Graduate School– Newark Catalog 1998–2000

Contents

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.

About the Cover:

Three Worlds by Nicholas Wilton was chosen to illustrate the front cover of this catalog in order to celebrate two new degree programs at the graduate school. Complementing Rutgers' strategic emphasis on international issues, the Graduate School–Newark, in conjunction with the Center for Global Governance and Change, now offers degree programs in Global Studies and in International Studies. These programs are particularly appropriate and pertinent for those who wish to give an international political context to their existing professional, quantitative, scientific, and technological skills. For complete descriptions of each of these programs, refer to pages 51-52 and 54-55 in this catalog.

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THE STATE UNIVERSITY OF NEW JERSEY

RUTGERS

NEWARK

Academic Calendars

Dates are subject to change.

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

1998–1999

September
1	Tuesday	Fall term begins.
7	Monday	Labor Day holiday.

November
24	Tuesday	Thursday classes meet.
25	Wednesday	Friday classes meet.
26	Thursday	Thanksgiving recess begins.
29	Sunday	Thanksgiving recess ends.

December
10	Thursday	Regular classes end. Monday classes meet.
11	Friday	Reading period begins.
15	Tuesday	Fall exams begin.
22	Tuesday	Fall exams end.
23	Wednesday	Winter recess begins.

January
17	Sunday	Winter recess ends.
18	Monday	Martin Luther King, Jr.'s birthday.
19	Tuesday	Spring term begins.

March
14	Sunday	Spring recess begins.
21	Sunday	Spring recess ends.

April
30	Friday	Regular classes end. Monday classes meet.

May
3	Monday	Regular classes end.
4	Tuesday	Reading period.
5	Wednesday	Spring exams begin.
12	Wednesday	Spring exams end.
19	Wednesday	University commencement.
19	Wednesday	Newark commencement.

1999–2000

September
1	Wednesday	Fall term begins.
6	Monday	Labor Day holiday.

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24	Wednesday	Friday classes meet.
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13	Monday	Regular classes end.
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March
12	Sunday	Spring recess begins.
19	Sunday	Spring recess ends.

May
1	Monday	Regular classes end.
2	Tuesday	Reading period.
3	Wednesday	Spring exams begin.
10	Wednesday	Spring exams end.
18	Thursday	University commencement.
18	Thursday	Newark commencement.

About the University

Rutgers, The State University of New Jersey, with over 48,000 students on campuses in Camden, Newark, and New Brunswick, is one of the major state university systems in the nation. 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, 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, and the College of Agriculture (now Cook College) in 1921. The precursors to several other Rutgers divisions were also founded during this period: the College 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 assumed university status in 1924, and legislative acts in 1945 and 1956 designated all its divisions as The State University of New Jersey. During these years the university expanded significantly with the founding of an evening division, University College, in 1934, and the addition of the University of Newark in 1946 and the College of South Jersey at Camden in 1950.

Since the 1950s, Rutgers has continued to expand, especially in the area of graduate education. The Graduate School–New Brunswick, Graduate School–Newark, and Graduate School–Camden serve their respective campuses. In addition, several professional schools have been established in such fields as management, social work, criminal justice, planning and public policy, applied and professional psychology, the fine arts, and communication, information, and library studies. A number of these schools offer undergraduate programs as well. Livingston College was founded in 1969 to provide a diverse community of students with the opportunity to pursue undergraduate degrees in the liberal arts and professions.

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 fulfill Rutgers' role as The State University of New Jersey.

Graduate Study at the University

GRADUATE SCHOOL–NEWARK

The Graduate School–Newark is dedicated to the advancement of scientific and human knowledge in an environment that encourages scholarly inquiry and intellectual growth. Graduate students are expected to develop the analytical and creative skills required for original scholarship, research, and problem solving, as well as a thorough understanding of an academic discipline.

Before the creation of a separate graduate school at Rutgers in Newark, the Graduate School–New Brunswick administered graduate programs in the arts and sciences on the Newark campus. By the 1950s master's and doctoral programs in psychology were added. Between 1965 and 1972, master's-level graduate programs were established in economics, English, geological sciences, history, and political science.

The Graduate School–Newark, with its own faculty and dean, was established in December 1975 and has continued to grow. Master's programs in liberal studies, nursing, public administration, biology, behavioral and neural sciences, chemistry, global studies, international studies, and applied physics, and Ph.D. programs in chemistry, criminal justice, biology, behavioral and neural sciences, management, nursing, mathematical sciences, applied physics, and public administration round out the current offerings.

The M.A. and M.A.T. in history, the M.S. and Ph.D. in applied physics, the M.S. and Ph.D. in biological sciences, and the Ph.D. in mathematical sciences are offered jointly with the New Jersey Institute of Technology.

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. Further information about the specific areas of specialization may be found under the general subject headings in the program section of this catalog.

Behavioral and Neural Sciences (Ph.D.)
Biology (M.S., Ph.D.)
Chemistry (M.S., Ph.D.)
Criminal Justice (Ph.D.) *
Economics (M.A.)

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

English (M.A., M.A.T.)
Environmental Geology (M.S.)
Global Studies (M.A.G.S.)
History (M.A., M.A.T.)
International Studies (M.S.I.S.)
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 (M.A., Ph.D.)
Public Administration (M.P.A., Ph.D.)

OTHER GRADUATE STUDY AT THE UNIVERSITY

In addition to the degree programs offered by the Graduate School–Newark, the following divisions of the university offer a variety of postbaccalaureate programs. In Newark there are the Graduate School of Management, the School of Criminal Justice, and the School of Law–Newark. In New Brunswick there are 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 the Mason Gross School of the Arts. In Camden there are 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.

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, an average of *B* or better in previous academic work is expected. Additional evidence of potential for graduate study is demonstrated by letters of recommendation and by scores on the Graduate Record Examination. Applicants should refer to the current application form for the specific requirements of the program under consideration. Admission is competitive, and some applicants who meet or surpass minimum requirements may be denied acceptance. Admission is recommended by the graduate program to which the individual applies, subject to the approval of 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 Admissions, Rutgers, The State University of New Jersey, 249 University Avenue, Newark, NJ 07102-1896 (973/353-5205). A complete application consists of the application form, letters of recommendation, the application fee, official transcripts of previous academic work, personal statement or essay, and test scores. Detailed procedures and instructions accompany the application forms.

Deadlines

Deadlines vary according to the requirements for specific programs. Applicants should refer to the application form for specific deadlines. The deadline for consideration for assistantships and fellowships is March 1. Some programs have established different financial aid deadlines, which are indicated in the application instructions. International students applying from abroad must submit application materials by November 1 for a spring term admission, and April 1 for a fall term admission. Programs reserve the right to close admission prior to stated deadlines or extend deadline dates if sufficient time exists to render decisions. The university may deny admission to students whose applications are incomplete as of the deadlines. Individuals should apply for admission and financial assistance as early as possible.

Tests

All programs except management and liberal studies require that applicants 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). The liberal studies program does not require any type of test. Some programs require or recommend the Subject Test of the Graduate Record Examination as well as the General Test.

* The M.B.A. is offered through the Graduate School of Management.

It is the policy of Rutgers University that tests taken within a period of three years prior to the time of application not be questioned on grounds of age. Graduate schools and programs may, however, require that test scores more than three years old be validated, either 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 (609/921-9000), or 1947 Center Street, Berkeley, CA 94704 (415/849-0950). Candidates may pick up applications at the Rutgers–Newark Office of Admissions weekdays from 8:30 A.M. to 4:30 P.M.

Application for Financial Aid

The deadline for application for most forms of financial assistance is March 15; however, some programs may have earlier deadlines. Applications for aid are not acted upon until an admissions decision has been made.

Nonimmigrant visa holders are not eligible for federal and state financial aid, but may qualify for assistantships and certain fellowships.

See the Financial Aid chapter for further information.

International Applicants

International applicants are required to take the Test of English as a Foreign Language (TOEFL) if English is not their native language. For further information about the test, write to TOEFL/TSE Services, P.O. Box 6151, Princeton, NJ 08541-6151, U.S.A. Satisfactory English proficiency is a prerequisite for graduate study at the university. Admitted students may be required to take a test of English proficiency soon after arrival at the university and may be obligated to take course work in English as a Second Language (ESL).

New international students appointed as teaching assistants are required to take an oral proficiency test regardless of their TOEFL scores. Nonimmigrant students must also present evidence of adequate financial resources to meet educational and living expenses.

The university may deny admission to international applicants for lack of English proficiency, insufficient financial resources, or because of improper visa status.

The Program in American Language Studies

The Program in American Language Studies (PALS), the English as a Second Language program for Rutgers, prepares nonnative speakers with English knowledge needed for academic work in the U.S. The PALS curriculum incorporates intercultural communication skills within a complete program of English courses. Courses offered fall, spring, and summer terms include:

Advanced Pronunciation,
Grammar and Composition, and
Comprehension and Conversation

Class sizes are limited and students receive individualized attention. Students must register to attend PALS courses. For additional information, contact PALS at 232 Smith Hall, or call 973/353-5013. You can also contact PALS by fax at 973/353-1438 or e-mail: pals@newark.rutgers.edu.

NOTIFICATION

Candidates admitted to the Graduate School–Newark are notified by the Office of Admissions. Registration may be cancelled if a student fails to satisfy the conditions of his or her 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 and transcript(s) of any intervening college work if they wish to be considered at a later date.

Admission to the Graduate School–Newark does not constitute admission to candidacy for an advanced degree. An application for such candidacy must be submitted to the dean of the Graduate School–Newark in accordance with the procedures set forth in the Degree Requirements chapter.

NONDEGREE GRADUATE STUDENT PROGRAM

To the extent that resources permit, the faculty considers admission to classes of qualified students who wish to pursue courses without enrolling in a degree program. Students should contact the admissions office (973/353-5205) for information on which programs offer nondegree study. Students who successfully complete courses through the nondegree program may receive graduate degree credit up to 12 credits if, within five years, they apply and are admitted 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 readmission of former students is processed through the Office of the Dean of the Graduate School–Newark, not the admissions office, and is required of all students who:

1. have officially withdrawn from school;
2. have not received a degree in the program for which they were enrolled; or
3. have not maintained continuous registration through either course work or "matriculation continued" status.

The following deadlines for readmission apply:

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 a one-year interval 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

1997–1998 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	$ 40.00
Tuition *	
Full-time New Jersey resident, per term	3,033.00
Full-time non-New Jersey resident, per term	4447.00
Part-time New Jersey resident, per credit	250.00
Part-time non-New Jersey resident, per credit	369.00
Student Fee, per term	
Full-time (12 or more credits)	307.75
Part-time (11 or fewer credits)	87.00
Matriculation continued	
For off-campus students, per term (1 credit)	7.00
Computer Fee, per term	
Full-time (12 or more credits)	50.00
Part-time (progressive)	20.00–47.00
Student Housing Rates	
Academic year, single room (for 9 months)	3,856.00
Residence education fee	186.00
Academic year, double room (for 9 months)	3,516.00
Residence education fee	186.00
Calendar year, single room (for 12 months)	4,586.00
Residence education fee	270.00
Calendar year, double room (for 12 months)	4,188.00
Residence education fee	270.00
Family housing:	
Efficiency, per month	433.00
One bedroom, per month	567.00
Two bedrooms, per month	628.00
Miscellaneous Fees	
Drop/add fee, per transaction	5.00
Late registration fee	50.00
Late payment fee	
For one day to one week and/or check not honored for payment	50.00
For each additional week or part thereof	5.00
Partial payment fee	10.00
Late payment fee for partial payments	
For one day to one week	10.00
For each additional week or part thereof	5.00
Return check service fee	10.00
Microfilming of doctoral dissertation	50.00
Binding fee	16.50
Transcript of record fee (per copy)	3.00
Reinstatement fee	50.00
Basic insurance and health services for part-time students, per term	85.00

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 information on New Jersey residency status, see Student Residency for Tuition Purposes in the Academic Policies and Procedures chapter.

STUDENT FEE

The student fee covers student use of the Student Center and the Health Center, membership in the Graduate Student Government, and certain administrative services. The fee *does not* include the fee for intercollegiate athletics which entitles undergraduates to discounted prices for tickets.

	Full-time	Part-time
General university fee	$ 11.97	$ 6.80
Student activities		
Regular	11.00	6.00
Special	9.25	3.85
Club sports recreation	6.00	4.00
Student health service	88.23	
Student/recreation centers	88.80	30.10
Debt service		
Building system student center	58.00	14.50
Student center operations	4.75	4.75
Career services	2.50	1.25
Student center activity	2.00	1.00
Newark facilities fee	6.25	3.00
Cultural and educational	3.00	1.00
Recreation	16.00	10.75
Total	$307.75	$87.00

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 all students for the first and second terms with due dates indicated. Students who do not receive a term bill by July 20 for the fall term and by December 5 for the spring term should notify their local student accounting office promptly.

It is the student's responsibility to obtain, complete, and return the term bill on time. Students who fail to do so are charged a late payment fee of $50. Graduate students enrolled for 6 or more credits who are unable to pay their term bills in full by the stipulated time may pay their bill according to the partial payment plan outlined below.

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.

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 collectable 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 $10 nonrefundable partial payment fee payable on or before the 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 15 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: 75 percent of net balance due plus a $10 nonrefundable partial payment fee.
2. Second payment: Net balance due on or before October 15 for fall term and on or before March 1 for spring term.

The nonrefundable fee for this partial payment plan is $10 per term and must be included with the first payment. Any subsequent installment not paid on time incurs an initial late fee of $10 for the first week or part of a week that payment is late, plus a $5 late fee for each additional week or part of a week that payment is late.

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 does 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 of $100 or greater, after sufficient notice has been given to the student. A student whose registration is terminated at any time during the refund period because of nonpayment of amounts owed the university will receive a revised bill based on a refund calculated as if it were a voluntary withdrawal. 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 a collection fee. "Holds" are removed upon satisfaction of the outstanding obligation. The terminated student may petition for reinstatement of enrollment 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 cancelled 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 a 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.

The effective date of withdrawal is the date on which a written statement of withdrawal is received by the registrar. No part of the student fee is refundable.

No reductions will be granted after the tenth day of classes to students who withdraw from one or more courses, but remain 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 class 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

There are two additional refund schedules that differ from the General Refund Policy schedule for Title IV funds recipients. 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, please contact the financial aid office.

Financial Aid

The staff in the Office of Financial Aid at Rutgers, The State University of New Jersey, is concerned with students' educational expenses. The impact of educational expenses upon the student and his or her family is sizable, in spite of the fact that tuition at Rutgers covers only a small portion of the actual cost of instruction for each student. In order to allow students with limited financial resources to attend college, every effort will be made to assist these students in finding alternatives in financing their education.

The majority of graduate students at the university, like most graduate students in America, receive some measure of financial aid. The amount of support each student receives depends in part, of course, upon the availability of funds. The availability of support is often dependent upon the specific graduate program and degree status. Support ranges from grants covering tuition charges to awards sufficient to pay all educational and 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 from scholarships, fellowships, assistantships, grants, low-interest loans, and part-time employment to students at the school. Application for such aid is made by completing the Free Application for Federal Student Aid (FAFSA) form. These forms are available from most college and university financial aid offices, including the Rutgers Office of Graduate Financial Aid. Applicants will be considered for all forms of aid for which they are eligible. Applicants who file by March 15 may expect a reply by June 1. Applications received after March 15 will be considered for remaining funds.

The following is a brief description of each program.

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 envelope provided with the form. Applications should be received by the federal processor by March 15 of the academic year preceding the academic year for which aid is sought. The forms are available at all Rutgers financial aid offices. The FAFSA should be filed at the same time the admission application is submitted but no later than March 15 to ensure full consideration for all available funds.

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

Counseling is available by appointment at the financial aid office to all students regardless of whether or not they qualify for financial aid. When comparing aid offers from Rutgers with other institutions, students should remember that charges often differ significantly from school to school.

Therefore, the important thing to consider 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 college, most part-time students who are gainfully employed do not demonstrate financial need.

The federal student financial aid sources (Perkins Loan, Federal Work-Study Program, and William D. Ford Federal Direct Loan programs) require that a student enroll in a minimum of 6 credits per term to be eligible.

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

Rutgers Excellence Fellowship Awards. This award is issued by departments of the university on the basis of exceptional academic merit, as evidenced by scholarly promise. The award is for $12,000 plus tuition remission and is renewable for up to one year. These awards are usually supplemented for two years of support, usually as teaching assistantships, by the graduate program.

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 $7,000 plus tuition remission, and may be renewed.

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 up to two academic years. To apply, check the appropriate box on the graduate and professional school application form. Any additional statements that provide evidence of academic or artistic achievement and significant life, work, and/or extracurricular activities should be submitted in duplicate with the application. Only those applicants receiving awards will be notified. The award is contingent upon acceptance to a graduate or professional school program. The application deadline for fall term awards is March 1, unless the program to which the student is applying has an earlier deadline. In that case, the student must submit an application form to the appropriate admissions office by the program deadline date.

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 $12,000 per academic year to exceptional 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 and attach a statement (in duplicate) with the application that describes the reasons for consideration in the program. 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.

Minority Advancement Program in Teaching and Research. Trustees' Minority Graduate Fellowships in the Humanities and Social Sciences. MAP excellence and Trustees' Minority Graduate Fellowship awards support African-American, Hispanic, or American Indian students who are seeking a Ph.D. These fellowships include stipends of $10,000 to $14,000 plus tuition. For more information, contact MAP, Rutgers, The State University of New Jersey, 25 Bishop Place, New Brunswick, NJ 08901-1181, or call 732/932-7034.

Minority Academic Career Programs (MAC). MAC fellowships offer a stipend of $5,000 plus a loan of up to $10,000 for minority students planning to enroll as full-time students for Ph.D., Ed.D. or Psy.D. degrees. The loan may be redeemable by faculty service in New Jersey at the rate of 25 percent of indebtedness forgiven per year for four years. Applications are available from the MAC office, Rutgers, The State University of New Jersey, 25 Bishop Place, New Brunswick, NJ 08901-1181.

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 planning 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.

Russell Scholarships. Walter C. Russell Graduate Scholarships provide for the cost of tuition. Application should be made to the director of the graduate program in which the student is enrolled before March 1 for awards for the ensuing academic year, and before December 1 for vacancies that might occur in the spring term.

Inge Gambe Graduate Scholarship. Academic excellence and service to the Rutgers–Newark community are the criteria for this $500 scholarship, which was established by the Graduate Student Government. For additional information, contact the Graduate Student Government, Rutgers, The State University of New Jersey, Robeson Campus Center, Newark, NJ 07102, or the Office of the Dean, Graduate School–Newark, Rutgers, The State University of New Jersey, Newark, NJ 07102.

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 $1,000 per year and are dependent upon available funds. Grants are renewable. Application is made by submitting a FAFSA. EOF grant recipients are not eligible.

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 the student's degree work, subject to continued student eligibility and provided satisfactory academic progress is made. Students must complete the FAFSA form.

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. It offers talented graduate students in the sciences significant funding to pursue their academic programs. Special awards are given to minority students who have been traditionally underrepresented in the sciences. Information and applications are available from the Fellowship Office, National Research Council, 2101 Constitution Avenue N.W., 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 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, since many national, state, and regional associations make special awards.

Students should be aware that each department is continually 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.

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 $30,000 (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 and extends over a maximum repayment period of ten years. Monthly payments of at least $40 are required.

Deferral of repayment is permitted for certain kinds of federal service and cancellation of loans is permitted for certain public services.

Consistent with federal regulations, all first-time Federal Perkins Loan borrowers at Rutgers are required to attend an entrance interview in order to be informed of their rights and responsibilities regarding the loan. In addition, Federal Perkins Loan recipients must attend an exit interview prior to graduation or withdrawal from school. Further details and procedures regarding the repayment of the Federal Perkins Loan are sent to each student recipient by Rutgers, The State University of New Jersey, Office of Student Loans, Division of Accounting, 65 Davidson Road, Piscataway, NJ 08854-8094.

William D. Ford Federal Direct Loans

Federal Direct Loans (Direct Loans) are available for students directly 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 for which students are eligible 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 approved by the U.S. Department of Education, be a United States citizen or an eligible noncitizen, be enrolled at least half-time per term, 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 Direct Stafford/Ford and Direct Unsubsidized Stafford/Ford Loan borrowers must attend an entrance interview in order to be informed of their rights and responsibilities regarding the loan.

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

Federal Direct Stafford/Ford Loan.
This loan is based on financial need. The government pays the interest on the loan while the student is attending school. The interest rate is variable; that is, it is adjusted each year. Effective July 1, 1994, the maximum rate for the Federal Direct Stafford/Ford Loan was 8.25 percent. Additionally, borrowers are charged an origination fee of 4 percent. Graduate students may borrow $8,500 per year. The total debt may not exceed $65,000 including loans for undergraduate years.

Federal Direct Unsubsidized Stafford/Ford Loan.
This loan *is not* based on financial need, but all interest charges must be paid by the student. The interest rate is the same as the Federal Direct Stafford/Ford Loan. Students may borrow up to $10,000 per year.

Emergency Loans.
Students who are experiencing a financial emergency may apply for a university loan for up to $500. The interest rate is 3 percent simple interest, and the loan must be repaid within the same semester. An emergency need must be demonstrated and funds must be available.

Students must contact their local financial aid office for additional information. If loans in excess of this amount are required, an appointment with a counselor is recommended to discuss long-term assistance. Students do not need to be recipients of financial aid nor to have filed a financial aid application to be considered for emergency loans.

A number of graduate schools offer low interest or interest free short-term loans to students in their program. 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 $11,086 (1997–1998) for an academic year.

Applications for assistantships are due on or before March 1, although awards are occasionally available at later dates. Prospective graduate students may apply for assistantships when they are sent 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, notice of this will be included with the admissions packet. A graduate student already enrolled at the university who wishes to apply for an assistantship should inquire at the office of the director of the graduate program in which the student is enrolled.

Federal Work-Study Program (FWSP).
Federal work-study employment may be offered as a self-help portion of the financial aid award. Application for this program is made by filing the FAFSA. On-campus jobs are available in many areas. Selection for a particular job is based on skills, job availability, university needs, and student preference. The assigned employment opportunity is based on an expectation that the student will work an average of fifteen hours weekly throughout the fall and spring academic terms; in the case of summer assignments, the expectation is that the student will work between fifteen and 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 Student Employment/Financial Aid Office. Off-campus employment is also available through the college work-study program. These jobs can be in nonprofit or for-profit agencies. Jobs are related to the student's major whenever possible. No job assignments are made until all paperwork required to accept the aid is complete.

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 prior to employment.

Veterans Benefits

The United States Veterans Administration operates various education assistance programs for eligible veterans, war orphans, surviving spouse or child of any veteran 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, New Jersey (telephone 1-800/827-1000); 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 732/932-7067.

Veterans and others mentioned above who plan to utilize veterans' education benefits should initially 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 the fact that they will receive veterans' education benefits to the Office of Financial Aid.

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 must also be reported to the campus Office of Veterans Affairs.

RESTRICTIONS ON FINANCIAL AID AND EMPLOYMENT

Graduate students may not ordinarily accept two different financial awards from the university simultaneously. Students who have applied for two different awards and are offered both should inquire at the dean's office of the school of matriculation before acceptance. 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 primarily by the John Cotton Dana Library, located in the center of the campus plaza. The Dana Library has a collection of over 645,940 volumes (including approximately 315,850 books, 108,691 bound periodicals, and 221,400 federal and state publications) as well as some 774,360 pieces of microform and 15,745 audiovisual items. Subscriptions to over 3,240 periodicals and other serials are currently maintained. 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 or variations in these hours are announced in the *Observer* and posted in the library and elsewhere on campus.

Dana Library's Media Services, housed in a state-of-the-art media complex, has a growing collection of videotapes, audio recordings and cassettes, slides, and other nonprint materials. The Media Services Complex, which is adjacent to the Institute of Jazz Studies, 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 system.

The Dana Library reference facilities include extensive access to a wide variety of databases on the campus-wide online information system, on the Internet, or in CD-ROM format. The Dana librarians meet with classes to provide instruction in the use of the new information technologies and in library research strategies in a state-of-the-art electronic/multimedia classroom. The librarians also provide guidance and assistance to students on a one-to-one basis in the use of appropriate bibliographic tools and information services. On a fee basis, the library also 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 Henry Ackerson Library of Law and Criminal Justice, which services the School of Law–Newark, also at 15 Washington Street. The Institute of Jazz Studies houses collections of more than 108,136 recordings in all formats, some 7,531 books on jazz and related subjects, a comprehensive collection of jazz periodicals, photographs, sheet music, big band arrangements, and realia and memorabilia.

Newark students and faculty members have direct borrowing privileges at all Rutgers University libraries on the New Brunswick, Newark, and Camden campuses. (See the Divisions of the University chapter for a complete list of university libraries.) The total holdings of the Rutgers libraries include over 3.04 million volumes, 3.9 million microform units, and 23,230 current serial subscriptions. Information on the holdings of all the Rutgers libraries, as well as of the Newark Public Library, is available in Dana's Reference Room. Rutgers is also 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.

Upon presentation of a valid Rutgers identification card, students and faculty also have borrowing privileges at the libraries of the New Jersey Institute of Technology, Essex County College, and the University of Medicine and Dentistry of New Jersey. Other available library facilities in Newark include the Newark Public Library, 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 CENTER

Rutgers University Computing Services (RUCS) provides computing, networking, and information services in support of instructional, research, and administrative activities by the Rutgers community. All RUCS 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 through the Internet, access to online library catalogs including Rutgers own IRIS catalog, access to the Campus Wide Information Service, word processing, spreadsheets, desktop publishing, graphics, and access to national and local electronic discussion groups. All of these services are available through over 400 PCs and Macs at RUCS and CIF facilities or remotely through telephone lines.

