative systems and group decision support systems

Associate Professors:

Michael Bieber, NJIT Department of Computer and Information Science; Ph.D., Pennsylvania
Hypertext; hypermedia functionality; digital libraries; management information systems; group support systems; collaborative systems; process reengineering; distributed education
Jerry Fjermestad, NJIT School of Management; Ph.D., Rutgers
Information systems and organizational decision making; executive information systems; technology diffusion; social impact of new technology; business process reengineering
James Geller, NJIT Department of Computer and Information Science; Ph.D., SUNY (Buffalo)
Artificial intelligence; database systems; object-oriented systems; parallel reasoning; knowledge-based systems; expert systems; natural language processing; character recognition
Marvin Nakayama, NJIT Department of Computer and Information Science; Ph.D., Stanford
Simulation modeling and analysis; fault-tolerant systems; communication networks; statistics; applied probability
Michael Recce, NJIT Department of Computer and Information Science; Ph.D., University College (London)
Neurophysiology; neural basis for spatial localization; models of spatial processing; application of neural network algorithms in robotics
Jason Wang, NJIT Department of Computer and Information Science; Ph.D., New York
Data mining and databases; knowledge engineering; software development; pattern analysis; computational biology; information retrieval and process management on the web
Joseph Wen, NJIT School of Management; Ph.D., Virginia Commonwealth
Information systems design and internet research

Assistant Professors:

James Calvin, NJIT Department of Computer and Information Science; Ph.D., Stanford
Probabilistic analysis of algorithms; global optimization; information-based complexity; search theory; applied probability
Vincent Oria, NJIT; Ph.D., ENST–Paris
Computer and information science
Richard Scherl, NJIT Department of Computer and Information Science; Ph.D., Illinois
Artificial intelligence; knowledge representation and reasoning; logic and software; computational linguistics; cognitive science

For the Finance Major:

Professors:

Ivan E. Brick, RBS; Ph.D., Columbia
Corporate finance; the impact of default risk, taxes, and asymmetric information upon the type of financial securities issued by firms; capital budgeting
Michael A. Crew, RBS; Ph.D., Bradford
Regulatory economics, peak-load pricing, and the theory of monopoly
Lawrence Fisher, RBS; Ph.D., Chicago
Portfolio theory; risk and returns of stocks and bonds; stock and bond market behavior
Ronald M. Harstad, RBS; Ph.D., Pennsylvania
Auction design; value elicitation; bidding; game theory; laboratory economics
Iftekhar Hasan, NJIT School of Management; Ph.D., Houston
Management of financial institutions; applied corporate finance; privatization and emerging markets; microfinance
Mahmud Hassan, RBS; Ph.D., Vanderbilt
Economics, health economics-labor management
Cheng-Few Lee, RBS; Ph.D., SUNY (Buffalo)
Corporate finance; security analysis; portfolio management; options and futures; risk management
S. Abraham Ravid, RBS; Ph.D., Cornell
Corporate finance; debt markets; privatization production and financial decisions; taxation
Howard Tuckman, RBS; Ph.D., Wisconsin
Factors in educational success in business schools

Associate Professors:

Theologus Bonitsis, NJIT School of Management; Ph.D., CUNY
Time series modeling; competitiveness of the U.S. economy; the trade deficit
Sharon Gifford, RBS; Ph.D., New York
Contract theory; economics of organizations; economics of information; entrepreneurship
Dongcheol Kim, RBS; Ph.D., Michigan
Empirical issues in asset pricing tests; market volatility in financial markets; modeling distributional form of security returns; nonstationarity of systematic risk
Farrokh K. Langdana, RBS; Ph.D., Virginia Polytechnic and State University
Fiscal and monetary policies; global macroeconomic policies; macroeconomic experimentation
Michael S. Long, RBS; Ph.D., Purdue
Corporate finance; valuation; entrepreneurship
Oded Palmon, RBS; Ph.D., Chicago
Corporate finance; taxation
Robert H. Patrick, RBS; Ph.D., New Mexico
Applied microeconomics; applied econometrics; natural resource and environmental economics; regulation of network industries
Yangru Wu, RBS; Ph.D., Ohio State
International finance; asset pricing; applied time-series analysis

Assistant Professors:

Dilip Patro, RBS; Ph.D., Maryland
Capital markets; asset pricing and emerging markets
Tavy Ronen, RBS; Ph.D., New York
Market microstructure; corporate finance
Ben J. Sopranzetti, RBS; Ph.D., Illinois
Banking; corporate finance; derivative securities
John K. Wald, RBS; Ph.D., California (Berkeley)
Corporate finance; law; economics; liquidity constraints
Bartel van de Walle, NJIT; Ph.D., Belgium
Mathematics

For the International Business Major:

Professors:

Farok J. Contractor, RBS; Ph.D., Pennsylvania
Foreign investment and markets; global enterprises; joint ventures; licensing
John H. Dunning, RBS; Ph.D., Southampton
Competitiveness; cross-border alliances; foreign direct investment; multinational enterprises
Richard Lehne, Department of Political Science, Rutgers–New Brunswick; Ph.D., Syracuse
American political institutions

Assistant Professor:

Sam Beldona, RBS; Ph.D., Temple
Competitiveness of U.S. firms; international corporate governance; multinational corporate strategy; myopia in international firms; valuation of intangible assets
William E. Newburry, RBS; Ph.D., New York
International business and management

Adjunct Members of the Faculty:

Kofi Afriyie; Ph.D., California
Foreign direct investments; globalization of industry and emerging market economies

Peter Gray; Ph.D., California (Berkeley)
International trade; foreign direct investments; globalization and economic development

For the Management Science Major and the Information Technology Major:

Professors:

Nabil R. Adam, RBS; Ph.D., Columbia
Database systems; digital libraries; electronic commerce; scheduling; simulation

Ronald D. Armstrong, RBS; Ph.D., Massachusetts (Amherst)
Integer programming; network flow theory; statistical application of mathematical programming

Benjamin Avi-Itzhak, RBS; D.Sc., Israel Institute of Technology
Operations research; electric energy generation; telecommunication networks; stochastic modeling

Adi Ben-Israel, RBS; Ph.D., Northwestern
Convexity and inequalities; matrix theory; optimization theory;, numerical analysis; dynamic programming; optimal control; economics of uncertainty; management of natural resources

Peter Hammer, RBS; Ph.D., Bucharest
Boolean methods on operations research; discrete optimization

Michael N. Katehakis, RBS; Ph.D., Columbia
Dynamic programming; reliability; queuing; sequential statistics; operations management

Kenneth Kendall, Rutgers' SB–C; Ph.D., SUNY (Buffalo)
Emerging information systems technologies; expert systems; artificial intelligence

Kenneth Lawrence, NJIT School of Management; Ph.D., Rutgers
Mathematical programming; multicriteria decision making; urban and regional planning; consensus forecasting; new pr
duct demand analysis; robust regression; nonli
ear regression; statistical sampling

Benjamin Melamed, RBS; Ph.D., Michigan
Modeling of telecommunications systems; stochastic processes; analysis and simulation; software modeling environments

Rosa Oppenheim, RBS; Ph.D., Polytechnic Institute of Brooklyn
Statistical process control; total quality management

Michael H. Rothkopf, RBS; Ph.D., Massachusetts Institute of Technology
Applied mathematical modeling; auctions and competitive bidding; applications of operations research; energy models

Andrzej Ruszczynski, RBS; Ph.D., Warsaw University of Technology
Stochastic programming; stochastic control; financial engineering; risk management

David F. Shanno, RBS; Ph.D., Carnegie Mellon
Mathematical optimization; linear and nonlinear programming; large scale modeling

Associate Professors:

Jonathan Eckstein, RBS; Ph.D., Massachusetts Institute of Technology
Optimization algorithms; parallel computing and applications

Douglas Jones, RBS; Ph.D., Florida State
Bayesian methods; computerized psychological and educational testing; data analysis

Julie E. Kendall, Rutgers' SB–C; Ph.D., Nebraska
Hypertext; organizational implications of push and pull information technologies; qualitative methods

Lei Lei, RBS; Ph.D., Wisconsin
Project scheduling; scheduling of transport; vehicle dispatching and routing

Lee Papayanopoulos, RBS; Ph.D., Columbia
Computer information systems; electronic classrooms; representative game theory; voting and reapportionment

Cheickna Sylla, NJIT School of Management; Ph.D., SUNY (Buffalo)
Operations management; decision support systems; training systems design

Assistant Professors:

Farid Alizadeh, RBS; Ph.D., Minnesota
Software for optimization with simultaneous linear, convex quadratic, and semidefinite constraints; application of semidefinite programming to combinatorial optimization and statistics

Vijay Atluri, RBS; Ph.D., George Mason
Clinical information systems; database management systems; distributed systems; information systems security; workflow management systems

Avigdor Gal, RBS; D.Sc., Technion–Israel Institute of Technology
Information technology; temporal and active databases

Sun Park, RBS; Ph.D., Michigan
Computer science and engineering

Zachary Stoumbos, RBS; Ph.D., Virginia Institute of Technology
Decision theory; experimental design; operations and production management; quality control; regression analysis; sequential analysis; total quality management and reengineering

For the Marketing Major:

Professors:

Phipps Arabie, RBS; Ph.D., Stanford
Market segmentation; product positioning; mathematical psychology

J. Douglas Carroll, RBS; Ph.D., Princeton
Data analytic techniques; human learning, perception, cognition, and choice behavior; multidimensional scaling; quantitative models in marketing

Elizabeth C. Hirschman, RBS; Ph.D., Georgia State
Philosophy of science; consumer behavior; popular culture; semiotics

Harsharanjeet Jagpal, RBS; Ph.D., Columbia
Advertising; new products; sales force compensation

Barbara Stern, RBS; Ph.D., CUNY
Consumer choice; gender and consumer behavior; literary theory and advertising; values and advertising

Associate Professors:

S. Chan Choi, RBS; Ph.D., Pennsylvania
Price competition; competitive product positioning; quantitative models in marketing

Robert Rothberg, RBS; Ph.D., Pennsylvania
New product development; product innovation; strategic planning

L.J. Shrum, RBS; Ph.D., Illinois
Effects of media violence on cognitive representations; cognitive processes underlying media effects; effects of television programming on social perceptions

Assistant Professors:

Suman Basuroy, RBS; Ph.D., Pittsburgh
Category management; marketing strategies; pricing, promotion

Patrali Chatterjee, RBS; Ph.D., Vanderbilt
Advertising response measurement; electronic commerce; consumer response and decision making in computer-mediated environments

Michael Mulvey, RBS; Ph.D., Pennsylvania State
Consumer research; advertising design and testing; brand image management; consumer saving and spending

Amitabh R. Mungale, RBS; Ph.D., Florida
Consumer behavior; experimental design; health care marketing; psychological approaches to advertising

Hao Zhao, RBS; Ph.D., Rochester
Advertising; consumer behavior; distribution; pricing

For the Organization Management Major:

Professors:

Alok Chakrabarti, NJIT School of Management; Ph.D., Northwestern
Technology management; strategic management and policy analysis

Fariborz Damanpour, RBS; Ph.D., Pennsylvania
Corporate governance; management of innovations and technology; organizational design and development

Nancy DiTomaso, RBS; Ph.D., Wisconsin
Diversity in organizations; labor force; managing knowledge-based organizations; organizational change and transformation; organizational culture; women, minorities, and cross-cultural management

Deborah Dougherty, RBS; Ph.D., Massachusetts Institute of Technology
Organizational capacities for sustained product /service innovation in complex organizations

George F. Farris, RBS; Ph.D., Michigan
Managing technological innovation; managing technology; stimulating creativity; technological entrepreneurs; technological innovators

Edwin Hartman, RBS; Ph.D., Princeton
Business ethics; character and organizational culture

Bruce Kirchhoff, NJIT School of Management; Ph.D., Utah
New business formation and early stage growth; technology-based business

Donald L. McCabe, RBS; Ph.D., New York
Cheating in college; college education and ethical development; ethical decision making

Hindy Schachter, NJIT School of Management; Ph.D., Columbia
Organizational behavior; history of scientific management; public administration; managing diversity; legal and ethical issues

Associate Professors:

Thomas A. Bryant, RBS; Ph.D., Massachusetts Institute of Technology
Management of science and technology; entrepreneurship

Chao C. Chen, RBS; Ph.D., SUNY (Buffalo)
Cross-cultural management; China; reward allocation; leadership; managing diversity

Rene Cordero, NJIT School of Management; Ph.D., Rutgers
Human resources; management of technology and innovation

Wayne Eastman, RBS; J.D., Harvard Law
Employment and labor law; history and politics of managerial and legal theory; law and economics; litigation strategy
Shanti Gopalakrishnan, NJIT; Ph.D., Rutgers
Organization management
Robert Hooijberg, RBS; Ph.D., Michigan
Leadership skills and effectiveness; using teams effectively
dt ogilvie, RBS; Ph.D., Texas
Creativity in decision making; executive leadership strategies; strategic decision making
Seung Ho Park, RBS; Ph.D., Oregon
Strategic alliances; interorganizational networks; corporate diversification; globalization of Asian multinational firms
Mark Somers, NJIT School of Management; Ph.D., CUNY
Attachment and commitment processes in organizations; task and unit level technologies; occupational and organizational socialization

Assistant Professors:

Seung Theresa Cho, RBS; Ph.D., Columbia
Business policy and strategy
Varghese P. George, RBS; Ph.D., Massachusetts Institute of Technology
Interfirm alliances; organizational communication; technological innovation
Daniel Z. Levin, RBS; Ph.D., Northwestern
Organization behavior
Asha Rao, RBS; Ph.D., Temple
International/cross-cultural management; Japanese management; power, influence, and negotiations
Michael A. Santoro, RBS; Ph.D., Harvard
Business ethics; international business and human rights; high-tech entrepreneurship; intellectual property; technical standards
Phyllis Siegel, RBS; Ph.D., Columbia
CEO self-handicapping; executive compensation; linkage between strategy and organizational behavior/human resource management; organizational justice and trust

Program

Rutgers University's Ph.D. in management program trains students for careers in teaching and research in business management. It admits a small number of highly qualified students, most of whom attend the program full time with financial support.

The program office is located on the Newark campus of Rutgers, The State University of New Jersey. It operates under the auspices of Rutgers Business School (RBS), which spans the Rutgers Newark and New Brunswick campuses. The program is staffed by RBS faculty on both and by associated faculty at New Jersey Institute of Technology (NJIT), which adjoins the Rutgers–Newark campus. Students take courses at all three campuses, but most of the courses for the program are offered at Rutgers–Newark.

Students in the program major in one of these areas:

Accounting
Accounting Information Systems
Computer Information Systems
Finance
Information Technology
International Business
Management Science
Marketing
Organization Management

Individualized majors also are possible. Application to an individualized major requires sponsorship by a potential faculty mentor, who specializes in the area of the major chosen. Areas where such mentors might be available include e-commerce, supply chain management, business ethics, tax accounting, and health-care management.

The program admits both full-time and part-time students. A full-time student can complete the program in four years. Such a student completes the course work in the first two years by taking three courses each term and then spends the last two years writing a dissertation. Part-time students are expected to cover the same ground in six years. By taking two courses per term, students in this category complete the course work in three years and devote their final three years to writing a dissertation.

For further information about the program, including information about financial aid and detailed information about faculty, courses, and major requirements, visit the program's web site at http://phd-business.rutgers.edu.

Curriculum

Although the first two years of a student's program emphasize course work, all students are expected to begin research projects by the summer after the first year. Most course work is completed by the end of the second year when full-time students take a qualifying examination. Part-time students may delay completion of their principal course work and the qualifying examination until the end of the third year. Students who are successful in the qualifying examination then undertake a major research project aimed at producing a dissertation.

The doctoral degree requires 72 credits. At least 24 of these credits must be in dissertation research. An additional 6 credits must be taken to satisfy the program's early research requirement, leaving most of the remaining 42 credits in doctoral courses. The exact number of courses required depends on the major. In some cases, additional courses are needed as prerequisites or to correct academic deficiencies. In addition, students must satisfy a professional development requirement and a functional field requirement. Many program requirements are implemented in different ways for different majors. Details are provided at the program's web site.

The Major

A student must complete five courses (15 credits) in his or her major. These courses usually define the broad area in which the student writes a dissertation and eventually works as a teacher and scholar. The courses a student takes to satisfy this requirement must be approved by the faculty, which may require additional courses to correct academic deficiencies.

Three courses (9 credits) must be completed in a minor designed to support the work in the major. For some majors, this minor is specified completely, while students in other majors have more latitude in picking courses, subject to faculty approval. The faculty in each major also specifies courses that provide students with foundations for the major course work and methodology for their research. Depending on the major, a student must complete four to six such courses (12 to 18 credits). Often these courses are taught outside the department administering the major. Details about the requirements and the faculty for each major are provided at the program's web site.

Early Research

Each student must complete 6 credits of structured early research as part of his or her course work. The student fulfills this requirement through two program-wide summer paper seminars, one for the first summer paper and one for the second summer paper. In consultation with a faculty member, who usually is the student's adviser, each student works on a paper during the remainder of the summer. This work is worth 3 credits. At the end of the summer, the faculty member who works with the student on the project consults with the course instructor and awards the student a grade.

The first summer paper often reviews an important but focused area of literature or replicates an important empirical study. The second summer paper should demonstrate the student's ability to initiate and complete an original research project, and it may serve as the student's dissertation proposal.

All students, full time and part time, enroll in the first summer paper seminar in the summer after their first year. Full-time students enroll in the second summer paper seminar in the summer after their second year, while part-time students can delay the second seminar until the summer after their third year.

Teacher and Professional Development

All students must satisfy a teacher development requirement, which is designed to prepare them to teach effectively and to help them improve their teaching skills throughout their careers. While they are taking courses, all students must participate in a sequence of workshops and seminars on teaching. In addition, every student, including those attending part time without fellowships or teaching assistantships, must teach at least one course in his or her area of expertise.

The activities that satisfy the teacher development requirement form part of the professional development program. This program is tailored to each area's and to each student's needs.

It encompasses the teacher development activities, the summer paper seminars, and other research seminars, including regular departmental seminars.

Students who need training in English as a second language must participate in courses in the university's Program in American Language Studies (PALS) until their English skills meet standards required for full participation in the program. All students, including native English speakers, are expected to pursue more advanced training in writing if their writing skills fall short of the level required for doctoral work.

Functional Fields

Every student must demonstrate competence in at least two of the following functional fields of business outside of his or her major: accounting, finance, human resources, and marketing. This may be done by showing practical experience in these fields or by passing courses at the master's level. Doctoral courses, because of their theoretical nature, usually do not satisfy this requirement. Students who do not have the required practical experience or course work before entering the program are expected to satisfy this requirement by passing M.B.A. courses.

The Qualifying Examination

The qualifying examination determines whether the student has acquired sufficient mastery of his or her major area of study to warrant admission to candidacy. At least four of the student's area faculty members serve on the committee that conducts the qualifying examination.

Full-time students are required to take their qualifying examination at the end of two years of course work. Part-time students may delay this timetable by no more than one year. A student who fails the examination must take it a second time and pass it within one term. As no third attempt is allowed, students who fail the examination twice must leave the program.

To appeal a decision by the qualifying examination committee, a student must submit a written statement to the program director within two weeks of receiving notification of the decision. All appeals are reviewed by the program's executive committee.

The Dissertation

To complete his or her doctoral degree, the candidate must pursue an original investigation under faculty direction and present the results of this research in a dissertation.

Within one year of passing the qualifying examination, the candidate must submit a written proposal that presents the projected content of the dissertation. The proposal becomes the vehicle for communicating the candidate's project to the faculty. It should provide sufficient detail to allow faculty members knowledgeable in the subject area to determine whether the research, in terms of quality and quantity, is acceptable and valid. According to university rules, the proposal should be prepared and defended before the candidate's dissertation committee as soon as the candidate and the adviser have agreed on preliminary guidelines for the dissertation.

The program director must formally appoint the dissertation committee before the proposal is defended. The candidate or the adviser requests that this be done by letter to the program office and sends a copy to the departmental doctoral coordinator. This committee will include an outside member, who should be consulted about the written proposal and should be at the defense if possible. The outside member must be a scholarly authority in the area of the student's dissertation work. He or she should come from outside the program's faculty and outside the Rutgers Business School and the units of NJIT that participate in the program. Preferably, the outside member should be from outside Rutgers and NJIT altogether, but this is not required.

The dissertation committee must have at least four members, including the outside member. At least one committee member must come from the Rutgers Business School. The chairperson of the committee, the dissertation adviser, may be from outside Rutgers and NJIT, but he or she must be appointed to the faculty of the Graduate School–Newark.

The chairperson of the dissertation committee, the dissertation adviser, determines the format of the proposal defense and conducts it. After the proposal defense, the dissertation adviser submits a copy of the proposal to the program office, together with a one-paragraph summary of the advice and direction that the dissertation committee has provided to the candidate in response to it.

The student must defend his or completed dissertation in public before the dissertation committee. This final defense is scheduled by the dissertation adviser, who must inform the program director of its time and place at least two weeks in advance. The program office will circulate an announcement of the defense to all members of the graduate faculty who may have an interest in the topic of the dissertation.

The complete dissertation must be in the hands of all members of the committee at least one month prior to the defense. The format of the defense, which is set by the dissertation adviser, must include opportunities for the faculty to question the candidate on the research.

Because the dissertation committee advises the candidate, that candidate should submit research results to all its members on a regular basis. The committee, in turn, should review regularly the candidate's program of study, and it may prescribe additional course work or readings at any time. The final dissertation must be approved by all members of the committee.

Transferring Credit

Students may transfer credit into this program from courses taken in other programs, but only if they meet certain conditions. First, the student must obtain a written statement from a faculty member in the student's major area indicating that the course meets certain quality standards. This means that the course must be equivalent to a doctoral-level course at Rutgers or NJIT or complement in some way the student's program of study. A student may transfer no more than 40 percent of the course requirements for a Ph.D. in management, and that transfer can only take place after the student has completed 12 credits in the program with a B or better. Each transfer must be approved by the program director and the dean of the Graduate School–Newark.

Related Master's Degrees

Depending on the student's major, course work for the Ph.D. in management also may contribute toward certain master's degrees. Such degrees will not be awarded, however, until the student completes all doctoral requirements, including the dissertation. Students may take courses that lead to a master's degree only if these courses contribute to their plan of study. To do so, the student will need approval from his or her adviser and the program director to ensure that these courses form part of the student's individualized study plan.

Master of Business Administration

A student in the Ph.D. in management program becomes eligible for the M.B.A. degree from Rutgers' Graduate School of Management (GSM) in two ways. The most obvious is to complete all requirements for the Ph.D. in management, including the dissertation requirement. The second route to eligibility for the M.B.A. involves satisfying all the following requirements:

- completing all the course requirements for the Ph.D. in management;
- passing the qualifying examination;
- completing M.B.A. courses at the level required by GSM in accounting, business policy, finance, and marketing;
- achieving at least a B average in all doctoral courses in the Ph.D. program.

Master of Science in Computer Science

Master of Science in Information Systems

Both a master of science in computer science and a master of science in information systems are available through NJIT. These courses may be taken, however, only by students in information

systems majors. In addition, a student taking these courses will need approval from his or her adviser and from the program director to ensure that the courses are part of an individual study plan. The degree will not be awarded until the student has completed all the doctoral requirements, including the dissertation. Under no circumstances may a student be awarded a master's degree in computer science or information systems if he or she leaves the program without finishing the Ph.D. requirements. For more information, see the relevant program regulations.

Master of Science in Operations Research

The master of science in operations research is available on the New Brunswick campus. These courses may be taken, however, only by students in management science or information technology majors. In addition, a student will need approval from his or her adviser and from the program director to ensure that these courses are part of an individual study plan. The degree will not be awarded until the student has completed all of the doctoral requirements, including the dissertation. Under no circumstances may a student be awarded a master's degree in operations research if he or she leaves the program without finishing the Ph.D. requirements. For more information, see the relevant program regulations.

Doctoral Study Courses*

Accounting 010

26:010:651. Advanced Topics in Financial Accounting (3)
Spring 2000 and every second spring thereafter.
Analysis of selected major concepts and issues in financial accounting theory and practice and their managerial implications. Topics include methodological issues.

26:010:652. Advanced Topics in Managerial Accounting (3)
Fall 2001 and every second fall thereafter.
Topics include information economics and its application to incentive contracting and performance evaluation under moral hazard and / or information asymmetry; cost management principles using activity-based analysis, queuing models, and other analytical procedures.

26:010:653. Current Topics in Auditing (3)
Fall 2000 and every second fall thereafter. Advanced review of auditing literature covering both internal and external auditing.
Topics include development of modern auditing theory, disclosure problems, principles of managerial control, and operational auditing.

26:010:680. Current Topics in Accounting Research (3)
Spring 2001 and every second spring thereafter.
Discussion and review of selected topics in accounting research implementation, and empirical testing in major fields of accounting.

26:010:685. Special Topics in Accounting (BA)

26:010:686. First Early Research Seminar in Accounting (3)

26:010:687. Second Early Research Seminar in Accounting (3)

26:010:688. Independent Study in Accounting (BA)

26:010:799. Dissertation Research in Accounting (BA)

Information Systems 198

26:198:721. Electronic Commerce (3)
Fall 2000 and every second fall thereafter. Prerequisites: Computer literacy and introductory courses in information systems and economics.
Theoretical foundations, implementation problems, and research issues of the emerging area of electronic commerce. Technological, conceptual, and methodological aspects of electronic commerce. Fundamentals of Internet technology, pricing of and accounting for Internet transport; security problems of the Internet; electronic payment systems; online financial reporting and auditing; intelligent agents; web measurements; electronic markets; and value chain over the Internet.

26:198:722. Expert Systems (3)
Fall 2001 and every second fall thereafter.
Basic theory of rule-based systems and Bayes networks. Alternative architectures for managing uncertainty. Use of probabilistic logic to model causality. Related ideas from machine learning, neural networks, and genetic algorithms. Applications to auditing, marketing, and production.

26:198:731. Applications of Database Systems (3)
Spring 2000 and every second spring thereafter. Prerequisite: A master's-level course in databases, such as 22:198:603 or NJIT CIS 631.
Emphasizes functions of database administrator. Includes survey of physical and logical organization of data and their methods of accessing; the characteristics of different models of generalized database management systems.

26:198:732. Multimedia Information Systems (3)
Spring 2001 and every second spring thereafter. Prerequisite: A master's-level course in databases, such as 22:198:603 or NJIT CIS 631.
Principal topics related to multimedia information systems, including organizing multimedia content, physical storage and retrieval of multimedia data, content-based search and retrieval, creating and delivering networked and multimedia presentations, and current research directions in this area.

26:198:685. Special Topics in Information Systems (BA)

26:198:686. First Early Research Seminar in Information Systems (3)

26:198:687. Second Early Research Seminar in Information Systems (3)

26:198:688. Independent Study in Information Systems (BA)

26:198:799. Dissertation Research in Information Systems (BA)

Applied Economics 223

26:223:552. Microeconomic Theory (3)
Fall 2001 and every second fall thereafter.
Surveys and applies elements of marginal analysis, capital theory, utility, and risk analysis to problems in demand analysis, production, cost and distribution, market structure and pricing, and capital budgeting.

26:223:553. Macroeconomic Theory (3)
Fall 2001 and every second fall thereafter.
Models, with attention to empirical work, of aggregate demand and supply and their components (i.e., investments and consumption, supply and demand for money and other financial assets, capital and labor markets). Determinants of the price level and of inflation; rates of interest, employment, and income; and international macroeconomic relations. Reviews major issues in the evaluation of monetary policy.

26:223:554. Econometrics (3)
Fall 2000 and every second fall thereafter. Prerequisite: 26:960:577.
Statistical techniques for the analysis of models applicable to economic data and their application to management problems.

* Doctoral 3-credit courses meet once a week, usually during the day, for the fourteen weeks of the fall and spring terms.

26:223:655. Advanced Econometrics (3)
Spring 2001 and every second spring thereafter. Prerequisites: 26:223:552 and 554.
Simultaneous equation models, seemingly unrelated regressions, autocorrelation, ARIMA models, and nonlinear estimation. Applications of such techniques to theoretical and empirical problems.

26:223:657. Advanced Microeconomics (3)
Spring 2000 and every second spring thereafter. Prerequisites: 26:223:552 and 26:960:577.
Advanced theoretical treatment of major topics in microeconomics, including alternative models of consumer demand and the demand for the factors of production; the theory of market equilibria, their existence, and stability; and the concepts of perfect competition, monopoly, and other market imperfections.

26:223:685. Special Topics in Applied Economics (BA)

26:223:686. First Early Research Seminar in Applied Economics (3)

26:223:687. Second Early Research Seminar in Applied Economics (3)

26:223:688. Independent Study in Applied Economics (BA)

26:223:799. Dissertation Research in Applied Economics (BA)

Finance 390

26:390:571. Survey of Financial Theory I (3)
Spring 2000 and every second spring thereafter. Prerequisites: 26:223:552 and 26:960:577.
Surveys the fundamental assumptions and the analytical techniques of the modern theory of finance. Choices involving risk using utility theory and state preference, portfolio selection, capital market equilibrium and its implications for corporate finance and portfolio selections, and option theory.

26:390:572. Survey of Financial Theory II (3)
Summer 2000 and every second summer thereafter. Prerequisite: 26:390:571.
Basic knowledge of theoretical and empirical model building in the area of corporate finance.

26:390:600. Analysis of Financial Markets and Institutions (3)
Offered in conjunction with 22:390:648. Check the M.B.A. schedule for offerings.
Examines the financial markets and institutions of the United States financial system from an institution's point of view. Covers the Treasury, Federal Reserve, banks, thrifts, insurance companies, and securities exchanges. Includes guest lectures and daytime field trips.

26:390:661. Corporate Finance (3)
Fall 2000 and every second fall thereafter. Prerequisite: 26:390:571. Corequisite: 26:223:554.
In-depth study of theoretical and empirical research on financial decision making by companies and firms. Covers capital budgeting and corporate finance, including dividend and capital structure decisions and the impact of alternative tax policies.

26:390:662. Investment Analysis and Portfolio Theory (3)
Fall 2000 and every second fall thereafter. Prerequisite: 26:390:571. Corequisite: 26:223:554.
The parallel development of portfolio theory and empirical research on investments. Topics include the development, testing, and application of mean-variance portfolio efficiency, market efficiency, the various forms of the capital asset pricing model, estimation of risk, option theory, portfolio immunization, and asset pricing theory.

26:390:668. Empirical Finance (3)
Spring 2001 and every second spring thereafter. Prerequisites: 26:390:571 and 572. Corequisite: 26:223:655.
Application of econometric techniques to the empirical study of finance and financial economics, especially the examination of weak effects with very large samples. Measurement problems in event studies and effects of anomalies in reported prices on computed returns and dealing with those effects. After completing this course and 26:223:655, the student should be able to evaluate critically both proposed and published studies. In addition, class participants will become adept at designing their own studies.

26:390:685. Special Topics in Finance (BA)

26:390:686. First Early Research Seminar in Finance (3)

26:390:687. Second Early Research Seminar in Finance (3)

26:390:688. Independent Study in Finance (BA)

26:390:799. Dissertation Research in Finance (BA)

International Business 553

26:553:501. Global Strategic Management (3)
Spring 2000 and every second spring thereafter.
Analyzes the collective knowledge about multinational enterprises, their strategy, design, and organization. Reviews the literature in international management and identifies gaps for possible research questions and dissertation topics. Topics include definitions of multinational corporations, diversification, the ownership and organizational strategies of firms, and the globalization of production markets.

26:553:601. Theory of International Business (3)
Spring 2001 and every second spring thereafter.
Critically appraises the main economic and behavioral theories of the determinants of international business activity over the past thirty years.

26:553:605. National Innovation Policies and International Business (3)
By arrangement for majors.
Examines the role of technology in economic development and national innovation systems as they evolve in the globalizing economy.

26:553:607. Governments, Competitiveness, and International Business (3)
By arrangement for majors.
Examines the forces determining the competitiveness of corporations and countries and how these factors have changed as markets and production have become increasingly globalized.

26:553:609. Global Business in Regulated and Developing Economies (3)
By arrangement for majors.
Examines the structural features of developing and transitional economies and the role international business plays in the restructuring and development of these economies.

26:553:685. Special Topics in International Business (BA)

26:553:686. First Early Research Seminar in International Business (3)

26:553:687. Second Early Research Seminar in International Business (3)

26:553:688. Independent Study in International Business (BA)

26:553:799. Dissertation Research in International Business (BA)

Organization Management 620

26:620:555. Seminar in Organizational Behavior (3)
Fall 2000 and every second fall thereafter.
Survey of theory and empirical research about the behavior of individuals and groups in organizations. Typical topics include motivation, socialization, job design, satisfaction, performance, leadership, group norms, and decision-making processes.

26:620:556. Seminar in Organization Theory (3)
Fall 2000 and every second fall thereafter.
Survey of theory and empirical research about the behavior of individuals and groups in organizations. Typical topics include models or organizations (e.g., theories of bureaucracy and closed, open, and natural systems); effects of technology, environment, power, and decision making; and organizational culture.

26:620:557. Methods of Research in Organizations (3)
Every spring. Prerequisite: 26:960:577.
Surveys methods used in the study of organizations, including experimental design, survey research, case methods, questionnaire and interview construction, and scaling techniques. Students expected to design feasible research projects that are later carried out.

26:620:558. Seminar in Strategic Management (3)
Fall 2001 and every second fall thereafter.
Introduces the field of strategy at the Ph.D. level. Critically reviews a wide variety of approaches to strategy research, including both behavioral and economic approaches, and the relation of other areas of research to strategy formulation and implementation.

26:620:604. Seminar in Leadership and Group Processes (3)
By arrangement for majors.
Important theories and empirical studies of leadership and group process. Key theoretical and methodological issues in transformational leadership, empowerment, and self-managing teams.

26:620:671. Management of Innovation and Technology (3)
By arrangement for majors.
Examines individual, structural, and contextual factors that facilitate and inhibit the generation and implementation of new technology. Emphasizes the management of innovation in organizations.

26:620:677. Culture and Organizations (3)
By arrangement for majors.
Explores theory and research on cultural differences among people at the group, organization, and national levels. Draws on research literature from social and behavioral sciences on cultural and cross cultural phenomena. Topics include the content and manifestations of culture, cultural similarities and differences, the transmission of culture, culture and subcultures, culture change, and organizational culture.

26:620:685. Special Topics in Organization Management (BA)

26:620:686. First Early Research Seminar in Organization Management (3)

26:620:687. Second Early Research Seminar in Organization Management (3)

26:620:688. Independent Study in Organization Management (BA)

26:620:799. Dissertation Research in Organization Management (BA)

Marketing 630

26:630:576. Quantitative Methods in Marketing (3)
By arrangement for majors.
Emphasis on quantitative approach to marketing decision making and model building in particular.

26:630:577. Advanced Quantitative Methods in Marketing (3)
By arrangement for majors. Prerequisite: 26:630:576.
Recent advances in quantitative methodology and mathematical models for research in marketing. Multidimensional scaling, conjoint analysis, tree and network models, stochastic choice models, factor and components analysis (including three-way and multiway approaches), correspondence analysis, latent class approaches, and other multivariate techniques and mathematical tools that apply to marketing

26:630:625. Clustering (3)
By arrangement for majors. Prerequisites: Calculus, intermediate statistics, optimization theory, and graph theory.
Emphasizes such methods of data analysis as clustering (including formal underpinnings, measures of association, or dissimilarity coefficients), overlapping clustering, partitioning, constrained clustering, consensus clustering, cluster validity, computational advances, and substantive developments, with emphasis on market segmentation and product positioning.

26:630:660. Qualitative Research Methods (3)
Spring 2000 and every second spring thereafter.
Emphasizes issues of eliciting, analyzing, and representing verbal data in qualitative research. Topics considered are definition and evaluation of qualitative research; methods of eliciting data from individuals and groups; methods of analyzing verbal data; issues of representing narratives; and new research directions using feminist, historical, and aesthetic methods.

26:630:665. Marketing Theory (3)
By arrangement for majors.
Examines theories for designing marketing policies in the firm. Topics include market segmentation, product positioning, Bayesian analysis of test market results, and diffusion models.

26:630:666. Research in Consumer Behavior (3)
By arrangement for majors.
In-depth examination of the structure and dynamics of purchasing and consuming activity. Attention given to models of consumer motivation, analysis of consumer choice, and the way in which consumers receive and process information as the basis of their buying decisions.

26:630:668. Causal Modeling (3)
Fall 2000 and every second fall thereafter. Prerequisite: 26:960:577.
In-depth analysis of recent advances in the statistical analysis of causal models. Topics include structural equation methods, log-linear modeling, and Bayesian methods.

26:630:669. Topics in Advertising (3)
By arrangement for majors.
Focus on advertising messages in which aesthetic elements, such as verbal and visual imagery, music, and graphic design, are designed to entertain as well as to inform the consumer. Nontraditional approaches to interpreting advertising studied, including various "postmodern" methods, such as historical inquiry, feminist analysis, and fine arts theory. Internet advertising, advertising to minorities, multicultural advertising, drama versus lecture advertisements, and other topics considered.

26:630:670. Multivariate Analysis (3)
Spring 2000 and every spring thereafter. Prerequisite: 26:960:577.
Multivariate normal distributions, principal components, factor analysis, canonical correlation, and discrimination and classification.

26:630:685. Special Topics in Marketing (BA)

26:630:686. First Early Research Seminar in Marketing (3)

26:630:687. Second Early Research Seminar in Marketing (3)

26:630:688. Independent Study in Marketing (BA)

26:630:799. Dissertation Research in Marketing (BA)

Management Science 711

26:711:561. Introduction to Mathematical Economics (3)
Fall 2001 and every second fall thereafter. Prerequisite: Differential calculus.
The quantitative tools and principles used to model operational procedures in economic and business systems—types of variables, mathematical sets, and functional forms in constrained and unconstrained optimization. Other topics include tractability, duality, Kuhn-Tucker theory, algorithms, and computation.

26:711:651. Linear Programming (3)
Fall 2000 and every second fall thereafter. Prerequisite: Undergraduate linear algebra.
Survey of linear programming and its applications. Topics include linear programming models, basic simplex method, duality theory and complementary slackness, sensitivity analysis, degeneracy, matrix notation and revised simplex method, and special linear programs (such as transportation and network flow theory; applications in statistics, economics, and finance models of linear programming; game theory; and introduction to interior point methods).

26:711:652. Nonlinear Programming (3)
Spring 2001 and every second spring thereafter. Prerequisite: 26:711:651.
Fundamentals of nonlinear optimization, with an emphasis on convex problems. Gradient, Newton, and other methods for unconstrained problems. Projection, linearization, penalty, barrier, and augmented Lagrangian methods for constrained problems. Lagrangian functions and duality theory. Assignments include computer programming and mathematical proofs.

26:711:685. Special Topics in Management Science (BA)

26:711:686. First Early Research Seminar in Management Science (3)

26:711:687. Second Early Research Seminar in Management Science (3)

26:711:688. Independent Study in Management Science (BA)

26:711:799. Dissertation Research in Management Science (BA)

Statistics 960

26:960:575. Introduction to Probability (3)
Every spring. Prerequisite: Undergraduate or master's-level course in statistics.
Foundations of probability. Discrete and continuous simple and multivariate probability distributions; random walks; generating functions; linear functions of random variable; approximate means and variances; exact methods of finding moments; limit theorems; stochastic processes, including immigration-emigration, simple queuing, renewal theory, and Markov chains.

26:960:577. Introduction to Statistical Linear Models (3)
Every fall. Prerequisite: Undergraduate or master's-level course in statistics.
Linear models and their application to empirical data. The general linear model; ordinary-least-squares estimation; diagnostics, including departures from underlying assumptions, detection of outliners, effects of influential observations, and leverage; analysis of variance, including one-way layouts, two way, and higher dimensional layouts, partitioning sums of squares, and incomplete layouts (Latin squares, incomplete blocks, and nested or repeated measures). Emphasizes computational aspects and use of standard computer packages, such as SPSS.

26:960:580. Stochastic Processes (3)
Every spring. Prerequisite: 26:960:575.
Review of probability theory with emphasis on conditional expectations; Markov chains; the Poisson process; continuous-time Markov chains; renewal theory; queuing theory; introduction to stochastic calculus (e.g., Ito's Lemma).

Doctoral Courses in Information Systems in the NJIT Department of Computer and Information Science

NJIT CIS 675. Evaluation of Information Systems (3)
Every term.
Exploration of the techniques, methodologies, and approaches to the evaluation of information systems within the context of the user and organizational environment. Subjects covered include automatic activity monitoring, controlled experimentation, survey and interview design, models of human performance and flow, and network models of information transfer in the organizational environment. Analysis of data gathered by the above approaches by such methods as analysis of variance and covariance, regression, and factor analysis. Emphasis on the application of these techniques in assessing information systems and their performance for users and organizations.

NJIT CIS 677. Information System Principles (3)
Every term.
Reviews the role of information systems in organizations and how they relate to organizational objectives and organizational structure. Identifies basic concepts, such as the systems point of view, the organization of a system, the nature of information and information flows, the impact of systems upon management and organizations, human information processing, and related cognitive concepts. Introduces various types of applications that are part of information systems.

NJIT CIS 679. Management of Computer and Information Systems (3)
Every spring.
Management policies and practices associated with the acquisition, development, implementation, system testing, and acceptance of computer and information systems. Emphasis on factors and considerations for the successful operation of computer and information systems within an organizational context. Motivating and organizing technical personnel, planning and managing the software development process, acquisition of hardware and software, planning of a facility, evaluation of the operation, charging policies, organizational objectives, and strategic applications of information systems.

NJIT CIS 732. Design of Interactive Systems (3)
Every fall. Prerequisite: CIS 675.
Covers the current professional literature on the design of interactive systems and human computer interfaces, including the "knowns, unknowns, and unk unks" of design. Three design projects will be completed. Emphasizes application areas that have a great deal of cognitive variability and diverse user populations. Student is responsible for a final project dealing with the current professional literature in a specific area of interface design.

NJIT CIS 776. Independent Study (for the CIS State-of-the-Art Paper) (3)

NJIT CIS 790. Doctoral Dissertation and Research (6–12)

In addition to the above offerings, the CIS department has a wide range of master's and doctoral courses in computer science, many of them available every term. See http://www.njit.edu for more information.

MATHEMATICAL SCIENCES 645

Degree Program Offered: Doctor of Philosophy
Director of Graduate Program: Gregory Kriegsmann, Department of Mathematics and Computer Science (NJIT) (973 / 596-9545)
Graduate Program Coordinator at Rutgers–Newark: Lee Mosher, Department of Mathematics and Computer Science, Smith Hall (973 / 353-5156)

Members of the Graduate Faculty *

Professor II:

Diana Shelstad, FAS–N; Ph.D., Yale
Automorphic representation theory; harmonic analysis on reductive groups

Professors:

Mark E. Feighn, FAS–N; Ph.D., Columbia
Low-dimensional topology; geometric group theory
Jane P. Gilman, FAS–N; Ph.D., Columbia
Hyperbolic geometry; Teichmüller theory; symbolic computation on Kleinian groups
Lee Mosher, FAS–N; Ph.D., Princeton
Low-dimensional topology; geometric group theory
Ulrich Oertel, FAS–N; Ph.D., California (Los Angeles)
Low-dimensional topology

Associate Professors:

William Keigher, FAS–N; Ph.D., Illinois (Urbana-Champaign)
Differential algebra; category theory
C. David Keys, FAS–N; Ph.D., Chicago
Harmonic analysis and representation theory of reductive p-adic groups; number theory
John D. Randall, FAS–N; Ph.D., Warwick
Four-manifolds; algebraic geometry
Robert Sczech, FAS–N; Dr. rer. Nat., Bonn
Algebra; number theory; automorphic forms
Jacob Sturm, FAS–N; Ph.D., Princeton
Number theory; analysis

Assistant Professors:

Li Guo, FAS–N; Ph.D., Washington (Seattle)
Number theory; algebra
Zhengyu Mao, FAS–N; Ph.D., Columbia
Automorphic forms; number theory; representation theory

Program

The Department of Mathematics and Computer Science at Rutgers–Newark and the Department of Mathematics at New Jersey Institute of Technology offer jointly the Ph.D. program in the mathematical sciences. A combined graduate faculty from the two institutions provides research opportunities in many fields of specialization, including representation theory, algebra, number theory, low-dimensional topology, Kleinian groups and Teichmüller theory, geometric group theory, and 4-manifolds. The program also offers courses in a wide variety of fields in applied mathematics.

The program is designed to provide students with a broad and deep knowledge of both classical and modern methods in the mathematical sciences. In addition, students gain experience in applying this knowledge to problems in the sciences and engineering.

Individuals entering with a bachelor's degree normally spend their first two years in course work and in preparation for the Ph.D. qualifying examination. They take that examination no later than September of their third year. Students are encouraged to take a range of courses in both pure and applied mathematics to help decide the research direction they will pursue.

The Ph.D. curriculum is divided into two options: pure mathematics and applied mathematics. The applied mathematics program is administered by New Jersey Institute of Technology. Students in the pure mathematics track are required to take 26:645:611 Real Analysis I, 26:645:612 Real Analysis II, 26:645:621 Complex Variables I, 26:645:631 Algebra I, 26:645:632 Algebra II, 26:645:641 Topology I, 26:645:642 Topology II, and 26:645:643 Differentiable Manifolds. The above course requirements can be waived, however, for students with master's degrees who have completed equivalent course work.

Additionally, all students are required to take at least 24 credits of advanced elective courses. These electives are chosen in consultations among the student, the student's adviser, and the advisory committee, and with the permission of the graduate program director.

The Ph.D. qualifying examination for students choosing the pure option consists of three parts, with each part covering the basic topics in a particular subdiscipline. Part A consists of real and complex analysis, Part B tests a student's knowledge of algebra, and Part C covers topology and geometry. After successful completion of the exam, students begin their doctoral research under the direction of a faculty member. All students are required to take at least 24 credits of doctoral dissertation research. Upon completion, the dissertation is presented to a thesis committee, which conducts a final oral examination.

More information about the program, the department, and the faculty may be obtained by visiting the program's web site at http://newark.rutgers.edu:80/~nwkmath.

Graduate Courses

26:645:611. REAL ANALYSIS I (3)
Continuity and differentiability of functions of many variables, the chain rule, higher derivatives, Taylor's theorem, maxima and minima, metric spaces, completeness, contraction mapping principle, inverse functions and the implicit function theorem, the Riemann integral and its properties, Lebesque measure and measurable functions, Lebesque integral, the dominated convergence theorem, comparison of the Riemann and the Lebesque integrals.

26:645:612. REAL ANALYSIS II (3)
Prerequisite: Real Analysis I.
Lebesque Measure Theory: Lebesque measure, Lebesque integral, functions of bounded variation, differentiation of integrals, absolute continuity and convex functions, L^p spaces. Minkowski and Hoelder inequalities, convergence, completeness. General Measure Theory: measure spaces and functions, integration, convergence theorems, signed measures, Radon-Nikodym theorem, the Lebesque Stieltjes integral, product measures and the Fubini theorem, the Hausdorff measure, Baire sets and Borel sets, regularities of Baire and Borel measures, construction of Borel measures, homogeneous spaces. Harmonic Analysis: Fourier analysis on R and R / Z, harmonic analysis on locally compact groups, existence of Haar measure, example: SL(n), Pontryagin duality, Fourier inversion, representation of compact groups, decomposition of L^2. Introduction into ODEs and PDEs: existence and uniqueness theorems.

26:645:613. FUNCTIONAL ANALYSIS (3) *
Prerequisite: Real Analysis I.
Fundamental principles of linear analysis: Hahn-Banach, uniform boundedness and closed graph theorems, Riesz representation theorem, weak topologies, Riesz theory of compact operators, spectral theory of operators on Hilbert space, and applications to differential and integral equations.

* This listing does not include members who are NJIT faculty.

* Pending approval by the courses of study committee.

26:645:621. COMPLEX VARIABLES I (3)
Prerequisite: Real Analysis I.
Complex differentiability, Cauchy-Riemann equations, power series and elementary functions. Cauchy's Theorem, the Cauchy integral formula, Cauchy's estimates, Morera's theorem. Entire functions, Liouville's theorem. Convergence, differentiation, and integration of sequences and series of holomorphic functions. Local mapping properties of holomorphic functions: isolation of zeros, conformality, inverse function theorem, critical points. Elementary Riemann surfaces. Classification of singularities. Laurent series. The residue theorem and applications: meromorphic functions, the Mittag-Leffler theorem. Holomorphic functions on the Riemann sphere, Möbius transformations. Maximum modulus principle, Schwarz's lemma, conformal maps of the unit disc. The Riemann mapping theorem, the Schwarz reflection principle. Harmonic functions, harmonic conjugates. The Dirichlet problem and the Poisson kernel for the unit disc.

26:645:622. COMPLEX VARIABLES II (3)
Prerequisite: Complex Variables I.
Theory of Riemann Surfaces: uniformization theorem, Abel-Jacobi theorem, theorem of Riemann-Roch and related topics including theta functions, the Riemann theta function, Jacobian functions, Jacobian variety, Abelian variety, etc.

26:645:623. SELECTED TOPICS IN COMPLEX ANALYSIS (3)
Prerequisite: Complex Variables I.

26:645:631. ALGEBRA I (3)
Groups: subgroups, homomorphisms, cyclic groups, Lagrange's theorem, quotient groups, symmetric, alternating and dihedral groups, direct products and sums, free groups, free abelian groups, finitely generated abelian groups, and Sylow theorems. Rings: homomorphisms, integral domains, fields, ideals, prime and maximal ideals, Chinese remainder theorem, factorization in commutative rings, UFD, PID, euclidean rings, rings of quotients, localization, local rings, polynomial rings, Gauss's lemma, and Eisenstein criterion.

26:645:632. ALGEBRA II (3)
Prerequisite: Algebra I.
Modules: left, right, and bimodules, direct sums and products of modules, homomorphisms, exact sequences, free modules, vector spaces, Hom and duality of modules, tensor products, modules over a PID, and elementary divisors. Galois Theory: finite extensions, algebraic extensions, minimal polynomials, Galois extensions, fundamental theorem of Galois theory, elementary symmetric functions, splitting fields, algebraic closure, normal and separable extensions, fundamental theorem of algebra, Galois group of a polynomial, finite fields, cyclic extensions, trace and norm, Hilbert's theorem 90, and cyclotomic extensions.

26:645:633. SELECTED TOPICS IN ALGEBRA (3)
Prerequisite: Algebra II.

26:645:634. NUMBER THEORY (3)
Prerequisite: Algebra I.
Algebraic number fields, rings of algebraic integers, discriminant, Dedekind domains, unique factorization into prime ideals, ramification theory in Galois extensions, finiteness of ideal class number, Dirichlet's unit theorem, quadratic and cyclotomic fields, the quadratic reciprocity law, the Dedekind zeta function, Dirichlet's class number formula, p-adic fields, and ideles and adeles.

26:645:635. ALGEBRAIC GEOMETRY (3)
Prerequisites: Algebra II and Complex Variables I.
Geometry of projectives spaces, cohomology of coherent sheaves, and schemes.

26:645:636. THEORY OF LIE GROUPS AND LIE ALGEBRA (3)
Prerequisites: Algebra II and Real Analysis II.
General structure of Lie groups and Lie algebras, semisimple Lie groups, and character theory of compact Lie groups.