TEACHING EXCELLENCE CENTER

The Teaching Excellence Center, located at 206 Blumenthal Hall, provides support to faculty, departments, schools, and colleges to enhance and improve teaching and learning activities on the Newark campus. Throughout the year, the center offers workshop seminars, programs, instructional development services, and grants for faculty and teaching assistants. The center also provides a confidential consultation service for departmental self-study and instructional review. In conjunction with the Graduate School–Newark, the center conducts a comprehensive orientation for new faculty and teaching assistants. The center's library has resources on teaching, including books, reprints, and audio and videotapes. Individual confidential consultation is available including videotaping of teaching, classroom observation, assistance in the development of a teaching portfolio, and instructional materials review. More information on the services and activities offered may be obtained by visiting the center or calling 973/353-1534.

HOUSING

Talbott Apartments consists of two- and four-bedroom units, with each unit housing four students. Talbott offers 24-hour security, on-site laundry facilities, and a modern fire and smoke detector system in each apartment and public area, along with convenient access to campus facilities. A limited number of nearby parking spaces are reserved for resident students at additional cost.

Student resident assistants reside on each floor, and a full-time professional resident director also lives in Talbott. This staff works together with residents to plan a full complement of educational, social, and recreational activities. They also encourage students, on an individual and group basis, to take full advantage of the unique cultural and educational environment 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, Robeson Campus Center, 350 Dr. Martin Luther King, Jr. Blvd., Newark, NJ 07102, or call 973/353-1037.

DINING SERVICES

Breakfast, lunch, and dinner are available on a cash basis in Robeson Campus Center whenever classes are in session. Daily selections include a make-your-own salad bar, grill and deli sandwiches, homemade soups, and a wide choice of hot entrees. 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, the newly renovated coffeehouse, offers a place to meet, relax, and get a cup of espresso or cappuccino. The dining service also provides catering services for student, faculty, staff, and alumni events in Robeson Center and throughout the campus.

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

For further information regarding these dining services and/or meal plan options available, please call the dining services manager at 973/353-1363.

RUTGERS STUDENT HEALTH SERVICE

The Rutgers Student Health Service, located on the first floor of Blumenthal Hall at 249 University Avenue on the Newark campus, provides medical services for all full-time students. Part-time students may 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 and registered nurses, health educators, and other professional staff. A wide range of services are provided, including general primary care, gynecology, health education, alcohol and other drug counseling, mental health services, immunizations, allergy desensitizations, 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. The health center is

open from 8:30 A.M. to 5:00 P.M., Monday through Friday. The center can be reached by telephone at 973/353-5231. Appointments are encouraged to reduce waiting time.

The health center pharmacy, located on the premises, is open from 9:00 A.M. to 4:30 P.M., Monday through Friday. The pharmacy can be contacted by telephone at 973/353-5201.

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

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 $3,500 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 may also purchase coverage for their spouse, sole domestic partner, 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) must also be insured. Insurance coverage for spouses and children must be purchased through the international health insurance coordinator, 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 having personal problems or experiencing difficulty coping with the stresses of university life. Appointments to see a counselor located in Blumenthal Hall can be made by calling 973/353-5805.

International Student Services

The Office of International Student Services assists non-immigrant international students with all matters of special concern to them and serves 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, the office 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 procedures and documents required for transfer of schools, extensions of stay, work permission, and practical training experiences. The office also provides 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 concerns. For additional information, please call 973/353-1427.

Counseling for Disabled Students

Students who wish assistance due to a disability should contact the adviser for disabled students, who is located in the Robeson Campus Center, Room 302. 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 1/800-855-1155.

On-campus housing for disabled students is available through the Office of Housing and Residence Life, Robeson Campus Center, Room 203. Call 973/353-1037 for further information.

Veterans Services

The Office of Veterans Affairs, located in the Robeson Campus Center, Room 302, serves student veterans at Rutgers–Newark and residents of the surrounding communities. Information and assistance are offered regarding G.I. benefits, admission, financial aid, work-study programs, tutoring, and employment opportunities. (Certification of a veteran's status as a full-time student is done at the Office of the Registrar, 249 University Avenue.) The staff keeps veterans informed of current state and national legislation which affects them. Both personal and group counseling for veterans can be arranged through this office. For further information, call 973/353-5300.

Career Counseling and Placement Service

The Career Development Center, located in Hill Hall, Rooms 309 and 313, offers a variety of services to students and alumni. Professional career counselors are available to help students determine suitable educational goals and career choices. The staff provides individual career counseling, group workshops, vocational and personality assessment, internship information, and special programs. Assistance is given with job search strategies, résumé construction, and interview techniques. The career library, housed in the center, has considerable information pertaining to occupational opportunities; undergraduate, graduate, and professional study; and standardized testing.

Part-time, summer, and full-time employment opportunities are posted daily at the Career Development Center. On-campus interviews with prospective employers are available during the fall and spring recruitment periods. Annual career fair events are also conducted in November and April. For further information, you may call 973/353-5311 or visit the center's home page at <http://Newark.rutgers.edu/~Lynneo/NCAScdc.html>.

DAY-CARE CENTERS

The Mt. Carmel Guild Children Center is available to the children of Rutgers–Newark faculty, staff, and students. It is a professional learning center for young children ages 1½ to 6 (kindergarten) years. Certified personnel staff the center which is adjacent to the Newark campus at 39 Bleeker Street. For further information, contact Kathleen O'Pray, Director (973/643-4956).

The Rutgers CHEN School, located at 32 Central Avenue, is available to children of economically eligible students, faculty, and staff of Rutgers–Newark and community residents. Staffed by certified personnel, the Rutgers CHEN School is a professional learning center for young children ages 3 months to 6 years. For further information, contact Dolores Towe, Director (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.; at Parking Deck II, 166 Washington Street, Monday through Thursday from 7:00 A.M. to 7:00 P.M.; and at Lot #508, adjacent to Bradley Hall, after 4:00 P.M. A Newark campus deck permit is required in all locations. The permit is valid for the entire academic year at a current cost of $25.00. In addition to the permit fee, daily rates of $2.75 are charged at each facility. Vehicles not displaying a valid Rutgers permit are subject to ticketing and/or towing.

Students residing at either Talbott or Woodward halls may purchase reserved 24-hour resident parking in Deck I. A limited number of reserved spaces are available; permits are sold on a first-come, first-served basis. Residents may opt to purchase an annual contract (September 1–August 31 for $745), academic year contract (September 1–May 31 for $625), or single-term permit (for $325). Partial payment contracts are available upon request. For further information and fee structure, please call 973/353-5873.

Vehicle registration materials, including registration forms and payment instructions, are mailed to students during the summer. Please use the return envelope accompanying your materials to expedite processing and to avoid waiting on line during the first week of class. Vehicle registration materials are also made available at new student registrations.

The university assumes no responsibility for the security of vehicles or their contents while parked at university facilities.

Shuttle Van Service

A free shuttle van service is available for the exclusive use of Rutgers and NJIT faculty, staff, students, and their guests throughout the academic year. Proper identification in the form of an ID card must be presented to enter the bus. The shuttle's designated stops include key locations around the main campus, law school, and the Broad Street and Pennsylvania Railroad stations, Kearny, and Harrison. Schedules are available at the University Police Headquarters or from shuttle service drivers. For more information, contact the Office of Parking and Transportation Services, 249 University Avenue, Blumenthal Hall, 973/353-5873.

Railroad Discounts

Full-time students who travel by train are eligible for the New Jersey Transit System Student Discount Program. In order to obtain a discount on the purchase of a monthly commutation ticket, a railroad discount form must be obtained at the train station. The form must be presented to the registrar's office for authorization prior to purchasing the monthly ticket.

If you would like assistance in planning your way to the campus or need further information, please contact the Office of Parking and Transportation Services at 973/353-5873. The office is located at 249 University Avenue, Blumenthal Hall (adjacent to the Alumni Field).

PHOTO IDENTIFICATION CARDS

All students, faculty, and staff are required to carry a valid Rutgers identification card at all times. The Rutgers ID must be presented for security purposes, student activities, library, athletic center, computer center usage, registrations, shuttle service, and as deemed necessary by other university departments.

The Office of Parking and Transportation Services processes ID cards for newly admitted students at their respective registrations. Validation stickers are issued to continuing students in the parking office upon presentation of a paid term bill. Thereafter, all photo ID business is transacted at the Office of Parking and Transportation Services. Initial ID cards are issued free of charge; a $5 fee is currently charged for replacement IDs. Regular office hours are Monday through Friday, 8:30 A.M. to 4:30 P.M. During the first month of each term, office hours are extended to 6:15 P.M. each Tuesday and Wednesday.

CAMPUS CENTER

The Robeson Campus Center, located at 350 Dr. Martin Luther King, Jr. Boulevard, serves as the focal point for student activities and provides space for gatherings of all kinds for the Rutgers–Newark community. Open to all students, faculty, staff, and alumni, the campus center offers meeting and conference rooms; student lounges, a game room for table tennis, pocket billiards, chess, and other table games; offices and mailboxes for student organizations; a multipurpose room capable of holding functions for more than 600 people; and additional meeting and activities space. The center also provides 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), a gift shop, and R Place, a coffeehouse and social gathering spot.

The hours for Robeson Campus Center are 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 is open Monday through Thursday from 8:00 A.M. to 7:00 P.M. and Friday from 8:00 A.M. to 4:00 P.M. The hours for R Place are Monday through Thursday from 11:30 A.M. to 9:00 P.M. and Friday 11:00 A.M. to 9:00 P.M.

To reserve space in Robeson Campus Center facilities, contact the administrative office in Room 219 or call 973/353-5568.

STUDENT ACTIVITIES

Rutgers maintains a quality out-of-classroom program experience as a means of broadening the overall educational development of its students. The Office of Student Development and the Rutgers–Newark Program Board plan and coordinate an extensive activity program which enriches the educational, cultural, and social experience of students. The Office of Multicultural Student Affairs is responsible for the development of specific programs and activities for our diverse student community. It serves as adviser to minority students and their organizations in all aspects of their cocurricular involvement at the campus.

Musicians, featuring both classical and contemporary styles, regularly appear on campus. The Rutgers–Newark string orchestra, concert band, and university chorus also provide outlets for student musical talent. Art exhibits are a frequent feature at the campus center. Professional and student groups perform at the theater, and frequent trips to the New York theaters are promoted by a number of student organizations. The *Observer,* the student newspaper, the *Encore,* the yearbook, *Gallery* and *Untitled,* literary magazines, WRNU, the student radio station, and several other student organizations provide valuable experience for students interested in communication media.

Close to 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 concern of the Graduate Student Government (GSG) is assuring that the interests of all graduate students are recognized and represented. The GSG is comprised of an executive board which includes a president, vice president, treasurer, secretary, senator, and one voting representative from each of the graduate programs. The GSG works to guarantee that funds from student fees are distributed to the participating programs in an effort to encourage quality activities and programs that help to enhance the campus environment for all graduate students. The GSG also sponsors a reception each year after graduation for the graduate school; at this reception, the GSG distributes awards for excellence in academics, teaching, and research. For further information on the GSG, please 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 sporting events and help support various recreational and community service projects.

The Golden Dome Athletic Center, located at the southeast corner of the campus, is the campus's main athletic facility. Known because of the uniquely designed and easily recognizable geodesic, gold-colored roof, the Golden Dome Athletic Center is a multipurpose facility for both intercollegiate athletics and recreation. The center includes the 2,000-seat Golden Dome Arena, an eight-lane, 25-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 Nautilus room, and a multipurpose aerobics and exercise room, which is equipped with electronic workout machines such as stairmasters, life steps, lifecycle, treadmills, Nordic Tracks, Lido circuit training equipment, and other state-of-the-art fitness machines in a health-club-like atmosphere.

Behind the Athletic Center is the Golden Dome Tennis Complex with five outdoor-lighted courts that provide an on-campus home for the Raider tennis teams as well as recreation.

A short walk from the Golden Dome and directly across from the main campus is Alumni Field. Alumni Field is usually the scene of Rutgers–Newark men's soccer games in the fall and baseball and softball contests in the spring and has a running track for recreational use year-round.

ALUMNI

Alumni Relations

The university seeks the full support of its alumni and, in return, offers them a number of services and programs. The responsibility for working with the university's entire alumni body, now numbering over 270,000, is vested in the Department of Alumni Relations. The department has two main objectives. First, it maintains contact with Rutgers alumni, informing them of the university's programs with the hope that they will 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 sponsor programs based on the interests of the alumni of that program. Active membership is maintained through payment of regular alumni dues. Each alumni association is represented in the Rutgers University Alumni Federation which sponsors university-wide 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 and throughout the country.

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

The department's Newark office is located at 15 Washington Street, Newark, NJ 07102 (973/353-5242).

Rutgers University Foundation

The Rutgers University Foundation was incorporated in 1973 as a semiautonomous division of the university responsible for soliciting funds from private sources.

With a full professional staff and a national network of volunteers who sit on advisory committees and assist in the solicitation of funds, the foundation has steadily—indeed, dramatically—increased the amount of annual private support for Rutgers, private support that provides funding for more than 1,500 university programs that encompass every division of the university and every campus.

In the process of developing new ways to finance programs at Rutgers from nonpublic sources, the foundation has garnered national recognition and awards for its fund-raising and communications. The professional staff includes experts in corporate and foundation relations, an area that accounts for more than half of the private monies received by the university. It also includes specialists in deferred and planned giving, in fund-raising for athletics, in soliciting annual gifts, in obtaining major and special gifts, and in managing campaigns to fund capital needs.

In 1984, the foundation undertook the most ambitious fund-raising endeavor in the university's history, the $125 million Campaign for Rutgers. Using advanced fund-raising methods to identify new philanthropic sources for Rutgers, the foundation structured the campaign to raise funds for areas that have direct bearing on the quality of education and research at the university. Campaign funds were earmarked to support distinguished professorships, to underwrite new program development and departmental research, to allow for renovation of campus facilities, to endow scholarships and fellowships, and to establish a pool of "opportunity resources" for all university divisions. In 1990, the campaign concluded 34 percent over goal and in the process increased annual contributions to the university from $9 million to $27 million.

Since the conclusion of the Campaign for Rutgers, annual contributions have continued to rise, exceeding $43 million during the 1995–96 fiscal year ($5.7 million of which was contributed by graduates of the university), and the foundation has undertaken several successful multimillion-dollar "special purpose" campaigns: the Campaign for the Center for the Study of Jewish Life, the 75th Anniversary Fund for Douglass College, the Campaign for Undergraduate Biological Sciences, The Campaign for Rutgers Stadium and Women's Athletic Scholarships, the Alexander Library Campaign, and the university-wide Campaign for Community, Diversity, and Educational Excellence.

Further information about the foundation may be obtained from the Rutgers University Foundation, Winants Hall, Rutgers, The State University of New Jersey, 7 College Avenue, New Brunswick, NJ 08901-1261 (732/932-7777).

Academic Policies and Procedures

STUDENT RESPONSIBILITY TO KEEP INFORMED

This catalog provides a compendium 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 regulations, academic and otherwise, 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 the catalog will be circulated to registered students through their graduate program office.

In general, students should address their questions to their graduate program director.

Questions related to general graduate student rules under the jurisdiction of the Graduate School–Newark may also be directed to the Office of the Dean, Hill Hall, Room 401.

REGISTRATION AND COURSE INFORMATION

A prepared registration form for each newly admitted student is sent directly to the student before the start of the fall and spring terms. Advising arrangements vary according to the needs of particular graduate offices. 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.* The 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 allowances of up to ten days have to be made for campus mail delivery, and it is more prudent to deliver them by hand. Courses can be added in the first five days of the semester and dropped for the first ten days. Registration can be confirmed via the Rutgers Touchtone Registration System (RTTRS). A printout of registration can also be requested at the registrar's office.

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.

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 the 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 of courses: from registration through the fifth day of classes.
2. Dropping of courses: from registration through the eleventh week of classes. Courses dropped during the first two weeks of class are deleted from the student's record; courses dropped from the third to eleventh week result in a *W* grade and a $5 late fee charge.

See the Tuition and Fees chapter for financial penalties.

Withdrawal from College. Students may withdraw from college through the twelfth week of classes; the signature of the dean is required. 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, submit it 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, December 1.

Intra-Institutional Registration

Graduate Courses

Students in the Graduate School–Newark may take courses offered by another graduate division of the university by consulting with their graduate program director and entering the necessary registration transaction via the Rutgers Touchtone Telephone Registration System 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

Graduate students may enroll in advanced undergraduate courses (at the 300 and 400 level) with the approval of their program director. This may be a regular part of the graduate program or a means 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 via the Rutgers Touchtone Telephone Registration System or in person at the registrar's office. The credit prefix appears on the permanent record as follows:

G. The undergraduate course has been approved for graduate credit.

E. The undergraduate course is excluded from credit in the graduate program.

No more than 12 credits numbered below 500 may be used in fulfillment of the requirements for an advanced degree, except in 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. They must:

1. consult with their graduate program director for approval;
2. complete the exchange form obtained from the graduate program office or the Office of the Dean;
3. for NJIT courses, students must report to Rutgers' registrar. For UMDNJ courses, 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"

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

Auditing Courses without Registration

Upon obtaining the permission of the instructor of the course and subject to the availability of space, full-time students of the school may audit courses without registration. It is understood that no academic credit is earned in this manner. No official record of audited courses is kept.

Undergraduate Enrollment in Graduate Courses

Qualified undergraduate students in the university are welcome to take courses offered by the graduate faculty. They must, however, first obtain approval of the instructor or the director of the program offering the course. Registration can be made via the touchtone registration system (TTRS) or in person at the registrar's office. Undergraduates must obtain the necessary permission from the undergraduate dean's office and their undergraduate major adviser.

Transfer of Credit

Graduate courses completed at other institutions may be accepted for credit at the university. Application may be made by the student only after completing at least 12 credits with grades of *B* or better at the Graduate School–Newark. Courses may be considered for transfer if the following stipulations apply:

1. the course must have been graded—neither *Pass* nor *Satisfactory* can be accepted;
2. the student must have earned a grade of *B* or better in the course;
3. the course may not include work for a thesis, independent study, or research;
4. the course must normally form a part of the student's program in his or her field of concentration;
5. the course must normally have been taken during the six-year period prior to the qualifying examination;
6. up to 30 graded credits of course work may be transferred from other graduate degree-granting institutions.

The number of courses transferable is limited in the following ways and subject to the recommendation of the program faculty:

Master's: A maximum of 40 percent of the minimum requirement for the degree is allowable. A student with a prior graduate degree may use up to 12 of these credits in fulfillment of the requirements for a subsequent master's degree, subject to the recommendation of the program concerned and the approval of the dean.

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

The faculty of a graduate program may also 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, exclusive of research, up to a maximum of 24 credits.

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 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. 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. A student registered for 12 or more credits has full-time status; a student registered for 11 or fewer credits has part-time status. In addition to regular course work, the following are also 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, thereby qualifying for full-time status.

CLASS SCHEDULES AND HOURS

Starting and closing dates for each term, scheduled holidays, and other important scheduling information can be found 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 shall 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 the make-up of work missed because of such absence. Examinations and special required out-of-class activities are ordinarily not scheduled on those days when such students refrain from participating in secular activities. Absences for reasons of religious obligation are not counted for purposes of reporting. 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. However, there are instances where 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. Arrangements for make-up work are announced by individual instructors.

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

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

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

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.

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*), future course registration will be denied unless waived in specific cases by the dean.

Credit Prefixes

The number of credits appearing on course records and registration cards may be preceded by a letter prefix as follows:

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

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

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

F. The course was failed; no credit earned.

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. Unofficial transcripts may also be requested through the touchtone telephone system.

The request must be received at least ten working days prior to the date the transcript is needed, accompanied by a fee of $3 for each copy. Checks should be made payable to Rutgers, The State University. Unofficial transcripts, for an active student's personal records, are available free of charge. 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.

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

Student complaints about grades will, where possible, be handled within the structure of the graduate degree program.

First, the student should confer informally with the instructor who recorded the grade in question. Such a conference shall take place within ten school days of official notification of the grade. If the matter is not resolved between the student and the instructor, the student should, within ten school days of the meeting between the student and instructor, take the issue in written form to the director of the graduate program or a designee for review and mediation. The director, or a designee, within ten school days of notification of the dispute, shall 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 whomever it chooses and may, in extraordinary cases, ask third parties from among the faculty to review the grade in question.

Appeal from the program faculty's decision may be made to the dean of the Graduate School–Newark. Such appeal shall be in writing, shall be made within ten school days of receipt of the program faculty's decision, and shall state the grounds for 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 the receipt of the appeal. For purposes of this procedure, "school day" is any day classes are in session, excluding the summer session.

SCHOLASTIC STANDING

Candidates for the master's and doctor's degree 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. If a student's academic performance falls below the expected standard, the program or the school may review the record and make recommendations concerning future registration in the Graduate School–Newark.

Procedures for Granting or Denying Graduate Degrees

Each graduate program which 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.
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 written thesis; and procedures for oral defense, including the number or percentage of committee members who must approve.
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 or not 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/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. Conditional requirements established at the time of admission must be satisfied by each student in question. 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 the student's performance. Such a warning specifies the source of concern, the applicable program or graduate school rules, and the proposed action. Warnings specify when and on what basis a recommendation for academic dismissal is being considered by the faculty. 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 and may be assisted in his or her presentation by a member of the university community.

If the program faculty's decision is to dismiss, such a decision must be in writing and specify the reasons for the dismissal and all warnings communicated to the student.

Appeal

Appeal from the program faculty's decision may be made to the dean of the Graduate School–Newark. This written appeal must be made within ten school days of receipt of the program faculty's decision and must state the grounds 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 the appeal. For purposes of this procedure, "school day" is any day classes are in session, excluding the 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 should also 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 acknowledgement 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, hourly, or 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, 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 who believe that violations have occurred should immediately contact the dean's office of the Graduate School–Newark. 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 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 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) and are heard at university hearings. Less serious offenses (nonseparable offenses) are heard according to the procedures in place at the student's college or school of affiliation.

Separable Offenses

The following offenses are deemed serious enough to potentially result 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 member of the university community to serve as their advisers, whether they are on the list or not.

Attorneys

Complainants and respondents may also, 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.

University Hearings

University hearings are presided over by a hearing officer and heard by a hearing board composed of students and faculty (with students always being in the majority). 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 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

The safety and security of all members of the university community is of paramount concern to the university's public safety staff.

Comprising commissioned police officers with full investigative and arrest authority, security guards, and dispatchers, members of the public safety staff patrol each campus and respond to requests for assistance on a full-time basis, 365 days a year and twenty-four hours a day. However, it is the duty of all students, faculty, and staff to actively maintain

a safe environment, to use due care in their own safety and the safety of others, and to comply with all local, state, and university regulations regarding their own protection and the protection of others.

Primary responsibility for safety and security on the New Brunswick/Piscataway campus is vested in the associate vice president for administration and public safety. On the Newark campus these responsibilities reside in the Office of the Provost and on the Camden campus they reside in the Office of Administrative Services.

Three brochures entitled *Safety Matters,* one each for the Camden, Newark, and New Brunswick/Piscataway campuses, explain in greater detail the public safety services and programs available at the university. For free copies of these brochures, contact the associate vice president for administration and public safety, Old Queen's Building, Rutgers, The State University of New Jersey, 83 Somerset Street, New Brunswick, NJ 08901-1281 (732/932-8404), specifying the campuses in which you have an interest.

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 which 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 executive vice president will have the authority throughout the university to declare a particular activity to be disruptive. In the three geographic areas of Camden, Newark, and New Brunswick, the respective provost will have the same authority.
2. Broadly defined, a disruption is any action which significantly or substantially interferes with the rights of members of the academic community to go about their normal business or which 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 absence the executive vice president, will have the authority to decide that civil authorities beyond the campus are to be called upon to contain those disruptions which the university police are unable to handle. In extraordinary circumstances, where neither the president nor the executive vice president is available to make such a decision, the provosts of the three geographic areas 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 dean of students on their respective campuses. In a disruption, the deans of students and their staff members have a two-fold 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.

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 Brian T. Rose, 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, ext. 11).

Nondiscrimination in University-Recognized Clubs and Organizations

University-sponsored clubs or organizations have certain obligations with regard to 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, and the Older Americans Act of 1975. Consideration should be given to:

Membership: clubs and organizations may not deny membership to anyone on the basis of race, sex, handicap, or age, with the exception of social sororities or fraternities which are entitled by law to remain single-sex organizations if tax exempt under 504a of IRS code 1954.

Benefits: clubs and organizations may not discriminate on the basis of race, sex, handicap, and age in providing aids, benefits, or services to students.

Holding Office: race, sex, handicap, or age may not limit any person from the ability to hold office.

As a condition of recognition, all clubs and student organizations must include a statement in their constitutions assuring nondiscrimination on the basis of race, sex, handicap, and age. Social fraternities and sororities are asked to include a statement assuring nondiscrimination on the basis of race, handicap, or age.

Questions regarding students' obligations under the law may be directed to the dean of students or to the Director of Compliance and Student Policy Concerns, Rutgers, The State University of New Jersey, 3 Bartlett Street, New Brunswick, NJ 08901-1190 (732/932-7312, ext. 11).

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 value 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 is intended to inform students that verbal assault, defamation, or harassment of others violates acceptable standards of conduct within the university. (This policy is not intended to supersede the university's policy against sexual 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 man-

ner 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 as a "heinous act."
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 as a "heinous act."

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 judgments of whether a particular act is of a separable or nonseparable level are made by the appropriate college official and are subject to review by the Office of the Vice President for Student Affairs.

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 T. 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;
Sheila P. Fleishman, director of student judicial affairs, 3 Bartlett Street, College Avenue campus, 732/932-9414;
Rory P. Maradonna, associate provost for student life, Armitage Hall, Room 248, Camden campus, 609/225-6050;
Raymond T. Smith, associate provost for student affairs, S.I. Newhouse Center, 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.

SEXUAL HARASSMENT POLICY

Sexual harassment of students by faculty, administrators, other employees, or fellow students is a form of sex discrimination prohibited by university policy and by Title IX of the Education Amendments Act of 1972. The university has both informal and formal procedures for resolving complaints. Students are encouraged to raise questions and bring problems for confidential discussion to the Office of the Dean or to the Director of Affirmative Action, 3 Bartlett Street, College Avenue campus, 732/932-2136. A brochure entitled *Tell Someone* is available from the above administrators upon request.

In differentiating between actions that constitute sexual harassment and those that establish a strictly personal, social relationship without discriminatory effects, the university applies the following criteria:

Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when:

1. submission to such conduct is made, explicitly or implicitly, a term or condition of an individual's education or employment;
2. submission to or rejection of such conduct is used as the basis for decisions affecting an individual's academic or employment status; or
3. such conduct has the purpose or effect of unreasonably interfering with an individual's learning or work performance or creating an intimidating, hostile, or offensive learning or work environment.

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. However, the university is permitted to provide directory information without the student's consent unless he or she requests in writing that such information be kept confidential. Rutgers defines directory information as name, campus address and telephone number, 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, and date(s) of degree(s).

Three of 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 campus-wide information system known as INFO on the Rutgers University Computer Network (RUNet), which is accessible via the Internet.
• through the publication of the student directory each fall.

Students may request that directory information be kept confidential by obtaining a form for this purpose from their dean's office or from the registrar's office. This form must be completed and received by the registrar before September 10 to avoid publication in the printed directory in that academic year; however, with respect to the verification office and Rutgers INFO, students can request that their directory information be kept confidential at any time. 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 you may 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.

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. The university recommends that those receiving financial aid not acquire a substitute number because the social security number is key to student identification by state and federal financial aid agencies. Thus, it is recommended that a substitute number be obtained only if student privacy concerns outweigh the possibility of a serious disruption in financial aid.

Further information on the law and Rutgers' policy and procedures on compliance with FERPA is available from the Office of Compliance and Student Policy Concerns in the Division of Student Affairs (732/932-7312, ext. 11).

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 day 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, but in no case 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 director of admissions or to 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 associate vice president for student services by the student within two weeks after the director of admissions or the university registrar has issued a determination. The decision of the associate vice president for student services 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 delays or neglects to question his or her eligibility status beyond the period specified above, the 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. 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; all university-conducted research must be available for public scrutiny and use.

Most research projects at the university are carried on by faculty members and students within the facilities offered by their own departments, but 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. The faculty in charge of each program may impose additional requirements of its own. The most significant of these additional requirements are announced in the program descriptions in the Programs, Faculty, and Courses chapter.

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 being the subject of the doctoral dissertation.

General Requirements

Doctoral programs are normally arranged in two phases: the preliminary general phase, during which the student usually pursues courses of study, is completed when the qualifying examination is passed; the later special phase, during which the student usually pursues courses of research, 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 the qualifying examination is completed), (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 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.

Courses taken to satisfy the requirements for the master's degree may, with the program's approval, be applied to the doctorate.

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 so informed by their department or committee chairperson or school dean.

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

Admission to Candidacy: The Qualifying Examination

The purpose of the qualifying examination is to determine whether a student has acquired sufficient mastery of the field of concentration to warrant admission to candidacy for the Ph.D. degree. It should be taken as soon as a student has completed the major portion of the course requirements, and it should be taken not later than six years after the student first registered in the Graduate School–Newark and not later than two terms before the student expects to take the final post-thesis examination. Certain programs specify that the qualifying examination be taken at stated times that meet this condition.

The examination, conducted by a committee of at least four members or adjunct members of the graduate faculty (the chairperson must be a full member), is comprehensive in character and may be written or oral or both.

The application for admission to candidacy for the degree of Doctor of Philosophy must be obtained by the student from the Office of the Dean and submitted to the chairperson of the committee at the time of the examination. It should then be returned, properly signed by the members of the committee and the graduate director, to the dean's office. Once the examination has been passed, the student must continue in registration, whether for courses, research, or matriculation continued, in order to maintain status as a candidate.

Dissertation and Dissertation Committee

Each candidate for the doctorate shall pursue, under faculty direction, an original investigation of a problem or problems in a field of concentration and present the results of this investigation in a dissertation. The dissertation must be approved by a faculty committee of at least four members appointed by the graduate program director. One member of the committee should be from outside the program in which the degree is sought. The chairperson of the committee, who supervises the investigation, must be a member of the graduate faculty approved for the supervision of doctoral research. The student is advised to consult with the members of his or her committee as the work on the dissertation progresses.

Once the student has developed, with the advice of the dissertation director, preliminary guidelines for a dissertation, a meeting of the committee, including the outside member whenever possible, and the candidate, is held to discuss the candidate's dissertation proposal. Subsequently,

the committee must be kept informed of the candidate's work and assist in its development. The committee agrees to give ample and early warning of any reservations concerning the student's progress and must specify in writing the changes required for dissertation acceptance.

The final draft of the dissertation should be prepared in strict accordance with the instructions given in the pamphlet *Thesis and Dissertation Form,* available at the Office of the Dean of the Graduate School–Newark. After the dissertation has been accepted by the committee, the original and one copy are to be filed 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,* embodying the principal finding of his or her research. As in the case of the dissertation, the abstract must be approved by the professor in charge of the work for the dissertation and accepted by the other members of the student's committee.

Final Examination

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

At the time of the final examination, it is the responsibility of the candidate to obtain from the Office of the Dean the candidacy application (on which the result of the qualifying examination is recorded) for completion by the committee at the final examination. The committee members must also sign the title page of the dissertation, signifying 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 completion of degree requirements. The names of those failing to meet these deadlines are automatically removed 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. A certification of completion is issued upon request in advance of the awarding of the diploma in May.

Publication of Dissertation and Academic Data

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

University Microfilms of Ann Arbor, Michigan, microfilms the dissertation and publishes the abstract. Information concerning the preparation of the dissertation and abstract, and the agreement with University Microfilms which the candidate is to sign, are available in the Office of the Dean. The fee for microfilming the dissertation and publishing the abstract is $50. Registration of copyright is also 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 both the Graduate School–Newark and those of the program in which they are enrolled. The requirements of the Graduate School–Newark are as follows:

1. A minimum of 30 credits of successful graduate study (program exceptions: nursing, 36; and psychology, 36 credits).
2. Successful completion of a final comprehensive examination in the student's field of concentration if required by the program.
3. Writing requirement to be satisfied by either a master's thesis or demonstration to the faculty of ability to write a creditable expository or critical essay. This may be fulfilled either as part of a regular course or seminar or in a special assignment designed for such purposes.
4. Foreign language examination if required by the program.
5. Sixty percent of the student's degree program in graduate level course work must be completed under the jurisdiction of the Graduate School–Newark.
6. 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).
7. No more than 9 credits with a grade of *C* or *C+*.
8. No more than 12 credits of advanced Rutgers undergraduate course work (numbered 300 or 400) approved by the graduate program.
9. Courses may be selected from a single program or from several related programs with the approval of the graduate program director.

Specific program requirements are noted in the Programs, Faculty, and Courses chapter.

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.

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 Rutgers, The State University of New Jersey, Graduate School of Education, 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. in that no limit is placed on the number of advanced undergraduate courses that may be taken, and all programs consist primarily of work in regular courses of study; no program requires the submission of 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 must satisfy the requirements of the Graduate School–Newark and the Public Administration Program. Program requirements are as follows:

1. A minimum of 42 credits of successful graduate study comprised of:
    a. A core of ten courses (30 credits) including 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 the career development needs and interests of the student, the interest and capacity of the sponsor to provide pertinent learning experiences, and the student's preferences regarding functional field, level of government, and geographic location. Interns may receive stipends where possible.

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

Committees and Advisers

When a student's program includes a thesis, the supervision of the course of study, the research for the thesis, and the conduct of the final examination is entrusted to an appointed committee 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. 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 toward mastery of a discipline depends to a large extent 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,* 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 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 prior to the time of the final examination.

If a student expects to take the final examination at the end of the summer session or at the beginning of the fall term, the application must be filed prior to the opening of the summer session. 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 or oral or may be a combination of both. At the time it is to be taken, the candidate must obtain from the Office of the Dean the previously filed application and submit it to the chairperson of the committee. The chairperson records the result on this form, and it is then the responsibility again of the candidate to return it, 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 intending to pursue the Ph.D. degree may elect to take the qualifying examination for the doctorate. 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 as follows:

Degree	Total Credits	Full- or Part-Time	Minimum	Average	Maximum
M.A., M.S.,	30	Full	1	1$\frac{1}{2}$	3
M.A.L.S., M.A.T.		Part	1	2$\frac{1}{2}$	5
M.P.A.	48	Full	1	2	4
		Part	2	4	6
M.S. (Nursing)	36	Full	1$\frac{1}{2}$	3	5
		Part	3	4	5
Ph.D.	72	Full	3	5	7
		Part	4	6	8

(Time in Years: Minimum, Average, Maximum)

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. Ensure 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. Students must refile this form if the deadline has passed.

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. However, 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. Students may, therefore, request a temporary certificate of completion by submitting a written request to the Office of the Dean of the Graduate School–Newark.

The diploma is withheld from any student who is under financial obligation to the university.

Programs, Faculty, and Courses

The following graduate programs are offered by the Graduate School–Newark and appear in this chapter in alphabetical order. The numbers indicate the curriculum code for each program.

- 112 Behavioral and Neural Sciences
- 120 Biology
- 160 Chemistry
- 202 Criminal Justice
- 220 Economics
- 350 English
- 380 Environmental Geology
- 480 Global Studies
- 510 History
- 558 International Studies
- 606 Liberal Studies
- 620 Management
- 645 Mathematical Sciences
- 705 Nursing
- 755 Physics, Applied
- 790 Political Science
- 830 Psychology
- 834 Public Administration

Located under each program is 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; information about special prerequisites for some courses may be obtained from graduate program offices and from instructors at initial class meetings. Courses numbered in the 700s are ordinarily intended for students preparing individual research theses for advanced degrees.

Advanced undergraduate courses (numbered in the 300s and 400s) offered in the several colleges of the university do not appear in this catalog, but among them are many which may serve as useful prerequisites to particular graduate courses and which under certain conditions may be accepted for credit toward graduate degrees. Within the limits described under Degree Requirements and Academic Policies and Procedures elsewhere in this catalog, a student in the Graduate School–Newark may register for an undergraduate course with the approval of his or her graduate director.

Information about undergraduate course offerings must be sought in the appropriate undergraduate catalogs and separate class schedules. Graduate-level courses at the University of Medicine and Dentistry of New Jersey, the Rutgers professional schools, the New Jersey Institute of Technology, and Princeton University must also be sought out 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 the course. The following subject codes are used in this catalog. (This list does not constitute a list of degree programs.)

010   Accounting
112   Behavioral and Neural Sciences
120   Biology
135   Business Administration
160   Chemistry
202   Criminal Justice
220   Economics
223   Applied Economics
350   English
352   English, American Literature
390   Finance
460   Geology
480   Global Studies
510   History
545   Industrial Relations and Human Resources
558   International Studies
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 indicate that each term course may be taken independently of the other (example: 26:160:601,602). Two course codes separated by a hyphen indicate 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, except if 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) indicated fall and spring anticipated schedule. 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 a number of lecture hours equal to the number of credits to be earned. Special hours or modes of class, other than lecture, are usually indicated in italics below the course title.

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
FOM	Faculty of Management
SSW	School of Social Work
IAB	Institute of Animal Behavior
NCAS	Newark College of Arts and Sciences
NJIT	New Jersey Institute of Technology
SB–C	School of Business–Camden
SB–NB	School of Business–New Brunswick
SCJ	School of Criminal Justice
SL–N	School of Law–Newark
SMLR	School of Management and Labor Relations
UC–N	University College–Newark
UMDNJ	University of Medicine and Dentistry of New Jersey

BEHAVIORAL AND NEURAL SCIENCES 112

Degree Program Offered: Doctor of Philosophy
Codirectors of the Graduate Programs:
Professor Ian Creese, 316 Aidekman Research Center (973/353-1080; ext. 3300)
Professor Paula Tallal, 201 Aidekman Research Center (973/353-1080; ext. 3200)

Members of the Graduate Faculty

Professors:

Colin G. Beer, *GS–N; D.Phil., Oxford*
   Ethology, especially communication and social development of birds; history and philosophical aspects of ethology; comparative psychology
György Buzsaki, *GS–N; 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, *GS–N; Ph.D., Bryn Mawr*
   Neurobiology of vocal behavior/acoustic communication in the regulation of reproductive behavior in the ring dove

Ian Creese, *GS–N; 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

Barry R. Komisaruk, *GS–N; Ph.D., Rutgers*
Neurophysiological study of pain and neuropharmacological suppression mechanisms, and reproductive behavior in mammals

Joan I. Morrell, *GS–N; Ph.D., Rochester*
Neuroanatomy and neuroendocrinology, especially in relation to central nervous mechanisms regulating reproductive behavior in mammals

Howard Poizner, *GS–N; 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, *GS–N; Ph.D., New York*
Hormones and maternal behavior in mammals; mother-young interactions and behavioral development in mammals

Paula Tallal, *GS–N; 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:

Elizabeth D. Abercrombie, *GS–N; Ph.D., Princeton*
Neurochemistry; plasticity in central monoaminergic systems; mechanism of action of psychotherapeutic drugs and drugs of abuse

Edward Bonder, *GS–N; Ph.D., Pennsylvania*
Cell biology

Doina Ganea, *GS–N; Ph.D., Illinois Medical School*
Molecular immunology

Alan Gilchrist, *GS–N; Ph.D., Rutgers*
Vision

Mark A. Gluck, *GS–N; 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

Ronald Hart, *GS–N; Ph.D., Michigan*
Molecular neurobiology

G. Miller Jonakait, *GS–N; Ph.D., Cornell Medical School*
Developmental neuroscience

Margaret Shiffrar, *GS–N; Ph.D., Stanford*
Human image interpretation; computational models of the integration of motion measurements across object contours; influence of high-level knowledge on low-level measurements of visual images

Harold I. Siegel, *FAS–N; Ph.D., Rutgers*
Hormonal basis of maternal behavior in rodents

James M. Tepper, *GS–N; Ph.D., Colorado*
Anatomy and physiology of basal ganglia and dopaminergic systems

Beverley Whipple, *CN; Ph.D., Rutgers*
Birth analgesia

Laszlo Zaborszky, *GS–N; 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, *GS–N; 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

Linda Brzustowicz, *GS–N; M.D., Columbia*
Molecular genetics and linkage analysis, focusing on the role of genetics in the etiology of behavioral disorders and in individual variability of response to psychoactive medications

Judy A. Kegl, *GS–N; Ph.D., Massachusetts Institute of Technology*
Neurolinguistics; theoretical linguistics; linguistic consequences of aphasia; Parkinson's disease and epilepsy; language emergence and critical periods for language acquisition

Teresa Perney, *GS–N; Ph.D., Chicago*
Molecular biology of ion channels; role of potassium channels in temporal processing, particularly in the auditory system

Anne Sereno, *GS–N; Ph.D., Harvard*
Visual attention, visual shorter-term memory, and eye movements as approached cognitively, neurophysiologically, and computationally

Ralph M. Siegel, *GS–N; Ph.D., McGill*
Neurophysiology, psychophysics and computational theory of vision in primates; nonlinear dynamical theory; motion perception

Adjunct Members of the Graduate Faculty

Marthaleah Chaiken, *GS–N; Ph.D., Rutgers*
Genetics and evolution of behavior

Israel Gel'fand, *CMBN; Ph.D., Moscow State; Ph.D. (Hon.) Oxford, Paris, Harvard*
Neurophysiology; mathematical analysis

Barry Everett Levin, *UMDNJ; M.D., Emory Medical*
Neurochemistry, especially central and peripheral catecholamine system functions

Benjamin Henry Natelson, *UMDNJ; M.D., Pennsylvania Medical*
Environment-brain visceral organ relationships, chiefly in primates

Michael Recce, *NJIT; Ph.D., New Jersey Institute of Technology*
Neurophysiological basis and computational modeling of spatial navigation, robot navigation

Allan Siegel, *UMDNJ; Ph.D., SUNY (Buffalo)*
Neurophysiological and behavioral analysis of aggression in cats

David W. Tank, *GS–N, Ph.D., Cornell*
Neuronal networks; calcium dynamics; fMRI and computational modeling

Program

The graduate program in behavioral and neural sciences provides students with a solid grounding in the concepts and research techniques of modern integrative neuroscience. The Ph.D. program provides a multidisciplinary approach to the study of molecules, neural systems, brain, behavior, and cognition.

The faculty of the behavioral and neural sciences graduate program are committed to a multidisciplinary and integrative approach to the study of brain, behavior, and cognition utilizing the latest techniques in molecular biology, neurochemistry, neurophysiology, neuroanatomy, neuropharmacology, neuroimaging, computational modeling, and cognitive neuroscience.

The graduate program's worldwide web site contains supplemental information to this catalog and may be reached at http://www.bns.rutgers.edu. Additional information may also be obtained from the student's adviser after admission to the program.

Research Facilities

Extensive biological and behavioral research facilities are available. The Center for Molecular and Behavioral Neuroscience is housed in the Aidekman Research Center, which was opened in 1991, and contains eight "wet" laboratories for systems and molecular neuroscience research, six human behavioral neuroscience laboratories that include state-of-the-art equipment and testing facilities for normal or impaired subjects, and a modern animal housing facility. The Institute of Animal Behavior, founded in 1958 and part of the Department of Psychology, has well-equipped behavioral, neuroanatomical, electrophysiological, and biochemical laboratories.

Course Requirements

In the first year, all students are required to take both terms of Foundations of Neuroscience and Behavior (26:112:565,566) and Critical Thinking in Neuroscience (26:112:650,651). Statistics in Neuroscience (26:112:509,510) and Research in Neuroscience (26:112:511,512) are also required and may be taken in either the first or second years. A minimum grade of *B* must be earned in each term of these courses or the course must be retaken. Students failing to earn a grade of *B* or better in the first term of Foundations in Neuroscience and Behavior will be placed on probation. Students must earn an overall grade-point average of 3.0 or better over both terms of Foundations in Neuroscience and Behavior in order to continue in the program.

In addition, students are required to take elective courses and to participate in journal clubs. For the doctoral degree in behavioral and neural sciences, a minimum of 44 nonresearch course credits plus 24 research course credits is required. Certain courses offered by the departments of biological sciences, psychology, chemistry, and physics, by the Research Training Program in Cellular and Molecular Biodynamics at Rutgers–Newark and at the nearby University of Medicine and Dentistry of New Jersey or New Jersey Institute of Technology may also be applied to the necessary electives in addition to the courses offered by the program in behavioral and neural sciences provided that they are approved by the director(s) of the graduate program. All courses must be completed with a minimum of *B* in order to be applied to the requirements for the doctoral degree.

Early Research Project

After completing the first year curriculum, and before the comprehensive examination may be attempted, students are required to successfully complete an early research project. The early research project is an independently performed research project approved by the faculty member in whose laboratory the research is performed.

The early research project should comprise a complete piece of original research, suitable in all respects for publication in a refereed journal. Special consideration may be given, on a case-by-case basis, for students who have expended equivalent research effort but whose projects do not yield publishable results.

Qualifying Examination

All students must pass the qualifying examination to advance to candidacy for the Ph.D. in behavioral and neural sciences. Qualifying examinations take place during the fall term of the student's third year in the program, typically during the third week of September. The qualifying examination is administered by a committee composed of six faculty members of the graduate program in behavioral and neural sciences. The committee for all students taking the qualifying examination in any given year is fixed and is appointed by the director(s) of the graduate program.

The qualifying examination is composed of two parts: a general and a special examination. The purpose of the general examination is to demonstrate the retention and the integration of fundamental concepts in the general field of neuroscience at a level that is appropriate for the Ph.D. candidate to possess. The purpose of the special examination is to demonstrate the ability to execute and defend a meaningful piece of original research and the skills necessary to write and publish experimental results.

Time Frame

The manuscript resulting from the early research project is submitted on the second Monday of September. The general examination is administered on Monday and Tuesday of the following week. The special examinations take place the next week. Thus, the total time from submission of the manuscript to completion of the qualifying examination process is no longer than three weeks. Students are informed as to their performance on both components of the qualifying examination following the special examination.

Examination Formats

The general examination is a written examination that takes place in two three-hour sessions over two days. Each year, every faculty member writes one essay question, based on that faculty member's lectures in Foundations in Neuroscience and Behavior, that is designed to be answered in writing within thirty to forty-five minutes. The qualifying examination committee divides these into two groups of seven questions each, one corresponding to cellular and molecular neuroscience and one corresponding to cognitive and behavioral neuroscience. Each student must select four questions from each group to be answered over the two-day period. There is no access to books or notes during the exam.

Each essay is graded by the faculty member who wrote it, in a pass-fail manner. Students must receive a passing grade on a minimum of seven of the eight essays in order to pass the general examination.

The special examination has both written and oral components, and is normally conducted by the six-member Qualifying Examination Committee. However, the student may request the addition of one additional faculty member from the program, other than the student's early research project adviser, to the examination committee.

The written component of the special examination consists of a write-up of the early research project in the form of a journal article. The journal format must be specified by the student (e.g., *Journal of Neuroscience, Journal of Cognitive Neuroscience, Journal of Neurochemistry,* etc.) and all aspects of the paper (e.g., title page, abstract, citations, reference list, figures, figure legends, key words, etc.) must be in the format required by that journal for submission of a manuscript. Since this paper is used to evaluate the student's ability to prepare a scholarly work prior to being advanced to candidacy for the Ph.D. degree, it should represent primarily the work of the student. This manuscript should be written with a minimum of input and feedback from the student's adviser. This does not mean that the experiments forming the basis for the paper, the analysis of the data, or their interpretation should not be discussed with the adviser. But the manuscript submitted to the Qualifying Examination Committee should comprise the student's own writing.

The special examination starts with a twenty to thirty minute oral presentation by the student of the early research project, illustrated with slides or overheads. Following this, the examination itself consists of a question and answer period in which the student is expected to be able to successfully defend all aspects of the work, and to discuss in a scholarly fashion scientific literature that is directly relevant to the project. It is expected that this part of the examination takes approximately sixty to ninety minutes.

Successful completion of the special examination requires approval by a majority of the members of the Qualifying Examination Committee. Upon passing the qualifying examination, the student is advanced to candidacy for the Ph.D. degree in Behavioral and Neural Sciences.

Policies Governing Reexamination

The student must pass both the special and the general portions of the qualifying examination to be advanced to candidacy. If the student fails either or both portions of the examination, the part or parts of the examination that were failed may be retaken once, at a time to be specified by the qualifying examination committee in consultation with the student's adviser, but no later than December 15th of the student's third year in the program.

Terminal Master's Degree

If the student fails to pass both components of the qualifying examination on the second attempt, the student will be asked to leave the program and a terminal Master of Science degree may be awarded, based on the recommendations of the Qualifying Examination Committee and the approval of the director(s) of the graduate program. Awarding of a terminal Master's degree is contingent upon completing at least 30 credits of graduate courses, including at least 24 credits with a *B* average, and submitting an acceptable written report of the early research project to the Qualifying Examination Committee.

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 from the chair of the Qualifying Examination Committee. This paper is reviewed by the Qualifying Examination Committee and, if it is found acceptable, the master of science degree is approved and awarded.

Doctoral Dissertations

Doctoral Dissertation Committee

As soon as reasonable after passing the qualifying examination, each student must establish a doctoral dissertation committee. The committee must consist of at least five members who serve as the examining committee at the oral defense of the dissertation. Four members of the committee must be members of the graduate program in behavioral and neural sciences. Other Rutgers faculty, such as from the Department of Biological Sciences, College of Nursing, or Department of Chemistry, may serve on the committee with the approval of the program faculty. At least one member of the committee must be an expert in the field of the candidate's research from outside Rutgers University. At least four members must certify satisfactory completion of the dissertation as evidenced by signing the graduation form.

Doctoral Dissertation Proposal

Time Frame and Dissertation Committee. The candidate must prepare and present a dissertation proposal as soon as reasonable after passing the qualifying examinations, but no later than one year before the planned dissertation defense. The goal of the proposal and its time frame are to ensure that the candidate has full benefit from the advice and guidance provided by the thesis committee. Candidates should form their dissertation committee prior to the

proposal preparation and presentation. Early on in the process of forming a dissertation committee the candidate, with approval from the thesis adviser(s), chooses a coordinator from the dissertation committee. The coordinator can be the dissertation adviser. The coordinator is responsible for introducing the candidate and facilitating the question and answer period during the proposal and presentation seminars, and in facilitating the proceedings of the closed sessions.

Written Proposal. The written proposal must be a scholarly presentation of the work proposed for the doctoral dissertation. The document must describe the experiments that will comprise the dissertation, both those experiments that have been completed and those that are proposed. The proposal introduction is a scholarly presentation and synthesis of the scientific literature that pertains to the dissertation, one that is more comprehensive than the introduction to a single scientific experiment or publication.