26:645:641. TOPOLOGY I (3)
Metric spaces, connectedness, compactness, Tychonoff's theorem, Baire category theorem, simplicial complexes, CW-complexes, manifolds, fundamental group, covering spaces, VanKampen's theorem, computations of the fundamental groups of CW-complexes, including graphs, surfaces, knot complements, S^n projective and spaces, Brouwer's fixed point theorem, simplicial approximation, and general position.

26:645:642. TOPOLOGY II (3)
Prerequisite: Topology I.
Singular homology, axioms, Mayer-Vietoris sequence, orientations, homology of CW-complexes including surfaces and projective spaces, higher homotopy groups, homotopy long exact sequences of pairs and fibrations, and Whitehead and Hurewicz theorems.

26:645:643. DIFFERENTIABLE MANIFOLDS (3)
Inverse and implicit function theorems, differential forms, Sard's theorem, Stokes' theorem, degree of a map, tangent and related bundles, deRham cohomology, Riemannian metrics, connections, and the intrinsic and extrinsic geometry of surfaces in 3-space.

26:645:644. GEOMETRIC AND DIFFERENTIAL TOPOLOGY (3)*
Prerequisites: Topology II and Differentiable Manifolds.
Cohomology theories, transversality, Poincare duality, topics of instructor's choice.

26:645:645. DIFFERENTIAL GEOMETRY (3)*
Prerequisite: Differentiable Manifolds.
Riemannian metrics, parallel translation and connections, curvature, exponential map, integrability theorems, and topics of instructor's choice.

26:645:647. CRYPTOGRAPHY (3)
Review of basic material from algebra and number theory, primality tests, factorization methods, simple cryptosystems, public key cryptography, the RSA algorithm, discrete logs, the knapsack problem and related cryptosystems, and applications to electronic banking and electronic cash.

26:645:721. ADVANCED TOPICS IN COMPLEX ANALYSIS (3)
Prerequisite: Permission of instructor.

26:645:731. ADVANCED TOPICS IN ALGEBRA (3)
Prerequisite: Permission of instructor.

26:645:734. ADVANCED TOPICS IN NUMBER THEORY (3)
Prerequisite: Permission of instructor.

26:645:736. ADVANCED TOPICS IN REPRESENTATION THEORY (3)
Prerequisite: Permission of instructor.

26:645:741. ADVANCED TOPICS IN TOPOLOGY (3)
Prerequisite: Permission of instructor.

26:645:742. DYNAMICAL SYSTEMS (3)
Prerequisites: Real Analysis I and II, Topology I, Complex Variables I.
Recommended: Complex Variables II.
Introduction to the mathematical study of chaos and fractals from examples in one-dimensional real and complex dynamical systems.

26:645:744. ADVANCED TOPICS IN GEOMETRY (3)
Prerequisite: Permission of the instructor.

26:645:750. INDEPENDENT STUDY (BA)
Study under supervision and guidance of a faculty member.

* Pending approval by the courses of study committee.

26:645:791. DOCTORAL SEMINAR (3)
Corequisite: Doctoral Dissertation and Research.
A seminar in which faculty, students, and invited speakers present summaries of advanced topics in the mathematical sciences. Students and faculty discuss research procedures and dissertation organization and content. Doctoral students present their own research for discussion and criticism.

26:645:799. DOCTORAL DISSERTATION AND RESEARCH (BA)
Prerequisite: Doctoral candidacy. Corequisite: Doctoral Seminar. A minimum of 24 credits is required. The student must register for at least 6 credits per term; registration for additional credits is permitted with the approval of the adviser, up to a maximum of 12 credits per term.
Research in the mathematical sciences carried out under the supervision of a faculty member. Culminates in a written dissertation to be published in a leading research journal.

26:645:800. MATRICULATION CONTINUED (E1)

26:645:866. GRADUATE ASSISTANTSHIP (E,BA)

26:645:877. TEACHING ASSISTANTSHIP (E,BA)

NJIT Courses

The following courses are offered by the New Jersey Institute of Technology. For complete course descriptions and prerequisites, see the NJIT graduate catalog.

NJIT: MATH 545. ADVANCED CALCULUS I (3)

NJIT: MATH 546. ADVANCED CALCULUS II (3)

NJIT: MATH 551. ENGINEERING MATHEMATICS (3)

NJIT: MATH 560. METHODS OF APPLIED MATHEMATICS I (3)

NJIT: MATH 561. METHODS OF APPLIED MATHEMATICS II (3)

NJIT: MATH 573. INTERMEDIATE DIFFERENTIAL EQUATIONS (3)

NJIT: MATH 611. NUMERICAL METHODS FOR COMPUTATION (3)

NJIT: MATH 613. ADVANCED APPLIED MATHEMATICS I: MODELING (3)

NJIT: MATH 614. NUMERICAL METHODS I (3)

NJIT: MATH 621. APPLIED EXTERIOR CALCULUS (3)

NJIT: MATH 630. LINEAR ALGEBRA AND APPLICATIONS (3)

NJIT: MATH 631. LINEAR ALGEBRA (3)

NJIT: MATH 634. MODERN ALGEBRA (3)

NJIT: MATH 645. ANALYSIS I (3)

NJIT: MATH 651. APPLIED MATHEMATICS I (3)

NJIT: MATH 652. APPLIED MATHEMATICS II (3)

NJIT: MATH 656. COMPLEX VARIABLES I (3)

NJIT: MATH 660. DIFFERENTIAL GEOMETRY OF CURVES AND SURFACES II (3)

NJIT: MATH 661. APPLIED STATISTICS (3)

NJIT: MATH 662. MATHEMATICAL STATISTICS I (3)

NJIT: MATH 668. PROBABILITY THEORY (3)

NJIT: MATH 671. ASYMPTOTIC METHODS I (3)

NJIT: MATH 672. BIOMATHEMATICS I: BIOLOGICAL WAVES AND OSCILLATIONS (3)

NJIT: MATH 673. BIOMATHEMATICS II: PATTERN FORMATION IN BIOLOGICAL SYSTEMS (3)

NJIT: MATH 675. PARTIAL DIFFERENTIAL EQUATIONS (3)

NJIT: MATH 676. ADVANCED ORDINARY DIFFERENTIAL EQUATIONS (3)

NJIT: MATH 677. CALCULUS OF VARIATIONS (3)

NJIT: MATH 683. FUNCTIONAL ANALYSIS (3)

NJIT: MATH 685. COMBINATORICS (3)

NJIT: MATH 687. QUANTITATIVE ANALYSIS FOR ENVIRONMENTAL DESIGN RESEARCH (3)

NJIT: MATH 689. ADVANCED APPLIED MATHEMATICS II: ODES (3)

NJIT: MATH 690. ADVANCED APPLIED MATHEMATICS III: PDES (3)

NJIT: MATH 691. STOCHASTIC PROCESSES WITH APPLICATIONS (3)

NJIT: MATH 698. SAMPLING THEORY (3)

NJIT: MATH 699. DESIGN AND ANALYSIS OF EXPERIMENTS (3)

NJIT: MATH 707. ADVANCED APPLIED MATHEMATICS IV: SPECIAL TOPICS (3)

NJIT: MATH 711. LOGIC AND SET THEORY (3)

NJIT: MATH 712. NUMERICAL METHODS II (3)

NJIT: MATH 720. TENSOR ANALYSIS (3)

NJIT: MATH 730. APPLIED ALGEBRA (3)

NJIT: MATH 745. ANALYSIS II (3)

NJIT: MATH 756. COMPLEX VARIABLES II (3)

NJIT: MATH 761. STATISTICAL THEORY OF RELIABILITY AND APPLICATIONS (3)

NJIT: MATH 762. MATHEMATICAL STATISTICS II (3)

NJIT: MATH 771. ASYMPTOTIC METHODS II (3)

NURSING 705

Degree Programs Offered: Master of Science, Doctor of Philosophy
Director of Graduate Program: Joanne Stevenson, Room 102, Ackerson Hall (973 / 353-5293, ext. 606; email: stevenson@nightingale.rutgers.edu)

Members of the Graduate Faculty

Karen Baldwin, CN; Ph.D., Columbia
Anne Brandes, CN; Ed.D., Rutgers
Christopher Coleman, CN; Ph.D., UC (San Francisco)
Geri L. Dickson, CN; Ph.D., Wisconsin (Madison)
Lucille S. Eller, CN; Ph.D., Case Western Reserve
Linda Flynn, CN; Ph.D., Rutgers
Mary Greipp, CN; Ed.D., Rutgers
Hurdis M. Griffith, Dean, CN; Ph.D., Maryland (Baltimore)
Elsie E. Gulick, CN; Ph.D., New York
Mary R. Haack, CN; Ph.D., Illinois (Chicago)
Patricia M. Hurley, CN; Ph.D., New York
Lucille A. Joel, CN; Ed.D., Columbia
Rachel Jones, CN; Ph.D., New York
Elise L. Lev, CN; Ed.D., Columbia
Ganga Mahat, CN; Ed.D., Columbia
Gloria McNeal, CN; Ph.D., Pennsylvania
Sally Miller, CN; Ph.D., Walden
Marie O'Toole, CN; Ed.D., Rutgers
Joanne Patterson-Robinson, CN; Ph.D., Pennsylvania
Judith Pollachek, CN; Ph.D., Rutgers
Nancy Redeker, CN; Ph.D., New York
Mary Ann Scoloveno, CN; Ed.D., Rutgers
Joanne S. Stevenson, Program Director and Associate Dean for Academic Affairs and Research, CN; Ph.D., Ohio State
Charlotte Thomas-Hawkins, CN; Ph.D., Pennsylvania
Adela Yarcheski, CN; Ph.D., New York
Carolyn Yocon, CN; Ph.D., Illinois

Professors Emeritae:

Dorothy J. DeMaio, CN; Ed.D., Rutgers
Beverly Whipple, CN; Ph.D., Rutgers

Faculty Research Interests

Faculty research interests include the care and promotion of health in infants, children, adolescents, and families. Faculty members also deal with such issues as symptom management in chronic illnesses; exercise in patients with hypertension; and quality-of-life issues for women in menopause, those with breast cancer, and persons with multiple sclerosis. Others are researching sleep patterns of hospitalized cardiac patients, patient-care outcomes in vulnerable populations, and high-technology home care.

Programs

Programs of study in nursing leading to master of science and doctor of philosophy degrees are offered through the Graduate School–Newark. The master's program builds upon the upper-division major of accredited baccalaureate programs. The doctoral program builds upon the master's degree with a major in nursing from an accredited program.

Master of Science

Purpose

The master's program prepares advanced practice nurses who are qualified to take relevant national certification examinations and become certified for prescriptive privileges in New Jersey and other states. The master's graduate will be prepared to:

1. apply knowledge gained from nursing and related disciplines as the basis for advanced nursing practice;
2. manage independently and collaboratively the health-care problems of clients in a variety of settings;
3. analyze values and beliefs as the basis for a personal philosophy of advanced nursing practice;
4. use research findings to provide high quality health-care, initiate change, and improve nursing practice;
5. design and provide quality, cost-effective care in health-care systems;
6. provide culturally competent care;
7. participate in regulatory, legislative, and professional policies to promote health communities;
8. use information systems for the storage, analysis, and retrieval of data for clinical practice and research;
9. evaluate the standards of practice and consensus or evidence-based practice guidelines applicable to a particular population or area of practice;
10. employ educational strategies (using instructional theories / research) with clients, families, staff members, and others;
11. use management theories and research to optimize health system functioning;
12. pursue doctoral study.

Organizing Framework

The master's curriculum prepares clinical nurse specialists and nurse practitioners who are able to function in continuously changing environments or health-care delivery systems. The curriculum consists of three components: core courses in nursing, cognate courses, and the clinical specialty in nursing.

Core courses build upon the knowledge and skills gained at the baccalaureate level. In core courses, students study ethics and advanced theories and research about the health of individuals, families, groups, and communities. They also discuss theories and research about management, education, role, and health-care policy. The essential theoretical foundations under-pinning nursing practice are addressed. The research focus is on identifying a problem, designing advanced methods for testing hypotheses, and organizing and managing qualitative and quantitative data.

The second component of the curriculum involves science courses that establish a foundation for clinical decision making. The final area of the curriculum concentrates on preparing advanced practice nurses for adult and aged primary care, advanced practice in women's health, community health nursing, family, acute care, advanced practice in pediatrics, and psychiatric / mental-health nursing. The theory and practicum courses cut across all areas, focusing on levels of health, specifi-cally health promotion, acute health problems, and chronic health problems.

Curriculum

Professional nursing is accountable to society for the effects of nursing practice. As the needs of society change in response to new knowledge and new technology, nursing evolves to meet these challenges. The roles of professional nurses are changing to complement and work with the changing roles of other health professionals. With society demanding increasing authority and responsibility from health professionals, leadership in planning and developing health resources as a part of a multidisciplinary team is a necessary response.

The master's program offers specialized study that takes students from the baccalaureate-prepared generalist to the advanced practitioner who is able to take on sophisticated roles in consultation, management, and education. The graduate program is designed to prepare nurses to deal with larger and more complex situations in providing health-care services in adult and aged primary care, adult and aged acute care, advanced practice in pediatrics, advanced practice in women's health, community health nursing, family nurse practitioner, and psychiatric / mental-health nursing.

Degree Requirements

The master's program in nursing may be completed in full- or part-time study. Some courses are offered in sequence and are not offered every term. Students in most tracks of the master's program must complete 42 credits of course work. The one exception is the family nurse practitioner track, which requires completion of 45 credits. Additional requirements are determined by the catalog in effect when the student is admitted or readmitted.

Students also are encouraged to enroll in various elective courses, which are available in other major academic units of the university. Courses may be taken in the Graduate School of Management, the School of Law–Newark, the School of Criminal Justice, the School of Social Work, and the public administration and other graduate programs offered by the Graduate School–Newark.

Time Limit. Requirements for the master of science degree with a major in nursing must be completed within five consecutive years from the date of matriculation. Matriculation continued status is included in matriculation time.

Admission

The requirements for admission to the master's program are as follows:

1. Baccalaureate degree in nursing from a nationally accredited program;
2. An undergraduate cumulative grade-point average of 3.0 (where A = 4.0);
3. One of the following: (1) five years of relevant practice experience, (2) a grade of B or better in three Rutgers' College of Nursing graduate courses taken on a nonmatriculated basis, (3) a B.S. in nursing from Rutgers in the past twelve months with a GPA of 3.2 or better, and (4) a satisfactory combined score on the verbal, quantitative, and analytical portions of the Graduate Record Examination taken within the last five years;
4. Current New Jersey Professional Nurse licensure;
5. Three satisfactory academic and professional letters of reference;
6. Completion of a descriptive / inferential statistics course and a physical assessment course* or equivalent, prerequisite to full matriculation.

Admission for Foreign Applicants

To qualify for full graduate status, foreign applicants must meet all of the following additional criteria:

1. Completion of a college or university program equal to the unit requirements for a baccalaureate degree in nursing;
2. Registered professional nurse licensure in the country of origin and registered professional nurse licensure in the state of New Jersey;
3. Completion of Test of English as a Foreign Language (TOEFL) with a satisfactory score for students whose first language is not English (the Test of Written English, part of TOEFL, is required);
4. Satisfactory completion of Rutgers' English as a Second Language Placement Examination. This test is administered by the Program in American Language Studies (PALS) and is given prior to the term for which the student is accepted. Details about taking the test are sent to the student by the admissions office along with the letter of acceptance to the program. Based upon

* Accepted physical assessment courses are offered through the Rutgers' College of Nursing Center for Professional Development.

the student's performance on this placement test, the PALS program makes recommendations that are to be followed by the graduate program in nursing;
5. Applicants in F-1 or J-1 student status must prove that they have sufficient funds to cover both their educational and living expenses.

Applicants are encouraged to write to the College of Nursing Office of Student Affairs asking for an informal evaluation before filing a formal application.

Please note that specific clinical specialties may impose additional requirements.

Academic Advisement

When a student is fully or conditionally accepted into the graduate program, the associate dean for student affairs consults with the graduate program director and assigns a member of the graduate faculty as the student's academic adviser. Students are notified of their advisers' names during new student orientation.

A student's adviser will be changed if a faculty member leaves the College of Nursing, if the adviser or student indicates that a change would be beneficial, or if the faculty member's workload needs to be readjusted. The change may be initiated by the adviser or student in a written request to the associate dean, Office of Student Affairs, and / or the graduate program director. The associate dean for student affairs, in consultation with the graduate program director, assesses and coordinates reassignment of the student to another adviser.

Academic Policies

1. A full-time course load is defined as 12 or more credits, and a course load of 18 credits or more requires the approval of the graduate program director.
2. A student registered for 11 or fewer credits has part-time status.
3. Students must be registered every term to continue matriculation. Those students who interrupt their studies may register, with the approval of the graduate program director, for matriculation continued.
4. When a student applies for admission, the requirements for the degree at that time become the student's program of study. Any courses taken as a nonmatriculated student are applied toward the degree only if the courses are required at the time of admission and were taken within the five-year time frame for earning the degree.
5. As many as 12 credits of graduate course work taken at other fully accredited institutions before enrollment in this program may be considered for replacing courses within the student's program. The courses must have been taken within the five-year time limit for the degree and all must meet the stipulations outlined in this catalog. To petition for approval of substitute courses, students should complete Form T-1, which is available at the Office of Student Affairs. Transfer of credits does not occur until a student has completed at least 12 credits in the graduate program.
6. No more than 9 credits with a grade of C or C+ may be used in meeting the requirements for a master's degree.
7. Students are expected to earn grades of B or better in their course work. An overall B average is required for graduation.
8. The grade of incomplete, IN, can be granted when a student has not completed the assigned work in a course because of illness or other reasons satisfactory to the instructor. The grade of IN is issued at the discretion of the instructor. The IN grade must be converted to a letter grade by the end of the drop / add period in the next term if the course with the incomplete grade is a prerequisite for a current course the student is taking. Any student failing to complete the assigned work to remove the IN grade is required to drop the subsequent course. University regulations require the removal of incompletes within a calendar year. If not removed, the IN remains on the transcript.

   In unusual and compelling situations, an extension may be recommended by the graduate program director and approved by the dean of the Graduate School–Newark. A specific plan for completion is required for an extension to be approved. The Request for Incomplete Status form may be obtained from the College of Nursing Office of Student Affairs.
9. All requirements for the master's degree must be completed within five consecutive years from the date of matriculation. Should extenuating circumstances necessitate prolonging the time limit, the student's record is reviewed. Extensions are granted only to those students who have a history of satisfactory performance and can document a timetable and plan to complete the requirements within a reasonable period of time. A written request for such an extension is made to the academic adviser, who makes a recommendation on the matter to the graduate program director. The director reviews the student's record and forwards the appropriate document of approval or disapproval to the dean of the Graduate School–Newark. The final decision rests with the dean of the Graduate School–Newark.

Clinical Placements

Clinical placements for graduate students are arranged collaboratively with the student, the professor responsible for the course, and a preceptor. The terms of the placement are formalized in a letter of agreement filed with the agency and in the Office of Student Affairs. Preceptors serve as role models and guide the clinical experience. The professor maintains contact with the preceptor, provides overall supervision, and assigns the final grade.

Professional Liability Protection

All graduate students are required to have professional liability insurance before they begin clinical work.

Grade Complaints

The nursing program has procedures to ensure that all parties get due process when a grade complaint arises. Any complaints by students about their grades should be handled within the graduate program. The program's procedures gives the student a chance to determine if an error was made in assigning the grade. On the other hand, they enable the instructor to explain why the grade was given. Complaints about grading practices of individual instructors are handled in the following manner:

1. Within ten days of receiving notification of the grade, the student should meet with the instructor who recorded the grade.
2. If the two parties cannot resolve the matter, the student must file within ten school days a written complaint with the graduate program director or a designee.
3. The program director's office reviews the case and attempts to mediate the dispute. Within ten school days of receiving the written complaint, the graduate program director or designee shall consult with all parties and propose a resolution.
4. If the student is not satisfied with the results achieved at that level, he or she can refer the matter to the Student Life Committee. To support this appeal, the student must forward to the chairperson of the Student Life Committee the previously written complaint and all materials submitted earlier in the case.
5. To review materials the student has submitted, the Student Life Committee forms a subcommittee composed solely of its members who have faculty status.
6. Within fifteen school days of receiving the complaint, the committee shall render a decision. In arriving at its decision, the committee may consult with anyone it chooses. In extraordinary cases, it even may ask third parties from among the faculty to review the grade in question.
7. Any student wishing to pursue the matter further may appeal the program faculty's decision to the dean of the Graduate School–Newark. Such an appeal must be made in writing within ten school days from the day the student received notice of the program faculty's decision. In this document, the student should outline clearly the grounds for the appeal.
8. The dean of the Graduate School–Newark shall render a decision within ten school days of the receipt of the appeal. This decision is final.

Health Requirements

All students enrolled in degree-granting programs must provide documents to prove that they have had all immunizations that are required by state law. The required immunization forms are included with the student's letter of admission. Students who do not submit documentation of immunizations before enrolling or during the first term of enrollment may not register for the following term. Any student seeking an exemption from this requirement for medical or religious reasons must request in writing that the requirement be waived.

In addition to the university's health requirements, the College of Nursing health policy requires the following:

1. Complete physical examination and laboratory tests;
2. Health history;
3. Tuberculin screening yearly if the person tests negatively. For those who test positively by Mantoux test, a chest x-ray is required upon admission;
4. Evidence of immunization against Hepatitis B;
5. Tetanus / diphtheria booster received within the last ten years;
6. Documentation of immunity to varicella, measles, mumps, and rubella.

Forms needed to meet these requirements are sent to each student by the College of Nursing. Within one month of his or her admission to the program, each student must return these forms to the Immunization Program at Hurtado Health Center, Rutgers, The State University of New Jersey, 11 Bishop Place, New Brunswick, NJ08901-1180.

Graduate Nurse Alliance

The Graduate Nurse Alliance (GNA), which was formalized in 1984, is open to all enrolled master's students. Students are expected to participate in this organization, which was formed to provide a medium of exchange between faculty members and graduate students. Among its other purposes, the GNA ensures that graduate students have representation on designated faculty committees; advocates student participation in curriculum planning, implementation, and evaluation; and acts as a liaison with the Graduate School–Newark student government.

Nondegree Students

Students who wish to take courses without enrolling in a degree program are given nondegree status. The following policies and procedures apply to nondegree students:

1. Applications for nondegree graduate nursing courses may be obtained from the Graduate School–Newark office, the admissions office, or the Office of Student Affairs at the College of Nursing. Students are encouraged to download their applications from the Internet by visiting http://gradstudy.rutgers.edu.
2. All students must be advised before registering for courses. The College of Nursing associate dean for student affairs is the adviser for all nondegree students.
3. No more than 12 credits may be earned as nondegree credits. This includes prerequisite courses for the graduate program in nursing.
4. Credit for nondegree courses may be applied to the graduate degree if the student applies and is admitted to the graduate program within five years. However, satisfactory completion of these courses does not guarantee admission to the graduate degree program. In addition, a student receives credit for these courses only if the courses were required at the time of admission. Course syllabi are available no later than the first day of class at http://nursing.rutgers.edu//nursing.

Core Courses

26:705:504. Human Diversity and Social Issues in the Community (3)
Advanced nursing practice examined from epidemiological perspective in the context of cultural and social pluralism. Emphasis on multiple dimensions of human diversity, with identification and assessment of vulnerable and underserved populations and ethical issues.

26:705:506. Contemporary Role of the Advanced Practice Nurse (3)
Establishes a theoretical context for role execution. Includes knowledge and strategies basic to practice as a teacher, manager, or provider of care. Analysis of the role of the nurse within the health-care delivery system. Emphasis on practical issues and the influence of public policy, regulation, reimbursement, work settings, and professional interrelationships. Focus on the nurse as an agent of change and evaluation of the effectiveness of nursing.

26:705:510. Theoretical Foundations of Nursing (3)
Prerequisite: Descriptive and Inferential Statistics.
Discusses the historical and philosophical bases for the development of a science, the components and processes of theory development, and the relationship of theory development to knowledge generation in the discipline of nursing. Analysis of existing conceptual models in nursing and their potential for and relevance to theory development, research, and practice. Identification and analysis of concepts relevant to theory development.

26:705:512. Research Methods in Nursing (3)
Prerequisite: 26:705:510.
Development of skills in the application of principles and methods of scientific research. How to identify and conceptualize a research problem that is relevant to nursing and then formulate testable hypotheses. Emphasis on research designs and methodologies, the psychometric properties of instruments, sampling techniques, methods of data analysis, and interpretation of research findings. Focus on the scientific merit of empirical studies and ethical and legal considerations.

26:705:513. Psychopathological and Psychosocial Foundations in Advanced Practice Nursing (3)
Prerequisite: 26:705:538.
Focus on biologic and behavioral theories and research from a variety of disciplines, including nursing for application of psychiatric assessment in primary-care settings. Analyzes research and makes case studies for the assessment, diagnosis, and treatment of psychiatric disorders across the life span. Works within a developmental framework that examines manifestations of psychiatric illnesses in children, adolescents, adults, and the aged.

26:705:520. Advanced Health Assessment (3)
Pre- or corequisite: 26:120:547.
Assessment competencies necessary for advanced practice nurses, with emphasis on assessment skills and upon the client as an individual in the context of the family. Focus on development of comprehensive understanding of clients for effective health-care delivery.

26:705:538. Pharmacodynamics for Primary Care (3)
Designed to meet needs of nurses in advanced practice who are eligible for prescriptive privileges. Focuses on pharmacological management of self-limited episodic complaints and stable chronic disease states across the life span commonly managed by advanced practice nurses.

Science Courses

26:120:528. Clinical Microbiology and Infectious Disease (3)
Prerequisite: General biochemistry at the baccalaureate level.
Practical, clinically oriented introduction to topics relevant to the immune system and infectious diseases in acutely ill adult patients. Provides student with understanding of basic biology of microbial pathogens and mechanisms by which they cause disease. Signs and symptoms of major infectious diseases discussed. Where relevant, consideration given to sociocultural aspects of disease states.