The written proposal is not expected to contain a large portion of completed dissertation experiments. The document should have a natural emphasis on preliminary data that would illustrate the feasibility of the research direction of the proposal. In addition, demonstration of the appropriateness and feasibility of the experimental methods that will be used, and demonstration that the candidate has a sufficient working knowledge of these methods is expected. In the case of proposed experiments, expected results and their relationship to hypotheses and alternative hypotheses set forth in the introduction should be furnished.

Oral Presentation and Examination. The oral presentation is not expected to contain a large portion of completed dissertation experiments. There should be a natural emphasis on preliminary data that would illustrate the feasibility of the research direction of the proposal. In addition, demonstration of the appropriateness and feasibility of the experimental methods that will be used, and that the candidate has a sufficient working knowledge of these methods should be provided. In the case of proposed experiments, which are likely to constitute the majority of the seminar, the presentation should emphasize explicit presentation of the rationale, hypotheses to be tested, methods, and finally, the expected results and their interpretation in the context of the proposed hypotheses. 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 highly recommended). The seminar is followed by a question and answer period during which the candidate takes questions from the university community.

The dissertation committee then meets with the candidate in closed session for more detailed examination of the proposal and the candidate's grasp of its scientific content. The candidate may be asked to revise any aspect of the proposal at this point. The goal of an accepted proposal is that the candidate and the committee reach consensus on the expected scientific content of the doctoral dissertation.

Dissertation Format

The doctoral dissertation must be in one of two formats, the traditional format or the compendium of journal articles formats.

The traditional format is composed of a minimum of five sections: 1) introduction, 2) methods, 3) results, 4) discussion, and 5) literature cited. Other sections, such as acknowledgments and dedications may be added.

The compendium of journal article format is a mixed format in which published manuscripts, those in press, or those that have been submitted for publication constitute the major portion of the dissertation. This format includes at a minimum four sections: 1) introduction, 2) publications, 3) discussion, and 4) literature cited. Other sections, such as acknowledgments or dedications, may be added.

Dissertation Defense

The date of the dissertation defense is scheduled for three weeks after the student submits the complete dissertation to each of the committee members. All members of the dissertation committee must be present for the final defense. The defense consists of a publicly announced, open colloquium. This is followed by a closed session with the dissertation committee.

Teaching Requirements

Students are also required to fulfill a three-term teaching assistantship.

Graduate Courses

26:112:501. 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.

26:112:502. SEMINARS ON THE LIMBIC SYSTEM (4)
Buzsaki
Issues in limbic system research; the format and importance of scientific debate as well as practice presentation of scientific material to a strong, learned community stressed.

26:112:509,510. STATISTICS IN NEUROSCIENCE (3,3)
L. Hirsch
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 meta-analysis.

26:112:511,512. RESEARCH IN NEUROSCIENCE (3,3)
R. Siegel
Research rotation.

26:112:514. INTRODUCTION TO HIGH-PERFORMANCE COMPUTING (1)
Introduction to high-performance computing, particularly with respect to parallel computing tools.

26:112:532. CELLULAR NEUROPHYSIOLOGY (3)
Tepper. Prerequisite: 26:112:565,566; or permission of instructor.
Advanced topics in cellular neurophysiology. Topics include membrane biophysics, synaptic transmission, and an overview of systems neurophysiology.

26:112:563. PROSEMINAR IN GENETICS AND EVOLUTION (3)
Basic principles of population genetics, ecology, and evolution. Topics include mechanisms of genetic change, maintenance of genetic variability, competition, population regulation, and life history strategies.

26:112:565,566. FOUNDATIONS OF NEUROSCIENCE AND BEHAVIOR (6,6)
Staff
Broad overview of basic tenets, philosophy, history, techniques, and research advances in behavioral and neural sciences.

26:112:589. INTRODUCTION TO NEUROPHARMACOLOGY (3)
Abercrombie
Basic neurochemistry and neuropharmacology relating to synaptic transmission. Chemistry and pharmacology of neurotransmitters. Experimental approaches.

26:112:607. SEMINARS IN LEARNING AND MEMORY (3)
Gluck. Prerequisites: 26:112:565,566; or permission of instructor.
Lectures and seminars on human and animal learning and memory by the instructor and outside experts in the field.

26:112:625. BASAL FOREBRAIN: ANATOMY TO FUNCTION (3)
Zaborszky. Prerequisites: 26:112:565,566; 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. The role of the basal forebrain in certain neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease are also covered.

26:112:626. BRAIN AND LANGUAGE (3)
Poizner
High-level cognitive functions subserving spoken and sign language and their neuronal substrates.

26:112:627,628. COLLOQUIUM IN NEUROSCIENCE (1,1)
R. Siegel. Prerequisites: 26:112:650,651.
Neuroscience topics of current interest are 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 are covered in depth. Continues training in various advanced topics in neuroscience begun in 26:112:650,651.

26:112:629. 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 system, the anatomical basis of neuroendocrine and central autonomic regulations. Anatomical organization of motivation, emotion, learning, and memory. CNS vasculature and cerebrovascular diseases. Brain imaging techniques and the comparison of such images with brain sections.

26:112:630. TEMPORAL PROCESSING (3)
Tallal
The role of temporal processing in various cognitive processes.

26:112:631. NEURAL PLASTICITY (3)
Buzsaki. Prerequisites: 26:112:565,566; or permission of instructor.
Lectures on cellular and systems level neuronal mechanisms underlying learning and memory and recovery of function following neuronal injury.

26:112:632. 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.

26:112:633. 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.

26:112:650,651. CRITICAL THINKING IN NEUROSCIENCE (3,3)
R. Siegel. 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 will be discussed. Part of the course will entail attendance and discussion of seminars presented by experts in various disciplines of neuroscience..

26:112:667. COGNITIVE PROCESSES (3)
Shiffrar
How the environment comes to be apprehended; perception, memory, and thinking.

26:112:706,707. RESEARCH IN BEHAVIORAL AND NEURAL SCIENCES (BA,BA)

26:112:708,709. INDIVIDUAL STUDIES IN BEHAVIORAL AND NEURAL SCIENCES (BA,BA)
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.

26:112:750. TECHNIQUES IN NEUROSCIENCE (3)
Zaborszky
Demonstrations of current neuroscience techniques. Students spend one day in laboratories studying different methods including: *Abercrombie:* in vivo microdialysis of neurotransmitters; *Brzustowicz:* genetic linkage and positional cloning; *Buzsaki:* microsurgical lesions in rats, behavioral-associated field unit activity; *Creese:* receptor labeling, quantitative receptor autoradiography, in situ hybridization, mRNA quantification; *Gluck:* human learning, neurocomputational modeling; *Perney:* subcellular localization of ion channels: *Poizner:* three-dimensional computer graphic analysis of human movement; *Siegel:* psychophysical and electrophysiological methods in monkeys, nonlinear dynamical modeling; *Shiffrar:* psychophysical measures of motion perception; *Tallal:* neuropsychological, linguistic techniques, animal models of temporal information processing; *Tepper:* in vivo intra- and extracellular recording from central nervous system neurons; *Zaborszky:* perfusion fixation, sectioning, standard processing of brain sections for light and electron microscopy.

26:112:800. MATRICULATION CONTINUED (E1)
Open only to students not on campus. By permission of the graduate program director only.

BIOLOGY 120

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

Members of the Graduate Faculty

Professors:
György Buzsáki, *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
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, *GS–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, *GS–N; 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., Berkeley*
Laser systems to measure proteins
Judith Shulman Weis, *FAS–N; Ph.D., New York*
Marine biology

Elizabeth D. Abercrombie, *CMBN; Ph.D., Princeton*
  Central monoaminergic systems
Edward M. Bonder, *FAS–N; Ph.D., Pennsylvania*
  Cell biology
Douglas S. Bush, *FAS–N; Ph.D., California (Berkeley)*
  Plant cell biology
Doina Ganea, *FAS–N; Ph.D., Illinois Medical*
  Molecular immunology
Andrew E. Kasper, *FAS–N; Ph.D., Connecticut*
  Paleobotany
Thomas W. Lysz, *UMDNJ–SOM; Ph.D., Connecticut*
  Neurochemistry
Douglas Wildes Morrison, *FAS–N; Ph.D., Cornell*
  Behavioral ecology
Zoltan Spolarics, *UMDNJ–SOM; M.D., Semmelweis University Medical School*
  (Budapest); Ph.D., Hungarian Academy of Sciences
  Anatomy; cell biology; injury sciences
James M. Tepper, *GS–N; Ph.D., Colorado*
  Neurobiology of monoamines

Assistant Professors:

Linda Brzustowicz, *CMBN; M.D., Columbia*
  Molecular genetics
Gill Diamond, *UMDNJ–SOM; Ph.D., Hebrew (Jerusalem)*
  Anatomy; cell biology; molecular biology
Geoffrey M. Henebry, *FAS–N; Ph.D., Texas (Dallas)*
  Landscape ecology
Eric B. Knox, *FAS–N; Ph.D., Michigan*
  Molecular systematics; evolutionary biology
Teresa M. Perney, *CMBN; Ph.D., Chicago*
  Ion channels; neurotransmission
Danny J. Schnell, *FAS–N; Ph.D., California (Davis)*
  Plant cell biology; biochemistry
Ralph Siegel, *CMBN; Ph.D., McGill*
  Psychophysics and computational theory of vision

Adjunct Members of the Graduate Faculty

Henry Edinger, *Associate Professor of Basic Sciences, UMDNJ;*
  Ph.D., Pennsylvania
Emily Russell, *Research Associate Professor, GS–N; Ph.D., Rutgers*

Programs

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 organismal biology, and plant biology.

The program also includes a research component that students meet by either writing a thesis on an experimental laboratory or field project or by submitting a research paper based on current literature in the field. The topic of the research paper is determined by both the student and the student's major adviser. 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) and must pass an oral defense of the submitted thesis. Students choosing the research paper option are required to take 30 credits of course work, pass a written comprehensive examination, and complete a research paper.

The Ph.D. curriculum in biology is divided into two tracks. Students may select either the cell/molecular/biochemical track or the ecology/evolution track. Each track requires 36 credits of course work, including three core courses, and a minimum of 36 credits of research.

Required courses for the cell/molecular/biochemical track are 26:120:571 Biochemistry I, 26:120:515 Molecular Biology of Eukaryotes, and 26:120:524 Cell Biology. One course from each of three areas is required for the ecology/evolution track: landscape, ecosystem, and community ecology (either 26:120:587 Systems Ecology: Ecosystems in the Landscape *or* 16:215:565 Community Dynamics), organismal ecology (either 26:120:593 Physiological Ecology *or* 16:215:533 The Behavior of Animal Populations *or* 16:215:590 Population Ecology), and evolution and systematics (either 26:120:503 Plant Morphology *or* 26:120:532 Mechanisms in Evolution *or* 26:120:594 Animal Systematics).

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

At the completion of the core course requirements and of 6 credits of successful laboratory rotations, the student takes the qualifying examination. The qualifying examination consists of a written and oral examination in the cell/molecular/biochemical track and a written review paper, an oral presentation, and an oral examination in the ecology/evolution track. After successful completion of the qualifying examination, the student is admitted to candidacy for the doctoral degree.

Once the student has attained candidacy, he or she chooses an adviser, begins research for his or her 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 the final defense of the dissertation. In addition the dissertation committee 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.

Departmental Facilities

Departmental equipment includes a microscope facility second-to-none in the state of New Jersey. This facility comprises both scanning and transmission-electron microscopes, a confocal microscope, and five image-processing stations. In addition, the department boasts an oligo synthesizer, automated DNA sequencer, ultracentrifuges, 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. Additional facilities are available at neighboring institutions. Affiliations are maintained with the University of Medicine and Dentistry of New Jersey, New Jersey Institute of Technology, and industrial research laboratories.

Graduate Courses

26:120:501. NEUROANATOMY (3)
  Equivalent to 26:112:501.
Overview of the neuroanatomical systems of the mammalian nervous system.

26:120:503. PLANT MORPHOLOGY (3)
  Prerequisites: Undergraduate ecology or botany, or permission of instructor.
A 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.
A survey of plant autecology, synecology, plant geography, and analytical techniques and methods useful in studying the relationships between plants and their environment.

26:120:508. GENERAL ECOLOGY (3)
Recommended: Ecology.
An in-depth introduction to several important areas of population, community, physiological, and behavioral ecology.

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.
The 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 between all living things. Includes free-living and symbiotic forms as examples of diversity.

26:120:515. MOLECULAR BIOLOGY OF EUKARYOTES (3)
Prerequisite: 26:120:571.
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.

26:120:517. 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: 21:115:403,404, or equivalent.
Biology of prokaryotic organisms. Emphasis on those physiological, biochemical, and ecological aspects that are unique to bacteria.

26:120:523. ZOOGEOGRAPHY (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.
A detailed study of the structure and function of cells and their organelles; the composition, organization, and functioning of various membrane systems; investigative techniques.

26:120:530. BIOPHYSICAL MEMBRANE PHYSIOLOGY (3)
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, the thermodynamics of irreversible processes, and electrophysiology.

26:120:532. MECHANISMS IN EVOLUTION (3)
Prerequisite: Comparative anatomy, invertebrate zoology, or evolution.
A 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.
A 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 I (3)
Prerequisites: Anatomy, physiology, and biochemistry, or permission of instructor. Open to graduate nurses only.
The physiology of the different organs and organ systems of the human body with emphasis on homeostatic and pathological conditions.

26:120:540. ADVANCED HUMAN PHYSIOLOGY II (3)
Prerequisite: 26:120:539. Open to graduate nurses only.
The pathophysiology of the various organ systems of the human body with emphasis on the basic mechanisms underlying disease processes.

26:120:547. PATHOPHYSIOLOGY (3)
Prerequisites: Anatomy, physiology, and biochemistry; or permission of instructor.
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.

26:120:551. 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.
An 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.
The 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.

26:120:571,572. BIOCHEMISTRY I,II (3,3)
Prerequisite: One year of organic chemistry.
A detailed examination of the chemistry and metabolism of biological compounds; structure and function of macromolecules, biosynthetic pathways; bioenergetics; photosynthesis and other sequential biological processes.

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

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.
A discussion of selected topics in advanced ecology. Current literature and newly developing approaches and theories stressed.

26:120:589. (S) CHEMICAL BASES OF NEURAL FUNCTION (3)
Prerequisites: Undergraduates, one year of chemistry and biology. Graduates, baccalaureate degree. Recommended: Organic chemistry and biochemistry.
An interdisciplinary course on biochemical bases of nervous system activity. Special emphasis on developmental neurochemistry, genomic and nongenomic mechanisms of hormone action, and membrane proteins involved in neurotransmitter action.

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

26:120:594. ANIMAL 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)
Prerequisite: 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.
An 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)

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)

CHEMISTRY 160

Degree Programs Offered: Master of Science, Doctor of Philosophy
Director of Graduate Programs: Professor Frank Jordan,
  Room 232, Olson Laboratories (973/353-5329)
Coordinator of Graduate Programs: Professor Hugh W. Thompson,
  Room 342, Olson Laboratories (973/353-5173)

Members of the Graduate Faculty

Professors:

R. Ian Fryer, *FAS–N; Ph.D., Manchester (England)*
  Heterocyclic/medicinal chemistry; design and synthesis of novel benzodiazepines and other heterocycles; molecular modeling and drug design
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
Ernst U. Monse, *FAS–N; Ph.D., Max Planck Institute (Mainz)*
  Isotope effects and their applications to theoretical chemistry
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 in organic and organometallic model systems; excited-state dynamics; transient laser spectroscopy
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:

Ramy S. Farid, *FAS–N; Ph.D., California Institute of Technology*
Bioinorganic chemistry; protein-mediated electron-transfer studies; peptide synthesis; porphyrin and transition-metal complex binding to synthetic proteins; synthetic hyperthermophilic enzymes
Elena Galoppini, *FAS–N; Ph.D., Chicago*
Synthesis and properties of novel hydrocarbon cage compounds and rigid, extended 3-D organic networks

Professor Emeritus:

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 (500MHz and 400 MHz multinuclear NMR); mass spectrometers; a circular dichroism spectrophotometer; an X-ray diffractometer; a fast reaction laboratory with t-jump and stopped-flow capabilities; high-performance liquid chromatographs and gas chromatographs; electrochemistry units; and three workstations for molecular modeling and computational chemistry. 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 many PCs and Macs, three Silicon Graphics workstations, and its own time-sharing computer with peripherals throughout the department. Major workstation software includes Sybyl, Spartan, and Biosym programs. Departmental computers are connected to the Rutgers fiberoptic network, which includes hundreds of computers throughout the university and provides access to the Internet.

Cooperative arrangements with neighboring New Jersey Institute of Technology permit cross-registration for NJIT courses. The faculty of fourteen provide research opportunities in many fields of specialization including biophysical and bioorganic approaches to enzyme mechanism and structure; molecular modeling and drug design; synthetic organic, organometallic, and inorganic chemistry; biological membranes; neurochemistry; laser spectroscopy; medicinal chemistry; and X-ray crystallography among others.

A total of 30 credits, no more than 6 in research, are required for the master's degree; 72 credits, of which 24 must be in course work, are required for the Ph.D. degree. Of these, 12 credits are normally taken by students in their first year in the form of four core courses that must be passed with grades of *B* or better. The core consists of 26:160:515 and 534, plus two more courses chosen by the student from among 26:160:511, 571, and 581. The remaining 12 or 18 credits in advanced courses are usually taken in the second and third years.

The department sets written cumulative examinations each month that are graded on a basis of 2, 1, or 0 points. Students in the master's program must achieve 3 points whereas those studying for the Ph.D. require 10 points. This requirement is generally fulfilled in a student's 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 also 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 that describes the results of original research performed by the student under the supervision of a faculty member of the department. Normally between four and five years are needed to complete the Ph.D. dissertation research project, which is then presented to a thesis committee in a final oral examination. Normally, students select a research adviser and commence their dissertation research project in the second term of the first year.

Graduate Courses

26:160:501. Chemistry of Heterocyclic Compounds (3)
Fryer. Prerequisite: One year of organic chemistry.
Selected advanced topics of recent interest and importance. Systematic approach to synthesis of simple heterocycles, from 3-membered through the benzo-fused diazines, with emphasis on ring-forming mechanisms. Reactivity of electron-poor and -rich systems. Heterocyclic ring rearrangements.

26:160:503. Modern Synthetic Organic Chemistry (3)
Hall. Prerequisite: Advanced organic chemistry.
A 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)
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.
The 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 will be included.

26:160:519. Physical Organic Chemistry (3)
Huskey. Prerequisite: 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)
Monse. 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.

26:160:522. Statistical Mechanics (3)
Monse. Prerequisite: 26:160:532.
Statistical mechanics of systems in equilibrium; Boltzmann, Fermi-Dirac, and Bose-Einstein statistics; microcanonical and grand-canonical ensembles; application to solution and solid-state chemistry.

26:160:525. ADVANCED CHEMICAL KINETICS (3)
Monse. Prerequisite: Elementary physical chemistry.
Rates of chemical reactions, their measurement, and the factors that govern them.

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)
Raynor. Prerequisite: Physical chemistry.
The basic principles and methods of quantum mechanics with emphasis on their application to atoms and molecules.

26:160:534. THERMODYNAMICS AND KINETICS (3)
Monse, Piotrowiak, 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.
The symmetry of crystals: point groups, space lattices, and space groups. The 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, Monse. 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.
The 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.
The 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.
The 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)
Farid, 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)
Farid, 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)
Prerequisites: 26:160:571 or equivalent.
Advanced topics of current interest.

26:160:581. BIOCHEMISTRY I (3)
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.

26:160:582. BIOCHEMISTRY II (3)
Frenkel and Staff. Prerequisite: 26:160:581 or equivalent.
Biosynthesis and metabolism of small molecules (carbohydrates, lipids, amino acids), including hormonal regulation of these processes; bioenergetics, including photosynthesis; biosynthesis of DNA, RNA, and proteins and their utilization in biotechnology.

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 pre-steady-state enzyme kinetics.

26:160:584. ENZYME KINETICS AND MECHANISM (3)
Huskey. Prerequisites: Organic chemistry, introductory physical chemistry, and biochemistry.
An 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 ultramicro-scale quantities of biologically relevant substances.

26:160:589. CHEMICAL BASES OF NEURAL FUNCTION (3)
Jordan. Prerequisites: One year of chemistry and biology. Recommended: Organic chemistry and biochemistry.
An interdisciplinary course on biochemical bases of nervous system activity. Special emphasis on developmental neurochemistry, genomic and nongenomic mechanisms of hormone action, and membrane proteins involved in neurotransmitter action.

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)

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 Room 1213, S.I. Newhouse Center for Law and Justice, Newark, NJ 07102 (973/353-5870).
Director of Graduate Program: Dean Ronald Clarke, School of Criminal Justice, S.I. Newhouse Center for Law and Justice (973/353-5870)

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
Jeffrey A. Fagan, *SCJ; Ph.D., SUNY (Buffalo)*
  Violence in families; youth gangs; the nexus of substance abuse and aggression
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
Gerhard O.W. Mueller, *SCJ; J.D., Chicago, L.L.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:

Ko-lin Chin, *SCJ; Ph.D., Pennsylvania*
  Street gangs; organized crime; drug use and trafficking; illegal immigration
Mercer L. Sullivan, *SCJ; Ph.D., Columbia*
  Neighborhood and community influences on crime; qualitative research methods; crime and the life course

Assistant Professor:

Candace McCoy, *SCJ; J.D., Cincinnati; Ph.D., California (Berkeley)*
  Plea bargaining; prosecution

Program

Please refer to the Graduate School–Newark Doctoral Program section and Degree Requirements chapter in this catalog and 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 the following specific program requirements.

The several elements of the normal course of study may be listed below, but it should not be understood that such a listing necessarily indicates the expected sequence of events. Indeed, students will be encouraged to initiate the dissertation research as soon as the necessary competence is assured; thus, 'course work' and 'dissertation research' may be undertaken during the same time period. The main elements are as follows:

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

The additional course work is to be distributed among the university's offerings. Only graduate level courses may be included. No more than 30 credits may be earned in institutions outside Rutgers.

In the term in which the qualifying examination is completed, the Core Area Committee has the responsibility for working with the student to establish a core area plan of subsequent course work to be completed. This plan is filed with the Ph.D. Committee. After the student has successfully completed the core area examination and formed a dissertation committee, that committee is responsible for evaluating the dissertation plan and recommending any additional requirements.

5. Acceptance and defense of the dissertation plan and approval of the course of study.
6. Completion of the approved course of study, meeting scholarship requirements.
7. Total credit requirement: 84 credits.
8. Approval of the dissertation.
9. Successful final examination and 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. The student becomes a formal candidate for this degree only after successful completion of the examinations listed below and 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: *Research Methods and Statistics, Crime and Criminology,* and *Law and Criminal Justice.* The format is an essay-type examination, and the purpose is to test basic working 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 that he or she has elected to focus on. The format is an eight-hour examination composed on a word processor. The student then meets with his or her Core Area Committee for an evaluation, and 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, receiving the consultation and advice of faculty 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, The State University of New Jersey, if they would normally form a part of the student's program in criminal justice, may be accepted for credit toward this degree. The student must have been registered in these courses during the six-year period preceding his or her qualifying examination, and the student must have earned grades of *B* or better. 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. Transfer of credit can not be granted until the student has 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, and the student 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's registration card must be reviewed by the associate dean. Ph.D. students may use telephone registration after their first year in the program. 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 assumes responsibility for the student's future academic advisement, and the student should consult with the chairperson each term prior to enrollment. If a different faculty member later assumes responsibility as the dissertation committee's chairperson, that faculty member then assumes responsibility for future academic advisement.

Scholastic Standing

Candidates for the doctorate are expected to show in their course work evidence of distinction. This should be demonstrated by grades of *A* in at least half the formal course work. Grades of *B* or better will be expected; 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 regarding academic probation, termination of studies, appeal, and student grade complaints is presented in the *Criminal Justice Doctoral Program Document,* available in the Office of the Dean, School of Criminal Justice. Also see the chapter on Academic Policies and Procedures in this publication.

Matriculation Continued

Students who are obliged to interrupt their studies may, with the approval of the dean, register for matriculation continued. There is no tuition fee for this registration, although a student fee of $7 plus a computer fee of $10 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 are 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 seven 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 measurement of 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; sources of measurement error identified. Analyze procedures for aggregating and reporting data and for measuring crime rates. Review of patterns and trends over time in specific forms of crime; identify 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)
Prerequisite: 27:202:510, 522, 540.
Seminar. Review of contemporary knowledge on the many drug-crime relationships. Review of articles that represent dominant views and consideration of alternative perspectives and criticism of empirical research and theory. Survey of the literature examines theory, research, intervention strategies, and crime control policies. Both adolescent and adult behaviors, and also the 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 emphasis on neurobiology, neurochemistry, personality, and social learning. Reviews principal methods of inquiry in scientific psychology in the study of the engines of behavior and current conceptual formulations on personality and criminal behavior in relation to principal categories of crime, with particular emphasis on 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 the rehabilitation of offenders in correctional facilities and outpatient settings. Topics to be covered 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.
The functions of theory building and testing reviewed as fundamental to the application of the scientific method in 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, using 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.
Focuses on policy planning, program development, and program evaluation in criminal justice. Fundamentals in each of these three areas—derived from applications in business, human services, social welfare, etc.—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 the structures, functions, and operations of criminal justice agencies, including the police, the court, and corrections (jail, probation, prison, and parole) within the context of the entire criminal justice system.

27:202:531. PROBATION, PAROLE, AND INTERMEDIATE SANCTIONS (3)
Provides 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; 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 reference to an analysis of the interrelationships among charging, conviction, and sentencing, and in relation to the functions of police and probation staff. Provides an overview of court goals, functions, and potential for system reform.

27:202:535. JUVENILE JUSTICE (3)
(Formerly 27:202:534)
Focuses 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 differential 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, 544.
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 an introduction to problems of data description, data analysis, hypothesis testing and inference, and an 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)
A 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. Intended to assure that the cross-fertilization of disciplines actually occurs.

27:202:556. FIELDWORK IN CRIMINAL JUSTICE (3)
Prerequisites: 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 the field placement.

27:202:610. CRIME CONTROL THEORY AND RESEARCH (3)
Prerequisites: 27:202:510, 540, 542.

Seminar. Analyze theory and research on crime control, including 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, as well as incapacitation strategies. Review and critique research on the effects of criminal and civil legal sanctions and problems in implementing effective sanctions. Methodological issues in the 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 the instructor. Some classes meet off-campus.

Seminar. Contributions of neuropsychobiology to an understanding of the dynamics of aggressive criminal behavior. Methods of investigation in contemporary neurosciences, with focus on brain imaging techniques; scientific issues in reasoning via analogy and in the assessment of inter-species 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, with particular focus on studies of the relative incidence of neuropathology among aggressive criminal offenders. Interaction between neuropathology and sociocultural and demographic factors in the elicitation and maintenance of patterns of aggressive behavior. Methods of criminal sanctioning and the control of criminally aggressive behavior issuing from the knowledge explosion in the neurosciences 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 theory 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. 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, the seaborne narcotics smuggles, terrorism at sea, thefts of boats and vessels, marine insurance fraud, fisheries offenses, ocean pollution, and common criminality at sea. Capacity of existing law enforcement agencies and the prospect of international cooperation to deal with criminality at sea evaluated.

27:202:616. ENVIRONMENTAL CRIME PREVENTION (3)
(Formerly 27:202:537)

Theoretical background to opportunity-reducing crime prevention through situational prevention (including key concepts of rational choice and displacement) and its relationship to crime prevention through environmental design, defensible space, and problem-oriented policing. Case studies illustrate the practical and policy difficulties of situational prevention.

27:202:619. ORGANIZED CRIME (3)
(Formerly 27:202:656)

Defines organized crime, its history, and examines criminological theories to explain it. Covers nontraditional or so-called emergent organized crime groups, such as urban street gangs, motorcycle gangs, prison gangs, etc. 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 incapacitive, deterrence, and "just deserts" models. Techniques for limiting sentencing discretion, including mandatory minimum sentences, presumptive sentences, and sentencing guidelines also discussed, as are noncustodial penalties.

27:202:624. CRIMINAL PROCEDURE AND THE CONSTITUTION (3)
(Formerly 27:202:612)

Advanced seminar. Examines 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)

The 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, or 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.

Focuses on post-adjudicatory handling of juvenile offenders. Examines the "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 examined.

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 DECISION MAKING (3)
(Formerly 27:202:654)
Prerequisite: Multivariate statistics.
Decisions made throughout the criminal justice system, including those of a victim to report a crime, of police, magistrates, prosecutors, judges, correctional agency personnel, and parole boards examined critically. 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), mathematical foundations for statistics (such as matrix algebra and probability theory), and selected advanced statistical or mathematical techniques for the analysis of criminal justice research problems (e.g., 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) are 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, ethical issues of protection of human subjects, coding and analysis of qualitative data, inductive theory construction, presentation of findings, coordinating qualitative with quantitative methods. Requires collection and analysis of some original data. Also 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 adviser 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 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.

ECONOMICS 220

Degree Program Offered: Master of Arts
Director of Graduate Program: Professor Carlos Seiglie,
  Room 830, Hill Hall (973/353-5259,5914)

Members of the Graduate Faculty

Professors:

Douglas Coate, *FAS–N; Ph.D., CUNY*
  Applied microeconomics; health economics
John W. Graham, *FAS–N; Ph.D., Northwestern*
  Applied macroeconomics; labor economics
Peter Loeb, *FAS–N; Ph.D., Rutgers*
  Econometrics; transportation economics
Leo Troy, *FAS–N; Ph.D., Columbia*
  Labor economics and industrial relations
James VanderHoff, *FAS–N; Ph.D., North Carolina (Chapel Hill)*
  Monetary and financial economics

Associate Professors:

Alvaro Rodriguez, *FAS–N; Ph.D., Columbia*
  Economic theory
Carlos Seiglie, *FAS–N; Ph.D., Chicago*
  International economics; microeconomics

Assistant Professors:

Gabriella Cagliesi, *FAS–N; Ph.D., Pennsylvania*
  International economics; econometrics
Yanni Tournos, *FAS–N; Ph.D., Northwestern*
  Industrial organization

Professor Emeritus:

John P. Cullity, *FAS–N; Ph.D., Columbia*
  Business cycles; international and financial economics

Program

The basic requirements for the Master of Arts degree in economics are successful completion of 30 credits and either a comprehensive final examination or a master's thesis. Currently, most students fulfill these requirements by completing 24 credits of course work (with an average grade of *B* or better) and 6 credits of research work (26:220:598,599 or 701,702) towards the completion of a master's essay. A final oral examination in defense of this essay may also include some general questions about economic theory and quantitative methods.

There are four required core courses: Microeconomic Theory (26:220:501); Macroeconomic Theory (26:220:503); Statistical Analysis (26:220:506); and Econometrics I (26:220:507). Students without a strong undergraduate background in economics and mathematics may want to consider taking some 300-level courses prior to beginning the core courses (although no graduate credit is offered for this remedial work). In addition to the core courses, students can choose to do elective work from a variety of fields. In recent years, the department has offered field courses in: economic development, monetary economics, public sector economics, international economics, human resources, industrial organization, labor economics, and financial economics.

To increase their selection of advanced field courses, matriculated students may be granted permission by the graduate program director to take up to 12 credits of graduate-level course work outside the economics department. This would include courses offered by the Graduate School of Management in Newark, the Ph.D. program in economics at Rutgers–New Brunswick, or the School of Law–Newark.

All graduate courses in economics meet one evening a week, beginning at 5:30 P.M. The program encourages both full-time and part-time study. Full-time students may take up to 12 credits per term and can expect to complete their course work within one or two years. Part-time students are advised to take no more than 6 credits per term if they have other significant job or family responsibilities. Most part-time students take about three years to complete the program. Graduate courses are not offered during the summer, but students may use the summer to conduct their research.

Graduate Courses

26:220:501,502. MICROECONOMIC THEORY (3,3)
An advanced course in economic theory dealing with the consumer, the firm, market structure, price determination, and the theory of income distribution. First course: applications to demand, production, and cost analysis. Second course: applications in financial equilibrium models and markets.

26:220:503,504. MACROECONOMIC THEORY (3,3)
Theories dealing with the income concept, determination of national income and product, employment, consumption, investment, money, rate of interest, fluctuations, and growth. Policy measures for full employment, growth, and stability.

26:220:506. STATISTICAL ANALYSIS (3)
Probability theory, distribution theory, estimation, and tests of hypotheses. Correlation and regression techniques. The general regression model and the analysis of variance.

26:220:507. (S) ECONOMETRICS I (3)
Econometric methods and applications. The classical linear regression model with analysis of underlying assumptions and the consequences of their violations. Applications to single and simultaneous equation models.

26:220:508. ECONOMETRICS II (3)
Continuation of 26:220:507. The theory and applications of single and simultaneous equations. Possible consideration of model building, specification error analysis, and forecasting along with BOX-Jenkins (ARIMA) procedures.

26:220:509,510. ECONOMIC FLUCTUATIONS AND GROWTH (3,3)
The characteristics, features, and causes of economic fluctuations. Theories of the business cycle. Policies for dealing with the problems of contraction and inflation. Current issues and problems of maintaining economic growth.

26:220:511. HISTORY OF ECONOMIC THOUGHT (3)
The evolution of economic doctrines from the mercantilists up to the neoclassicists. The contributions of Smith, Ricardo, Malthus, Mill, Marx, and their critics.

26:220:513,514. MONETARY THEORY AND POLICY (3,3)
Definition of the supply of money: the quantity theory of money, liquidity, preference, and asset approaches to the demand for money. The Federal Reserve System, monetary policy, and balance of payments problems.

26:220:515,516. ECONOMICS OF THE PUBLIC SECTOR (3,3)
Theories of public expenditures and taxation. Criteria for public investment. Cost-benefit analysis. Optimal tax policies and full employment, stability, and growth.

26:220:518. (F) INTERNATIONAL ECONOMICS I (3)
The real theory of international trade. Topics include the classical theory of international trade, comparative advantage and reciprocal demand, the Heckscher-Ohlin model, the gains from trade, trade and factor prices, trade and income distribution, trade and economic growth, the theory of protection, distortion and optimal policies, the theory of tariff structure, and the theory of discriminatory tariff reduction and of custom unions.

26:220:519. (S) INTERNATIONAL ECONOMICS II (3)
Extends and applies the fundamentals of macro theory and policy to the open economy. Topics include exchange rates and the balance of payments, the Keynesian system and foreign trade multipliers, the theory of macroeconomic policy in the open economy, the monetary approach to the balance of payments, and the economics of flexible exchange rates.

26:220:520. (S) ECONOMICS OF HUMAN RESOURCES (3)
Theoretical and empirical work on the supply of labor, in particular those aspects relating to investment in human capital. Hours of work and labor force participation, labor mobility and wage differentials, investment in human capital and the personal income distribution, unemployment, and inflation.

26:220:523. (S) INDUSTRIAL ORGANIZATION (3)
Theories of the firm and market behavior; empirical examination of structure-performance relationships; application to current policy problems with emphasis on antitrust. Topics include competition, monopoly, and social welfare; measurement of market power; policy treatment of monopoly, collusion, mergers, price discrimination, and vertical restrictions. Possible additional topics include profitability, advertising, technological change, entry and exit, and the relationship to market structure.

26:220:529,530. LABOR ECONOMICS (3,3)
Theoretical analysis of the supply of and demand for labor; trends in labor force participation; study of wage determination, theories of unemployment and education and training; role of labor unions and collective bargaining; analysis of government policies in the labor market.

26:220:535. FINANCIAL ECONOMICS (3)
The economic theory underlying the analysis of financial decisions and models of decision making with uncertainty are developed with applications to consumers' investment decisions and firms' capital expenditures decisions.

26:220:551. (F) MATHEMATICAL ECONOMICS (3)
Functions, differentiation, and integration and their applications to economic analysis, especially to the theory of the firm, market equilibrium, input-output analysis, business cycles, and growth theories.

26:220:553. URBAN ECONOMICS (3)
The role of cities in the growth of regions; theories of urban growth; models of urban land use; poverty, housing, crime, and transportation; local government tax and expenditure policy.

26:220:598,599. INDIVIDUAL STUDY IN ECONOMICS AND QUANTITATIVE ANALYSIS (3,3)
Prerequisites: Permission of the instructor and the director of the graduate program.
Individual study for students with a research project in any area of economics.

26:220:685. SPECIAL TOPICS IN APPLIED ECONOMICS (3)

26:220:701,702. RESEARCH IN ECONOMICS (3,3)

26:220:800. MATRICULATION CONTINUED (E1)

ENGLISH 350 (Includes American Literature 352)

Degree Program Offered: Master of Arts
Director of Graduate Program: Professor Rachel Hadas,
Room 520, Hill Hall (973/353-5405)

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
John Demaray, *FAS–N; Ph.D., Columbia*
  Late medieval and Renaissance literature; Dante; Milton; Shakespeare; Spenser
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; the lyric; 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
Irwin Primer, *FAS–N; Ph.D., Yale*
  Life and thought of Bernard Mandeville; the impact of the Maximes *of LaRochefoucauld on eighteenth-century British culture; the maxim in the contexts of prose style; theories of the passions to 1800*
Virginia Tiger, *FAS–N; Ph.D., British Columbia*
  Narratology; gendered genres; feminist literary theory; twentieth-century British literature

Associate Professors:

Frances Bartkowski, *FAS–N; Ph.D., Iowa*
  Feminist theory and cultural studies
George Davis, *FAS–N; B.A., Columbia*
  Afro-American literature; Afro-American culture; fiction
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 between 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 in the Victorian period
Charles Russell, *FAS–N; Ph.D., Cornell*
  History and theory of the Avant-Garde, modernism and postmodernism; contemporary American fiction

Assistant Professors:

David Baker, *FAS–N; Ph.D., Columbia*
  Renaissance nondramatic literature
Sterling Bland, *FAS–N; Ph.D., New York*
  Afro-American literature
Belinda Edmondson, *FAS–N; Ph.D., Northwestern*
  Caribbean literature; Afro-American literature; literary theory
S. Shankar, *FAS–N; Ph.D., Texas*
  Post-colonial literature and literary theory

Programs

The graduate English programs cover all areas of English and American literature—including world Anglophone literature—as well as creative writing.

Students may take courses on either a full-time or a part-time basis. They may enter the program on a nonmatriculated basis and, upon subsequent admission, count all earned credits toward the degree.

Students in the literature program must earn 30 credits. These may be earned either as ten 3-credit courses or as eight courses and 6 credits for a master's thesis. They are required to pass a foreign language examination. There are some distribution requirements, but students are largely free to pursue their areas of interest. Students must pass a comprehensive written exam, based on a core reading list, in order to obtain the degree.

Students in the creative writing program must also earn 30 credits. Six 3-credit courses are in literature and four are in creative writing, either poetry or prose. There are no foreign language or distribution requirements. Creative writing students, however, must have a substantial portfolio of their work approved by the faculty in order to obtain the degree. The M.A.T. degree is not offered.

Graduate Courses (350)

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

26:350:503. INTRODUCTION TO GRADUATE LITERARY STUDY (3)
Poetry and prose from several periods of English and American literature; studies in bibliography; interpretations and textual scholarship and criticism; survey of various methods of literary study.

26:350:506. RHETORIC, LITERARY THEORY, AND WRITING INSTRUCTION (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)
  Primer
Survey of kinds of narrative and evolution of main forms, with attention to theory of fiction in the writings of Booth, Frye, and others.

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

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

26:350:511. POETS AND POETRY (3)
  Hadas
Intensive readings in selected poets' writings in English in the twentieth century. Investigation of a range of traditions and critical responses, especially from post–World War II to the present.

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)
An 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.

26:350:517,518. CREATIVE WRITING: PROSE (3,3)
Prerequisite: Writing samples—story, novel chapter, or medium-length essay. The first two of a four-course sequence of writing workshops. Sequences are designed to help students in the creative writing program produce a manuscript-sized work. Courses need not be taken in sequence.
Emphasis on student work, which is read and discussed in class and in individual conferences with the instructor. Regular, written criticism provided by both instructor and fellow students. Students required to work only in one genre, fiction *or* nonfiction.

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

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

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

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 the full range of editorial and production procedures involved in the publication of a literary or academic journal.

26:350:533,534. CHAUCER (3,3)
Heffernan
A 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)
An advanced course designed to refine skills in writing (exposition, argument, description) and critical, analytical reading.

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

26:350:541,542. THE SIXTEENTH CENTURY (3,3)
A 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, exclusive of Shakespeare, with emphasis on Marlowe and Jonson.

26:350:544. STUDIES IN THE RENAISSANCE EPIC (3)
Demaray
A 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, Demaray
Intensive study of several plays with concern for scholarship and criticism and the seventeenth-century background.

26:350:547. MIMESIS AND POETRY (3)
Demaray
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)
Demaray
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.

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

26:350:554. MILTON (3)
Demaray
A 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 liberty. Emphasis on an original critical appreciation of Milton's literary artistry.

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)
Primer
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 20th century theorists of satire. Included among the latter 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)
Primer
Readings in Defoe, Addison and 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
An 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)
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)
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)
The 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.

26:350:569,570. THE ROMANTIC PERIOD (3,3)
Jaye
The 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 major poets, novelists, and essayists of the period beginning with Carlyle and including Tennyson, Browning, Arnold, Dickens, Eliot, and Hardy, especially as they prefigure modern themes, problems, and literary techniques.

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 and studied side by side with fiction, plays, or 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 AND POETRY (3)
daVinci-Nichols, Tiger
Study of representative works by the important dramatists and poets of the period. Such poets as W.B. Yeats, W.H. Auden, and Dylan Thomas and such dramatists as Bernard Shaw, Samuel Beckett, Harold Pinter, and Tom Stoppard are read in light of historical shifts in theme and technique.

26:350:617,618. CREATIVE WRITING: PROSE (3,3)
Prerequisite: Writing samples—story, novel chapter, or medium-length essay. The second pair of the four-course sequence of writing workshops for matriculating and nonmatriculating students in the creative writing program. The four courses are designed to help students compile a manuscript-sized work.
Major emphasis on the student's ongoing work, which is read and discussed in the class and in individual conferences with the instructor. Students provide written criticism on each submission read. The instructor also provides written commentary on each submission.

26:350:698. READINGS IN LITERATURE (3)
Readings in critical relations between works of different periods or genres, the variety of literary responses to a given historical moment. The relation of English and American literature to its intellectual and social origins, 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.

26:350:701,702. MASTER'S THESIS (BA,BA)
Thesis supervised by two faculty members, one directing the project. Arranged for qualified students only and with the permission of the faculty members concerned. Program director's permission must be secured in preceding term.

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.

26:352:523,524. AMERICAN LITERATURE SINCE 1900 (3,3)
Foley
Selected literary themes based on readings drawn from the work 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
A 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 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

Professors:

Warren Manspeizer, *FAS–N; Ph.D., Rutgers*
   Stratigraphy; plate tectonics
John J. Puffer, *FAS–N; Ph.D., Stanford*
   Igneous petrology; geochemistry; environmental geology
Andreas H. Vassiliou, *FAS–N; Ph.D., Columbia*
   Mineralogy; ore-genesis; X-ray crystallography

Associate Professor:

Alexander E. Gates, *FAS–N; Ph.D., Virginia Polytechnic Institute*
   Structural geology; tectonics; radon

Assistant Professors:

Victoria C. Hover, *FAS–N; Ph.D., Michigan*
   *Low-temperature geochemistry; environmental geology; soil and
   sediment geochemistry*
Samuel T. Peavy, *FAS–N; Ph.D., Virginia Polytechnic Institute*
   Applied geophysics

Adjunct Members of the Faculty:

Alice M. Blount, *Ph.D., Wisconsin*
   *Clay mineralogy; economic geology-nonmetallics; X-ray crystallography;
   Newark Museum*
Lloyd Burkle, *Ph.D., New York*
   Marine geology; micropaleontology; Lamont-Doherty Geological Observatory
Joseph M. Hull, *Ph.D., Rochester*
   Structural geology, University of Uppsala
Emily W.B. Russell, *Ph.D., Rutgers*
   *Paleoecology; palynology; Associate Editor, Bulletin of the
   Torrey Botanical Club*

Professors Emeriti:

Sam I. Argon, *FAS–N; Ph.D., Johns Hopkins*
   Structural geology
Hessle Filmore Garner, *FAS–N; Ph.D., Iowa*
   Geomorphology; sedimentology
George Theokritoff, *FAS–N; Ph.D., London*
   Paleontology; biostratigraphy

Programs

At the time of publication, a program leading to the M.S. degree
in Environmental Geology was being developed in Newark for
full- and part-time students in collaboration with the Department
of Geological Sciences at Rutgers–New Brunswick and the Depart-
ment of Civil and Environmental Engineering at the New Jersey
Institute of Technology (NJIT). For more current and complete
information and regulations, please contact the director of the
graduate program at 973/353-5109.

Students enrolled in the M.S. Program in Environmental Geology
at Rutgers–Newark will be able to elect a thesis option (24 credits
of course work plus 6 credits of thesis research) or a nonthesis
option (36 credits of course work plus a final comprehensive
written examination) and will be required to take a minimum of
15 graduate credits at Rutgers–Newark from among graduate
courses in environmental geology, analytical methods, hydro-
geology, environmental geophysics, soil geochemistry, and geo-
morphology. The remaining credits will be chosen from among all
graduate courses offered at Rutgers–New Brunswick Department
of Geological Sciences or from among selected graduate courses
in remote sensing, GIS, and hydrology offered at the NJIT Depart-
ment of Civil and Environmental Engineering. Thesis research is
expected to involve environmental aspects in geologic disciplines
such 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 geological sciences graduate programs and to students
admitted to the NJIT Department of Civil and Environmental Engi-
neering graduate programs or other NJIT environmental science or
engineering graduate programs.

Graduate Courses

(For courses that reflect the new program in Environmental
Geology, contact the department.)

26:460:506. (S) INTRODUCTORY GEOPHYSICS (3)
   Gates. Prerequisite: Permission of instructor.
Structure of the solid earth as revealed by seismology, gravity,
magnetism, and heat flow. Applications to place tectonics and
geophysical prospecting. Field exercises.

26:460:510. ADVANCED READINGS IN GEOLOGY (3)
   Prerequisite: Permission of instructor.
Study of the literature pertaining to selected geological topics;
analysis of the epistemology used; preparation of critical
written reports.

26:460:520. PETROLEUM GEOLOGY (3)
   Prerequisites: 21:460:314, 320, or equivalent.
The nature and occurrence of petroleum with emphasis on the
geologic conditions favoring its accumulation.

26:460:551. (F) ADVANCED PALEONTOLOGY (3)
   Theokritoff
Morphology of selected groups of fossil invertebrates; principles
of taxonomy and use of paleontologic literature.

26:460:553. MICROPALEONTOLOGY: FORAMINIFERA (3)
   *Lec. 2 hrs., lab. 3 hrs. Prerequisite: Invertebrate paleontology or
   invertebrate zoology.*
Morphology, taxonomy, evolution, ecology, and distribution
of foraminifera and their use in the solution of stratigraphic
problems. Special attention given to classification.

26:460:555. MICROPALEONTOLOGY: PALYNOLOGY (3)
   *Russell. Lec. 2 hrs., lab. 3 hrs. Prerequisites: General geology and biology,
   or permission of instructor.*
Morphology, taxonomy, evolution, ecology, and stratigraphic occur-
rences of spores and pollen. Emphasis on preparation techniques.

26:460:560. (S) BIOSTRATIGRAPHY AND PALEOECOLOGY (3)
   Theokritoff. Prerequisites: Paleontology and stratigraphy.
Principles and methods used in the interpretation of the occur-
rences of organisms for their stratigraphic and ecologic significance.

26:460:563. STRATIGRAPHIC MODELS (3)
   Manspeizer. Prerequisite: Stratigraphy.
Interpretation of the distribution of rocks and fossils in space
and time through the study of modern depositional domains.
Models considered: deltaic, turbidite, flysch, shelf, abyssal plain,
and postorogenic basin. Emphasis on paleocurrent systems in
formation of the rock record.

26:460:565. (S) ATOMIC STRUCTURE OF MINERALS (3)
   Vassiliou. Prerequisite: Permission of instructor.
Atomic structure of minerals with emphasis on the silicates.
Consideration of geometrical crystal structure and bonding theory,
application of analytical mineralogic techniques including polariz-
ing microscope, X-ray, diffraction methods, X-ray fluorescence,
differential thermal analysis, and infrared spectroscopy.

26:460:567. (S) IGNEOUS AND METAMORPHIC PETROLOGY (3)
   Puffer. Prerequisite: Optical mineralogy.
Physicochemical principles of igneous and metamorphic processes
with special emphasis on magmatic differentiation, granitization,
and the chemistry of metamorphic reactions and facies. Micro-
scopic study of thin sections and rock suites from classical areas.

26:460:569. (F) ADVANCED SEDIMENTARY PETROLOGY (3)
   Manspeizer. Lec. 2 hrs., lab 3 hrs. Prerequisite: Optical mineralogy.
Petrogenesis of sedimentary rocks based on their field associations
and thin sections. Topics include sedimentary structures, textures
and fabrics, diagenesis, sedimentary tectonics, paleocurrents,
and paleogeography.

26:460:570. (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.

26:460:571. (F) PALEOGEOMORPHOLOGY (3)
Prerequisites: Geomorphology, stratigraphy, sedimentation.
Analysis of fossil topography: depositional, erosional, and structural, with examples taken from cratonic shelves, engeosynclinal zones, orogens, and cratonic uplifts on several continents.

26:460:575. ORE DEPOSITS (3)
Puffer, Vassiliou
Examination of various ore forming processes. Emphasis on metal ores. Several important ore deposits are described in lecture, in lab, and in the field.

26:460:577. (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.

26:460:581. (F) GLOBAL TECTONICS (3)
Analysis of large-scale structural features and their origin, with particular reference to plate tectonics.

26:460:582. (S) ADVANCED STRUCTURAL ANALYSIS (3)
Gates. Prerequisite: Structural geology.
Quantitative analytical techniques in both the field and laboratory. Stereographic projections, fault population studies, incremental and finite strain measurement, petrofabrics, and other topics. Field exercises.