21:120:539. ACUTE-CARE PATHOPHYSIOLOGY I (3)
First part of two-term course on underlying physiological causes of disease states in critically ill adult clients. Uses body-systems approach to address major pathological alterations managed in critical-care setting for clients who are hemodynamically unstable and technologically dependent. Discusses sociocultural influences on disease management, especially for vulnerable populations.

26:120:540. ACUTE-CARE PATHOPHYSIOLOGY II (3)
Second half of two-term course on underlying physiological causes of disease states in critically ill adult clients. Using body-systems approach, focuses on major pathological alterations that must be managed in critical-care setting for clients who are hemodynamically unstable and technologically dependent. Discusses sociocultural influences on management of disease states, especially for vulnerable populations.

26:120:547. ADVANCED PATHOPHYSIOLOGY (3)
Examination of pathogenesis of major conditions affecting humans across the life span and their clinical management. Integration of laboratory and diagnostic data, as well as client assessment.

Clinical Concentration Courses

Primary Care of Adults and the Aged (Course sequencing: 26:705:522, 523, 540, 541, 532, 533)

26:705:522. PRIMARY CARE OF ADULTS AND THE AGED THEORY I (3)
Prerequisites: 26:705:504, 510, 520; 26:120:547. Pre- or corequisites: 26:705:506, 512, 538.
Advanced specialized knowledge relevant to young, middle-aged, and older adult clients examined for design and management of clients. Theories and research related to adult response patterns across states of health critiqued.

26:705:523. PRACTICUM IN PRIMARY CARE OF ADULTS AND THE AGED I (3)
Corequisite: 26:705:522.
Synthesis of theory and research relevant to nursing practice with development of proficiency as advanced practice nurses. Diagnostic reasoning, teaching, and collaborative practice for an adult client population across states of health examined.

26:705:540. PRIMARY HEALTH-CARE THEORY II (3)
Prerequisites: Completion of specialty theory and Practicum I courses.
Builds on graduate core and specialty knowledge to promote cost-effective, quality primary health care where advanced practice nurses are initial contact for the clients within the health-care system, promoting client wellness, diagnosing and treating common health deviations, stabilizing chronic health problems, and referring patients to other providers. Focus on specific women's and men's health issues.

26:705:541. PRIMARY HEALTH-CARE PRACTICUM II (3)
Corequisite: 26:705:540.
Continued development of competency in assessment, differential diagnosis, and management of gender-specific health alterations and health-promoting lifestyle changes in women and men.

26:705:532. PRIMARY CARE OF ADULTS AND THE AGED THEORY III (3)
Prerequisites: 26:705:522, 523, 540.
Advanced specialized knowledge relevant to nursing of young, middle-aged, and older adults critiqued. Focus on management of adult health and illness in primary-care settings. High frequency health problems emphasized.

26:705:533. PRACTICUM IN PRIMARY CARE OF ADULTS AND THE AGED III (3)
Corequisite: 26:705:532.
Competency in advanced primary-care nursing to adults across the life span, with emphasis on management of health and illness, health promotion, disease prevention, chronic illness episodes, and acute illness in primary-care settings.

Advanced Practice in Acute Care (Course sequencing: 26:705:627, 628, 629, 630)

26:705:627. ADVANCED PRACTICE: ACUTE-CARE THEORY I (3)
Pre- or corequisites: 26:705:504, 510, 512; 26:120:547.
Presents a conceptual model for the practice of advanced nursing care of critically ill adults. Focuses on selected physiological and psychological ramifications of trauma and acute illnesses.

26:705:628. ADVANCED PRACTICE: ACUTE-CARE PRACTICUM I (3)
Corequisite: 26:705:629.
Delivery of advanced acute-care nursing to adults across the life span. Emphasis on advanced practice of ill and injured young, middle-aged, and older adult clients in acute-care settings.

26:705:629. ADVANCED PRACTICE: ACUTE-CARE THEORY II (4)
Pre- or corequisites: 26:705:522, 540, 628.
Advanced specialized knowledge relevant to nursing acutely ill and injured young, middle-aged, and older adult clients critiqued. Focus on management of adult health and illness in acute-care settings.

26:705:630. ADVANCED PRACTICE: ACUTE-CARE PRACTICUM II (6)
Continued development of competency in delivery of advanced acute-care nursing to adults across the life span. Emphasis on management of illness and injury within a focus of acute-care and advanced nursing practice roles.

Community Health Nursing* (Course sequencing: 26:705:524, 525, 570, 550, 534, 535)

26:705:524. COMMUNITY HEALTH NURSING THEORY I (3)
Prerequisites: 26:705:504, 510, 520; 26:120:547. Pre- or corequisites: 26:705:506, 512, 538.
Advanced specialized knowledge relevant to nursing care for health promotion and prevention in populations, groups, and individuals and families in the community examined. Focus on assessment and analysis of patterns of health, interdisciplinary collaboration, program planning, and policy development.

26:705:525. COMMUNITY HEALTH NURSING PRACTICUM I (3)
Corequisite: 26:705:524.
Exploration and analysis of community health nursing in a designated community. Emphasis on the health needs of a community and focus on community assessment: the identification of health problems and / or potential problems, planning and implementation of a community program to alleviate the problem(s), and evaluation of the plans.

26:705:570. MANAGEMENT OF HEALTH DATA (3)
Prerequisites: Descriptive and Inferential Statistics, Research Methods (Master's Level).
Students create and manage quantitative data to assess health needs, evaluate health outcome data, and test hypotheses and research questions using descriptive and inferential statistics. Includes assumptions underlying various methods, interpretation, and statistical methods using spreadsheets and a statistical software package. Basic concepts for creating and editing computer files and computer methods taught, with emphasis on application.

26:705:550. HEALTH PROMOTION DESIGN PRACTICUM (3)
Prerequisites: 26:705:523, 525. Corequisite: 26:705:570.
Focuses on application of knowledge essential to advanced practice nursing with populations, aggregates, and individuals and families in the community. Emphasis is on development and utilization of data sets as basis for designing health promotion programs and services.

* The dual M.S. / M.P.H. degree option was implemented in the fall of 2000. For details, visit: http://nursing.rutgers.edu/nursing.

26:705:534. Community Health Nursing Theory II (3)
Prerequisites: 26:705:524, 525.
Advanced specialized knowledge relevant to the design, implementation, and evaluation of programs that address health promotion and prevention in populations, groups, and the individual / family in the community examined. Focus on planning, implementation, evaluation of programs, and services.

26:705:535. Community Health Nursing Practicum II (3)
Corequisite: 26:705:534.
Application of theory to advanced nursing practice, administration, or education in a community setting. Practicum is focused on student-identified role in community health nursing.

Advanced Practice in Women's Health (Course sequencing: 26:705:522, 523, 540, 541, 528, 529)

26:705:522. Primary Care of Adults and the Aged Theory I (3)
See description under Primary Care of Adults and the Aged.

26:705:523. Practicum in Primary Care of Adults and the Aged I (3)
See description under Primary Care of Adults and the Aged.

26:705:540. Primary Health-Care Theory II (3)
See description under Primary Care of Adults and the Aged.

26:705:541. Primary Health-Care Practicum II (3)
See description under Primary Care of Adults and the Aged.

26:705:528. Advanced Practice in Women's Health (3)
Prerequisites: 26:705:526, 527, 540.
Critically examines theories and research findings related to patterns of high-risk childbearing families. Concepts, models, theories, and patterns that focus on high-risk prenatal and neonatal clients and the role of the advanced practice nurse explored.

26:705:529. Practicum in Advanced Practice in Women's Health (3)
Corequisite: 26:705:528.
Practicum in advanced practice with childbearing families with application of concepts, models, and theories essential to care of high-risk childbearing families. Focus on comprehensive assessment; intervention; and care of mothers, neonates, and their families.

Advanced Practice in Pediatric Nursing (Course sequencing: 26:705:526, 527, 540, 541, 536, 537)

26:705:526. Advanced Practice in Pediatric Nursing Theory I (3)
Prerequisites: 26:705:504, 510, 520; 26:120:547. Pre- or corequisites: 26:705:506, 512, 538.
Synthesis of concepts, models, theories, and patterns essential to advanced family nursing practice examined. Construct for advanced family nursing in individual's and family's expressions of primary health during childrearing.

26:705:527. Advanced Practice in Pediatric Nursing Practicum I (3)
Corequisite: 26:705:526.
Application of concepts, models, and theories essential to practice of advanced family nursing with childbearing and childrearing families. Focus on comprehensive assessment, intervention, and preventive care for childrearing families.

26:705:540. Primary Health-Care Theory II (3)
See description under Primary Care of Adults and the Aged.

26:705:541. Primary Health-Care Practicum II (3)
See description under Primary Care of Adults and the Aged.

26:705:536. Advanced Practice in Pediatric Nursing Theory III (3)
Prerequisites: 26:705:526, 527, 540.
Critical examination of theories and research findings related to children and their families, utilizing a conceptual framework in delivering care to infants, children, adolescents, and families experiencing acute and / or chronic health-care problems.

26:705:537. Advanced Practice in Pediatric Nursing Practicum III (3)
Corequisite: 26:705:536.
Application of theories and concepts related to acute and / or chronic health problems in care of infants, children, and adolescents. Design and manage nursing interventions, programs, and resources for the delivery of advanced nursing practice in pediatric settings.

Family Nurse Practitioner (Course sequencing: 26:705:526, 527, 540, 541, 532, 533, 530, 531)

26:705:526. Advanced Practice in Pediatric Nursing Theory I (3)
See description under Advanced Practice in Pediatric Nursing.

26:705:527. Advanced Practice in Pediatric Nursing Practicum I (3)
See description under Advanced Practice in Pediatric Nursing.

26:705:540. Primary Health-Care Theory II (3)
See description under Primary Care of Adults and the Aged.

26:705:541. Primary Health-Care Practicum II (3)
See description under Primary Care of Adults and the Aged.

26:705:532. Primary Care of Adults and the Aged Theory III (3)
Prerequisites: 26:705:540, 541.
Advanced specialized knowledge relevant to nursing of young, middle-aged, and older adults critiqued. Focus on management of adult health and illness in primary-care settings. High frequency health problems emphasized.

26:705:533. Practicum in Primary Care of Adults and the Aged III
Corequisite: 26:705:532.
Competency in advanced primary-care nursing to adults across the life span, with emphasis on management of health and illness, health promotion, disease prevention, chronic illness episodes and acute illness in primary-care settings.

26:705:530. Primary-Care Management of Families with Episodic Health Needs (3)
Prerequisites: 26:705:532, 533.
Principles of ongoing assessment and primary family nursing care of children, adults, and families with acute episodic common health problems are introduced. Concepts relating to individual and family interactions, growth and development, and health patterns of the middle-aged family are examined.

26:705:531. Families Episodic Health Needs Practicum (3)
Corequisite: 26:705:530.
Clinical practice focuses on the delivery of primary health care by the family nurse practitioner to children, adults, and families with episodic health problems. Application of concepts and theories to care of the midlife family and to patterns related to health needs.

Psychiatric/Mental Health Nursing
(Course sequencing: 26:705:514, 515, 552, 553, 516, 517)

26:705:514. Human Behavior: Theory I (3)
Prerequisites: 26:705:504, 510, 520; 26:120:547. Pre- or corequisites: 26:750:506, 512, 538.
Advanced practice role with individuals, families, and therapeutic groups as clients. Behavior patterns in chronic mental health problems; patterns of interventions from biological, psychosocial, and developmental perspectives, as well as relevant research examined.

26:705:515. Human Behavior: Practicum I (3)
Corequisite: 26:705:514.
Advanced nursing knowledge of individuals, families, and groups is applied to advanced nursing practice. Individual and group patterns assessed in order to plan, manage, and evaluate selected clients. Students develop individual learning contracts congruent with College of Nursing and agency policies.

26:705:516. Human Behavior: Theory II (3)
Prerequisites: 26:705:514, 515. Pre- or corequisite: 26:705:540.
Advanced practice role with individuals, families, and therapeutic groups as clients. Behavior patterns in crises and acute mental health problems, patterns of interventions from a short-term perspective, and relevant research examined.

26:705:517. Human Behavior: Practicum II (3)
Corequisite: 26:705:516.
Advanced nursing knowledge of individuals, families, and groups applied to advanced nursing practice. Individual and group patterns of behavior are analyzed in order to plan, manage, and evaluate the care of selected clients.

26:705:552. Family Systems Theory I (3)
Synthesizes advanced practice psychiatric mental health knowledge relevant to high-risk families; examines theories and research findings pertinent to the mental-health care of families. Knowledge needed for mental-health assessment, psychodynamic formulation, and intervention with culturally diverse, high-risk families will be addressed.

26:705:553. Family Systems Practicum I (3)
Application and integration of knowledge and skills essential to advanced practice psychiatric mental-health nursing with high-risk families. Focuses on assessing families' mental-health needs, developing psychodynamic formulations, delivering empirical-based family interventions, and implementing outcome measures.

Electives

Electives may be taken within the College of Nursing. Courses also are available by arrangement in the Graduate School of Management, the School of Law–Newark, the School of Criminal Justice, the School of Social Work, and the public administration and other graduate programs in the Graduate School–Newark.

26:705:543. Primary-Care Management of Families with Chronic Health Problems (3)
Prerequisites: 26:705:540,541.
Focus on patterns of response to chronic health problems across the life span and the contracting family. Principles of ongoing family and health assessments and delivery of primary care to children, adults, and families with chronic health problems emphasized.

26:705:544. Families with Chronic Health Problems Practicum (3)
Corequisite: 2:705:543.
Clinical course focusing on the delivery of primary health care by the family nurse practitioner to children, adults, and their families with chronic health problems. Emphasis on ongoing assessment, management, and patterns of response to chronic illness. The integral relationship between the family, community, health-care system, and care of a chronically ill person examined.

26:705:566. Curriculum and Teaching in Nursing (3)
Prerequisite: 26:705:506.
Provides a basic structure to enable teachers to abstract theoretical constructs. Offers critiques of various philosophies of nursing and education and lays groundwork for articulation of individual philosophy. Makes survey of curriculum designs through the evaluation process.

26:705:568. Nursing Administration (3)
Prerequisite: 26:705:506.
Explores conceptual model of an organization in which professional nurses function. Model offered that fosters analytical thinking, is applicable to any organization, and facilitates integration of knowledge from many disciplines.

26:705:620. Theories of Aging (3)
Explores biopsychosocial theories postulated to enhance understanding of the aged.

26:705:631. Advanced Practice: Acute-Care Theory III (3)
Continued development of expertise in managing life-threatening conditions of acute-care clients.

26:705:632. Advanced Practice: Acute-Care Practicum III (3)
Corequisite: 26:705:629.
Continued development of competency in delivery of advanced acute-care nursing to adults across the life span. Emphasis on management of illness and injury within focus of acute-care and advanced nursing practice roles.

26:705:638. Analysis and Development of Computer Programs in Nursing (3)
Focus on analysis and development of computer programs for nursing. Topics include computer systems, information systems, computer-based education, decision making with computers, and artificial intelligence. Development of computer literacy skills and computer applications in nursing practice.

26:705:650. Independent Study (1–3 BA)
Student must have written permission and agreement from faculty adviser and participating faculty member. Final approval for study required from graduate program director.
In-depth study of selected interest area.

Doctor of Philosophy

Purpose

The doctor of philosophy program is designed to meet the educational needs of nurses who are committed to playing a significant role in the creation, clarification, and refinement of nursing knowledge. The program prepares nurse scientists who will advance the discipline of nursing through research, theory development, and other academic endeavors. Graduates will be expected to provide leadership for the advancement of the discipline in the scientific community and in academic and service institutions.

A graduate of the doctoral program in nursing will be prepared to:

1. evaluate the theoretical, philosophical, and historical concepts of nursing and examine critically the multiple dimensions of contemporary research;
2. design and test theoretical explanations about phenomena of concern to nursing;
3. design, conduct, and evaluate original research;
4. provide leadership in creating and disseminating new knowledge;
5. collaborate effectively with scholars in the scientific and professional communities.

The Ph.D. curriculum requires 59 credits beyond the master's degree. Of that total, 14 to 17 credits must come in nursing courses, which include 12 credits in theory development and research and

2 credits in contemporary issues in nursing. A student may take 3 additional credits in a special topics course in nursing that is related to his or her research interest.

Another 18 to 21 credits are required in the following areas: research methodology, statistics, and cognate courses. Finally, the Graduate School–Newark requires students to take a minimum of 24 credits in research toward the degree and follow all other policies of GS–N.

In addition to the 59 credits of study, students seeking the doctorate must:

1. take a qualifying examination for admission to candidacy. This examination is given after a student has completed 26:705:678 Theory Development and Research in Nursing II and the major portion of the course requirements;
2. submit a dissertation proposal;
3. complete a dissertation that is based on original research in a significant aspect of nursing;
4. make an oral defense of the dissertation.

The faculty believes that theory development and theory testing are integral parts of the research process. Therefore, students entering the doctoral study program are expected to have passed a master's-level course in nursing theory and nursing research and have completed successfully a basic statistics course before they enroll in the nursing sequence. As an initial course or before admission, the student also must complete successfully 26:705:570 Management of Health Data. The credits for this course do not count toward the Ph.D. credit requirements. Students can get a waiver on this course requirement by passing an equivalency test offered by the College of Nursing.

Each student should work with his or her chairperson to map out the number of credits he or she will take for dissertation research. In the early stages of their dissertation work, students should take no more than 6 credits per term of dissertation research.

Time Limit. Requirements for the Ph.D. degree must be completed within eight years.

Admission

The requirements for admission to the Ph.D. program are:

1. a baccalaureate degree in nursing from a nationally accredited program,
2. a master's degree with a major in nursing from a nationally accredited program,
3. a cumulative graduate grade-point average of at least 3.2 (where A = 4.0),
4. GRE scores (verbal, quantitative, and analytical abilities) taken within five years of admission,
5. a personal interview (a telephone interview, when appropriate, may be arranged),
6. submission of the following materials:
   a. current registered nurse licensure,
   b. an essay describing the applicant's goals for doctoral study and career goals relative to nursing research,
   c. curriculum vitae,
   d. two scholarly papers of which the applicant is sole author,
   e. three letters of reference from professional sources that support the applicant's ability to succeed in the doctoral program. Two of these letters must come from nurse academicians,
   f. two official transcripts of all previous college work,
   g. completed application form in duplicate.

Doctoral Study Courses

26:705:625. Theories and Research in Health Promotion (3)
Focuses on health promotion of individuals, families, and communities across the life span. Relevant theories developed and tested in nursing and other disciplines reviewed. Research findings evaluated, with attention to gaps in knowledge and recommendations for further research. Current trends in research related to health promotion and disease prevention discussed.

26:705:626. Theories and Research in Chronic Illness (3)
Examines chronic illness of individuals, families, and communities across the life span. Relevant theories developed and tested in nursing and other disciplines reviewed. Research findings evaluated, with attention to gaps in knowledge and recommendations for further research. Current trends in research related to chronic illness management and prevention of complications discussed.

26:705:675. Evolution of Nursing Knowledge (3)
Historical, philosophical, and theoretical bases of nursing knowledge. Analysis of conceptual systems / models for nursing in terms of potential for theory development and research. Identification of phenomena relevant to nursing that require new theoretical explanation or further refinements.

26:705:676. Contemporary Dimensions of Research in Nursing (3)
Prerequisite: 26:705:675. Pre- or corequisite: 26:906:532.
In-depth examination of research in nursing, including developing areas of inquiry, instrument development, ethical and legal issues, and funding sources. Evaluation of nursing knowledge to discover fruitful areas for future investigation in order to revise, extend, or create new knowledge.

26:705:677. Theory Development and Research in Nursing I (3)
Prerequisite: 26:705:675. Corequisite: 26:705:676.
Beginning theory development, i.e., concept formation and analysis; the inductive process; and qualitative research methods. Issues related to the creation of knowledge unique to the discipline.

26:705:678. Theory Development and Research in Nursing II (3)
Prerequisites: 26:705:675, 677. Pre- or corequisite: 26:906:532.
Advanced theory development, including relational statements, hypothesis formation, the deductive process, and quantitative research methods. Impact of deductive theory and quantitative approaches to the development of nursing knowledge.

26:705:679. Contemporary Issues in Nursing (2)
Prerequisites: 26:705:675, 677, 678. Pre- or corequisite: 26:705:676.
Selected issues and research in nursing education, nursing administration, and nursing practice. Extensive examination of nursing research leading to policy formulation and strategies for policy implementation.

26:705:703. Dissertation Research (BA)
Research under supervision of faculty member.

Electives

26:705:680. Special Topics (3)
Topics include substantive knowledge in the areas of faculty research. Topics change each term.

26:705:701. Dissertation Seminar I (3)
Elective. Prerequisites: 26:705:675, 676, 677, 678.
Conceptual phase of the research process, including description of research problems, formulation of problem statements, development of theoretical background, and derivation of testable hypotheses.

26:705:702. Dissertation Seminar II (3)
Elective. Prerequisites: 26:705:675, 676, 677, 678, 701.
Research designs and methods appropriate to the study of individual research problems. All aspects of empirical phase of research, especially instrumentation, statistical tools, and ethical guidelines.

PHYSICS, APPLIED 755

Degree Programs Offered: Master of Science, Doctor of Philosophy
Director of Graduate Program: Professor Ken K. Chin, Room 466, Tiernan Hall, NJIT (973 / 596-3297; email: chin@admin1.njit.edu)

Members of the Graduate Faculty

Professors:

William Carr, NJIT; Ph.D., Carnegie Mellon
Micromachining and microelectronics
Ken K. Chin, NJIT; Ph.D., Stanford
III-V devices; MBE; surface sciences
Tobin Fink, NJIT; Ph.D., Rutgers
Atomic and nuclear physics
Alexander E. Gates, FAS–N; Ph.D., Virginia Polytechnic Institute and State University
Structural geology
Philip Goode,* NJIT; Ph.D., Rutgers
Astrophysics
John C. Hensel,* NJIT; Ph.D., Michigan
Solid-state physics
Anthony M. Johnson,* NJIT; Ph.D., CUNY
Ultrafast optical and optoelectronic phenomena
Roland Levy,* NJIT; Ph.D., Columbia
CVD; PVD; materials synthesis
Robert Marcus, NJIT; Ph.D., Michigan
Microelectronics and micromechanics
Richard Mendelsohn, FAS–N; Ph.D., Massachusetts Institute of Technology
Biophysical chemistry
Karl D. Moeller, NJIT; Ph.D., Hamburg (Germany)
Far-infrared spectroscpy and optics
Daniel E. Murnick, FAS–N; Ph.D., Massachusetts Institute of Technology
Laser spectroscopy and applied physics
William Savin, NJIT; Ph.D., Rutgers
Nuclear physics and solid-state pysics
Earl D. Shaw, FAS–N; Ph.D., California (Berkeley)
Free electron laser research
H. Wang, NJIT; Ph.D., California Polytechnic Institute
Solar physics

Associate Professors:

Edward M. Bonder, FAS–N; Ph.D., Pennsylvania
Electron microscopy facility
Kenneth R. Farmer II, NJIT; Ph.D., Cornell
Ultrathin films and MEMS
John Federici, NJIT; Ph.D., Princeton
Ultrafast laser and spectroscopy
Heim Grebel, NJIT; Ph.D., Weizmann Institute of Science (Israel)
Optoelectronics
N.M. Ravindra, NJIT; Ph.D., Roorkee (India)
Microelectronics and solid-state physics
Susanne Raynor, FAS-N; Ph.D., Georgetown
Theoretical chemistry
O.L. Russo, NJIT; Dr.Eng.Sci., New Jersey Institute of Technology
Electroreflectance
Trevor Tyson, NJIT; Ph.D., Stanford
Theoretical and experimental X-ray absorption spectroscopy
Zhen Wu, FAS-N; Ph.D., Columbia
Atomic and molecular physics; laser spectroscopy and surface science

Programs and Facilities

Students in the program in applied physics have access to many resources, including far-infrared free electron laser, laser spectroscopy laboratory, surface science laboratory, biosensor laboratory, and a Microelectronics Research Center with class 10 clean room facility for CMOS technology and micromachining research. Other available technology includes molecular beam epitaxy (MBE) for III-V optoelectronic materials and device research, chemical vapor deposition (CVD) and physical vapor deposition (PVD) materials synthesis, ultrafast optical and optoelectronic phenomena, ultrathin film and microelectromechanical systems (MEMS), Electronic Imaging Center, rapid thermal annealing, infrared optoelectronic device laboratory, and various materials- and device-characterization facilities.

Interdisciplinary applied physics research is carried out in collaboration with electrical engineering, chemistry, biological sciences, and geological sciences faculty members, as well as with the University of Medicine and Dentistry of New Jersey (UMDNJ). There also is extensive cooperative research with the National Solar Observatory, Bell Laboratories, the U.S. Army Research Laboratory, and other industrial and federal research laboratories.

Joint M.S. Program in Applied Physics

The joint Rutgers–Newark / NJIT M.S. degree in applied physics requires 30 credits above the 600 level. Students must take 24 credits of course work. Of the 24 credits, 18 must be in physics or related areas (including mathematical physics or applied mathematics), and the remaining 6 credits are electives. Four graduate physics courses (26:755:611 Advanced Classical Mechanics, 26:755:621 Classical Electrodynamics I, 26:755:631 Quantum Mechanics I, and 26:755:641 Statistical Mechanics) are required.

Thesis research for 6 credits completes the master's program. Alternatively, with the approval of the student's adviser, a 3-credit project plus an additional 3-credit course may replace the 6-credit thesis requirement.

Joint Ph.D. Program in Applied Physics

For entering students with B.S. or B.A. degrees, the joint Rutgers–Newark / NJIT Ph.D. degree in applied physics requires 75 credits above the 600 level. A cumulative grade-point average of 3.0 is required in course work. Students take 39 credits in courses and earn the remaining 36 credits they need in dissertation research. Course work includes 24 credits in physics courses (including mathematical physics or applied mathematics) and 15 credits in electives.