26:460:597,598. SEMINAR: TOPICS IN GEOLOGY (BA,BA)

26:460:601,602. ADVANCED STUDIES IN GEOLOGY (BA,BA)

26:460:701,702. RESEARCH IN GEOLOGY (BA,BA)

GEOLOGY 460 (See Environmental Geology)

GLOBAL STUDIES 480

Degree Program Offered: Master of Arts in Global Studies
Director of Graduate Program: Professor Richard Langhorne, Room 1315, S.I. Newhouse Center (973/353-5585)

Participating Faculty

The following members and associate members of the graduate faculty, identified more fully under their respective programs, are among those who participate in the multidisciplinary degree program in global studies:

Lauren A. Benton, *History*
John Dunning, *Management*
Yale Hicks Ferguson, *Political Science*
Frank Fischer, *Political Science*
Marc Holzer, *Public Administration*
Warren Kimball, *History*
Richard Langhorne, *Political Science*
Saul H. Mendlovitz, *School of Law–Newark*
Jerry Rosenberg, *International Business and Business Environment*
Mary Clare Segers, *Political Science*
Carlos Seiglie, *Economics*
Gabriella Cagliesi, *Economics*
Rey Koslowski, *Political Science*
Virginia Walsh, *Political Science*

Program

The Center for Global Change and Governance at Rutgers, The State University of New Jersey, offers a multidisciplinary master's degree program in global studies that leads to the Master of Arts in Global Studies (M.A.G.S.) degree. This is a joint-degree program offered by the Graduate School–Newark for students who are also enrolled in or have completed one of Rutgers' professional graduate programs (law, public administration, business, criminal justice, nursing). The program makes full use of the wide range of international and global expertise available at the graduate school and provides an opportunity for graduate students to benefit from a new approach to global change and governance. The themes and topics of the courses available, and particularly those of the four core courses, address the issues arising from the increasing globalization of human activities and its institutional, economic, and political consequences.

The M.A.G.S. degree program requires successful completion of 30 credits. The M.A. in Global Studies is designed for students who are already admitted to or have completed a degree at other professional schools at Rutgers, and wish to enhance their education with a formal joint degree, such as the J.D./M.A.G.S. or the M.B.A./M.A.G.S. A core of four courses is required: 21:790:541 International Political Economy, 26:790:537 Recent International Relations: Global Governance, 26:790:530 Environmental Politics and Policies, and a multidisciplinary capstone course, 26:480:572 The Evolution of the International System. Internships, a research seminar, and a thesis option are available upon approval. Students planning to pursue more advanced graduate work in global studies and/or related fields should take the research seminar and the thesis option.

Graduate Courses

26:480:571. COLLOQUIA ON GLOBAL CHANGE AND GOVERNANCE (2 TO 4)

26:480:572. THE EVOLUTION OF THE INTERNATIONAL SYSTEM (4)
Evolution of the international system from the pre-state era, through the emergence and dominance of states, to the highly pluralistic contemporary international environment. Understand and assess the significance of the input from other courses involved in the program, as a whole. Assessment of contribution and methods of other disciplines in the context of contemporary global conditions. Case studies.

26:480:601,602. INTERNSHIP OR RESEARCH SEMINAR (3,3)
26:480:701,702. THESIS (3,3)

Multidisciplinary Graduate Courses at the Graduate School–Newark

These courses are fully described in their respective sections of this catalog.

Criminal Justice

27:202:536. COMPARATIVE CRIMINAL JUSTICE SYSTEMS (3)

Economics

26:220:518. INTERNATIONAL ECONOMICS I (3)

26:220:519. INTERNATIONAL ECONOMICS II (3)

History

26:510:531. AMERICAN DIPLOMATIC HISTORY (3)

26:510:547. COMPARATIVE WORLD COLONIALISM (3)

Management (International Business)

26:553:501. GLOBAL STRATEGIC MANAGEMENT (3)

26:553:601. THEORETICAL ASPECTS OF INTERNATIONAL BUSINESS (3)

26:553:603. INTERNATIONAL TRADE AND INVESTMENT (3)

Political Science

21:790:387. INTERNATIONAL LAW II (3)

26:790:513. ETHICS AND GLOBAL POLITICS (3)

26:790:521. PROBLEMS OF INTERNATIONAL THEORY (3)

26:790:530. ENVIRONMENTAL POLITICS AND POLICIES (4)

26:790:537. RECENT INTERNATIONAL RELATIONS: GLOBAL GOVERNANCE (4)

21:790:541. INTERNATIONAL POLITICAL ECONOMY (4)

Multidisciplinary Graduate Courses at the Graduate School of Management

22:373:593. INTERNATIONAL BUSINESS ENVIRONMENT (3)
Introduces potential managers in both domestic U.S. and multi-national firms to the major environmental influences on their future decisions, and to basic analytical tools such as country risk assessment, hedging of foreign exchange risk, and cost-benefit analysis. Even simple actions, such as planning a foreign journey or executing import and export orders denominated in foreign currency, require hedging decisions to minimize foreign exchange risk. Over one-sixth of the U.S. economy is now accounted for by the foreign sector. Imports and investment decisions by the U.S. and other firms affect jobs and economies far removed from the locus of the decisions. Managers, particularly overseas in more regulated, centrally planned, or less industrialized environments, must make decisions not only on an economic basis, but must also consider political factors in their judgments.

22:373:605. INTERNATIONAL BUSINESS LAW (3)
Focuses on key legal issues affecting the conduct of international business. Topics covered include: legal aspects of trading and investing across national borders; foreign investing in the U.S.; U.S. customs laws and practices; import protection against unfair trade practices; taxation of international trade and investment; currency and investment controls; and some of the unique institutions affecting the conduct of international business.

22:373:612. INTERNATIONAL BUSINESS POLICY (3)
Focuses on competitiveness within both a national and multi-national context. Focuses on the manager who has to formulate strategy for the company. Integration of investment rules, political climates, foreign exchange fluctuations, tariff and trade policies of nations, and interaction between the firm and government. Traditional aspects of administration and strategy formulation, such as organization design, cross-cultural personnel relationships, production, or marketing standardization and planning, are examined in a multinational context. Heavy emphasis on case studies which cut across various functional disciplines.

Multidisciplinary Graduate Course at the School of Law–Newark

23:600:638. INTERNATIONAL LAW AND A JUST WORLD ORDER (3)
The role of legal processes, institutions, and organizations in the evolving world community. Covers the manner in which traditional international law arose, and analyzes the basic concepts of international law: sources, subjects, sovereignty, treaties and agreements, jurisdiction, state responsibility, the use of force, and peaceful settlement of disputes. Insofar as possible, deals with the interrelated problems of war, poverty, social injustice, and ecological stability.

23:600:757. INTERNATIONAL LAW AND GENOCIDE (3)
Fousek, Mendlovitz
Development of law under the rubrics of crimes against humanity and genocide. The Nuremburg judgment and attempts over the past fifty years to establish a formal legal regime comprehending, defining, preventing, and punishing the behavior placed under these rubrics.

HISTORY 510

Degree Programs Offered: Master of Arts, Master of Arts for Teachers
Director of Graduate Programs: Professor Jan E. Lewis, Room 317, 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; Antebellum America
Peter B. Golden, *FAS–N; Ph.D., Columbia*
  Medieval Eurasia; Turko-Byzantine and Turko-Slavic relations; history of Islam
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
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
Karl W. Schweizer, *NJIT; Ph.D., Cambridge*
  British and European diplomatic; international relations; historiography
Odoric Y.K. Wou, *FAS–N; Ph.D., Columbia*
  Modern Chinese social and economic history

Associate Professors:

Lauren Benton, *NJIT; Ph.D., Johns Hopkins*
  Comparative economic development
James Goodman, *FAS–N; Ph.D., Princeton*
  Twentieth-century U.S.; race, politics, history, and fiction
David H. Hosford, *FAS–N; Ph.D., Wisconsin*
  Tudor-Stuart England
Irwin L. Merker, *FAS–N; Ph.D., Princeton*
  Ancient Greek and Roman history
Frederick Russell, *FAS–N; Ph.D., Johns Hopkins*
  Medieval Western European history; the Patristics; political theory; intellectual history
Gabor Vermes, *FAS–N; Ph.D., Stanford*
  Modern East-Central European history; modern political movements and ideologies
Olga Wagenheim, *FAS–N; Ph.D., Rutgers*
  Latin-American history

Assistant Professors:

Jon Cowans, *FAS–N; Ph.D., Stanford*
  Modern Europe; France; political culture
Lisa Herschbach, *NJIT; Ph.D., Harvard*
  Medicine; technology
Beryl E. Satter, *FAS–N; Ph.D., Yale*
  Twentieth-century U.S.; history of women; cultural history
Christopher Sellers, *NJIT; Ph.D., Yale*
  Medicine; environment; technology

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, graduate courses are normally given in the late afternoon or evening. The object of the program is to furnish a broad yet rigorous training in history in preparation for either 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. All students must submit, as proof of scholarly competence, a research paper or a thesis. A thesis is not required, but is recommended for those considering further graduate work. A thesis may be substituted 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 up to 12 credits in the undergraduate education department to secure some of the courses needed 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. Students do not usually write a thesis and do not have to major in one area (though there are course distribution requirements).

Additional description of programs, regulations, and admission procedure is available on request from the graduate history office (973/353-5411).

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)
An 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)
An 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)
An 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)
An 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)
An 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)
An 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)
An 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)
An introduction to the major historiographical problems and recent literature in European history from 1350 to 1650.

26:510:543,544. PROBLEMS AND READINGS IN EUROPEAN HISTORY 1650–1850 (3,3)
An introduction to the major historiographical problems and recent literature in European history from 1650 to 1850.

26:510:545,546. PROBLEMS AND READINGS IN EUROPEAN HISTORY SINCE 1850 (3,3)
An 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 is 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)
An 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)
An 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)
An examination of issues and methods in American urban and ethnic history, with a consideration of some leading problems in the field.

26:510:557,558. SELECTED TOPICS IN EUROPEAN SOCIAL AND ECONOMIC HISTORY (3,3)
An 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 develop Newark as New Jersey's most important city and as one of the most troubled urban communities in the U.S. Attention to the origins of Newark's decline; 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.

26:510:566. AMERICAN HISTORIOGRAPHY (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 some of the works that have employed those approaches.

26:510:572. PHILOSOPHY OF HISTORY (3)
A 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. The Hapsburg monarchy and its successor states.

26:510:576. PROBLEMS AND READINGS IN AMERICAN HISTORY, 1492–1789 (3)
An 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)
An 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)
An 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)
An 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)
An 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 are made by both the professor and the seminar participants.

26:510:669. BUSINESS AND GOVERNMENT IN THE TWENTIETH CENTURY I (3)
An exploration through selected readings of industrial and financial concentration in the U.S. and attempts at resolution of the dilemma through overhead management (the New Deal), associationalism (the trade association), and decentralism (antitrust).

26:510:670. BUSINESS AND GOVERNMENT IN THE TWENTIETH CENTURY II (3)
Examines the history of the relationship of federal government policies, presumptions, and practices to American business activity—financial, industrial, and commercial—outside the U.S.

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.

INTERNATIONAL STUDIES 558

Degree Program Offered: Master of Science in International Studies
Director of Graduate Program: Professor Richard Langhorne, Room 1315, S.I. Newhouse Center (973/353-5585)

Participating Faculty

The following members and associate members of the graduate faculty, identified more fully under their respective programs, are among those who participate in the multidisciplinary degree program in global studies:

Lauren A. Benton, *History*
John Dunning, *Management*
Yale Hicks Ferguson, *Political Science*
Frank Fischer, *Political Science*
Marc Holzer, *Public Administration*
Warren Kimball, *History*
Richard Langhorne, *Political Science*
Saul H. Mendlovitz, *School of Law–Newark*
Jerry Rosenberg, *International Business and Business Environment*
Mary Clare Segers, *Political Science*
Carlos Seiglie, *Economics*
Gabriella Cagliesi, *Economics*
Rey Koslowski, *Political Science*
Virginia Walsh, *Political Science*

Program

The Center for Global Change and Governance at Rutgers, The State University of New Jersey, offers a multidisciplinary master's degree program in international studies that leads to the Master of Science in International Studies (M.S.I.S.) degree. The program makes full use of the wide range of international and global expertise available at the graduate school and provides an opportunity for graduate students to benefit from a new approach to global change and governance. The themes and topics of the courses available, and particularly those of the four core courses, address the issues arising from the increasing globalization of human activities and its institutional, economic, and political consequences.

The M.S.I.S. degree program requires successful completion of 48 credits. Particularly well-qualified, full-time students can complete the course requirements within one calendar year of residency by obtaining equivalency credits from previous relevant graduate work in law, criminal justice, public administration, business, history, political science, or other related disciplines. Similarly, equivalencies for qualified students with technical expertise (e.g., technology related to environmental and international health issues) can be arranged, enabling such students also to earn an M.S.I.S. degree in a calendar year. All students must pass a reading examination in one foreign language and a comprehensive examination. In accordance with the policies of the Graduate School–Newark, students may apply up to 12 credits of related graduate work or upper-division undergraduate work toward the degree with the approval of their adviser. A core of four courses is required: 26:790:541 International Political Economy, 26:790:537 Recent International Relations: Global Governance, 26:790:530 Environmental Politics and Policies, and a multidisciplinary capstone course, 26:558:572 The Evolution of the International System. Internships, a research seminar, and a thesis option are available upon approval. Students planning to pursue more advanced graduate work in global studies and/or related fields should take the research seminar and the thesis option.

Graduate Courses

26:558:571. COLLOQUIA ON GLOBAL CHANGE AND GOVERNANCE (2 TO 4)

26:558:572. THE EVOLUTION OF THE INTERNATIONAL SYSTEM (4)
Evolution of the international system from the pre-state era, through the emergence and dominance of states, to the highly pluralistic contemporary international environment. Understand and assess the significance of the input from other courses involved in the program, as a whole. Assessment of contribution and methods of other disciplines in the context of contemporary global conditions. Case studies.

26:558:601,602. INTERNSHIP OR RESEARCH SEMINAR (3,3)

26:558:701,702. THESIS (3,3)

Multidisciplinary Graduate Courses at the Graduate School–Newark

These courses are fully described in their respective sections of this catalog.

Criminal Justice

27:202:536. COMPARATIVE CRIMINAL JUSTICE SYSTEMS (3)

Economics

26:220:518. INTERNATIONAL ECONOMICS I (3)

26:220:519. INTERNATIONAL ECONOMICS II (3)

History

26:510:531. AMERICAN DIPLOMATIC HISTORY (3)

26:510:547. COMPARATIVE WORLD COLONIALISM (3)

Management (International Business)

26:553:501. GLOBAL STRATEGIC MANAGEMENT (3)

26:553:601. THEORETICAL ASPECTS OF INTERNATIONAL BUSINESS (3)

26:553:603. INTERNATIONAL TRADE AND INVESTMENT (3)

Political Science

21:790:387. INTERNATIONAL LAW II (3)

26:790:513. ETHICS AND GLOBAL POLITICS (3)

26:790:521. PROBLEMS OF INTERNATIONAL THEORY (3)

26:790:530. ENVIRONMENTAL POLITICS AND POLICIES (4)

26:790:537. RECENT INTERNATIONAL RELATIONS: GLOBAL GOVERNANCE (4)

26:790:541. INTERNATIONAL POLITICAL ECONOMY (4)

Multidisciplinary Graduate Courses at the Graduate School of Management

22:373:593. INTERNATIONAL BUSINESS ENVIRONMENT (3)
Introduces potential managers in both domestic U.S. and multi-national firms to the major environmental influences on their future decisions, and to basic analytical tools such as country risk assessment, hedging of foreign exchange risk, and cost-benefit analysis. Even simple actions, such as planning a foreign journey or executing import and export orders denominated in foreign currency, require hedging decisions to minimize foreign exchange risk. Over one-sixth of the U.S. economy is now accounted for by the foreign sector. Imports and investment decisions by the U.S. and other firms affect jobs and economies far removed from the locus of the decisions. Managers, particularly overseas in more regulated, centrally planned, or less industrialized environments, must make decisions not only on an economic basis, but must also consider political factors in their judgments.

22:373:605. INTERNATIONAL BUSINESS LAW (3)
Focuses on key legal issues affecting the conduct of international business. Topics covered include: legal aspects of trading and investing across national borders; foreign investing in the U.S.; U.S. customs laws and practices; import protection against unfair trade practices; taxation of international trade and investment; currency and investment controls; and some of the unique institutions affecting the conduct of international business.

22:373:612. INTERNATIONAL BUSINESS POLICY (3)
Focuses on competitiveness within both a national and multi-national context. Focuses on the manager who has to formulate strategy for the company. Integration of investment rules, political climates, foreign exchange fluctuations, tariff and trade policies of nations, and interaction between the firm and government. Traditional aspects of administration and strategy formulation, such as organization design, cross-cultural personnel relationships, production, or marketing standardization and planning, are examined in a multinational context. Heavy emphasis on case studies which cut across various functional disciplines.

Multidisciplinary Graduate Course at the School of Law–Newark

23:600:638. INTERNATIONAL LAW AND A JUST WORLD ORDER (3)
The role of legal processes, institutions, and organizations in the evolving world community. Covers the manner in which traditional international law arose, and analyzes the basic concepts of international law: sources, subjects, sovereignty, treaties and agreements, jurisdiction, state responsibility, the use of force, and peaceful settlement of disputes. Insofar as possible, deals with the interrelated problems of war, poverty, social injustice, and ecological stability.

23:600:757. INTERNATIONAL LAW AND GENOCIDE (3)
Fousek, Mendlovitz
Development of law under the rubrics of crimes against humanity and genocide. The Nuremburg judgment and attempts over the past fifty years to establish a formal legal regime comprehending, defining, preventing, and punishing the behavior placed under these rubrics.

LIBERAL STUDIES 606

Degree Program Offered: Master of Arts in Liberal Studies
Director of the Graduate Program: Professor Josephine Grieder, Room 411, Hill Hall (973/353-1045)

Members of the Graduate Faculty

Professors:

Colin Beer, *GS–N; D.Phil., Oxford*
Conceptual and historical aspects of ethology, comparative psychologies
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
Mary Clare Segers, *FAS–N; Ph.D., Columbia*
Political theory; women and politics; ethics and public policy; religion and politics
Leonard J. Wang, *FAS–N; Ph.D., Columbia*
French literature, aesthetics, history of ideas from the Middle Ages through the baroque period

Associate Professors:

Ira Cohen, *FAS–N; Ph.D., Wisconsin*
  Social theory; history of social thought; sociology of science
Edwin M. Hartman, *FAS–N; Ph.D., Princeton*
  Management philosophy; the logic of strategy; conceptual foundations
  of organizational theory
Michael D. Rohr, *FAS–N; Ph.D., Stanford*
  Ancient Greek philosophy; metaphysics

Program

Graduate liberal studies is designed for adults wishing 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 the following: a baccalaureate degree; at least a *B* cumulative grade-point average in undergraduate studies; a written essay; and an interview in which the candidate's individual needs, achievements, and study goals are evaluated. No entrance examinations are required.

The requirement for a Master of Arts in Liberal Studies (M.A.L.S.) is successful completion of 30 credits, distributed as follows: 12 credits in core courses; 12 credits in electives; 6 credits in a final project. Elective credits may represent a concentration of courses chosen from the graduate school offerings and preparing students for their final project. At the discretion of the program director, a number of elective courses may be transferred to the program for credit toward the degree after matriculation. Study plans and final projects are designed in consultation with program faculty members. Nonmatriculated study is also 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 typical of, but not confined to, four historical periods: classical Greek to early Christian; medieval and Renaissance; seventeenth through nineteenth centuries; and the twentieth century:

  26:606:501   From Myth to History
  26:606:502   Faith, Love, and Reason
  26:606:503   Revolutions and Counter-revolutions
  26:606:504   Science, Ideologies, and Social Values
  26:606:505   The Modern Mind

Topics may vary from term to term. Course 26:606:501 is the usual entry level course; other courses may be taken in any sequence. At various times, courses other than those listed above will 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)
  26:606:506   Science and Film (3)
  21&62:730:334   Philosophy of Science (3)
  26:790:529   Science, Technology, and Public Policy (3)

Culture and the Arts
  16:082:506   Approaches to Art History (3)
  26:606:508,509   Shakespeare in the Twentieth Century (3,3)
  26:606:514   Myth and Mythologies (3)
  26:606:520,521   Modern Masterpieces (3,3)

The American Experience
  26:352:523,524   American Literature (3,3)
  26:510:551   American Intellectual and Cultural History (3)
  26:790:608   American Political Thought (3)

The Social Sciences
  21&62:070:492   Seminar: Anthropology of War (3)
  26:220:511   History of Economic Thought (3)
  26:790:512   Ethical Issues and Policy (3)
  21&62:830:423   History and Modern Viewpoints in Psychology (3)
  21&62:830:481   Comparative Psychology (3)

Gender Studies
  27:202:515   Female Criminality (3)
  26:350:563,564   Women in Literature (3,3)
  21:830:401,402   Aspects of Human Life in Society (3,3)

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 between 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 COUNTER-REVOLUTIONS (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)
Content draws on themes relating to 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 life.

26:606:505. THE MODERN MIND (3)
Organized around the twin theses of self and society, freedom and servitude, this course studies nineteenth- and twentieth-century thinkers from Darwin to Marx to Freud searching for secular, rational, and scientific ways of seeing the world after the death of God.

26:606:506. SCIENCE AND FILM (3)
Examines representations of science and quasi-science in films addressing technocratic biases. Course content varies from term to term.

26:606:508,509. SHAKESPEARE IN THE TWENTIETH CENTURY (3,3)
  daVinci-Nichols
Recurring patterns, themes, and imagery in at least one play from each of the major genres—history, comedy, tragedy, problem drama—and 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.

26:606:520,521. MODERN MASTERPIECES (3,3)
Readings, performances, slide shows, and films examining the impact of major twentieth-century political, social, and intellectual movements on drama, short fiction, painting, and performance art.

26:606:522,523. Topics in Liberal Studies (3,3)
Special topics in liberal studies designed by Rutgers and other faculty. Topic announced each term as courses are offered.

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.L.S degree. 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

For information about programs leading to the M.B.A. as a terminal professional degree, the student should obtain the prospectus of the Graduate School of Management from Room 115, Engelhard Hall, 92 New Street, Newark, NJ 07102 (973/353-1234).

Degree Program Offered: Doctor of Philosophy
Director of Doctoral Program: Professor Glenn Shafer,
  Room 302C, Ackerson Hall (973/353-1604)

Members of the Graduate Faculty

Professors:

Nabil Adam, *FOM; Ph.D., Columbia*
  Scheduling; computer simulation and database systems
Phipps Arabie, *FOM; Ph.D., Stanford*
  Multivariate data analysis, with emphasis on techniques used for market segmentation, product positioning, and the study of social networks
Ronald D. Armstrong, *Director, Ph.D. in Management Program, FOM; Ph.D., Massachusetts*
  Mathematical programming; data processing; operations management
James L. Bicksler, *FOM; Ph.D., New York*
  Theory of finance and the market for corporate control
Ivan E. Brick, *FOM; Ph.D., Columbia*
  Financial theory with primary focus on areas of market efficiency and the financing decision of the firm
J. Douglas Carroll, *FOM; Ph.D., Princeton*
  Multidimensional scaling and related techniques of data analysis, especially applied to marketing and psychology
Alok K. Chakrabarti, *Dean, NJIT–School of Industrial Management; Ph.D., Northwestern*
  Management of innovation; strategic management; international business
Farok J. Contractor, *FOM; Ph.D., Pennsylvania (The Wharton School)*
  Technology transfer, licensing, joint venture, and other agreements between international companies
Michael A. Crew, *FOM; Ph.D., Bradford (England)*
  Industrial organization; theory of the firm; public utility economics
Nancy DiTomaso, *FOM; Ph.D., Wisconsin (Madison)*
  Organizational and social theory; human resource management; public policy; labor force and organizational structure; organizational and managerial effectiveness
John H. Dunning, *FOM; Ph.D., Southampton*
  Economics of international direct investment and the multinational enterprise
George F. Farris, *FOM; Ph.D., Michigan*
  Management of high technology organizations; technical supervision; the informal organization in research and development; innovation and productivity of scientists and engineers
Lawrence Fisher, *FOM; Ph.D., Chicago*
  Behavior of security markets; analysis of the risk and returns of investments
David Hawk, *NJIT; Ph.D., Pennsylvania*
  Strategic management and international business

Starr Hiltz, *NJIT; Ph.D., Columbia*
  Evaluation of information systems and group decision support systems
L. Richard Hoffman, *FOM; Ph.D., Michigan*
  Automation; organizational structure; individual problem solving; leadership; group problem solving
T. Edward Hollander, *FOM; Ph.D., Pittsburgh*
  Combines work in financial accounting with continuing national involvement in higher education policy formulation and state-wide governance of higher education
Harsharanjeet S. Jagpal, *FOM; Ph.D., Columbia*
  The theory of the firm under uncertainty; preference theory; advertising; psychometrics; times series methods
Kenneth Kendall, *SB–C; Ph.D., Ph.D., SUNY (Buffalo)*
  Management information systems
Bruce Kirchoff, *NJIT; Ph.D., Utah*
  Strategic management
Kenneth Lawrence, *NJIT; Ph.D., Rutgers*
  Operations management; marketing
C.F. Lee, *SB–NB; Ph.D., SUNY*
  Capital market theory; dividend policy; financial accounting and applied econometrics
William C. Lins, *FOM; Ph.D., Columbia; CPA, New York*
  Auditing; information systems; financial accounting theory; financial reporting; budgeting
James McHugh, *NJIT; Ph.D., New York*
  Graph theory; network analysis
W. Giles Mellon, *FOM; Ph.D., Princeton*
  Monetary policy and theory; banking and financial institutions; financial management
Thomas Murray, *NJIT; Ph.D., Massachusetts*
  Information systems management
Paul S. Nadler, *FOM; Ph.D., New York*
  Commercial banking; financial institutions; implications of monetary, fiscal, and debt management policy
Peter A. Ng, *NJIT; Ph.D., Texas*
  Software engineering; intelligent robotics systems; data communications and networking; distributed processing; knowledge-based systems
Rosa Oppenheim, *FOM; Ph.D., Polytechnic Institute of Brooklyn*
  Quality control; mathematical programming; integer programming; graph theory; applications of Box-Jenkins model building techniques
Naomi G. Rotter, *NJIT; Ph.D., New York*
  Social perceptions of the alcoholic; educational applications of interactive video disks
Hindy L. Schachter, *NJIT; Ph.D., Columbia*
  Interorganizational coordination; organizational communication; public personnel policy
Glenn Shafer, *FOM; Ph.D., Princeton*
  Applications of probabilistic methods to artificial intelligence and expert systems
David Shanno, *RUTCOR; Ph.D., Carnegie Mellon*
  Linear and nonlinear programming; numerical analysis; parallel computing
Barbara Stern, *FAS–N; Ph.D., CUNY*
  Literary elements and advertising effects; gender roles and consumer behavior; financial service marketing and media attitudes
Ephraim F. Sudit, *FOM; Ph.D., New York*
  Productivity accounting; budgeting and standard costing procedures under uncertainty; measurement of efficiency and effectiveness
Julius Surkis, *FOM; Ph.D., Polytechnic Institute of Brooklyn*
  Modeling of urban emergency service systems and health care delivery systems
Ted H. Szatrowski, *FOM; Ph.D., Stanford*
  Multivariate analysis with applications to patterned covariances; nonparametric/sequential analysis; biostatistics; computer software development for patterned covariance problems
Murray Turoff, *NJIT; Ph.D., Brandeis*
  Information systems; computer conferencing systems; collaborative systems; design of user-oriented interactive computer systems; office automation; management information systems; decision support systems; modeling; planning; forecasting.
Miklos Vasarhelyi, *FOM; Ph.D., Southern California*
  Applications of expert systems to auditing, vague context understanding; the economics of telecommunication
David K. Whitcomb, *FOM; Ph.D., Columbia*
  Investment and capital markets; micro-structure of capital markets; economic regulation; microeconomic theory

Associate Professors:

Layek Abdel-Malek, *NJIT; Ph.D., Polytechnic Institute of New York*
  Robotics assembly processes; performance of manufacturing systems; facilities planning and location; energy systems logistics; inventory management
Moshe Adler, *FOM; Ph.D., California (Los Angeles)*
  Talent and success; the advantages and disadvantages of public vs. private property

Da-Hsien Bao, *FOM; Ph.D., Southern California*
  Accounting decision processes and criteria; productivity accounting
Theologos Bonitsis, *NJIT; Ph.D., CUNY*
  Empirical testing of hypothesized theoretical domestic and international financial relationships and vector autoregressive forecasting modeling
Samir El-Gazzar, *FAS–N; Ph.D., CUNY*
  Economics of financial reporting and information production capital markets; quantitative analysis for control and performance measurement
Gail Farrelly, *FOM; D.B.A., George Washington*
  Risk perception in financial markets; dividend policy; linguistic analysis; corporate reputation
Seymour Fine, *FOM; Ph.D., Columbia*
  Social marketing, defined as the application of marketing theory to the dissemination of human services and social ideas
Henry Goldberg, *NJIT; Ph.D., Cornell*
  Operations management; data networking products
Gikas Hardouvelis, *SB–NB; Ph.D., California (Berkeley)*
  Financial economics; finance; macroeconomics
Iftekar Hasan, *NJIT; Ph.D., Houston*
  Financial institutions; corporate finance; multinational financial management; statistics
Douglas H. Jones, *FOM; Ph.D., Florida State*
  Nonparametric statistics; stochastic processes; psychometrics; empirical bayes; robust regression; survey sampling designs
Michael N. Katehakis, *FOM; Ph.D., Columbia*
  Adaptive optimization of probabilistic systems
Farrokh Langdana, *FOM; Ph.D., Virginia Polytechnic Institute and State University*
  Microeconomic experimentation; the role of stabilization policy in an expectations-driven economy
John Malindretos, *NJIT; Ph.D., Rutgers*
  Corporate finance and trade issues; foreign exchange; differences in debt pricing
Donald McCabe, *FOM; Ph.D., New York*
  Decision making under conditions of uncertainty; business ethics
Miriam K. Mills, *NJIT; Ph.D., New York*
  Policy analysis; labor-management relations; health administration; social impacts of technology; human resource management
Dan Palmon, *FOM; Ph.D., New York*
  Financial reporting; general accounting theory; corporate finance
Oded Palmon, *SB–NB; Ph.D., Chicago*
  Finance; applied microeconomics; public finance
S. Abraham Ravid, *FOM; Ph.D., Cornell*
  Corporate finance; economics of uncertainty; regulatory economics; energy models
Robert R. Rothberg, *FOM; Ph.D., Pennsylvania*
  Strategic planning; new product development in high technology industries; venture groups
Alex Sanella, *FOM; Ph.D., New York*
  Empirical research in financial accounting; cost allocations; segment reporting
Julian M. Scher, *NJIT; Ph.D., New York*
  Simulation; decision support systems; management information systems; programming languages; computer conferencing applications; business and managerial applications of computers
Bin Srinidhi, *FOM; Ph.D., Columbia*
  Management accounting and control; application of queueing models to accounting problems
Emilio Venezian, *FOM; Ph.D., California Institute of Technology*
  Economics of uncertainty in the context of financial institutions

Assistant Professors:

James Bailey, *FOM; Ph.D., Washington*
  Psychological experience of evaluation
Tung Lung Chang, *NJIT; Ph.D., George Washington*
  International business; multinational strategy in international competition
Fariborz Damanpour, *GSM; Ph.D., Pennsylvania*
  Management of innovation; organization design in high technology firms; organizational effectiveness
Julie Kendall, *SB–C; Ph.D., Nebraska (Lincoln)*
  Management information systems; systems analysis and design
Mark Somers, *NJIT; Ph.D., CUNY*
  Organizational behavior; human resource management
Lazar Spasovic, *NJIT; Ph.D., Pennsylvania*
  Modeling rail-truck intermodal operations; evaluating alternatives for distributing freight; transportation management

Adjunct Members of the Faculty:

Howard Gage, *NJIT; Ph.D., New York*
  Ergonomics; occupational safety and health; biomedical
Roy B. Helfgott, *NJIT; Ph.D., New School for Social Research*
  Human resource management; employee relations; impact of robotics

Program

The Ph.D. in Management is an interdisciplinary program, both in subject matter and in organization. Students register in and receive their degrees from the Graduate School–Newark; courses are offered by faculty members of the Faculty of Management, three departments of the New Jersey Institute of Technology, and by other Rutgers faculty members.

The doctoral program prepares individuals with bachelor's or higher degrees in any academic discipline for positions in fields that require the application of a variety of advanced analytical techniques to management decisions. Its intent is to prepare scholars well qualified for careers in college and university teaching, research, management, and consulting. To achieve this goal, the student is expected not only to complete a thorough study of and carry out research in his or her primary and secondary fields of concentration, but also—as part of the preparation for research—to attain a sound knowledge of the analytical methods that are common to the basic disciplines that underlie research in management, to become familiar with the paradigms of those disciplines, and to gain knowledge of the functional fields in management.

Curriculum

The curriculum requires at least 72 graduate credits, all of which are usually in courses intended primarily for doctoral students. One third of these credits are in fields that comprise a common core, one third are directly in the primary and secondary fields, and one third represent research for the doctoral dissertation.

In addition, because of the variety of disciplinary backgrounds that are suitable for the program, many students—particularly those who do not have a quantitative background—should expect to take several noncredit prerequisite courses. Moreover, all students in the program must demonstrate knowledge in two of four specific functional fields—a requirement that may be met by taking a graduate course in each field.

Transfer students who enter the program after having completed substantial graduate work in management or a related field such as computer science, economics, engineering, operations research, political science, psychology, or sociology may qualify for transfer credit for work that is substantially equivalent to courses required or offered by this program. Courses offered by MBA programs are normally designed to train line managers. Only rarely are they equivalent to courses that are part of the doctoral core.

Doctoral candidates for the Ph.D. in management must complete the following requirements for a minimum of 72 credits: proficiency requirements (described below), the common core (24 credits), major field of concentration (15 credits), minor field of concentration (9 credits), and supervised dissertation research (24 credits).

Proficiency Requirements. Courses taken only for the purpose of satisfying proficiency requirements are not considered part of the 72 credits required for the Ph.D. program.

1. *Prerequisites.* These are normally satisfied by the undergraduate preparation: mathematics, including differential and integral calculus (working knowledge of matrix algebra is strongly recommended); probability and statistics; and computer programming, including a formal introduction to computers and substantial experience in writing programs in a language such as Basic, Fortran, Cobol, or Pascal *and running them.*

    The mathematics and statistics requirements are normally met by having recently completed a full-year (6-credit) course in each field or by passing a proficiency examination; the computer programming requirement by a one-term (3-credit) course. Failure to meet the prerequisites before entering the program is likely to impede progress in course work.

2. *Functional Fields.* Students must complete at least one master's-level course in two of the following four functional fields: accounting, finance, human resources, and marketing. Each requirement may be met through an appropriate course, independent study, or passing an examination. The faculty in the major or minor area of concentration may specify either or both of the functional fields in which proficiency must be attained.

The Common Core (24 credits). These credits must be taken in courses intended primarily for doctoral students.

1. Six credits in each of the following fields, for a total of 12 credits: (a) economics: 26:223:552 and 553; and (b) probability, statistics, and the design of experiments: 26:960:575 and 577.
2. Three to 6 credits in each of the following fields, for a total of 12 credits (the faculty in the primary field of concentration may specify the particular courses to be taken): (a) management science: 26:711:561 and 26:960:580; (b) behavioral science: 26:620:555 and/or 556; and (c) systems management: NJIT/CIS:677, NJIT/CIS:675, and/or NJIT/CIS:679.

Transfer students may receive credit for particular courses by having a prior course approved for transfer credit by the appropriate area adviser and the program director. Noncredit exemption from a field requirement may be received from the program director.

The primary and secondary fields of concentration should represent the student's major research and teaching interests. At present, work is offered in seven fields: accounting, computer applications and information systems in management (includes the former field of software management and production), finance, marketing, operations management, organization management, and international business.

Each doctoral student is expected to develop a thorough, in-depth knowledge and understanding of the literature, research methods, and paradigms in the primary field of concentration. In consultation with an adviser, the student must design a plan of formal course work, independent study, and original research to attain the required competence. This attainment is demonstrated by passing the primary field examination.

Similarly, each student must develop a thorough understanding of his or her secondary field of concentration and demonstrate it by passing each course with a grade of *B* or better.

Full-time students who meet all of the prerequisites at the time they enter the program may expect to complete their formal course work within two and one-half years. Completion of the program (including passing the field examination and undertaking the research for and writing of the doctoral dissertation) typically requires about two more years. Part-time students will need a correspondingly longer time to complete the degree. Although there is no explicit requirement for spending part of the program as a full-time student, a substantial period of full-time study is strongly recommended.

The field examination may be taken when the student has completed all of the course work. Students who have satisfied the requirements listed above are admitted to candidacy after passing the primary field examination.

Doctoral candidates are expected to continue their professional development. Students at all levels in the program are expected to participate in advanced seminars in their primary and secondary fields. These seminars provide regular interaction among candidates, other graduate students, and the faculty; a place to discuss work in progress; and an opportunity for candidates, faculty, and outside experts to present research for critical appraisal.

Dissertation Requirement

Doctoral candidates are required to conduct extensive original research on a significant aspect of management and to write a dissertation on their research that makes a substantial contribution to its field of knowledge. Some dissertations may concern the application of management theory and practice to actual management decision problems; all are expected to meet the traditional scholarly and research values that are normally found in academic doctoral dissertations.

After admission to candidacy, the student presents a written dissertation proposal for approval. In preparing the proposal, he or she should consult widely among the faculty. During this time, the program director appoints a dissertation committee to guide the candidate's research. The committee normally has four or five members. The chairperson must be a member of the graduate faculty who has been approved for the supervision of doctoral research. The other committee members are chosen for their

expertise in the field of research and need not all have their primary appointments in the same academic unit. There should be one member appointed from outside the program faculty.

After the candidate has formulated the research question, the committee holds an open hearing to determine whether the proposed study appears to be both sufficiently important and reasonably feasible. After approval of the topic and research plan (by majority vote of the committee), full-time students are expected to complete the dissertation within twelve additional months and part-time students within twenty-four months. In addition to continuing to work closely with his or her committee, the candidate is expected to submit progress reports to the program director at six-month intervals.

Upon completion, the candidate defends the dissertation in an open hearing before a committee that is normally the same as the committee that approved the proposal. The hearing may be held after the complete text of the thesis has been approved by the committee or as soon as an "acceptable draft," which appears to be complete except for expository changes, has been approved. Passing the examination is determined by majority vote of the committee. Expository changes, if any, must be approved in accordance with an *ad hoc* procedure determined by the committee at the time of the defense. The dissertation itself must be approved for form by the dean.

Related Master's Degrees

Master of Business Administration

A student in the Ph.D. in management program becomes eligible for the degree of Master of Business Administration in the Graduate School of Management upon meeting one of the following sets of requirements:

1. *Completion of all requirements for the Ph.D. in management.* To apply, a doctoral candidate should consult with the director prior to the term in which the doctorate is expected.
2. *Completion of formal courses for the Ph.D. in management.* A student who has successfully completed the course requirements of the Ph.D. in management program (see requirements under "Curriculum") may be awarded the M.B.A. subject to the following additional conditions: (a) meeting the functional field requirements in accounting, finance, and marketing and at a level at least equivalent to that of the M.B.A. program's core requirements; (b) receiving credit for a graduate course in business policy equivalent to that of the M.B.A. program; (c) passing the primary field examination; and (d) having the application certified by the director of the Ph.D. in management program. The student must complete the required 48 credits in doctoral courses with a minimum cumulative grade-point average of *B* (3.00); this grade-point average must also be maintained in the doctoral core courses.

Master of Arts in Economics

Depending on the field of concentration, a Ph.D. in management student may also become eligible for the Master of Arts degree awarded by the program in economics of Graduate School–Newark with additional course work. To qualify, the student must file a separate application for admission with the program in economics and select a program of courses that meets the latter's requirements. However, the student may remain registered in the Ph.D. in management program. For details and advising, consult the director of the graduate program in economics.

Master of Science in Computer Science

The degree of Master of Science in Computer Science is available through the New Jersey Institute of Technology. To receive the Master of Science in computer science, the candidate is expected to complete the course requirement of the primary field of concentration in computer applications and information systems in management and the master's project. Consult the director of the NJIT graduate program in computer science about requirements and procedures.

Class Schedule

The program accepts both part-time and full-time students. The normal course load for a part-time student is 6 credit hours per term. A full-time student normally takes 12 credit hours per term. Part-time students can not expect to complete all course work by taking only night classes. Part-time students should also be aware that several months of concentrated effort is often required to complete a dissertation. Furthermore, all students occasionally may be required to attend classes on the New Brunswick campus.

Doctoral 3-credit courses meet once a week for the 14 weeks (including examinations) of the fall and spring terms. Doctoral courses offered by NJIT normally meet from 6:00 P.M. to 9:05 P.M. during its fall and spring terms.

Typical Course Sequences

Core Courses

See the Common Core listed above.

Primary Specialization Courses

Accounting: (Prerequisites: Courses in financial and managerial accounting equivalent to 22:135:583 and 588; 22:135:604 and 605; 22:835:644; and 22:835:627 or 22:135:644) 26:223:554 or 26:620:557 and 26:010:651,652,653,680.
Applied Economics: 26:223:554, 655, 657, 658, 659.
Computer Applications and Information Systems in Management: (Prerequisites: Pascal; NJIT/CIS:631, 635, 661, 677, or equivalent) NJIT/CIS:776 and four electives chosen from CIS:600- and 700-level courses, including at least two 700-level courses. Core courses include CIS:675 and 731.
Finance: (Prerequisite: accounting) 26:223:554, 26:390:571, 661, 662.
Marketing: 26:630:576, 665, 666, 667, 668.
Operations Management: 26:711:585, 586, 675, and 682, 26:960:580. Core courses include 26:711:561 and 26:960:575, 577.
Organization Management: Course in research methods (typically 26:620:557) and four additional courses selected from 26:620:672,673, and elective courses. Electives presently offered include 26:620:671,674, NJIT/OS:781, and special topics offered as 26:620:685. Core courses include 26:620:555, 556.

Secondary Specialization Courses

Accounting: 26:010:651, 652, 653.
Applied Economics: 26:223:655, 657, 659.
Computer Applications and Information Systems in Management: (Prerequisites: Pascal; NJIT/CIS:610 and 677.) A related sequence of three 600- or 700-level courses approved by the faculty and area adviser. Core courses include CIS:675.
Finance: 26:390:571 and two courses from 26:390:660, 661, and 662.
Marketing: 26:630:576, 665, 666.
Operations Management: 26:711:585, 586, 682.
Organization Management: 26:620:557, 672, 673.

Graduate Courses

Accounting 010

26:010:651. (F) ADVANCED TOPICS IN FINANCIAL ACCOUNTING (3)
Prerequisites: 22:135:583, 588.
Analysis of selected major concepts and issues in financial accounting theory and practice and their managerial implications. Topics include methodological issues.

26:010:652. (F) ADVANCED TOPICS IN MANAGEMENT ACCOUNTING (3)
Prerequisites: 22:135:583, 588.
Advanced discussion and review. Topics include cost estimation and allocation, budgetary planning and control, direct versus absorption costing, performance measurement, management information systems for accounting, and behavioral aspects.

26:010:653. (S) CURRENT TOPICS IN AUDITING (3)
Prerequisites: 22:135:583, 588.
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. (S) CURRENT TOPICS IN ACCOUNTING RESEARCH (3)
Prerequisites: 26:010:651,652.
Discussion and review of selected topics in accounting research, focusing on methodologies, research design, research implementation, and empirical testing in major fields of accounting.

26:010:685. SPECIAL TOPICS IN ACCOUNTING (BA)

26:010:687. ACCOUNTING RESEARCH SEMINAR (BA)

26:010:688. INDEPENDENT STUDY IN ACCOUNTING (BA)

26:010:799. DISSERTATION RESEARCH IN ACCOUNTING (BA)

Computer Applications and Information Systems in Management 198

26:198:685. SPECIAL TOPICS IN COMPUTER APPLICATIONS AND INFORMATION SYSTEMS IN MANAGEMENT (BA)

26:198:687. RESEARCH SEMINAR IN COMPUTER APPLICATIONS AND INFORMATION SYSTEMS IN MANAGEMENT (BA)

26:198:688. INDEPENDENT STUDY IN COMPUTER APPLICATIONS AND INFORMATION SYSTEMS IN MANAGEMENT (BA)

26:198:731. APPLICATIONS OF DATABASE SYSTEMS (3)
Prerequisite: 22:135:672 or NJIT:CIS:631.
Emphasizes the functions of database administrator. Includes survey of physical and logical organization of data and their methods of accessing, and the characteristics of different models of generalized database management systems.

26:198:799. DISSERTATION RESEARCH IN COMPUTER APPLICATIONS AND INFORMATION SYSTEMS IN MANAGEMENT (BA)

Applied Economics 223

26:223:552. (F) MICROECONOMIC THEORY (3)
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. (S) MACROECONOMIC THEORY (3)
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. (S) ECONOMETRICS (3)
Prerequisite: 26:960:577.
Statistical techniques for the analysis of models applicable to economic data and their application to management problems.

26:223:655. (F) ADVANCED ECONOMETRICS (3)
Prerequisites: 26:223:552, 553, 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. (F) ADVANCED TOPICS IN MICROECONOMICS I (3)
Prerequisites: 26:223:552, 26:960:577.
An advanced theoretical treatment of major topics in micro-economics, 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.

26:223:658. (S) ADVANCED TOPICS IN MICROECONOMICS II (3)
Prerequisite: 26:223:657. Pre- or corequisites: 26:223:657, 659.

26:223:659. (S) ADVANCED MACROECONOMIC THEORY (3)
Prerequisites: 26:223:552, 553, 554.
Survey of recent contributions to macroeconomics and monetary theory with emphasis on empirically verifiable and/or policy-oriented propositions.

26:223:685. SPECIAL TOPICS IN APPLIED ECONOMICS (BA)

26:223:687. RESEARCH SEMINAR IN APPLIED ECONOMICS (BA)

26:223:688. INDEPENDENT STUDY IN APPLIED ECONOMICS (BA)

26:223:799. DISSERTATION RESEARCH IN APPLIED ECONOMICS (BA)

Finance 390

26:390:571. (S) SURVEY OF FINANCIAL THEORY (3)
Prerequisites: 26:223:552, 26:960:577.
Surveys the fundamental assumptions and the analytical techniques of the modern theory of finance. Topics include choices involving risk using utility theory and state preference theory, portfolio selection, capital market equilibrium and its implications for corporate finance and portfolio selection, and option theory.

26:390:572. SURVEY OF FINANCIAL THEORY II (3)
Prerequisite: 26:390:571.
Basic knowledge of theoretical and empirical model building in the area of corporate finance.

26:390:660. (F) ANALYSIS OF FINANCIAL MARKETS AND INSTITUTIONS (3)
Prerequisite: 26:223:553.
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 day-time field trips.

26:390:661. (F) FINANCIAL MANAGEMENT TECHNIQUES (3)
Prerequisites: 26:223:554, 26:390:571.
In-depth study of theoretical and empirical research on financial decision making by firms. Covers capital budgeting and corporate finance, including dividend and capital structure decisions and the impact of alternative tax policies.

26:390:662. (S) INVESTMENT ANALYSIS AND PORTFOLIO THEORY (3)
Prerequisites: 26:223:554, and 26:390:571, or 22:135:665.
Seminar covering 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.

26:390:685. SPECIAL TOPICS IN FINANCE (BA)

26:390:687. RESEARCH SEMINAR IN FINANCE (BA)

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)
Analyzes the collective knowledge about multinational enterprises (MNEs), 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 owner-ship and organizational strategies of firms, and the globalization of production markets.

26:553:601. THEORETICAL ASPECTS OF INTERNATIONAL BUSINESS (3)
Critically appraises the main economic and behavioral theories of the determinants of international business activity over the past thirty years.

26:553:603. INTERNATIONAL TRADE AND INVESTMENT (3)
Theoretical paradigm developed that allows the many facets of international activity in trade investment, production, and finance to be integrated into a single model. Critically analyzes extant theories of international trade and foreign direct investment.

26:553:605. NATIONAL INNOVATION POLICIES AND INTERNATIONAL BUSINESS (3)
Examines 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)
Examines the forces determining the competitiveness of corpora-tions and countries and how these have changed as markets and production have become increasingly globalized.

26:553:609. GLOBAL BUSINESS IN REGULATED AND DEVELOPING ECONOMIES (3)
Examines the structural features of developing and transition economies and the role international business plays in the restructuring and development of these economies.

Organization Management 620

26:620:015. EXCHANGE REGISTRATION NJIT (MANAGEMENT) (BA)

26:620:555. (F) THEORY AND RESEARCH IN ORGANIZATIONAL BEHAVIOR (3)
Offered in alternate years as NJIT/HRM:655.
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. (S) THEORY AND RESEARCH IN ORGANIZATIONAL STRUCTURE AND PROCESS (3)
Survey of the basic theory and empirical research about the design of organizations and their functioning. 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. (S) METHODS OF RESEARCH IN ORGANIZATIONS (3)
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 carried out later.

26:620:558. (S) THEORY AND RESEARCH IN POLICY AND STRATEGY (3)
Exposure to most of the core literature in strategic management. Includes the "classics" of the field, the important conceptual models, empirically based models of strategy, the policymaker's role, formal planning systems, environmental analysis, strategic implementation, alternative views of strategic management, approaches and issues in strategic management research, and recent empirical work in strategic management research.

26:620:670. (S) HUMAN RESOURCES (3)
Examines theoretical issues and empirical research in human resource management (HRM). Focus on understanding the basics of HRM practice in relation to research in various areas of personnel planning and selection, compensation and reward system, employee development issues, work-life issues, conflict and negotiation, and HRM evaluation.

26:620:671. (F) MANAGEMENT OF TECHNOLOGICAL INNOVATION (3)
Examination of factors tending to stimulate and inhibit individual and group creativity in organizations and its translation into innovative output by the organizations. Emphasis on management of research and development.

26:620:672. (F) INDIVIDUALS IN ORGANIZATIONS (3)
Prerequisite: 26:620:555.
Advanced treatment of current theory and research on people at work and the relationship of work to other aspects of people's lives.

26:620:673. (S) SEMINAR IN GROUP BEHAVIOR (3)
Prerequisite: 26:620:555.
Covers the principal theories of group behavior relevant to people at work, including the evaluation of research underlying these theories. Deals with the nature of the group interaction process—its antecedents and its consequences for individual members, the group itself, and the environment in which the interaction takes place. Reviews research on groups from historical, theoretical, and methodological perspectives.

26:620:685. SPECIAL TOPICS IN MANAGEMENT (BA)

26:620:687. RESEARCH SEMINAR IN MANAGEMENT (BA)

26:620:688. INDEPENDENT STUDY IN MANAGEMENT (BA)

26:620:799. DISSERTATION RESEARCH IN MANAGEMENT (BA)

Marketing 630

26:630:576. (S) QUANTITATIVE METHODS IN MARKETING (3)
Emphasis on quantitative approach to marketing decision making and model building in particular.

26:630:625. CLUSTERING (3)
Prerequisites: Calculus, intermediate statistics, and knowledge of optimization 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.

26:630:665. (F) MARKETING THEORY (3)
Prerequisite: 26:630:576.
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. (S) CONSUMER BEHAVIOR (3)
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.

26:630:667. (S) ADVANCED MARKETING THEORY (3)
Prerequisite: 26:630:665.
A survey of recent theoretical developments in marketing. Topics include alternatives to the utility paradigm of consumer preference, marketing decision making in the multiproduct firm, and choosing marketing policy in a stochastic environment.