Among the 24 credits of physics courses, six courses are mandatory: 26:755:611 Advanced Classical Mechanics, 26:755:621 Classical Electrodynamics I, 26:755:631 Quantum Mechanics I, 26:755:641 Statistical Mechanics, 26:755:721 Classical Electrodynamics II, and 26:755:731 Quantum Mechanics II. At least 12 credits offered for the degree must be at or above the 700 level. Course work may include graduate courses in electrical engineering, bioscience, chemistry, or other areas, depending upon the student's field of research.

For entering students with M.S. or M.A. degrees, the joint Ph.D. degree in applied physics requires 54 credits above the 600 level. Course work comprises 18 credits, and 36 credits are in dissertation research. Course work includes 9 credits in physics courses (including mathematical physics or applied mathematics), and the remaining 9 credits are taken in electives. At least 12 credits must be at or above the 700 level. A cumulative grade-point average of 3.0 is required in course work, which may include graduate courses in electrical engineering, bioscience, chemistry, or other areas, depending on the student's research interest.

Qualifying examinations, both written and oral, are required for the Ph.D. These examinations, which are given in August / September of each academic year, must be taken by the end of the first year. Students who fail the examination on the first attempt get one additional chance to pass.

The Ph.D. dissertation will be evaluated by a committee consisting of the candidate's academic adviser and three other faculty members, one from Rutgers–Newark, one from NJIT, and one from outside the program. It takes from three to six years for full-time students and four to eight years for part-time students to complete the program. Students with degrees in chemistry and other related areas are accepted into the program.

Graduate Courses

26:755:611 (NJIT: PHYS 611). ADVANCED CLASSICAL MECHANICS (3)
Fall term. Prerequisite: Undergraduate course work in advanced mechanics or equivalent.
Newton's law of motion; mechanics of a system of particles; D'Alembert's principle and Lagrange's equations; derivation of Lagrange's equations from variational principle; conservation theorems and symmetry properties; the Hamilton equations of motion; canonical transformation, Poisson brackets; Hamilton-Jacobi theory; the rigid body equations of motion; small oscillations.

* Distinguished Professor of New Jersey Institute of Technology

26:755:621 (NJIT: PHYS 621). CLASSICAL ELECTRODYNAMICS I (3)
Fall term. Prerequisites: Undergraduate course work in electromagnetism; working knowledge of ordinary and partial differential equations, special functions, complex variable functions, and vector analysis.
Electrostatics; magnetostatics, and boundary value problems; time-varying fields, Maxwell equations, conservation laws; plane and spherical electromagnetic waves; wave propagation in dielectric and conducting media; waveguides and resonant cavities.

26:755:631 (NJIT: PHYS 631). QUANTUM MECHANICS I (3)
Spring term. Prerequisite: 26:755:611.
Limits to classical physics; wave mechanics and the Schrödinger equation; uncertainty principle; eigenvalues and eigenfunctions of simple systems, including quantum well, potential barrier, harmonic oscillator, and hydrogen atom, matrix mechanics, Hilbert space and operator method; approximation methods; scattering theory; time-dependent perturbation theory; quantization of electromagnetic radiation; quantum theory of angular momentum, spin.

26:755:641 (NJIT: PHYS 641). STATISTICAL MECHANICS (3)
Spring term. Prerequisite: 26:755:631.
Review of thermodynamic laws; ensemble theory; thermodynamic functions; classical ideal gas and imperfect gas; chemical reactions; Boltzmann, Bose-Einstein, and Fermi-Dirac statistics; quantum statistical theory of solids, magnetism, and phase transitions.

26:755:651 (NJIT: PHYS 651). ATOMIC AND MOLECULAR PHYSICS (3)
Prerequisite: NJIT: Phys 441.
Fundamentals of quantum mechanics; one-electron atoms; orbital angular momentum, spin, and total angular momentum; transition rates and selection rules; multielectron atoms, LS coupling, and JJ coupling; optical properties of atoms, the lasers; H_2 molecules; molecular bonding; molecular spectra; the Raman effect.

26:755:654 (NJIT: PHYS 654). NUCLEAR AND PARTICLE PHYSICS (3)
Prerequisite: NJIT: Phys 441.
Nuclear stability; saturation of nuclear forces; two nucleon potentials for finite nuclei, the deutron; nucleon-nucleon scattering; effective interactions; nuclear matter; models of nuclear structure; nuclear excitations; description of elementary particle phenomenon; applications of scattering theory; conservation laws and symmetrical properties of interactions; structure of nucleons.

26:755:661 (NJIT: PHYS 661). SOLID-STATE PHYSICS (3)
Fall term.
Review of basic quantum mechanics; free electron theories of metals; lattices in real and momentum space; electron levels in a periodic potential; the tight binding method for calculating band structures; classification of solids; electrical and optical properties of semiconductors; cohesive energy; phonons; dielectric properties of insulators; magnetism; superconductivity.

26:755:667 (NJIT: PHYS 667). MODERN EXPERIMENTAL TECHNIQUES FOR MATERIALS PROCESSING AND CHARACTERIZATION (3)
Prerequisite: NJIT: Phys 441 or equivalent.
Bonding and material classification, phase transitions and phase diagrams, basic material structures and properties. Various techniques for crystal growth and thin film fabrication. Diffusion, ion implantation, and wet and dry etching. Chemical, structural, electrical, optical, and mechanical techniques.

26:755:671 (NJIT: PHYS 671). APPLIED OPTICS (3)
Prerequisite: Undergraduate course work in electromagnetism.
Mawell's theory, linear and elliptical polarized light, Fresnel's equations, electromagnetic waves in crystals, dielectric functions, optical constants. Ellipsometry, interference, amplitude and wavefront dividing interferometry, Fabry-Perot interferometer, modes in layered structures. Fraunhofer and Fresnel diffraction, spatial coherence, Zernike's theorem. Symmetric and asymmetric Fourier transform spectroscopy. Fourier optics, imaging with quasimonochromatic and monochromatic light, holography. Scattering of light. Geometrical optics of thin and thick lenses, aberration. Radiometry, blackbody, synchrotron, and laser radiation. Radiometric quantities. Introduction to nonlinear optics.

26:755:675 (NJIT: PHYS 675). CELLULAR BIOPHYSICS (3)
Lec., lab. Prerequisites: Differential and integral calculus and introductory physics.
Basis for cell membrane voltages, both static and dynamic. Basic biochemistry pertinent to biological systems, bioelectricity of the cell membrane, electrophysiology, and relevant microscopy. Laboratory includes electronics; bioelectric measurements, both in artificial and biological cells; and microscopy.

26:755:687 (NJIT: PHYS 687). PHYSICS OF MATERIALS (3)
Fall term. Prerequisite: NJIT: Phys 441 or equivalent.
Fundamentals of quantum mechanics; energy bands in crystals; electrical conduction in metals and alloys, semiconductors; optical properties of materials; quantum mechanical treatment of optical properties; magnetic properties of materials; thermal properties, heat capacity, and thermal expansion in solids.

26:755:689 (NJIT: PHYS 689). SIMULATIONS OF ELECTRONIC DEVICE STRUCTURES (3)
Prerequisite: NJIT: EE 657 or equivalent.
Extensive introduction to the modeling programs used to stimulate devices and the processes used to build them. SIMION, SUPREM, PISCES, ANSYSM, and ANSYST.

26:755:690 (NJIT: PHYS 690). DIRECTED STUDY OF APPLIED PHYSICS (3)
Directed study under the guidance of a physics faculty member on a topic of microelectronics or on other areas of applied physics.

26:755:700 (NJIT: PHYS 700). MASTER'S PROJECT (3)
Prerequisite: Written approval of graduate adviser. For students admitted to the master of science program in applied physics who do not enroll in 26:755:701.
Extensive paper involving experimental or theoretical investigation of a topic in microelectronics or other applied physics area required. Cooperative projects with industry or government agencies may be acceptable. Project carried out under the supervision of a designated physics graduate faculty member.

26:755:701 (NJIT: PHYS 701). MASTER'S THESIS (3)
Prerequisite: Written approval of graduate adviser. For students admitted to the master of science program in applied physics.
Experimental or theoretical investigation of a topic in microelectronics or other applied physics area. Cooperative projects with industry or government agencies may be acceptable. The thesis is written under the supervision of a designated physics graduate faculty member. The completed written thesis must be of sufficient merit to warrant publication in a scientific or technical journal. The student must register for a minimum of 3 credits per term. Degree credit is limited to 6 credits indicated for the thesis.

26:755:721 (NJIT: PHYS 721). CLASSICAL ELECTRODYNAMICS II (3)
Spring term. Prerequisites: 26:755:621 or equivalent; basic knowledge of tensor analysis.
Simple radiating systems, scattering and diffraction; special theory of relativity; dynamics of relativistic particles and electromagnetic fields; collisions between charged particles, energy loss, and scattering; radiation from an accelerated charge, synchrotron radiation, and bremsstrahlung.

26:755:731 (NJIT: PHYS 731). QUANTUM MECHANICS II (3)
Fall term. Prerequisite: 26:755:631 or equivalent.
Review of quantum mechanics and theory of special relativity; second quantization; relativistic one-particle problem; Klein-Gordon equation and Dirac equation; canonical field theory; relativistic scattering theory; introduction to quantum electrodynamics and quantum field theory; Feynman diagrams and applications.

26:755:732 (NJIT: PHYS 732). GENERAL RELATIVITY AND GRAVITATION (3)
Prerequisites: 26:755:611, 621, 631; or equivalent.
Review of special relativity; principles of equivalence and the metric tensor; tensor analysis; effects of gravitation; Einstein's field equations; the Schwarzschild singularity; gravitational radiation and cosmology.

26:755:761 (NJIT: PHYS 761). SOLID-STATE THEORY (3)
Prerequisite: 26:755:661 or equivalent.
Fundamentals of group theory; symmetry of solids; application of group theory in solid-state physics; density functional theory; the one-electron approximation and energy bands; thermodynamic and transport properties; pseudopotentials and other methods of band structure calculation; Fermi liquid theory, collective excitation and mean field theory of superconductivity and magnetism; lattice vibrations, the electronphonon interaction, and the BCS theory of superconductivity.

26:755:762 (NJIT: PHYS 762). ELECTRONIC STRUCTURE OF SOLIDS (3)
Prerequisite: 26:755:631 or equivalent.
Tight binding theory; bond orbitals and the electronic structure of covalent solids; universal tight-binding parameters and the prediction of the bonding and dielectric properties of semiconductors; ionic solids and the bonding and dielectric properties of insulators. Theory of silicon dioxide and related compounds and their properties; transition metals and their compounds.

26:755:763 (NJIT: PHYS 763). SURFACE AND INTERFACE PHYSICS (3)
Prerequisite: 26:755:661 or equivalent.
Introduction to UHV (Ultra High Vacuum) technique; clean surface preparation; surface symmetry and LEED (Low Energy Electron Diffraction); surface and interface electronic structure and electron spectroscopy; XPS, UPS, AES, and ESCA; surface compositional and geometric structure and EXAFS; STM (Scanning Tunneling Microscopy) and STS (Scanning Tunneling Spectroscopy).

26:755:771 (NJIT: PHYS 771). QUANTUM ELECTRONICS (3)
Prerequisites: 26:755:631, 651; or equivalent.
Physics of lasers and the interaction of radiation with matter. Semiclassical and quantum theory of the interaction of the laser with single and multiple electromagnetic fields, and with homogeneously and Doppler-broadened media.

26:755:772 (NJIT: PHYS 772). APPLIED PLASMA PHYSICS (3)
Prerequisites: 26:755:621, 631; or equivalent.
Properties of ionized systems, electromagnetic interactions, experimental techniques, and selected topics on discharges and thermonuclear plasmas.

26:755:773 (NJIT: PHYS 773). PARTICLE-SOLID INTERACTIONS (3)
Prerequisites: 26:755:631, 661; or equivalent.
The particle-solid interactions that form the basis for ion implantation, sputter deposition, reactive ion etching, and other microelectronic processing technology. Ion beam interactions with solids and solid-state materials and structures. Rutherford backscattering experiments and ion channeling. Methods for observing defect distributions in materials, surfaces, and surface layer interfaces using ion scattering techniques.

26:755:774 (NJIT: PHYS 774). PRINCIPLES OF SPECTROSCOPY (3)
Prerequisites: 26:755:651, 761; or equivalent.
Theoretical and experimental principles of spectroscopy. Atomic absorption, emission, IR (infrared), Raman, fluorescence, NMR, X-ray spectroscopies. Fourier transformation techniques. Coherent and incoherent sources.

26:755:781 (NJIT: PHYS 781). PHYSICS OF ADVANCED SEMICONDUCTOR DEVICES (3)
Prerequisites: 26:755:687, NJIT: EE 657; or equivalent.
Physical principles and operational characteristics of the most important semiconductor devices for advanced electronics systems that process data at rates higher than 1 Gb/s, or handle analog signals at frequencies above 1 Ghz. Devices addressed include submicron MOSFET, MESFET, heterostructure MESFET, heterostructure bipolar transistors, quantum-effect devices, microwave devices, and photonic devices.

26:755:787 (NJIT: PHYS 787). PHYSICS OF SENSORS AND ACTUATORS (3)
Prerequisites: NJIT: EE 657, 26:755:687; or equivalent.
Fundamentals of sensors: optical, thermal, chemical, mechanical, and electrical. Study of noise, phase-sensitive detection and other low-level measurement techniques. Semiconductor surface microstructures, including temperature, pressure, strain, acceleration, humidity, mass flow, and gas sensors. Actuators, including micromotors, microrobots, and other micromechanisms. Semiconductor vacuum microelectronic devices.

26:755:789 (NJIT: PHYS 789). PHYSICS OF ADVANCED SEMICONDUCTOR DEVICE PROCESSING (3)
Spring term. Prerequisites: NJIT: EE 657, 26:755:687; or equivalent. Intended for doctoral students in applied physics, electrical engineering, and materials science.
Silicon and GaAs technologies: crystal growth methods, epitaxy, oxidation, lithography, dry and wet etching techniques, polysilicon, diffusion, ion implantation, metallization (including silicidation), process integration, analytical characterization techniques, assembly and packaging, and yield and reliability.

26:755:790 (NJIT: PHYS 790). DOCTORAL DISSERTATION AND RESEARCH (BA)
Prerequisite: Doctoral candidacy. Corequisite: 26:755:791. A minimum of 36 credits is required. The student must register for at least 6 credits of dissertation research per term. Registration for additional credits, up to 12 per term, is permitted with the approval of the department graduate adviser.
Experimental or theoretical investigation of a topic in applied physics, including microelectronics, materials science, and laser physics is expected. Cooperative projects with industry or government agencies may be acceptable. Research and writing are carried out under the supervision of a designated graduate faculty member. The completed written dissertation should be a substantial contribution to the knowledge of the topic under research and should be of sufficient merit to warrant publication in a leading scientific or technical journal.

26:755:791 (NJIT: PHYS 791). DOCTORAL SEMINAR (0)
Departments of physics at NJIT and Rutgers–Newark joint seminar or research and current topics in microelectronics, materials science, laser physics, and other applied physics areas.

26:755:800. MATRICULATION CONTINUED (E1)

26:755:866. GRADUATE ASSISTANTSHIP (E,BA)

26:755:877. TEACHING ASSISTANTSHIP (E,BA)

POLITICAL SCIENCE 790

Degree Program Offered: Master of Arts
Director of Graduate Program: Professor Mary C. Segers, Room 721, Hill Hall (973/353-5105)

Members of the Graduate Faculty

Professors:

Melvin Dubnick, FAS–N; Ph.D., Colorado
American government; public administration
Yale Hicks Ferguson, FAS–N; Ph.D., Columbia
Theories of global politics; international political economy; American foreign policy; Latin America
Frank Fischer, FAS–N; Ph.D., NYU
Public policy and administration; American government; environmental politics
Richard Langhorne, FAS–N, Director, Center for Global Change and Governance; M.A., Cambridge
Processes of global change; institutions of diplomacy
Kenneth Miller, FAS–N; Ph.D., Johns Hopkins
Comparative politics; American political theory; Europe
Alexander J. Motyl, FAS–N; Ph.D., Columbia
Comparative politics; Russia and the former Soviet republics; East European politics

Norman Samuels, FAS–N; Ph.D., Duke
Political theory
Mary Clare Segers, FAS–N; Ph.D., Columbia
Political theory; gender politics; ethics and global politics; religion and politics; ethical issues in policy and administration

Associate Professors:

Elizabeth Hull, FAS–N; Ph.D., New School for Social Research
Constitutional politics; American government
Rey Koslowski, FAS–N; Ph.D., Pennsylvania
International relations; theories of global politics; international organization; regional integration; European politics

Assistant Professors:

Mara Sidney, FAS–N; Ph.D., Colorado
Urban politics; public policy; race and ethnicity; American government
Elizabeth Strom, FAS–N; Ph.D., CUNY
Urban politics and public policy; American government
Virginia Walsh, FAS–N; Ph.D., Southern California
International relations; international political economy; methodology; global environmental issues

Program

The master of arts program in political science focuses on the study of politics and public policy. Faculty members in the program work closely with the graduate Department of Public Administration and with several departments of the Newark College of Arts and Sciences, the School of Law–Newark, the Graduate School of Management, the School of Criminal Justice, the Center for Global Change and Governance, and the Cornwall Center.

Areas of major specialization are the American political system and international relations. Courses also are available in comparative political systems and political theory and methodology. Students seeking the M.A. degree must complete 30 credits of course work, including the core course 26:790:533 Research Methods in Political Science. In addition, they must complete successfully a comprehensive examination in one area. A thesis option also is available, and 26:790:510 Public Policy Analysis is highly recommended for the research-oriented student.

The School of Law–Newark and the Graduate School–Newark offer a concurrent juris doctor / master of arts degree in political science. As many as 12 of the 30 credits required for the M.A. degree may be satisfied by approved courses in the law school. Separately, with approval of the law school, a law student may take as many as 9 credits in political science as electives in the J.D. program. Students wishing to participate in this program must be admitted to both the Graduate School–Newark and the School of Law–Newark.

Graduate Courses

26:790:501. Policymaking in the American Political System (3)
Examines the role of political and governmental institutions in the policymaking processes.

26:790:502. Problems of American Government (3)
Selected problems of national and state governments in the U.S.

26:790:504. Comparative Public Policy (3)
Approaches to the study of policymaking in different political systems. Includes case studies.

26:790:505,506. Contemporary Constitutional Issues (3,3)
Introduction to the literature of constitutional law and politics. Exploration of selected problem areas.

26:790:509. Introduction to Public Administration (3)
Recurring problems in public administration. Major works.

26:790:510. Public Policy Analysis (3)
Core course.
Focus on approaches to the analysis of the policymaking process and the evaluation of its outputs. Emphasis on the policy agenda-setting processes, the politics of problem definition, policy decision-making strategies, cost-benefit analysis, the problem of legitimation and political feasibility, policy implementation, experimental evaluation research, and the role of values in policy analysis. Special attention given to the integration of empirical and normative research in the analytical process.

26:790:511. Contemporary Political Theory (3)
Systematic examination of the writings of major political theorists in terms of a specific problem or a series of related questions.

26:790:512. Ethical Issues in Public Policy and Administration (3)
Consideration of selected ethical problems and dilemmas facing policymakers and public administrators. These include such issues as conflict of interest, confidentiality, deception, official disobedience, whistle-blowing, record-keeping, and questions of distributive justice in health care and employment opportunities. Special attention given to conflicts between expedience and principle in policymaking and policy implementation. Readings in political theory and political ethics, as well as cases and commentary.

26:790:513. Ethics and Global Politics (3)
Consideration of ethical dilemmas in global politics. Topics include just war theory, intervention and the use of force, democracy and development, distributive justice and humanitarian assistance, human rights, and the moral responsibilities of leaders and citizens. Readings in political theory, as well as cases and commentary in international relations and global politics.

26:790:515. Urban Government and Politics (3)
Analysis of problems arising from the structure, functions, and politics of urban government in the U.S., with particular attention to the current problems of metropolitan areas.

26:790:516. Urban Public Policy (3)
Analysis of selected policy problems affecting urban areas.

26:790:518. Topics in Political Theory (3)
Analysis of selected topics in political theory.

26:790:521. Theories of Global Politics (3)
General theories of global politics and international relations.

26:790:529. Science, Technology, and Public Policy (3)
Study of political issues that involve science, such as arms control, nuclear proliferation, energy and natural resources, technology transfer, population growth, and food supplies. Also, the politics of science and the organization and funding of scientific research.

26:790:530. Environmental Politics and Policy (3)
Analysis of selected topics in the politics and policy of environmental issues in both global and domestic contexts.

26:790:533. Research Methods in Political Science (3)
Core course.
General introduction to methods in political science research for students with diverse substantive interests.

26:790:536. (S) Advanced Research Methods in Political Science (3)
Stresses systems analysis as a tool for policy formulations; program evaluation for assessing the effectiveness and efficiency of agency operations; information systems development to provide necessary data for meaningful systems analysis and program development.

26:790:537. GLOBAL GOVERNANCE (3)
Organization of world politics and international cooperation beyond formal international organizations; emphasis on international regimes, institutions and norms; examination of nongovernmental organizations (NGOs); epistemic communities and multilateral cooperation.

26:790:538. GLOBAL ENVIRONMENTAL ISSUES (3)
Examines global environmental institutions and issues.

26:790:539. GENDER, POLITICS, AND POLICY IN THE UNITED STATES (3)
Analysis of the roles women play in the political system as citizens, activists, and officeholders. Examines how basic public values (privacy, justice, equality, welfare) are interpreted through law and public policy to shape women's lives. Focus on American politics, with some attention to other societies.

26:790:540. GENDER AND GLOBAL POLITICS (3)
Political status of women in global perspective. Topics include women's leadership and political participation (both countrywide and in global organizations, such as the UN, the World Bank, and nongovernmental organizations); gender and development planning; and women's rights as human rights.

26:790:541. INTERNATIONAL POLITICAL ECONOMY (3)
Global economic affairs. Presents alternative theoretical approaches to the subject, including classical liberal, Marxist / dependencia, economic, power-centered, state-centered, and justice-centered theories. Utilizes case studies in international economic diplomacy.

26:790:542. TOPICS IN RECENT INTERNATIONAL RELATIONS (3)

26:790:543,544. PROBLEMS OF COMPARATIVE POLITICS (3,3)
Examination of different conceptual and theoretical approaches to comparative politics, with particular emphasis on political systems, states, regimes, institutions, nationalism, class, globalization, development, transitions, and revolutions.

26:790:546. HUMAN RESOURCES POLICY (3)
Examination of the economic, political, and administrative interrelationships in the delivery of human resource policies and employment training programs.

26:790:569. AMERICAN FOREIGN POLICY (3)
Formation of American foreign policy, including the roles of individuals and agencies in the executive branch, Congress, interest groups, public opinion, and the influence of the international environment. Special emphasis on techniques of analysis of the policymaking process and international economic issues.

26:790:570. PROBLEMS OF PUBLIC POLICY (3)
Major issues of policy in the U.S. and other political systems. Problems treated vary from term to term.

26:790:571. AMERICAN POLITICS AND PUBLIC POLICY (3)
Impact of American politics upon public policy issues of contemporary relevance.

26:790:572. PROBLEMS OF POLITICAL PARTIES (3)
Literature, methodology, and data on political party organization and nominating procedures, with particular attention to the U.S.

26:790:573. ADMINISTRATIVE LAW AND POLICY (3)
Basic legal concepts affecting the administrative process; a historical overview; examination of discretionary powers, rule-making, and legislative delegation of powers.

26:790:574. INTERNSHIP IN POLITICAL SCIENCE (3)

26:790:597,598. ADVANCED STUDIES IN POLITICAL SCIENCE (3,3)
Reading and individual study by arrangement. Regular conferences, both written and oral reports.

26:790:608. AMERICAN POLITICAL THOUGHT (3)
Major themes in American political thought from the seventeenth century to the present. Emphasis on contemporary movements and ideas.

26:790:631. SEMINAR IN POLITICAL DEVELOPMENT (3)
The modernization process; selected problems involving democratic, totalitarian, and non-Western nations and the relationship of social and economic change to political matters.

26:790:697,698. RESEARCH IN POLITICAL SCIENCE (3,3)
M.A. thesis research.

PSYCHOLOGY 830

Degree Program Offered: Doctor of Philosophy
Director of Graduate Program: Professor Maggie Shiffrar, Room 338, Smith Hall (973 / 353-5971)

Members of the Graduate Faculty

Professors:

Colin Beer, FAS–N; D.Phil., Oxford
Ethology, history, and philosophical aspects of ethology; comparative psychology

Mei-Fang Cheng, FAS–N; Ph.D., Bryn Mawr
Neurobiology of vocal behavior/acoustic communication and reproductive behavior in the ring dove

Alan Gilchrist, FAS–N; Ph.D., Rutgers
Visual perception; surface color perception

Barry R. Komisaruk, FAS–N; Ph.D., Rutgers
Neurophysiological study of pain and neuropharmacological suppression mechanisms; reproductive behavior in mammals

Kenneth Kressel, FAS–N; Ph.D., Columbia
Divorce mediation; clinical application of social psychology; resolution of social conflict

Joan I. Morrell, CMBN; Ph.D., Rochester
Neuroanatomy and neuroendocrinology, especially in relation to central nervous mechanisms regulating reproductive behavior in mammals

Howard Poizner, CMBN; Ph.D. Northeastern
Neuropsychology; neurological basis of language; cerebral specialization in the deaf; 3-D computer graphic analysis of motor and language processes in deaf signers and patients with disorders of motor control

Lillian Robbins, FAS–N; Ph.D., New York
Social psychology

Jay S. Rosenblatt, FAS–N; Ph.D., New York
Hormones and maternal behavior in mammals; mother-young interactions and behavioral development in mammals

Paula Tallal, CMBN; Ph.D., Cambridge
Experimental psychology; developmental neuropsychology; language development and disorders; psychoacoustics; speech synthesis and perception; neural bases of perception, memory, cognitive, and motor processes

Associate Professors:

Mark A. Gluck, CMBN; Ph.D., Stanford
Theories of human learning and memory; neurobiology of learning and memory; computational neuroscience; adaptive "neural" networks and their applications; animal learning theory

Stephen J. Hanson, FAS–N; Ph.D., Arizona State
Cognitive sciences; connectionist models; concepts and categorization

Maggie Shiffrar, FAS–N; Ph.D., Stanford
Motion perception; action-perception coupling

Harold Siegel, FAS–N; Ph.D., Rutgers
Development of maternal responsiveness

Assistant Professors:

April A. Benasich, CMBN; Ph.D., New York
Developmental neuropsychology; language development and disorders, including familial genetic contributions to developmental trajectories; perceptual-cognitive abilities (habituation, recognition memory, auditory temporal processing) and language development in infants at risk for developmental delays; public policy focus on early intervention programs

Ben Martin Bly, FAS–N; Ph.D., Stanford
Language; functional brain organization; fMRI

Kent Harber, FAS–N; Ph.D., Stanford
Interracial feedback biases; coping and social support

Maria Kozhevnikov, FAS–N; Ph.D., California (Santa Barbara)
Mental imagery, spatial updating, multimedia learning

Catherine E. Myers, FAS–N; Ph.D., London
Computational neuroscience (neural network models), learning and memory, experimental neuropsychology
Bart Rypma, FAS-N; Ph.D., Georgia Institute of Technology
Working memory; reasoning; cognitive aging; prefrontal cortical functioning
Gretchen Van de Walle, FAS–N; Ph.D., Cornell
Perceptual and conceptual development in infancy

Adjunct Member:

Susan V. Szapiel, FAS-N; M.D., Rush Medical College, Chicago
Visual cortical functional architecture; optical imaging; brain plasticity; verstibular plasticity

Professors Emeriti:

John Ceraso, FAS–N; Ph.D., New School for Social Research
Organization and memory; learning, forgetting, reasoning
Melvin Feffer, FAS–N; Ph.D., Chicago
Personality development; moral development; critique of psychoanalysis
Howard Ernest Gruber, FAS–N; Ph.D., Cornell
Creativity; case study method; cognitive development
Ernst Walter Hansen, FAS–N; Ph.D., Wisconsin
Experimental design; statistics; behavioral development

Program

The graduate program in psychology offers training in the behavioral sciences including concentrations in perception, cognitive science, cognitive neuroscience, social and biopsychology. There is a strong emphasis on research, empirical methods, teaching, and presentation skills throughout the duration of graduate studies. At the end of each year, all students give a formal presentation of their recent research findings.

In preparation for cross-disciplinary research, all students are required to take and pass one course in each of our five concentration areas. Additionally, students must pass foundation courses that include statistics, experimental design, and our pro-seminar. To gain depth as well as breathe in the behavioral sciences, students must also complete 21 credits of electives during their training. In addition to course work and continuous research, during the month of September, all third-year graduate students must pass the comprehensive examination. The comprehensive exam consists of five different essay questions, one from each of our core areas.

The dissertation committee is formed after the student has passed the comprehensive examination but before he or she has conducted final dissertation research. This committee must approve the student's dissertation proposal, and it has full control over the nature of that proposal. The committee consists of a chairperson, who is a full member of the graduate faculty; two other members of the graduate faculty; and an outside member. All members of the committee and all changes in the committee must be approved by the program director. The membership of the committee can be changed, however, by agreement between the committee chairperson and the program director.

When the dissertation is complete, the student and the committee chairperson schedule an oral defense, working in consultation with the other committee members. The date of the oral defense must be approved by the program director at least four weeks before the defense takes place. All members of the graduate faculty are invited to attend the defense. Every attempt is made by the members of the dissertation committee to reach a unanimous decision, but if this should prove impossible, a student can pass the defense with affirmative votes from three of the four members.

Graduate Courses

26:830:506. Psychology Proseminar (3)
Seminar course offering a general introduction to the psychological sciences and a detailed overview of research currently being conducted in the Department of Psychology.

26:830:511. Introduction to Cognitive Neuroscience (3)
Bly
Relationship between the structure and function of the brain. Comprehensive overview of how neurophysiological activity leads to perception and cognition.

26:830:512. Advanced Topics in Cognitive Neuroscience (3)
Bly, Rypma
Selected topics in state-of-the-art cognitive neuroscience research.

26:830:545. Behavioral Science Research Design (3)
Harber
How to design controlled experiments in the behavioral sciences.

26:830:560. Introduction to Neuroendocrinology (3)
Siegel
Relationship of nervous and endocrine systems; function and regulation of hypothalamus-pituitary-endocrine organs, their secretions organs, and their secretions (including adrenal, thyroid, parathyroid, pancreas, gonads, placenta); steroid and peptide hormones and neurotransmitters; neuroendocrine-immune systems.

26:830:569. History and Systems of Psychology (3)
Beer. Prerequisites: Permission of instructor and one graduate course in psychology.
Selected topics in the history and the social and economic backgrounds of psychology. The relationship of psychology to trends in work, culture, literature, and political theory, with special focus on the history of child psychology, psychoanalysis, and cognitive theory.

26:830:571,572. Individual Studies in Psychology (3,3)
Guided reading and laboratory research on special topics, individually planned for each student, under the supervision of faculty members.

26:830:575. (F) Seminar: Perception I (3)
Gilchrist, Shiffrar
Survey of the basic problems, theories, and research findings in the study of human perception, especially visual perception. Primary emphasis on the perceptual constancies, including perception of size, distance, depth, motion, form, and surface color.

26:830:576. (S) Seminar: Perception II (3)
Gilchrist, Shiffrar
Advanced seminar on selected topics in human visual perception.

26:830:577. Cognitive Development (3)
Van de Walle
How cognition, thought, and perception change as individuals progress from infancy to adulthood.

26:830:578. (S) Seminar: Human Memory and Learning (3)
Basic processes in human learning and retention, including single item and associative learning, factors influencing learning, and forgetting. One theme is the relationship between the basic processes of learning and retention and the more complex areas of meaning, concept formation, problem solving, thinking, and language.

26:830:585. Psycholinguistics (3)
Discussion of the issues, philosophical and methodological, involved in studying language as a formal computational system, as a biological system, and as a psychological system.

26:830:586. Selected Topics in Psycholinguistics (3)
Examination of current developments in the field of psycholinguistics.

26:830:590. Ethology (3)
Beer
Historical and critical examination of the theories and research of ethologists.

26:830:591. Topics in Avian Behavior (3)
Cheng
Introduction to avian neural and endocrine systems, emphasizing the organization of these systems in mediating adaptive behavior (song development, nesting behavior, and parental care). Comparisons with mammals.

26:830:593. SPECIAL TOPICS IN ANIMAL BEHAVIOR (3)
Fall term: different topic is covered each term by behavioral and neural sciences faculty and outside speakers presenting lectures. Topic announced during preceding term. Spring term: orientation in psychobiology is covered by each Institute of Animal Behavior faculty member.

26:830:595,596. (F,S) RESEARCH METHODS IN PSYCHOLOGY (3,3)
Hanson. Prerequisite: Undergraduate statistics or design course.
Seminar examines the design and analyses of laboratory and field experimentation.

26:830:597. PROSEMINAR: NEUROPHYSIOLOGY AND BEHAVIOR (3)
Komisaruk and staff. Prerequisite: Permission of instructor.
Structure and function of the mammalian nervous system; neuroanatomy, neurophysiology, neuropharmacology; functions of spinal cord, autonomic NS, limbic system, higher brain mechanisms, reproductive behavior, pain modulation, sensorimotor and viscerosomatic integration.

26:830:612. SEMINAR IN SOCIAL PSYCHOLOGY (3)
Harber, Kressel, Siegel
Discussion and debate of the state of the art in social research.

26:830:613. CONFLICT AND RESOLUTION (3)
Kressel
Focus on psychological approaches to the mediation of social conflict at the interpersonal, organizational, and international levels. Topics include theories of conflict; cognitive, behavioral, psychodynamic, and institutional obstacles to the constructive management of conflict; strategies and tactics of intervention; and theoretical and empirical issues in the study of the mediation process. Case materials in family, labor, community, organizational, and international mediation analyzed. Gives a general background in the psychology of human conflict and its management.

26:830:621. (F,S) RESEARCH SEMINAR IN PSYCHOLOGY (3)
Individual research apprenticeship in psychology with a member of the faculty.

26:830:663. EVOLUTION OF SOCIAL BEHAVIOR (3)
Review of the evolution of social behavior. Topics include kin selection, sexual selection, mating systems, parental investment, and communication.

26:830:667. COGNITIVE PROCESSES (3)
Shiffrar. Credit not given for both this course and 26:112:667.
How the environment comes to be apprehended; perception, memory, and thinking.

26:830:668. SELECTED TOPICS IN COGNITION (3)
Hanson, Kozhevnikov, Rypma, Shiffrar, Van de Walle
Examination of current developments in cognitive science

26:830:674. (S) SEMINAR: SELECTED TOPICS IN HUMAN LEARNING (3)
Examination of current developments in the learning and memory areas; special emphasis given to work that is critical of current theoretical assumptions and to work that attempts to relate learning and memory to more complex cognitive function.

26:830:681,682. SEMINAR IN PSYCHOBIOLOGY (3,3)
Cheng
Weekly presentation of current research in psychobiology by leading outside scientists, members of the faculty, and pre- and postdoctoral fellows.

26:830:684. ANIMAL BEHAVIOR (3)
Beer
General conceptual and methodological issues: description and explanation, causality and intentionality, nature and uses of models. Student presentations on topics such as nature / nurture, circadian rhythms, imprinting, animal navigation, drive, communication, and physical substrates of learning.

26:830:685. PSYCHOBIOLOGY OF BEHAVIORAL DEVELOPMENT (3)
Rosenblatt
Current research on a variety of topics in behavioral development among birds and mammals. Topics include prenatal development, early sensorimotor patterns, suckling and feeding, learning and motivation, social development.

26:112:698. NEUROENDOCRINOLOGY AND BEHAVIOR (3)
Komisaruk, Siegel
Neuroendocrine control of courtship, mating, and maternal behavior; pregnancy, parturition, sexual differentiation, stress; cellular mechanisms of hormone action on the nervous system; neuroendocrine role of steroids, neuropeptides, monoamines, and amino acids.

26:830:700. RESEARCH IN PSYCHOLOGY (BA)
Nondissertation research done in conjunction with a faculty member.

26:830:701,702. RESEARCH IN PSYCHOLOGY (BA,BA)
Prerequisite: Successful completion of qualifying exam.
Dissertation research done under the supervision of a faculty member.

26:830:800. MATRICULATION CONTINUED (E1)
Only open to students not attending any classes or actively doing research on campus.

PUBLIC ADMINISTRATION 834

Degree Programs Offered: Master of Public Administration, Doctor of Philosophy
Chairperson: Professor Marc Holzer, Room 726, Hill Hall (973 / 353-5093, ext. 23)
Director of the M.P.A. Program: Professor Kathe Callahan, Room 724, Hill Hall (973 / 353-5093, ext. 31)
Director of Executive M.P.A. Program: Professor Dorothy Olshfski, Room 716, Hill Hall (973 / 353-5093, ext. 19)
Director of Ph.D. Program: Professor Marc Holzer, Room 726, Hill Hall (973 / 353-5093, ext. 23)

Members of the Graduate Faculty

Professors:

Raphael Caprio, FAS–N; Ph.D., Rutgers
Urban geography; housing; land development
Melvin J. Dubnick, FAS–N; Ph.D., Colorado (Boulder)
Public administration and American government
Dennis Gale, FAS–N; Ph.D., George Washington
Urban planning
Marc Holzer, FAS–N; Ph.D., Michigan
Public sector productivity; international public administration
Robert Klein, FAS–N; M.A., Columbia
Local government budgeting and urban politics
Norma Riccucci, FAS–N; Ph.D., Syracuse
Personnel management

Associate Professors:

Maria Canino, FAS–N; Ed.D., Harvard
Education; administration and social welfare policy
Gerald J. Miller, FAS–N; Ph.D., Georgia
Local and state budgeting and finance
Meredith Newman, FAS–N; Ph.D., Deakin
Human resource administration and gender issues
Dorothy Olshfski, FAS–N; Ph.D., Temple
Management theory and assessment practice
Evan Stark, FAS–N; Ph.D., SUNY (Binghamton)
Health care policy; organizational development

Assistant Professors:

Lynn Burbridge, FAS–N; Ph.D., Stanford
Political economy; policy and program assessment
Kathe Callahan, FAS–N; Ph.D., Rutgers
Citizen participation and performance measurement

Adjunct Members of the Graduate Faculty:

Tom Hogan, FAS–N; M.P.A., Pennsylvania State
Strategic planning and management
Alma Joseph, FAS–N; Ed.D., Rutgers
Human resources administration; leadership; analytical methods

Raymond Schwartz, FAS–N; M.S., Columbia
Information system and technology management
Alan Zalkind FAS–N; M.P.A., New York
Human resources administration and management

Programs

Master of Public Administration

Public administration is an interdisciplinary and interinstitutional program of professional training for people who are working in the public or nonprofit sectors or preparing to enter those fields. The department offers the M.P.A. degree at two locations: an on-campus program in Newark and an executive M.P.A. program in the Trenton area. Both programs are accredited by the National Association of Schools of Public Affairs and Administration (NASPAA).

Courses offered by the Department of Public Administration of the Graduate School–Newark are supplemented by course offerings at the Newark College of Arts and Sciences, the School of Law–Newark, the Graduate School of Management, and the School of Criminal Justice. In addition, certain helpful courses are available from the New Jersey Institute of Technology and the University of Medicine and Dentistry of New Jersey.

In addition to giving the student the basic professional competencies in public administration, the program provides a broad understanding of the field and its relevant issues. Students become competent at defining public problems, analyzing quantitative and qualitative data, developing creative solutions, communicating these solutions to others, and implementing ethical and practical courses of action. Issues examined include the complexities of urban and suburban problems, the operation of public and nonprofit organizations, the expectations and rights of clients that these organizations serve, and the responsibilities of management.

Candidates for the M.P.A. degree must complete 42 credits, including a core curriculum of 30 credits and 12 credits of electives. The degree requirements include a capstone course with a paper or comprehensive examination. In addition, those students without work experience in a public or nonprofit agency must complete an internship for a minimum of three months at an agency or institution. They do this work under the guidance and supervision of a faculty member and a supervisor at the agency. The program makes an effort to ensure that the internship is relevant to the educational needs of the student and to the operating needs of the agency.

Attending part time, students can earn the degree in about three years. The program may grant credit for past or present public service at the professional level. In addition, the M.P.A program may allow students to transfer credits for graduate work done previously under a formal graduate degree program at an accredited institution. There is a 12-credit limit, however, on the total number of credits a student can receive through a combination of prior graduate course work and professional experience. Similarly, no more than 12 credits may be awarded for either transfer credits or professional experience alone.

Joint B.A. or B.S./M.P.A.

This five-year program makes it possible for qualified students to earn a baccalaureate degree from the Newark College of Arts and Sciences or University College–Newark and a master's degree from the Graduate School–Newark. The program is designed for the highly motivated student who has decided at an early stage in his or her studies to pursue a career in public administration. The program requirements are:

1. completion of 94 undergraduate credits in liberal arts subjects and meeting the general education requirements of Newark College of Arts and Sciences / University College–Newark,
2. completion of an undergraduate major at Newark College of Arts and Sciences / University College–Newark,
3. a cumulative grade-point average of 3.20 or better at Newark College of Arts and Sciences / University College–Newark,
4. Graduate Record Examination test score (junior year) acceptable to the graduate program in public administration.

Application for early admission to the graduate program in public administration is made at the beginning of the second term of the junior year. Upon satisfactory completion of 30 credits in the graduate program, those students receive their B.A. or B.S. degree from Newark College of Arts and Sciences / University College–Newark. When the students complete satisfactorily the remaining requirements of the graduate program, they are awarded a master of public administration degree. Upon their admission to the graduate program in public administration, students are bound by the academic regulations and degree requirements of the Graduate School–Newark.

Core Curriculum for the M.P.A. M.P.A. students must complete ten 3-credit core courses (30 credits) from four clusters. Whenever possible, courses from cluster one should be taken before those in cluster two. Courses in cluster four are taken toward the end of the master's course work.

Core Curriculum Cluster One

26:834:501	Introduction to Public Administration (3)
26:834:521	Technology and Public Administration (3)
26:834:541	Political Economy and Public Administration (3)
26:834:561	Analytic Methods (3)

Core Curriculum Cluster Two

Select two from the following:

26:834:522	Public Organizations (3)
26:834:523	Human Resources Administration (3)
26:834:524	Strategic Planning and Management (3)
26:834:525	Management Techniques (3)
26:834:526	Public and Nonprofit Productivity (3)
26:834:529	Performance Measurement (3)*
26:834:582	Health Care Management (3)

Core Curriculum Cluster Three

Select one from the following:

26:834:542	Government Budgeting Systems (3)
26:834:543	Public Financial Management (3)
26:834:571	Nonprofit Budgeting (3)
26:834:576	Resource Development for Nonprofit Organization (3)

Core Curriculum Cluster Four

26:790:512	Ethical Issues in Public Policy and Administration (3)
26:834:562	Research Design (3) (formerly Policy and Program Assessment)
26:834:563	Capstone (3) (formerly Project in Policy and Program Assessment)

Electives for the M.P.A. Four 3-credit courses (12 credits) are required to complete the 42-credit curriculum. After the core curriculum cluster one is completed, electives may be sequenced throughout a student's program. Students may select electives from the following courses. With the approval of their advisers, students also may take electives in other departments to fit their individual educational and career goals.

Electives in General Public Administration and the Environment

26:834:503	Topics in Public Administration (3)
26:834:504	Topics in Public Administration (3)
26:834:505	Intergovernmental Management (3)
26:834:507	Leadership (3)
26:834:703	Internship in Public Administration (3)

Electives in Management Theory and Skills

26:834:524	Strategic Planning and Management (3)
26:834:525	Management Techniques (3)
26:834:526	Public and Nonprofit Productivity (3)
26:834:528	Information Systems and Public Administration (3)
26:834:572	Cases in Public and Nonprofit Productivity (3)

* Pending approval by the courses of study committee.

Electives in Economics, Budgeting, and Finance
- 26:834:520 Municipal Financial Administration (3)
- 26:834:543 Public Financial Management (3)
- 26:834:545 Capital Budgeting (3)
- 26:834:546 Infrastructure Finance (3)
- 26:834:568 Government Revenue Systems (3)
- 26:834:576 Resource Development for Nonprofit Organization (3)

Electives in Analytic Techniques
- 26:834:564 Research Design II (3) (formerly Analytic Methods II)

Electives in Health Care and Environmental Health
- 26:834:581 Introduction to Health-Care Systems (3)
- 26:834:582 Health-Care Management (3)
- 26:834:584 Health-Care Finance (3)
- 26:834:585 Health-Care Policy (3)
- 26:834:586 Violence in the U.S. (3)

Electives in Urban Educational Administration and Leadership
- 26:834:554 Public School Finance (3)*
  Urban School Leadership and Communications (3)*
  Urban Educational Policy (3)*
  Leadership in Curriculum, Instruction and Assessment (3)*
  Foundations of Urban Educational Administration and Supervision (3)*
  Public Education Law Seminar (3)*

Electives in Nonprofit Management
- 26:834:570 Theory and Practice of Nonprofit Management (3)
- 26:834:571 Nonprofit Budgeting (3)
- 26:834:575 Grant Writing and Grants Management (3)
- 26:834:576 Resource Development for Nonprofit Organizations (3)
- 26:834:577 Human Resource Management for Nonprofits (3)
- 26:834:578 Strategic Planning and Management for Nonprofits (3)

Public Service and Professional Education Activities

In addition to their academic activities, faculty members contribute to a variety of government and public and nonprofit management education programs. Prominent among these are the Joseph C. Cornwall Center for Metropolitan Studies and the National Center for Public Productivity. The Cornwall Center was established to shed light on the dual nature of cities, including the complex dynamics shaping the quality of life in metropolitan areas. Funded by public organizations and foundations, the National Center conducts research and training on measuring and improving public agency productivity. As part of its mission, the National Center makes annual Exemplary Awards in State and Local Government and publishes jointly with the American Society for Public Administration, the Public Performance and Management Review, a quarterly journal. The department also sponsors the journals Public Voices and the Chinese Public Administration Review.

Certificate Programs

Certificate in Nonprofit Management

Students seeking the Certificate of Nonprofit Management normally complete four core courses: 26:834:523 Human Resource Management for Nonprofits, 26:834:524 Strategic Planning and Management for Nonprofits, 26:834:570 Theory and Practice of Nonprofit Management, and 26:834:571 Nonprofit Budgeting. These courses are offered in the summer.

Three of those courses (Human Resource Management for Nonprofits, Strategic Planning and Management for Nonprofits, and Nonprofit Budgeting) count toward the core requirements and Theory and Practice of Nonprofit Management counts as an elective for students who decide to matriculate into the M.P.A. program. Certificate students must receive a grade of B or better in each of the certificate courses, and all certificate courses must be taken at Rutgers–Newark.

Certificate of Advanced Professional Training in Public Administration

Students who complete successfully a 12-credit sequence of designated courses are awarded a certificate of advanced professional training. The certificate program is particularly useful for professionals holding a master's degree in areas such as nursing, education, or social work. Students seeking the Certificate of Advanced Professional Training in Public Administration normally complete four core courses: 26:834:501 Introduction to Public Administration, 26:834:522 Public Organizations, 26:834:541 Political Economy and Public Administration, and 26:834:542 Government Budgeting Systems.

Certificate students must receive a grade of B or better in each of the certificate courses, and all certificate courses must be taken at Rutgers–Newark.

Doctor of Philosophy

The doctor of philosophy program in public administration trains prospective faculty, researchers, and public sector leaders. Before enrolling, applicants must have received an M.P.A. degree or other relevant master's degree. In addition to public administration, the Ph.D. program considers applicants holding advanced degrees from a variety of degree areas, including political science, social work, education, law, or public health.

Areas of possible concentration include productive public management, comparative public administration and global governance, public policy analysis, and urban systems. Specialized courses also are available in such areas as organization theory and behavior, leadership, ethics, budgeting and public finance, urban services, and quantitative methods.

Most core curriculum classes typically meet on Monday through Thursday afternoons. Electives and courses offered through the other departments usually meet in the early evenings. Students may also take elective offerings as courses of independent study or at other Rutgers campuses.

Consideration of applications begins in early February and continues after that on an open basis. Applicants, particularly those in need of financial aid, are encouraged to apply as early as possible. It is particularly important for applicants without recent entrance exams (such as the GRE or GMAT) to have prepared for and taken the GRE before submitting an application.

Approximately ten students are accepted each year, and all are required to complete at least 6 credits of course work per term before they sit for the examinations.

The academic requirements for the doctorate include at least 48 credits of course work beyond the master's degree, successful completion of a series of comprehensive examinations, and the completion of an acceptable doctoral dissertation.

A limited number of graduate fellowships, providing for tuition and a stipend, are awarded on a competitive basis through the Graduate School–Newark.

Possible Schedule of Progress for Full-Time Students

year 1 + summer	24 course credits
year 2 + summer	24 course credits
year 2 + mid	comprehensive exams
year 3 fall	dissertation proposal
year 3–year 4	dissertation

Students may take longer to complete the degree depending upon the number of credits taken each term, progress on the exams, development and approval of the dissertation proposal, and completion of the dissertation.

* Pending approval by the courses of study committee.

Qualifying Examination. Qualifying examinations must be taken within three years of a student's entry into the program. A student will be allowed only two attempts to pass the examination.

Dissertation. Once a student has completed all course work, he or she must maintain student status by registering in either dissertation research (when applicable) or matriculation continued. Either registration will keep students on the active roles when they have not registered for course work.

Each candidate for the doctorate shall produce, under faculty direction, a dissertation that is an original investigation of a problem or a collection of problems leading to a significant contribution in the field of concentration. While the student is working on a dissertation, he or she must enroll regularly for dissertation credit. Students must register for a total of 24 dissertation credits prior to graduation. The decision on how many credits a student registers for each term is subject to discussion with the program director.

Every student must submit a formal proposal representing the projected content of his or her dissertation. The dissertation proposal committee shall act as an advising group for the candidate. After he or she completes successfully the comprehensive examinations, each student then selects an adviser, who becomes chairperson of that student's dissertation committee. The student is required to work with the faculty adviser on developing the proposal and should look to that adviser as a primary source of guidance and supervision. As the work progresses, the student is encouraged to consult with other potential members of the dissertation proposal committee.

The dissertation proposal committee normally consists of four or five members, with one of the members coming from outside the core faculty of the program. Preferably, this outside member should come from an institution other than Rutgers.

Once the student has worked out a draft proposal, he or she meets with the faculty adviser and other members of the dissertation proposal committee to discuss the draft. As the research progresses, the student must keep the dissertation proposal committee informed on how the research is progressing and allow the committee members to assist in its development. The committee agrees to give ample and early warning of any reservations it might have about the student's progress. The panel must specify in writing any changes it will require for dissertation acceptance.

Dissertation Defense. An oral defense of the dissertation is required after submission of the final document to the dissertation committee for approval. The student must get signatures of all members of the dissertation committee for final approval of the dissertation to be granted.

Doctoral Core Curriculum in Public Administration

Theoretical Foundations (12 credits)

26:834:601 The Study of Public Organizations (3)
26:834:602 Decision Making and Policy Analysis (3)
26:834:603 Public Administration in a Democratic Society (3)
26:834:611 Administrative Politics (3)*

Performance Applications (12 credits)

26:834:604 Performance Improvement in Public Administration (3)
26:834:605 Government Budgeting and Resource Acquisition (3)
26:834:606 Administrative Law (3)
26:834:612 Performance Measurement and Evaluation (3)*

Prerequisite for Methods Sequence

Analytic Methods. All students should have taken an introductory statistics course before entering the program. In addition, each student must pass a placement examination at orientation or present evidence of strong preparation (i.e., multiple courses) in quantitative methods. As a result of his or her exam scores, a student may be required to take Analytic Methods at the M.P.A level in the first term. If so, this course will not count toward the doctoral methods requirement.

Acceptable preparation would include (1) measures of central tendency, (2) frequency distributions, (3) measures of dispersion (e.g., the standard deviation), (4) elementary probability theory, (5) normal and binomial distributions, (6) elementary sample theory, (7) confidence intervals, (8) tests of hypotheses and significance, (9) chi-square test, (10) correlation analysis, (11) simple regression, and (12) use of statistical computer programs.

Research Methodology (12 credits)

26:834:561 Analytic Methods (0)
(Required for students without adequate preparation in statistical skills; may be waived for students with significant quantitative background.)
26:834:607 Quantitative Methods I (3)
26:834:609 Qualitative Methods in Public Administration (3)
26:834:610 Logic of Inquiry in Public Administration (3)
26:834:611 Research Seminar (3)
Students must take another 3 credits in either qualitative or quantitative research methods. The department offers a course that may be used to fulfill this requirement:
26:834:608 Quantitative Methods II (3)
The Department of Economics also offers a course that may fulfill this requirement:
26:220:507 Econometrics I (3)
With the approval of an adviser, a qualitative or quantitative research methods course also may be elected from other departments throughout the university.

Area of Specialization (12 credits; may include additional methodology courses)

(1) Productive Public Management
(2) Comparative Public Administration and Global Governance
(3) Public Policy Analysis
(4) Urban Systems
(5) Other areas if approved by the program director

Dissertation Research (24 credits)

Graduate Courses

General Public Administration and the Environment

26:834:501. Introduction to Public Administration (3)
Concepts and methods for analyzing significant factors and relationships in governmental agencies and nonprofit organizations as they function in their environments. Students identify and diagnose the principal types of problems encountered at levels of high administrative responsibility in government and the nonprofit sector.

26:834:503,504. Topics in Public Administration (3,3)
Examination of selected issues and problems in public sector administration and management. The specific area within which issues are presented varies, but it may include health, public policy, human resources, and specialized topics. Students should check with the department to determine the precise curriculum to be offered in a given term.

26:834:505. Intergovernmental Management (3)
Management issues associated with administrative relationships among the levels of government in the United States, including fiscal and regulatory relations.

26:834:507. Leadership (3)
Leadership vs. management; leadership qualities and characteristics; leadership skills, such as conflict management and team building; leadership tasks, including vision, agenda setting, and mobilizing resources; leadership in organizational and political settings; role of followership; and impact of diversity upon leaders and leadership.

* Pending approval by the courses of study committee.

26:834:508. Public Accountability (3)*
Examines role of accountability in public and not-for-profit agencies, with special attention to legal, professional, bureaucratic, and political accountability systems. Stress placed on managerial, behavioral, and ethical issues of various accountability mechanisms.

26:790:512. Ethical Issues in Public Policy and Administration (3)
Consideration of selected ethical problems and dilemmas facing policymakers and public administrators. These issues include conflict of interest, confidentiality, deception, official disobedience, whistle-blowing, and record-keeping, as well as questions of distributive justice in health care and employment opportunities. Special attention given to conflicts between expedience and principle in policymaking and policy implementation. Readings in political theory and political ethics, as well as cases and commentary.

26:834:575. Grant Writing and Grants Management (3)
Grant writing and management for public and nonprofit agencies: proposal writing, promotional and support materials, budget development, fund-raising sources, grants-management system.

26:834:576. Resource Development for Nonprofit Organizations (Fund-Raising) (3)
Emphasizes best practices and provides practical experience in the methods that nonprofits use to ensure that their objectives are financed by means other than grants. The study of fund-raising encompasses strategic planning for annual giving, major gifts, and planned giving. Attention given to specific fund-raising techniques: stewardship training, case statements, direct mail, telephone solicitation, special events, lapsed donors, taxation and bequests, and capital campaigns.

26:834:703. Internship in Public Administration (3)
Participation in activities of an agency or institution under supervision of a faculty member and supervisor in the agency. Requires reports and analyses of activities.

Management Theory and Skills

26:834:521. Technology and Public Administration (3)
Implications of computer hardware and software issues for public sector management, with particular emphasis on applications of microprocessors. Includes a survey of database management problems, control, resource allocation, communications, and networking issues. Laboratory exercises required.

26:834:522. Public Organizations (3)
Theories of organizational behavior and performance as applied to public and nonprofit sector agencies; includes organizational authority systems, relationships between public and private organizations, development and fulfillment of organizational mandates in the public sector, and use of resources within organizations.

26:834:523. Human Resources Administration (3)
Human resource administration in public and nonprofit settings, including human resource planning, staffing, development, and compensation. Behavioral and environmental determinants are examined, including production technology, market factors, service delivery, and government regulations.

26:834:524. Strategic Planning (3)
Strategic planning and management in the public and nonprofit sectors, including methods that facilitate achieving organizational goals in a changing environment. Attention paid to forecasting, goal and objective setting, strategy building, and resource mobilization.

26:834:525. Management Techniques (3)
Problem-solving techniques that focus on effective managerial performance. Productivity and management improvement assessment techniques, including networking, queuing, simulations, linear programming quality-control approaches, focus groups, and the delphi technique.

26:834:526. Public and Nonprofit Productivity (3)
Analysis and critique of the most recent research on productivity in public organizations, with particular attention to human factors, work processes, effective-outcome measurement, and labor-management relations.

26:834:527. Cases in Public and Nonprofit Productivity (3)
Interrelates conceptual works in productivity with case studies that describe actual operations of public productivity programs. Cases cover concepts of measurement, management, technology and capital investment, and labor-management relations, with an emphasis on understanding the linkages between theory and practice.

26:834:528. Information Systems and Public Administration (3)
Focus on practical application of management information systems in the public sector through case studies and implementation strategies. Looks at such topics as databases, system architecture, data normalization, benefit-cost analysis; offers an introduction to programming. General familiarity with personal computers is required.

26:834:529. Performance Measurement (3)*
Assessment of organizational performance, with particular attention to concepts of efficiency, effectiveness, outputs and outcomes. Examines evaluation design, data collection procedures, data analyses, and citizen involvement.

26:834:582. Health Care Management (3)
Focus on major social and political issues involved in the organization, delivery, and management of health-care systems.

Economics, Budgeting, and Finance

26:834:541. Political Economy and Public Administration (3)
Explores basic economic concepts and applies them to relevant public-administration issues. Looks at microeconomic and macroeconomic problems as they impact the public and nonprofit sectors.

26:834:542. Government Budgeting Systems (3)
Budget concepts and processes used by the American governments and their administrative units. Provides essential skills and experience in budgetary analysis and management applicable to nonprofit as well as public sector agencies.

26:834:543. Public Financial Management (3)
Surveys all major activities that concern the allocation, investment, and control of public funds. Activities include financial analysis, cash and pension fund investing, accounting, auditing, and financial reporting. Touches upon questions of budgeting and revenues in the context of fiscal policymaking.

26:834:544. Municipal Financial Administration (3)
Development of budget, accounting, and auditing systems to meet the needs for planning and management of government programs at the state and local levels.

26:834:545. Capital Budgeting (3)
All aspects of capital budgeting, including what is appropriately included in capital budgets, what governments use capital budgets and why, how to create a capital improvement plan, and how to convert a capital improvement plan into a capital budget.

26:834:546. Infrastructure Finance (3)
Implementation of the financing of a capital improvement plan for infrastructure items, such as streets, parks, public utilities, and other public works. Short- and long-term methods of financing, and the mix of markets in which funds may be sought. Emphasis on the latest financial tools created among investment banks in the public finance area. Fieldwork required.

* Pending approval by the courses of study committee.

26:834:547. GOVERNMENT REVENUE SYSTEMS (3)
Creation and management of the revenue systems of a state or local government. Focus on taxes, fee for services, intergovernmental aid, and interest income. Laboratory application and fieldwork required.

26:834:561. ANALYTICAL METHODS (3)
Quantitative methods in the analysis of planning and management problems. Includes descriptive statistics, statistical distributions, probability, hypothesis development, significance testing, correlation, contingency table analysis, and regression.

26:834:562. RESEARCH DESIGN (3)
(Formerly Policy and Program Assessment)
Prerequisite: 26:834:561.
Comprehensive literature review, methodology, and data collection strategies. Students develop full research proposal including research question; those who are writing a paper as their capstone requirement use this proposal as the basis for their paper.

26:834:563. CAPSTONE (3)
(Formerly Project in Policy and Program Assessment)
Prerequisite: 26:834:562.
Final required course of self-directed study. Students who opt for a capstone paper will write their paper. Students sitting for the comprehensive exams will prepare for their exams.

26:834:564. RESEARCH DESIGN II (3)
(Formerly Analytic Methods II)
Multivariate statistical models as they apply to problems in the public and nonprofit sectors. May include multivariate and nonlinear regression, ANOVA, factor analysis, clustering techniques, models to analyze regional income, employment, and transportation problems; introduction to GIS.

Health Care and Environmental Health

26:834:581. INTRODUCTION TO HEALTH-CARE SYSTEMS (3)
Provides an overview of the health-care system in the U.S., including a survey of health-care uses, providers, financing, and quality of care issues.

26:834:582. HEALTH-CARE MANAGEMENT (3)
Focus on major social and political issues involved in the organization, delivery, and management of health-care systems.

26:834:584. HEALTH-CARE FINANCE (3)
Processes and methods of financial management in the health-care industry. Patterns of health-care expenditures, methods of financing health care, financial planning and development, third party reimbursement, and controls in health institutions management.

26:834:585. HEALTH-CARE POLICY (3)
Analysis, development, implementation, and evaluation of policies and programs affecting health. Focuses on health-care institutions, with some attention to managing health problems with nonmedical interventions at the community level. Uses the case method applied to realistic situations in which specific decisions must be made by health managers or officials.

26:834:586. VIOLENCE IN THE U.S. (3)
Life-cycle approach to violence, including violence against children; juvenile, domestic, male-male, and cultural violence. With each type of violence, examination of historical and empirical dimensions of the problem; current theories about dynamics and causality, and the likely efficacy of current and proposed interventions. Emphasis placed on class, racial, and gender inequalities.

Urban Educational Administration and Leadership

26:834:554. PUBLIC SCHOOL FINANCE (3)*
The course covers the educational decision making process in the political and economic systems in which they exist. Particular attention is given the tax structures which yield the resources directly supporting education, especially the property tax, as well as non tax resources and the federated governmental structure through which they pass.

URBAN SCHOOL LEADERSHIP AND COMMUNICATIONS (3)*
Through an examination of school administration, leadership, and supervision literature and its application to urban districts, prospective school administrators analyze the complexities of urban school problems and improvement.

URBAN EDUCATIONAL POLICY (3)*
Through a historical, sociological, and political analysis of educational problems, this course explores a variety of policy initiatives and reforms, including curriculum and learning standards, school choice, tuition vouchers, charter schools, privatization, and whole school reform.

LEADERSHIP IN CURRICULUM, INSTRUCTION, AND ASSESSMENT (3)*
Explores recent policies and practices in curriculum, instruction, and assessment, including recent debates about national and state curriculum and learning standards and how to assess them. Special attention focuses on the New Jersey State Core Curriculum standards, various instructional strategies to teach these, and their assessment.

FOUNDATIONS OF URBAN EDUCATIONAL ADMINISTRATION AND SUPERVISION (3)*
Drawing upon the literature on school administration and leadership, theories and practices are applied to the specifics of urban schools and urban school reform. Within this context, students explore how school administrators can be at the center of school restructuring and revitalization.

PUBLIC EDUCATION LAW SEMINAR (3)*
This seminar deals with the basic legal structure of the public education system and explores a range of current legal and educational policy issues confronting the public schools.

Certificate in Nonprofit Management

Core Courses

26:834:570. THEORY AND PRACTICE OF NONPROFIT MANAGEMENT (3)
Summer Session I
Introduces theory, history, structure, and management of nonprofit organizations. Emphasis is given to critical functions such as fundraising and grantsmanship, financial management and budgeting, marketing and communications, leadership styles, and monitoring and evaluation.

26:834:571. NONPROFIT BUDGETING (3)
Summer Session III
Introduces budget concepts and processes used by nonprofits; provides essential skills and experience in budgetary analysis and management for nonprofit agencies and organizations.

26:834:577. HUMAN RESOURCE MANAGEMENT FOR NONPROFITS (3)
Summer Session I
Explores concepts, practices, and strategies of human resource planning; staff development, compensation, and evaluation. Emphasizes volunteer management, staff-board and trustee relationships.

* Pending approval by the courses of study committee.

26:834:578. Strategic Planning and Management for Nonprofits (3)
Summer Session III
An integrated overview of theory, processes, and practices emphasizing methods and techniques for achieving nonprofit organizational goals and customer satisfaction

Doctoral Courses

26:834:601. The Study of Public Organizations (3)
Basic approaches that underlie a wide variety of explanations of structure and behavior in complex organizations, particularly public organizations.

26:834:602. Decision Making and Policy Analysis (3)
Logic, form, use, and critical assessment of decision making and policy analysis in public administration. Development of a practical yet critical perspective on policy analysis and its role in public administrative decision making and behavior.

26:834:603. Public Administration in a Democratic Society (3)
Seminar on issues surrounding the role of public sector institutions in modern societies, with special attention to the relationship between administrative and democratic institutions.

26:834:604. Performance Improvement in Public Administration (3)
Assessment and improvement of organizational performance. Topics include the specification of goals and objectives; the identification of outputs and outcomes; and impact analysis, including unintended consequences of public programs. Emphasis placed on management improvement strategies.

26:834:605. Government Budgeting and Resource Acquisition (3)
Literature on budgeting and budget, both operating and capital, in federal, state, and local governments. Particular attention to the individual and organizational factors that intertwine to influence budget making in a political environment.

26:834:606. Administrative Law (3)
Administrative aspects of law making and interpretation, with particular attention to the relevant functions of public agencies. Emphasizes contemporary issues of the workplace, of products, and of environmental standards. Examines due-process rights within many contexts, rights and responsibilities toward anyone in a public or quasi-public role, and personal responsibilities as professionals.

26:834:607,608. Quantitative Methods I,II (3,3)
Basic research skills, including research design, data collection procedures, and statistical methods. Logic and philosophy of social science research, with special attention to current methodological issues and controversies.

26:834:609. Qualitative Methods in Public Administration (3)
Qualitative approaches to social science inquiry, including concepts of research epistemology, interpretive research design, and specific nonquantitative techniques, such as interviewing and case studies. Complements a structured format (assigned reading and class activities) with a field-based research project.

26:834:610. Logic of Inquiry in Public Administration (3)
Introductory class in the Ph.D. programs methods sequence, designed to provide students with a critical appreciation and understanding of various approaches to the study of public administration and public affairs. Initial focus on foundations of social science inquiry, with special attention to influence of empirical, positivist, behavioral, and rational-choice approaches; application of each approach in quantitative and qualitative research designs.

26:834:611. Administrative Politics (3)*
Bureaucratic power as a function of expertise, information, and coalition building. The importance of administrative discretion, political sensitivity, and skill. Political relationships among individuals, work groups, agencies, and other entities. American political institutions and processes.

26:834:612. Performance Measurement and Program Evaluation (3)*
The assessment of organizational performance, with particular attention to concepts of efficiency, effectiveness, outputs, and outcomes. Evaluation design, data collection procedures, data analyses.

26:834:613. Citizen Participation and Productive Management (3)*
This course analyzes various approaches to the relationship between citizen participation and productive public management. It explores factors influencing citizen involvement. It examines potential benefits and dysfunctions of an active citizenry. An important focus is on the role of public administrators in creating structures and networks to encourage citizens to work with officials in policy development and implementation.

26:834:698. Independent Study in Public Administration (3)
Independent research on a topic related to public administration under the guidance of an adviser.

26:834:701. Dissertation Research in Public Administration (3)
Develop and complete a Ph.D. dissertation in public administration.

URBAN SYSTEMS 977
(Joint Ph.D. Program with NJIT and UMDNJ)

Degree Program Offered: Doctor of Philosophy
Director of Doctoral Program: Dr. Joseph M. Holtzman (973 / 972-8564; email: urban_sys@umdnj.edu)
Coordinator of Urban Health Specialization: Dr. Elizabeth S. Parietti (973 / 972-0748 or 3876; email: parietes@umdnj.edu)
Coordinator of Urban Environment Specialization: Professor Peter C. Papademetriou (973 / 596-3078; email: papadem@njit.edu)
Coordinator of Urban Educational Policy Specialization: Professor Alan Sadovnik (973 / 353-1216; email: sadovnik@andromeda.rutgers.edu)

The Ph.D program in urban systems, which is offered jointly by the Graduate School–Newark, New Jersey Institute of Technology (NJIT), and the University of Medicine and Dentistry of New Jersey (UMDNJ), draws upon the strengths of all three schools. It prepares students for research in urban systems and participation in the development, implementation, and evaluation of policies and services for urban populations. Program participants conduct original research in urban systems and apply lessons gained from the social sciences to improving urban services, planning, design, and policies.

The program requires 72 credits for the doctorate. It has three specializations: (1) urban health systems (2) urban environmental studies and 3) urban educational policy. Faculty members come from the health sciences, architecture, public administration, political science, economics, planning and policy, history, management, information systems, and computer sciences.

* Pending approval by the courses of study committee.

Graduates have a wide range of career options, including work as university faculty members and researchers, government executives in policy and planning posts, and as analysts and administrators in various health-care fields. They also are equipped to take positions as directors of foundations, political organizations, environmental groups, and architectural associations.

Admission to the Program

Applicants to the Ph.D. program in urban systems should demonstrate academic and professional achievement, scholarly potential, and interpersonal skills. While a master's degree is preferred, outstanding individuals without an M.A. degree also are considered. Materials required for admission include:

- Completed application form.
- Scores from the Graduate Record Examination or equivalent examinations (such as MCAT, GMAT, DAT). Inquiries about substituting other examinations should be addressed to the program director.
- Competitive scores on the Test of English as a Foreign Language (TOEFL) for all students whose first language is not English.
- Official transcripts of all prior academic work.
- Three letters of recommendation (faculty preferred).
- Written statement of purpose.
- Interview (optional).

Application forms are available from the Office of University Admissions, New Jersey Institute of Technology, University Heights, Newark, NJ 07102. Prospective students also may acquire applications by calling 973 / 596-3300 or by visiting the NJIT web site at http://www.njit.edu/admissions/apply.html.

Curriculum

The curriculum consists of a 21-credit core grouping, a 12-credit research component, 15 credits in specialization courses, and a 24-credit dissertation sequence.

Core Courses

- History and Future of the Metropolis
- Urban Populations: Demography and Trends
- Urban Planning and Policy Development
- Urban Government and Politics
- Urban Economic Systems
- Urban Health Systems: History, Structure, and Challenges
- Elements of Infrastructure Planning

Research Courses

- Logic of Scientific Inquiry
- Research Seminar I: Quantitative Methods
- Research Seminar II: Qualitative Methods
- Early Research Program

Major Specializations

Urban Health Systems Specialization

Students complete 15 credits in this area, taking 9 from required courses and picking up the remaining 6 credits from electives. Under a systems approach, students employ knowledge and techniques from several disciplines to study the complex web of health-care delivery to urban populations. They explore economically viable alternatives to traditional delivery systems, propose health policy solutions, address ethical implications for delivery alternatives, and assess outcomes. Course work exposes students to research on the health status of urban populations, their health beliefs and practices, and health informatics (the social impact of computerization). They also look at theories related to public policy, planning, health economics, evaluation and outcomes of health delivery methods, health law, and related topics. The required courses for this specialization are (1) Health Status of Urban Populations, (2) Health Beliefs and Practices of Urban Populations, and (3) Survey of Health Informatics.

Urban Environment Specialization

Students complete 15 credits in this area, taking 9 from required courses and picking up the remaining 6 credits from electives. They study the physical and spatial complexities of the built domain and the forces that gave rise to such urban manifestations as rapid social change, frequent demographic shifts, technological innovations, and shifting public policies. The curriculum draws upon the related disciplines of architecture, architectural history, urban social science, and city planning. It exposes students to extensive scholarship and rigorous analysis of architectural and planning theory and practice. The required courses for this specialization are (1) Development of the American City, (2) Architecture and Health: The Pathology of Urban Systems, and (3) Architectural Perspectives in Urban Research.

Urban Educational Policy Specialization

In this specialization, which is under development, students will learn to think critically about systemic improvement of urban schools. The program helps participants connect the study of urban education to the history, sociology, politics, and economics of urban life. Students develop research-based knowledge of urban educational systems and practices through an interdisciplinary approach of course work, research, and internships. Using New Jersey's historic Abbott v. Burke case as a foundation, students examine urban educational reforms in the state's thirty urban Abbott districts. They look at whole school reform, mandated early childhood education, and equity financing. Students explore the limits and possibilities of urban educational policy in improving the quality and functioning of urban schools. Graduates are prepared to take positions as university faculty members; educational researchers and policymakers at the national, state, local, and foundation levels; and as policy analysts in school systems.

Core Curriculum Courses

HISTORY AND FUTURE OF THE METROPOLIS (3)
Examines the role of technology, culture, and economics in shaping the American city from the colonial era to the present. Themes and topics, which can vary, include trends in immigration, health, housing and demography, the role of transportation, the development of suburbia, and urban reform and renewal. A wide range of issues examined, using insights from the past to shed light on challenges faced by contemporary urban planners, policymakers, and residents. Students make extensive use of resources in the Newark and New York metropolitan areas through fieldwork and research.

URBAN POPULATIONS: DEMOGRAPHY AND TRENDS (3)
Description and analysis of characteristics of urban populations. Examines impact of immigration, fertility, ethnicity, and socioeconomic status on urban populations. Explores development of modern population centers, with focus on interactions among population growth, disease, and epidemics; looks at the public-health response, including regulation of the water supply, sanitation, and food purity and handling.

URBAN PLANNING AND POLICY DEVELOPMENT (3)
Discusses activities of urban governments, particularly in the use and development of urban land. Primary focus is on the way cities plan, regulate, and develop their resources. Looks at factors that constrain local officials, including a lack of economic management tools and the impact of state and federal policies. Students study scholarly materials on these themes and analyze programs currently used in American cities.

URBAN GOVERNMENT AND POLITICS (3)
Examines the political and governmental dimensions of the city. Students look at cities not only as part of the intergovernmental system but also as entities with their own political and governmental agendas. Many of the nation's most important national policy efforts are implemented on the local level, and city governments themselves formulate policies intended to address local problems.

URBAN ECONOMIC SYSTEMS (3)
Applies fundamental principles of classical economics to urban systems. Reviews basic theory of welfare economics, which underlies techniques of cost-benefit, cost-effectiveness, and cost-utility analyses. Also covers such traditional economic concepts as consumer demand, basic cost and production theory, opportunity cost, risk assessment, the valuation of time-streams and net benefits, problems of valuation, reimbursement, and techniques for monetary valuation. Special attention paid to the design, function, management, regulation, and evaluation of urban health, welfare, social, and educational systems.

URBAN HEALTH SYSTEMS: HISTORY, STRUCTURE, AND CHALLENGES (3)
In-depth analysis of social stratification, deviance, social control, and role performance as they apply to urban health-care systems. Specific topics include resource allocation, inequalities in health care, and the right to health care. Attention also paid to ethical issues in evolving health-care delivery systems.

ELEMENTS OF INFRASTRUCTURE PLANNING (3)
Introductory survey of basic principles; operation and design of physical infrastructure systems, including roads, public transportation, community facilities, public open space, surface drainage; electric, gas, water, waste disposal, and telecommunications services.

Governance of the University

State of New Jersey

James E. McGreevey, Governor of the State

Rutgers Board of Governors 2001–2002

Chair:
Gene O'Hara

Vice Chair:
Albert R. Gamper, Jr.

Members:
Joan L. Bildner
Ruben Cardona
Frederick D. DeSanti
Louis T. DiFazio
Ronald W. Giaconia
David Jefferson Harris, Jr.
Francis L. Lawrence, ex officio
Dean J. Paranicas
Thomas A. Renyi
Anne M. Thomas
Kathleen M. Scott, faculty representative
Arlene S. Walker-Andrews, faculty representative
Jason Miller, student representative

Secretary:
Mildred R. Schildkamp

Assistant Secretary:
Enrica Gioè Chrétien

Treasurer:
JoAnne G. Jackson

Rutgers Board of Trustees 2001–2002

Chair:
Duncan L. MacMillan, Princeton

Vice Chairs:
Leslie E. Goodman, Lawrenceville
Patricia Nachtigal, Upper Montclair

Members:
Jeffrey Barist, Short Hills
Henry E. Bartoli, Far Hills
Michael T. Beachem, Old Bridge
Joan L. Bildner, Short Hills
Michael A. Bogdonoff, Philadelphia, PA
Liam P. Brohan, Easton, PA
Ruben Cardona, Morganville
John Herbert Carman, Somesville, ME
Judith T. Caruso, Gillette
C.K. Chu, Westport, CT
Mary J. Chyb, North Brunswick
Clinton C. Crocker, Tinton Falls
Thomas G. Dallessio, Hopewell
Anthony J. DePetris, Camden
Frederick D. DeSanti, Brookside
Louis T. DiFazio, Mantoloking
Milita B. Dolan, Pembroke Pines, FL
Michael R. Dressler, Cresskill
Robert P. Eichert, Edison
Bruce G. Freeman, Princeton
Albert R. Gamper, Jr., Far Hills
Ronald W. Giaconia, Little Falls
Lucia DiNapoli Gibbons, Sparta
Rochelle Gizinski, Brick
David Jefferson Harris, Jr., New Brunswick
Gerald C. Harvey, Summit
John A. Hendricks, Whippany
Robert A. Hering, Watchung
Garry Katz, Cliffwood Beach
Kevin E. Kennedy, Red Bank
Robert K. Koehler, Convent Station
Robert A. Laudicina, Norwood
Francis L. Lawrence, ex officio
J. Bruce Llewellyn, New York, NY
Henry A. Lubinski, Fanwood
Michael C. MacDonald, Pittsford, NY
Vaughn L. McKoy, New Brunswick
Ernest C. Mueller, North Caldwell
Gene O'Hara, Rumson
Brian D. Perkins, Princeton
Eileen L. Poiani, Nutley
Richard J. Rawson, Neshanic Station
Lillian Ringel, Maplewood
Bethany Rocque-Romaine, Old Bridge
Michael T. Salpas, Annandale

Hector L. Sambolin, Jr., Sewaren
John J. Scally, Jr., Short Hills
Philip S. Schein, Bryn Mawr, PA
Kenneth M. Schmidt, New York, NY
Dorothy M. Stanaitis, Gloucester City
Abram J. Suydam, Somerset
Anne M. Thomas, Flemington
Karen M. Torian, Plainfield
Addie S. Wright, Marietta, GA
Guy N. Zazzara, Summit
Jason Redd, student representative
Kim Marie Wozniak, student representative
Michael D. Rohr, faculty representative
Mark C. Vodak, faculty representative
Felix M. Beck (emeritus), Livingston
Floyd H. Bragg (emeritus), North Brunswick
Peter Cartmell (emeritus), Rumson
Kevin J. Collins (emeritus), Saddle River
Carleton C. Dilatush (emeritus), Point Pleasant
Evelyn S. Field (emerita), Bridgewater
Carlton A. Holstrom (emeritus), Pipersville, PA
Paul B. Jennings (emeritus), Piscataway
Charles A. Jurgensen (emeritus), Newville, PA
Walter L. Leib (emeritus), Scotch Plains
Richard A. Levao (emeritus), Frenchtown
Norman Reitman (emeritus), Highland Park
George T. Reynolds (emeritus), Princeton
Alvin J. Rockoff (emeritus), North Brunswick
Marijane Singer (emerita), Woodcliff Lake
Edward J. Slotkin (emeritus), Bloomfield Hills, MI
Arthur L. Taub (emeritus), East Brunswick
Michael R. Tuosto (emeritus), North Brunswick
Mary Vivian Fu Wells (emerita), Matawan

Secretary:
Mildred R. Schildkamp, Monroe Township

Assistant Secretary:
Enrica Gioè Chrétien, Mountainside

Treasurer:
JoAnne G. Jackson, Piscataway

Administrative Officers

Universitywide

Francis L. Lawrence, Ph.D., President
Raphael J. Caprio, Ph.D., Vice President for Continuous Education and Outreach
Michael W. Carroll, M.A., Executive Director of the Rutgers University Foundation and Vice President for Development and Alumni Relations
Emmet A. Dennis, Ph.D., Vice President for Student Affairs and Dean, University College–New Brunswick
James L. Flanagan, Sc.D., Vice President for Research
Susan G. Forman, Ph.D., Vice President for Undergraduate Education
Marianne I. Gaunt, M.L.S., University Librarian
JoAnne G. Jackson, M.B.A., Senior Vice President and Treasurer
Mildred R. Schildkamp, B.S., Secretary of the University and Assistant to the President
David R. Scott, J.D., University Counsel
Joseph J. Seneca, Ph.D., University Vice President for Academic Affairs
Paul A. Snyder, Ph.D., Vice President for Institutional Research and Planning
Nancy S. Winterbauer, Ed.D., Vice President for University Budgeting

Camden

Roger J. Dennis, J.D., Provost
Felix James, J.D., Associate Provost for Community Outreach
Rory P. Maradonna, M.B.A., Associate Provost for Student Affairs
Mark Rozewski, M.C.R.P., Associate Provost for Administration and Finance

Newark

Norman Samuels, Ph.D., Provost and Dean, Graduate School–Newark
Harvey H. Feder, Ph.D., Associate Provost for Academic Programs
Carol L. Martancik, M.P.A., Associate Provost for Administrative Services
dt ogilvie, Ph.D., Associate Provost for Information Technology
Raymond T. Smith, Ed.D., Associate Provost for Student Affairs
Gene A. Vincenti, M.B.A., Associate Provost for Budget and Campus Development

Divisions of the University

ACADEMIC DIVISIONS

Rutgers, The State University of New Jersey, provides educational and research services throughout the state on campuses located in Camden, Newark, and New Brunswick. The principal university center is located in New Brunswick, where Rutgers originated two centuries ago.

Camden

Camden offers programs at three undergraduate colleges and at five graduate schools. With an enrollment of 5,000 students, it offers exceptional educational opportunities in addition to providing the advantages and resources associated with a major state university.

Faculty of Arts and Sciences–Camden
Margaret Marsh, Ph.D., Dean

Established in 1983 as a result of academic reorganization of the Camden campus, the Faculty of Arts and Sciences–Camden offers academic programs for undergraduate and graduate work in twenty-three arts and sciences disciplines and in a variety of interdisciplinary areas.

School of Business–Camden
Milton Leontiades, Ph.D., Dean

Established in 1988, the School of Business–Camden sets major requirements and teaches all courses leading to the Bachelor of Science degree in the professional areas of accounting and management. The School of Business also sets the major requirements and teaches all courses leading to a Master of Business Administration degree.

Camden College of Arts and Sciences
Margaret Marsh, Ph.D., Dean

A coeducational, liberal arts college, CCAS is the successor institution to the College of South Jersey, which was established in 1927 and became part of the state university in 1950.

University College–Camden
Margaret Marsh, Ph.D., Dean

University College–Camden is an evening college of liberal arts and professional studies serving part-time students since 1950.

Graduate School–Camden
Margaret Marsh, Ph.D., Dean

Graduate programs in the liberal arts were started in Camden in 1971 under the jurisdiction of the Graduate School–New Brunswick. The Graduate School–Camden was established as an autonomous unit in 1981.

School of Law–Camden
Rayman L. Solomon, J.D., Ph.D., Dean

Founded in 1926, the School of Law–Camden joined the university in 1950 as the South Jersey division of the School of Law–Newark. It became an independent unit of the university in 1967. The law school offers a curriculum leading to the degree of Juris Doctor, including advanced study in special areas.

Summer Session–Camden
Thomas Venables, Ed.D.

The Summer Session, begun in 1913 and established as a division of the university in 1960, offers a wide variety of graduate and undergraduate courses during three sessions in the summer months.

Newark

Newark offers programs at three undergraduate colleges and at four graduate schools. With an enrollment of approximately 10,000 students, it offers strong academic programs, excellent facilities, and an outstanding faculty.

Faculty of Arts and Sciences–Newark
Steven J. Diner, Ph.D., Dean

The Faculty of Arts and Sciences–Newark was established in 1985 to expand and strengthen the instructional program for undergraduate students at the Newark campus. The combined faculties of Newark College of Arts and Sciences and University College–Newark offer courses and academic programs in more than sixty subject areas.

Newark College of Arts and Sciences
Steven J. Diner, Ph.D., Dean

Founded in 1930 as Dana College, this undergraduate, coeducational, liberal arts college became part of Rutgers when the University of Newark was integrated into the state university in 1946.

College of Nursing
Hurdis Margaret Ann Griffith, Ph.D., Dean

The College of Nursing was established in 1956 as an expansion of the university's offerings in the former School of Nursing of the Newark College of Arts and Sciences. Its graduate program is conducted through the Graduate School–Newark.

University College–Newark
Steven J. Diner, Ph.D., Dean

University College–Newark is an evening and weekend college of liberal arts and professional studies serving part-time students since 1934. Within the context of the liberal arts tradition, University College students are offered a full range of courses and curricula, including programs in business and preparation for the professions leading to the degrees of Bachelor of Arts and Bachelor of Science.

Rutgers Business School–Newark and New Brunswick
Howard Tuckman, Ph.D., Dean

Established in 1993 as the Faculty of Management, Rutgers Business School offers undergraduate and graduate programs on or through the university's Newark and New Brunswick campuses. Rutgers Business School: Undergraduate–Newark is a four-year undergraduate school. It offers the bachelor of science degree jointly with either the Newark College of Arts and Sciences or University College–Newark. Degree programs are available in accounting, finance, management, and marketing. Rutgers Business School: Undergraduate–New Brunswick is a two-year, upper-division school offering programs in accounting, finance, management, management science and information systems, and marketing. The school admits students from Douglass, Livingston, Rutgers, and University colleges in their junior year. The bachelor of science degree is awarded jointly by the business school and the undergraduate college the student attended. Rutgers Business School: Graduate Programs–Newark and New Brunswick date from the Seth Boyden School of Business, which was founded in 1929 and incorporated into Rutgers in 1946. The school offers the master of business administration, an M.B.A. degree in professional accounting, a master of accountancy in taxation, a master of accountancy in governmental accounting, a master of accountancy in financial accounting, a master of quantitative finance, and a variety of dual degrees. The Ph.D. degree in management is offered jointly by the Graduate School–Newark and New Jersey Institute of Technology.

Graduate School–Newark
Norman Samuels, Ph.D., Dean

The Graduate School–Newark was established as a separate instructional division of the university with degree-granting authority in 1976.

School of Criminal Justice
Leslie W. Kennedy, Ph.D., Dean

The School of Criminal Justice, which opened in 1974, offers a graduate program that provides students with a sound foundation for work in teaching, research, or criminal justice management. The Master of Arts degree is offered through the school, and the Ph.D. degree is offered in conjunction with the Graduate School–Newark.

School of Law–Newark
Stuart L. Deutsch, J.D., Dean

The university's graduate programs in law originated in other institutions. The New Jersey School of Law, founded in 1908, and the Mercer Beasley School of Law, founded in 1926, merged in 1936 to become the University of Newark School of Law, which became part of Rutgers in 1946.

Summer Session–Newark

The Summer Session, begun in 1913 and established as a division of the university in 1960, offers a wide variety of graduate and undergraduate courses during three sessions in the summer months.

New Brunswick

The New Brunswick campus is the largest and most diversified of the university's three campuses, with 16 academic units, 1,800 faculty, and 33,000 students enrolled in undergraduate and graduate programs.

Faculty of Arts and Sciences–New Brunswick

Holly M. Smith, Ph.D., Executive Dean

Established in 1981 as a result of academic reorganization of the New Brunswick campus, the Faculty of Arts and Sciences–New Brunswick teaches all arts and science courses for undergraduate and graduate students in degree-granting units and sets the major requirements for all arts and science majors. Organized into disciplines and departments, it offers forty-four undergraduate major programs and twenty-nine graduate programs, which are administered by the Graduate School–New Brunswick.

Douglass College

Linda Stamato, Acting Dean

Founded in 1918 as the New Jersey College for Women, Douglass is the largest women's college in the nation. While maintaining rigorous standards of instruction in the fundamental disciplines of the liberal arts, Douglass supports and develops programs that link major courses of study to future careers. The college also implements special programs as well as independent activities designed to help women students develop the qualities required for achievement in any field of endeavor.

Livingston College

Arnold Hyndman, Ph.D., Dean

Livingston College opened in 1969 as a coeducational institution dedicated to serving a diverse student body reflecting the racial, ethnic, and socioeconomic composition of today's society. As a college of the liberal arts and professions, Livingston is committed to a multidisciplinary program that brings together a diverse group of students, faculty, and staff in a cosmopolitan community dedicated to learning.

Rutgers College

Carl Kirschner, Ph.D., Dean

Rutgers College was chartered in 1766 and is the original nucleus around which the university developed. Formerly an undergraduate college for men, it is now coeducational. Dedicated to the promotion of excellence in undergraduate education, Rutgers College provides its students with clear guidelines in the pursuit of a liberal arts education.

University College–New Brunswick

Emmet A. Dennis, Ph.D., Dean

University College–New Brunswick is an evening college of liberal arts and professional studies serving part-time students since 1934. Within the context of the liberal arts tradition, University College–New Brunswick students are offered a full range of courses and curricula, including programs in business and preparation for the professions leading to the degrees of Bachelor of Arts and Bachelor of Science.

Cook College

Ian L. Maw, Ph.D., Acting Dean

A coeducational and residential college, Cook offers undergraduate programs in various applied disciplines with an emphasis on environmental, agricultural, food, and marine sciences. Formerly the College of Agriculture and later the College of Agriculture and Environmental Science, Cook College adopted its present name in 1973. Graduate programs are offered through the Graduate School–New Brunswick.

Ernest Mario School of Pharmacy

John L. Colaizzi, Ph.D., Dean

First organized in 1892 and incorporated into the state university in 1927, the Ernest Mario School of Pharmacy offers a six-year professional program leading to the Doctor of Pharmacy (Pharm.D.) degree and a graduate program offering a post-B.S. Pharm.D. degree (both traditional two-year and nontraditional). Other graduate programs leading to advanced degrees through the Graduate School–New Brunswick are available. In addition, the college sponsors a continuing education program for the benefit of practicing pharmacists throughout the state.

Mason Gross School of the Arts

George B. Stauffer, Ph.D., Dean

This branch of Rutgers opened in July 1976. The school grants both undergraduate and graduate degrees. Formed to provide an education in the arts of the highest professional caliber, the school offers an M.F.A. degree in visual arts and theater arts; D.M.A., A.Dpl., M.M., and B.Mus. degrees in music; and a B.F.A. degree in visual arts, dance, and theater arts.

Rutgers Business School–Newark and New Brunswick

Howard Tuckman, Ph.D., Dean

Established in 1993 as the Faculty of Management, Rutgers Business School offers undergraduate and graduate programs on or through the university's Newark and New Brunswick campuses. Rutgers Business School: Undergraduate–Newark is a four-year undergraduate school. It offers the bachelor of science degree jointly with either the Newark College of Arts and Sciences or University College–Newark. Degree programs are available in accounting, finance, management, and marketing. Rutgers Business School: Undergraduate–New Brunswick is a two-year, upper-division school offering programs in accounting, finance, management, management science and information systems, and marketing. The school admits students from Douglass, Livingston, Rutgers, and University colleges in their junior year. The bachelor of science degree is awarded jointly by the business school and the undergraduate college the student attended. Rutgers Business School: Graduate Programs–Newark and New Brunswick date from the Seth Boyden School of Business, which was founded in 1929 and incorporated into Rutgers in 1946. The school offers the

master of business administration, an M.B.A. degree in professional accounting, a master of accountancy in taxation, a master of accountancy in governmental accounting, a master of accountancy in financial accounting, a master of quantitative finance, and a variety of dual degrees. The Ph.D. degree in management is offered jointly by the Graduate School–Newark and New Jersey Institute of Technology.

School of Communication, Information and Library Studies

Gustav Friedrich, Ph.D., Dean

This school was formed in 1982 by a merger of two schools to provide academic programs that focus on various facets of communication and information science. The school offers undergraduate programs of study in communication, and journalism and mass media. Students are admitted to the school in their junior year from the five residential undergraduate colleges in New Brunswick: Cook, Douglass, Livingston, Rutgers, and University colleges. Bachelor of Arts degrees are awarded jointly by the School of Communication, Information and Library Studies and the undergraduate college. At the graduate level, programs are offered that lead to the degree of Master of Library Service, the Master of Communication and Information Studies, and, jointly with the Graduate School–New Brunswick, the Doctor of Philosophy degree. Courses for in-service librarians also are provided.

School of Engineering

Michael T. Klein, Sc.D., Dean

Instruction in engineering began at Rutgers in 1864, when New Jersey designated Rutgers College to be the State College for the Benefit of Agriculture and Mechanic Arts. The College of Engineering became a separate unit in 1914 and was renamed the School of Engineering in 1999. The school is dedicated to the sound technical and general education of the student. It offers a Bachelor of Science degree in seven disciplines as well as a curriculum in applied sciences. Its graduate programs are conducted through the Graduate School–New Brunswick.

Edward J. Bloustein School of Planning and Public Policy

James W. Hughes, Ph.D., Dean

Founded in 1992, the Edward J. Bloustein School of Planning and Public Policy provides focus for all of Rutgers' programs of instruction, research, and service in planning and public policy. The school offers undergraduate programs in urban studies and public health, each leading to the baccalaureate degree. On the graduate level, the school confers Master of City and Regional Planning, Master of City and Regional Studies, Master of Public Affairs and Politics, Master of Public Policy, Master of Public Health, and Doctor of Public Health degrees; the latter two degrees are offered jointly with the University of Medicine and Dentistry of New Jersey–School of Public Health. A dual-degree program in public health and applied psychology leading to the Master of Public Health and Doctor of Psychology degrees is offered with the Graduate School of Applied and Professional Psychology. A program also is offered that leads to the Doctor of Philosophy degree in urban planning and policy development; this degree is conferred by the Graduate School–New Brunswick. In addition, the school offers joint-degree programs with Rutgers' two law schools, with the Graduate School of Management, and with the Graduate School–New Brunswick.

School of Management and Labor Relations

Barbara A. Lee, Ph.D., J.D., Dean

The School of Management and Labor Relations, formed in 1994, provides undergraduate instruction in labor studies and employment relations. At the graduate level, programs are offered that lead to the degrees of Master of Science in Human Resource Management, Master of Arts in Labor and Employment Relations, and Doctor of Philosophy in Industrial Relations and Human Resources.

Graduate School–New Brunswick

Holly M. Smith, Ph.D., Dean

Graduate programs in the arts and sciences have been offered since 1876. The Graduate School–New Brunswick awards advanced degrees in more than sixty disciplines and is responsible for all Doctor of Philosophy degrees at Rutgers–New Brunswick. The faculty is drawn from virtually all academic divisions of the university.

Graduate School of Applied and Professional Psychology

Stanley B. Messer, Ph.D., Dean

The GSAPP was established in 1974 to train direct-service psychologists who have a special commitment to community involvement. It offers the Doctor of Psychology (Psy.D.) degree in professional psychology with specializations in the areas of clinical psychology, school psychology, and organizational psychology. The GSAPP also awards the Master of Psychology (Psy.M.) degree en passant to the doctorate; the Psy.M. is not offered as a terminal degree.

Graduate School of Education

Louise C. Wilkinson, Ed.D., Dean

Courses in education were first offered by Rutgers College in the late nineteenth century. A separate school offering its own curricula was organized in 1924. The GSE offers programs leading to the degrees of Master of Education, Specialist in Education, and Doctor of Education.

School of Social Work

Mary E. Davidson, Ph.D., Dean

Established in 1954 to prepare students for professional social work practice, the SSW offers a two-year graduate curriculum leading to the Master of Social Work degree. Jointly with the Graduate School–New Brunswick, it offers a program leading to the Doctor of Philosophy degree, and its faculty also teaches an undergraduate social work program.

Summer Session–New Brunswick

Thomas A. Kujawski, Ed.M.

The Summer Session, begun in 1913 and established as a division of the university in 1960, offers a wide variety of graduate and undergraduate courses during three sessions in the summer months.

ACADEMIC CENTERS, BUREAUS, AND INSTITUTES

Advanced Food Technology, Center for. Nabisco Institute for Advanced Food Technology, Cook Campus

Advanced Information Processing, Center for. CoRE Building, Busch Campus

Agricultural Experiment Station, New Jersey. Martin Hall, Cook Campus

Alcohol Studies, Center of. Smithers Hall, Busch Campus

American Woman and Politics, Center for the. Wood Lawn, Douglass Campus

Art Museum, Jane Voorhees Zimmerli. College Avenue Campus

Biological Research, Bureau of. Nelson Biology Laboratories, Busch Campus

Biostatistics, Institute for. Hill Center, Busch Campus

Biotechnology Center for Agriculture and the Environment. Cook Campus

Ceramic Research, Malcolm G. McLaren Center for. 607 Taylor Road, Busch Campus

Coastal and Environmental Studies, Center for. Doolittle Hall, Busch Campus

Computer Science Research, Laboratory for. Hill Center, Busch Campus

Controlled Drug-Delivery Research Center. Pharmacy Building, Busch Campus

Crime Prevention Studies, Center for. S.I. Newhouse Center for Law and Justice, Newark Campus

Criminological Research, Institute for. Lucy Stone Hall, Livingston Campus

Critical Analysis of Contemporary Culture, Center for the. 8 Bishop Place, College Avenue Campus

Discrete Mathematics and Theoretical Computer Science, Center for. CoRE Building, Busch Campus

Eagleton Institute of Politics. Wood Lawn, Douglass Campus

Economic Research, Bureau of. New Jersey Hall, College Avenue Campus

Edison Papers, Thomas A. 16 Seminary Place, College Avenue Campus

Engineered Materials, Institute for. Engineering Building, Busch Campus

Engineering Research, Bureau of. Engineering Building, Busch Campus

Fiber Optic Materials Research Program. 607 Taylor Road, Busch Campus

Fisheries and Aquaculture Technology Extension Center. Martin Hall, Cook Campus

Government Services, Center for. Edward J. Bloustein School of Planning and Public Policy, 33 Livingston Avenue, College Avenue Campus

Health, Health Care Policy, and Aging Research, Institute for. 30 College Avenue, College Avenue Campus

Historical Analysis, Rutgers Center for. 88 College Avenue, College Avenue Campus

Human Evolutionary Studies, Center for. 131 George Street, College Avenue Campus

International Business Education, Center for. Janice H. Levin Building, Livingston Campus

International Conflict Resolution and Peace Studies, Center for. Hickman Hall, Douglass Campus

International Faculty and Student Services, Center for. 180 College Avenue, College Avenue Campus

Jazz Studies, Institute of. Dana Library, Newark Campus

Jewish Life, Center for the Study of. 12 College Avenue, College Avenue Campus

Journalism Resources Institute. 185 College Avenue, College Avenue Campus

Marine and Coastal Sciences, Institute of. 71 Dudley Road, Cook Campus

Materials Synthesis, Center for. Engineering Building, Busch Campus

Mathematical Sciences Research, Center for. Hill Center, Busch Campus

Mathematics, Science, and Computer Education, Center for. Science and Engineering Resource Center, Busch Campus

Metropolitan Studies, Joseph C. Cornwall Center for. Smith Hall, Newark Campus

Molecular and Behavioral Neuroscience, Center for. Aidekman Center, Newark Campus

Negotiation and Conflict Resolution, Center for. Edward J. Bloustein School of Planning and Public Policy, 33 Livingston Avenue, College Avenue Campus

Neighborhood and Brownfields Redevelopment, National Center for. Edward J. Bloustein School of Planning and Public Policy, 33 Livingston Avenue, College Avenue Campus

Operations Research, Center for. Hill Center, Busch Campus

Packaging Science and Engineering, Center for. Engineering Building, Busch Campus

Physics Research, Bureau of. Serin Physics Laboratories, Busch Campus

Rutgers Cooperative Extension. Martin Hall, Cook Campus

Surface Modification, Laboratory for. Serin Physics Laboratories, Busch Campus

Transportation Center, Alan M. Voorhees. Edward J. Bloustein School of Planning and Public Policy, 33 Livingston Avenue, College Avenue Campus

Urban Policy Research, Center for. 33 Livingston Avenue, College Avenue Campus

Waksman Institute of Microbiology. 190 Frelinghuysen Road, Busch Campus

Walt Whitman Center for the Culture and Politics of Democracy. Hickman Hall, Douglass Campus

Wireless Information Network Laboratory. Electrical Engineering Building, Busch Campus

Women, Institute for Research on. 160 Ryders Lane, Douglass Campus

Women's Leadership, Institute for. 162 Ryders Lane, Douglass Campus

Workforce Development, John J. Heldrich Center for. Edward J. Bloustein School of Planning and Public Policy, 33 Livingston Avenue, College Avenue Campus

Centers Operated Jointly

Biotechnology and Medicine, Center for Advanced.

Environmental and Occupational Health Sciences Institute.

Hazardous Substance Management Research Center.

UNIVERSITY LIBRARY SYSTEM

Alcohol Studies Library. Smithers Hall, Busch Campus

Annex. Annex Building, Busch Campus

Archibald Stevens Alexander Library. 169 College Avenue, College Avenue Campus

Art Library. Hamilton Street, College Avenue Campus

Bailey B. Pepper Entomology Library. John B. Smith Hall, Georges Road and Jones Street, Cook Campus

Blanche and Irving Laurie Music Library. Douglass Library, Chapel Drive and George Street, Douglass Campus

Chemistry Library. Wright Chemistry Laboratory Building, Busch Campus

Chrysler Herbarium Library. Nelson Biology Laboratories, Busch Campus

Criminal Justice Library. S.I. Newhouse Center, 15 Washington Street, Newark Campus

East Asian Library. Alexander Library, College Avenue Campus

Institute of Jazz Studies Library. Bradley Hall, Newark Campus

John Cotton Dana Library. 185 University Avenue, Newark Campus

Kilmer Area Library. Avenue E, Livingston Campus

Library of Science and Medicine. Bevier Road, Busch Campus

Mabel Smith Douglass Library. Chapel Drive and George Street, Douglass Campus

Mathematical Sciences Library. Hill Center, Busch Campus

Media Services. Kilmer Area Library, Livingston Campus

Paul Robeson Library. 300 North Fourth Street, Camden Campus

Physics Library. Serin Physics Laboratories, Busch Campus

School of Law–Camden Library. Fifth and Penn Streets, Camden Campus

School of Law–Newark Library. S.I. Newhouse Center, Washington Street, Newark Campus

School of Management and Labor Relations Library. Ryders Lane, Cook Campus

SERC Reading Room. Science and Engineering Resource Center, Frelinghuysen Road, Busch Campus

Special Collections and University Archives. Alexander Library, College Avenue Campus

Stephen and Lucy Chang Science Library. Foran Hall, Cook Campus

Index

W1502–15M–02