26:630:668. (F) ADVANCED MARKETING RESEARCH (3)
Prerequisite: 26:630:576.
In-depth analysis of recent advances in marketing research methods. Topics include conjoint analysis, log-linear modeling, and Bayesian methods.

26:630:685. SPECIAL TOPICS IN MARKETING (BA)

26:630:687. RESEARCH SEMINAR IN MARKETING (BA)

26:630:688. INDEPENDENT STUDY IN MARKETING (BA)

26:630:799. DISSERTATION RESEARCH IN MARKETING (BA)

Operations Management 711

26:711:561. (F) FUNDAMENTALS OF OPTIMIZATION (3)
Prerequisite: Differential calculus.
Survey of optimization methods for deterministic systems. Topics include linear algebra; classical optimization methods for unconstrained and constrained functions; search techniques; linear programming; integer programming; and dynamic programming.

26:711:581. (S) PROBLEMS IN OPERATIONS MANAGEMENT (3)
Applied aspects of control theory, network theory, and multiechelon production and inventory systems.

26:711:585. (S) CONTROL MODELS IN OPERATIONS MANAGEMENT (3)
Project control, scheduling theory as it relates to the control function, manpower scheduling. Discusses model formulation, solution techniques, and system dynamics. Applies model formulation and computer simulation to dynamic systems.

26:711:586. (F) PLANNING MODELS IN OPERATIONS MANAGEMENT (3)
Multi-period and multi-stage aggregate and hierarchical planning models with linear and nonlinear cost functions; plant, warehouse, and microfacility location problems. Applies models that use linear, mixed-integer, branch-and-bound, and dynamic programming techniques.

26:711:675. (F) DISCRETE OPTIMIZATION (3)
Prerequisite: 26:711:561 or equivalent.
Models and algorithms for solution of discrete optimization problems with emphasis on computer implementation. Review of linear programming; advanced linear programming; integer programming models; algorithms for integer, mixed integer, and linear problems, including branch-and-bound methods and cutting planes; additional branch-and-bound applications; integer programming duality; decomposition; network optimization, including network models, specialized linear-programming, and other computer algorithms.

26:711:676. (S) STATISTICAL ASPECTS OF STOCHASTIC SIMULATION (3)
Prerequisites: Courses in computing, statistics, and simulation modeling design and analysis of simulation experiments.
Finding the accuracy and reliability of simulation-based statistics; efficiency of computer-based statistics; comparison of alternative models.

26:711:677. (F) SEMINAR IN OPERATIONS MANAGEMENT IN THE SERVICE SECTOR (3)
Offered in alternate years.
Study, analysis, and discussion of current management problems and their potential solutions for enterprises in the service sector. Emphasis on the research and quantitative methods used for structuring and evaluating managerial actions.

26:711:682. (S) SEMINAR IN THE THEORY AND RESEARCH OF MANAGEMENT SCIENCE (3)
Considers theories and significant empirical research in management science and operations research.

26:711:685. SPECIAL TOPICS IN OPERATIONS MANAGEMENT (BA)

26:711:687. RESEARCH SEMINAR IN OPERATIONS MANAGEMENT (BA)

26:711:688. INDEPENDENT STUDY IN OPERATIONS MANAGEMENT (BA)

26:711:799. DISSERTATION RESEARCH IN OPERATIONS MANAGEMENT (BA)

Statistics 960

26:960:575. (S) INTRODUCTION TO PROBABILITY (3)
Prerequisite: Basic statistical techniques.
Foundations of probability. Discrete and continuous simple and multivariate probability distributions; random walks; generating functions; linear functions of random variables; approximate means and variances; exact methods of finding moments; limit theorems; stochastic processes including immigration- emigration, simple queueing, renewal theory, Markov chains.

26:960:577. (F) INTRODUCTION TO STATISTICAL LINEAR MODELS (3)
Prerequisite: Applied 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 outliers, 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 SAS.

26:960:580. (F) STOCHASTIC PROCESSES (3)
Prerequisite: 26:960:575.
Review of probability theory with emphasis on conditional expectations; Markov chains; the Poisson process; continuous-time Markov chains; renewal theory; queueing theory; introduction to stochastic calculus, e.g., Ito's Lemma.

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: CIS 101. COMPUTER PROGRAMMING (FORTRAN) (N3)

NJIT: CIS 213. INTRODUCTION TO COMPUTER SCIENCE (PASCAL) (N3)

NJIT: CIS 505. PROGRAMMING, DATA STRUCTURES, AND ALGORITHMS DESIGN (PASCAL) (N5)

NJIT: CIS 610. DATA STRUCTURES AND ALGORITHMS (3)
Equivalent to 22:135:678.

NJIT: CIS 621,622. NUMERICAL ANALYSIS I, II (3,3)

NJIT: CIS 630. OPERATING SYSTEMS DESIGN (3)

NJIT: CIS 631. DATA MANAGEMENT SYSTEMS DESIGN (3)
Equivalent to 22:135:672.

NJIT: CIS 632. ADVANCED DATABASE SYSTEMS DESIGN (3)

NJIT: CIS 635. PROGRAMMING LANGUAGES (3)

NJIT: CIS 636. COMPILING SYSTEM DESIGN (3)

NJIT: CIS 640. RECURSIVE FUNCTION THEORY (3)

NJIT: CIS 641. FORMAL LANGUAGES (3)

NJIT: CIS 650. COMPUTER ARCHITECTURES (3)

NJIT: CIS 651. DATA COMMUNICATIONS (3)

NJIT: CIS 653. MICROCOMPUTERS AND APPLICATIONS (3)

NJIT: CIS 657. PRINCIPLES OF INTERACTIVE COMPUTER GRAPHICS (3)

NJIT: CIS 659. IMAGE PROCESSING AND ANALYSIS (3)

NJIT: CIS 661. SYSTEMS SIMULATION (3)
Equivalent to 22:135:680.

NJIT: CIS 662. MODEL ANALYSIS AND SIMULATION (3)

NJIT: CIS 665. ALGORITHMIC GRAPH THEORY (3)

NJIT: CIS 667. DESIGN TECHNIQUES FOR ALGORITHMS (3)

NJIT: CIS 668. PARALLEL ALGORITHMS (3)

NJIT: CIS 670. ARTIFICIAL INTELLIGENCE (3)

NJIT: CIS 671. KNOWLEDGE BASED SYSTEMS (3)

NJIT: CIS 673. SOFTWARE DESIGN AND PRODUCTION METHODOLOGY (3)
(Formerly CIS:753)

NJIT: CIS 675. INFORMATION SYSTEMS EVALUATION (3)

NJIT: CIS 677. INFORMATION SYSTEMS PRINCIPLES (3)
(Supersedes NJIT: CIS 739.)

NJIT: CIS 679. MANAGEMENT OF COMPUTER AND INFORMATION SYSTEMS (3)
Equivalent to 22:135:680.

NJIT: CIS 682. GEOMETRIC MODELING (3)

NJIT: CIS 700. MASTER'S PROJECT (3)

NJIT: CIS 701. MASTER'S THESIS (6)

NJIT: CIS 710. COMPUTER SCIENCE SEMINAR (NC)

NJIT: CIS 725. INDEPENDENT STUDY IN COMPUTER SCIENCE (3)

NJIT: CIS 731. APPLICATIONS OF DATA BASE SYSTEMS (3)
May be offered as 26:198:731.

NJIT: CIS 732. DESIGN OF INTERACTIVE SYSTEMS (3)

NJIT: CIS 735. COMPUTER MEDIATED COMMUNICATION SYSTEMS (3)

NJIT: CIS 754. MEASUREMENT AND EVALUATION OF SOFTWARE QUALITY AND PERFORMANCE (3)

NJIT: CIS 762. COMPUTERIZED INFORMATION SYSTEMS FOR PLANNING AND FORECASTING (3)

NJIT: CIS 767. COMPUTER-BASED DECISION SYSTEMS (3)

NJIT: CIS 775. SEMINAR IN SOFTWARE ENGINEERING (3)

NJIT: CIS 776. INDEPENDENT STUDY IN INFORMATION SYSTEMS (3)

NJIT: CIS 785,786. SELECTED TOPICS IN COMPUTER AND INFORMATION SCIENCE I, II (3,3)

NJIT: CIS 790. DOCTORAL DISSERTATION AND RESEARCH (6-12)

NJIT: CIS 791. DOCTORAL SEMINAR (NC)

NJIT: CIS 792. PRE-DOCTORAL RESEARCH (3)

NJIT: CIS 794. COMPUTER SCIENCE COLLOQUIUM (NC)

NJIT: EM 650. OPERATIONS RESEARCH (3)

NJIT: EM 693. MANAGERIAL ECONOMICS (3)

NJIT: EM 771. OPERATIONS COST AND MANAGEMENT CONTROL (3)

NJIT: OS 781. HUMAN RESOURCES MANAGEMENT (3)

MATHEMATICAL SCIENCES 645

Degree Program Offered: Doctor of Philosophy
Director of Graduate Program: Gregory Kriegsmann, Department of
  Mathematics and Computer Science, Smith Hall (973/353-5156)

Members of the Graduate Faculty: *

Professor

Jane P. Gilman, *FAS–N; Ph.D., Columbia*
  Kleinian groups and Teichmüller theory; hyperbolic geometry

Associate Professors:

Mark E. Feighn, *FAS–N; Ph.D., Columbia*
  Low dimensional topology; geometric group theory
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
Henry W. Levinson, *FAS–N; Ph.D., New York*
  Graph theory; knots and braids
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
John D. Randall, *FAS–N; Ph.D., Warwick*
  Four-manifolds; algebraic geometry
Robert Sczech, *FAS–N; Dr. rer. Nat., Bonn*
  Number theory
Jacob Sturm, *FAS–N; Ph.D., Princeton*
  Number theory

Assistant Professors:

Li Guo, *FAS–N; Ph.D., Washington (Seattle)*
  Number theory
Michah Sageev, *FAS–N; Ph.D., California (Berkeley)*
  Geometric group theory

Visiting Assistant Professor:

Jun Hu, *FAS–N; Ph.D., CUNY*
  Dynamical systems

Program

The Department of Mathematics and Computer Science at
Rutgers–Newark and the Department of Mathematics at the
New Jersey Institute of Technology offer jointly the Ph.D. program
in the Mathematical Sciences. A combined graduate faculty
provides research opportunities in many fields of specialization,
including representation theory, graph theory, number theory,
low-dimensional topology, Kleinian groups and Teichmüller
theory, geometric group theory, and 4-manifolds, as well as 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 and
to offer experience in applying this knowledge to problems in the
sciences and engineering. Students entering with a bachelor's
degree normally spend their first two years in course work and in
preparation for the Ph.D. qualifying examination, and then
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 in order to determine or confirm the
direction of their research interests.

The Ph.D. curriculum is divided into two options: pure mathe-
matics and applied mathematics. The applied mathematics program
is administered by the New Jersey Institute of Technology.
Students taking 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 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, each covering the basic topics in a
particular subdiscipline. Part A (real and complex analysis), Part B
(algebra), and Part C (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 on the world wide web 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 integral.

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, abso-
lute 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. Intro-
duction into ODE's and PDE's: 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.

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.

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* This listing does not include members who are NJIT faculty.
† Some courses are pending approval by the Graduate School–Newark
  Courses of Study Committee.

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 Analysis 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, 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, Eisenstein criterion.

26:645:632. ALGEBRA II (3)
Prerequisite: Algebra I.
Modules: left, right, and bi-modules, direct sums and products of modules, homomorphisms, exact sequences, free modules, vector spaces, Hom and duality of modules, tensor products, modules over a PID, 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, 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, ideles and adeles.

26:645:635. ALGEBRAIC GEOMETRY (3)
Prerequisites: Algebra II and Complex Analysis I.
Geometry of projectives spaces, cohomology of coherent sheaves, 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, 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, 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, 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, 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, topics of instructor's choice.

26:645:646. DYNAMICAL SYSTEMS (3)
Prerequisites: Real Analysis I and II, Topology I, Complex Analysis I.
Recommended: Complex Analysis II.
Introduction to the mathematical study of chaos and fractals from examples in one-dimensional real and complex dynamical systems.

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, applications to electronic banking and electronic cash.

26:645:721. ADVANCED TOPICS IN COMPLEX ANALYSIS (3)
Prerequisite: Permission of the instructor.

26:645:731. ADVANCED TOPICS IN ALGEBRA (3)
Prerequisite: Permission of the instructor.

26:645:734. ADVANCED TOPICS IN NUMBER THEORY (3)
Prerequisite: Permission of the instructor.

26:645:736. ADVANCED TOPICS IN REPRESENTATION THEORY (3)
Prerequisite: Permission of the instructor.

26:645:741. ADVANCED TOPICS IN TOPOLOGY (3)
Prerequisite: Permission of the instructor.

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.

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 six credits per term; registration for additional credits is permitted with the approval of the adviser up to a maximum of twelve 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. ASYMPOTOTIC METHODS II (3)

NURSING 705

Degree Programs Offered: Master of Science, Doctor of Philosophy
Acting Director of Graduate Program: Hurdis M.Griffith,
  Room 102, Ackerson Hall (973/353-5293)

Members of the Graduate Faculty

Professors:

Dorothy DeMaio, *C.N.; Ed.D., Rutgers*
  Credentialing in nursing/child health
Hurdis M. Griffith, *C.N.; Ph.D., Maryland*
  Putting prevention into practice
Elsie Gulick, *C.N.; Ph.D., New York*
  Instrument development
Patricia M. Hurley, *C.N.; Ph.D., New York*
  HIV/AIDS symptom management and delivery of care
Lucille Joel, *C.N.; Ed.D., Columbia*
  Health care delivery systems
Noreen Mahon, *C.N.; Ph.D., New York*
  Adolescent problems
Adela Yarcheski, *C.N.; Ph.D., New York*
  Issues in adolescent health

Associate Professors:

Jean Arnold, *C.N.; Ed.D., Columbia*
  Computer assisted instruction
Mary E. Greipp, *C.N.; Ed.D., Rutgers*
  Reflex sympathetic dystrophy syndrome
Elise Lev, *C.N.; Ed.D., Columbia*
  Strategies for managing cancer treatment
Elizabeth Norman, *C.N.; Ph.D., New York*
  Posttraumatic stress syndrome, wartime nursing
Nancy Redeker, *C.N.; Ph.D., New York*
  Correlates of cardiac surgery
Mary Ann Scoloveno, *C.N.; Ed.D., Rutgers*
  Adolescent drinking behavior
Beverly Whipple, *C.N.; Ph.D., Rutgers*
  Birth analgesia

Assistant Professors:

Geri Dickson, *C.N.; Ph.D., Wisconsin (Madison)*
  Women's health
Lucille Eller, *C.N.; Ph.D., Case Western Reserve*
  Alternative therapies for HIV infection
Ganga Mahat, *C.N.; Ed.D., Columbia*
  Nursing student education
Marlene Rankin, *C.N.; Ph.D., Texas Woman's*
  Scientific misconduct; smoking cessation in pregnant women
Susan Reinhard, *C.N.; Ph.D., Rutgers*
  Caregivers of the seriously mentally ill

Programs

Programs of study in nursing leading to a Master of Science and Doctor of Philosophy degree are offered through the Graduate School–Newark. The master's program builds upon the upper-division major of baccalaureate programs accredited by the National League for Nursing (NLN). The doctoral program builds upon the master's degree with a major in nursing from an NLN-accredited program.

Master of Science

Purpose

The objectives for the graduate program in nursing provide the Rutgers' master's graduate with an opportunity to: synthesize theories and knowledge from nursing, the humanities, and related sciences which support advanced nursing practice in a specialized area of practice; integrate advanced nursing knowledge as the basis for advanced nursing practice; integrate, within a specialty, the roles of practitioner, educator, researcher, and administrator with clients, health care providers, and health care policymakers; design

and manage nursing interventions, programs, resources, and systems for the delivery of nursing care to client systems using advanced knowledge and skills; design educational strategies for client systems and health care providers using educational concepts, principles, and skills; provide leadership in developing and maintaining standards of nursing practice using ethical principles and legal concepts; evaluate nursing interventions, programs, personnel, policies, and technology using theoretical models and methods; conceptualize a nursing research problem and design research using scientific principles and methods, and appraise the relevance of research findings; design and utilize nursing technology to plan, manage, evaluate, and research clinical nursing problems; and acquire a foundation for doctoral study.

Organizing Framework

The master's curriculum is designed to prepare clinical nurse specialists and nurse practitioners who are able to function in continuously changing environments or systems in which health care is delivered. The curriculum reflects the philosophy espoused by the faculty regarding the metaparadigm concepts of nursing. The organization of the curriculum consists of three components: generic courses in nursing, cognate courses, and the clinical specialty in nursing.

The first component of the curriculum consists of generic courses in nursing, the content of which systematically builds upon knowledge and skills gained at the baccalaureate level. Ethics and advanced theories and research relative to the health of individuals, families, groups, communities, and theories and research pertaining to management, education, role, and health-care policy are discussed. The essential processes involved in concept analysis and theory development, especially using nursing conceptual models, are addressed. The emphasis in research is on the identification of a research problem, advanced methods and designs used for hypothesis testing, and the organization and management of qualitative and quantitative data.

The second component of the curriculum consists of cognate (elective) courses in related disciplines. Cognate courses are selectively chosen to further students' knowledge in such areas as administration, education, or clinical practice.

The third component of the curriculum concentrates on the preparation of clinical nurse specialists and nurse practitioners in the areas of adult and aged primary care, adult and aged acute care, advanced practice in pediatrics, advanced practice with childbearing families, community health nursing, family nurse practitioner, and psychiatric/mental health nursing. The theory and practicum courses across all areas focus on levels of health, specifically health promotion, acute health problems, and chronic health problems. Patterns identified in human environment interaction at all levels of health provide the substantive bases relative to theories, research, and practice addressed in the specialty courses.

Broadly conceived, patterns are attributes, characteristics, properties, and behaviors of individuals, families, groups, or communities having recurring manifestations that are directly or indirectly observable. As entities, patterns are relatively stable, fairly predictable, and can be related to one another in meaningful ways. Patterns can be identified in the literature as concepts that meet the aforementioned criteria and that represent the metaparadigm concepts of nursing. Of particular interest to nursing are indices of health and illness that are associated with or result from patterns.

Advanced specialized knowledge in each clinical nursing area is derived from the scientific literature, and emphasis is placed on examining and critiquing theories and research from the literature in nursing focusing on patterns. Advanced specialized practice characterizes the role of the nurse practitioner who uses knowledge gained from the three components of the curriculum in the care of select populations in a variety of settings. The roles of the clinical nurse specialist and nurse practitioner are multifaceted and include that of expert practitioner, educator, researcher, and administrator. The master's curriculum in nursing prepares clinical nurse specialists and nurse practitioners who are leaders in their field and who possess knowledge foundational to doctoral education in nursing.

Curriculum

The curriculum pattern for the graduate nursing program is based on the fact that professional nursing is mandated by and accountable to society for the effect of nursing practice. As the needs of society change in response to new knowledge and technology, nursing evolves through a process of resocialization. Professional nursing roles develop that are collaborative and complementary to roles of other health professionals; these reflect increasing authority and responsibility for decision making in areas of research and practice. Leadership in the planning and development of health resources as a part of the multidisciplinary team is a necessary response.

The master's program offers specialized study. Students advance from the baccalaureate-prepared generalist to the advanced practitioner capable of assuming roles that encompass consultation, management, and educational functions. The graduate program is designed to prepare nurses to deal with larger and more complex situations in the process of providing health care services in the areas of adult and aged primary care, adult and aged acute care, advanced practice in pediatrics, advanced practice with childbearing families, community health nursing, family nurse practitioner, and psychiatric/mental health nursing.

Degree Requirements

Degree requirements for the master's program include the completion of 42 credits in all tracks except for the family nurse practitioner track, which requires completion of 45 credits, and successful passage of a final comprehensive examination. Additional requirements are determined by the catalog under which the student is admitted or readmitted.

Elective courses are available in other major academic units of the university; students are encouraged to enroll in these courses. 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 in the Graduate School–Newark.

The master's program in nursing may be completed in either full- or part-time study. Full-time students are admitted only in the fall term. Some courses are offered in sequence and are not offered every term.

The candidate for the master's degree must pass a departmental comprehensive examination in the last term of study. This examination is designed to measure the student's broad comprehension of the master's program curriculum content. A candidate may take the Master's Comprehensive Examination only twice. If the examination is failed twice, the candidate is not granted the master's degree.

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 program accredited by the National League for Nursing.
2. An undergraduate cumulative grade-point average of 3.0 (where $A = 4.0$).
3. 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. Prerequisite to full matriculation, the following courses must be successfully completed: a descriptive/inferential statistics course; a physical assessment course* or equivalent.

* Accepted physical assessment courses are offered through the Rutgers' College of Nursing Continuing Education Program.

Admission for Foreign Applicants

Foreign applicants must meet all of the following criteria to qualify for full graduate status:

1. Completion of a college or university program equal to the unit requirements for a baccalaureate degree in nursing.
2. An undergraduate grade-point average comparable to that of 3.0 or above on a 4.0 point scale (where *A* = 4.0).
3. Registered professional nurse licensure in the country of origin and registered professional nurse licensure in the state of New Jersey.
4. A satisfactory combined score on the verbal, quantitative, and analytical portions of the Graduate Record Examination taken within the last five years.
5. Completion of Test of English as a Foreign Language (TOEFL) with a minimum score of 600 for students whose first language is not English. The Test of Written English, part of TOEFL, is required.
6. 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 has been accepted. Details about taking the test are sent to the student with the letter of acceptance to the program by the Admissions Office. Based upon the student's performance on this placement test, the PALS program makes recommendations that are to be followed by the graduate program in nursing.
7. Three satisfactory academic and professional letters of reference.
8. Satisfactory completion of the prerequisite courses: a descriptive/inferential statistics course and physical assessment.
9. Applicants in F-1 or J-1 student status must document sufficient funds to cover both educational and living expenses.

Applicants are encouraged to write to the College of Nursing Office of Student Life and Services 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 life and services, after consultation with the graduate program director, assigns a member of the graduate faculty to serve as the student's academic adviser. Students are notified of their advisers' names during new student orientation.

An adviser will be changed if a faculty member leaves the College of Nursing or if the adviser and/or student thinks that a change would be beneficial, or if the faculty member's work load 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 Life and Services, and/or the graduate program director. The associate dean for student life and services, 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 normal load is 15 credits. 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, with the approval of the graduate program director, register for matriculation continued. There is no tuition for this registration, although a student fee is charged.
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 only applied toward the degree if the courses are required at the time of admission and were taken within the five-year time frame for earning the degree.
5. Graduate course work totaling 6 credits taken at other fully accredited institutions prior to enrollment in this program may be considered for replacing required courses within the student's program. The courses must have been taken within the five-year time limit for the degree and meet the stipulations outlined in this catalog. To petition for approval of substitute courses, complete Form T-1, obtained from the Office of Student Life and Services.

An additional 6 credits may be considered for transfer as elective credits. To petition for transfer of elective credits, obtain Form T-2 from the Office of Student Life and Services and complete as directed. Transfer of credits does not occur until a minimum of 12 credits has been completed 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 at the discretion of the instructor. Since the nursing curriculum builds upon and expands the content of previous course offerings, the grade of *IN* must be converted to a letter grade by the end of the drop/add period in the next term if the student is registered in a course for which the incomplete course is prerequisite.

A 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 Life and Services.
9. All requirements for the master's degree must be completed within a period of five consecutive years from the date of matriculation. Should extenuating circumstances necessitate prolonging the time limits, the student's record is reviewed and 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. For such an extension, a written request is made to the academic adviser, who recommends and presents his or her recommendation to the graduate program director. The director reviews the student's record and forwards the appropriate document to the dean of the Graduate School– Newark, indicating approval or disapproval. 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 student's academic record. Preceptors serve as role models and guide the clinical experience. The professor maintains contact with the preceptor, provides overall supervision, and awards the final grade.

Professional Liability Protection

All graduate students are required to have professional liability insurance prior to beginning clinical work.

Grade Complaints

Any complaints by students about their grades should be handled within the structure of the graduate program. The purpose of the following protocol is to ensure due process for all parties. It allows the student to determine if an error has been made in assigning the grade, and, alternatively, it provides the instructor with an opportunity to explain why the grade was given.

Complaints concerning the grading practices of individual instructors are handled in the following manner:

1. The student should confer with the instructor who recorded the grade in question. Such a conference must take place within ten school days of grade notification.

2. If resolution does not occur, a written complaint must be filed by the student within ten days with the graduate program director or a designee for review and mediation.
3. The graduate program director or designee, within ten school days after notification of the dispute, shall consult with all parties and propose a resolution.
4. In the event that a resolution does not occur at the level of the graduate program director, the matter shall be referred to the Student Life Committee by the student.
5. The student must forward the previously written complaint and previously submitted scholastic materials to the chairperson of the Student Life Committee.
6. A subcommittee of members of the Student Life Committee who hold graduate faculty status will be formed to review the submitted materials.
7. This committee shall render a decision within fifteen school days. In arriving at a decision, the committee may consult with whomever it chooses and may, in extraordinary cases, ask third parties from among the faculty to review the grade in question.
8. The program faculty's decision may be appealed to the dean of the Graduate School–Newark. Such an appeal must be in writing, state the grounds for the appeal, and be filed within ten school days of receipt of the program faculty's decision.
9. 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 documentation of immunizations that are required by state law. Required immunization forms are included with the student's letter of admission. Students who do not submit documentation of immunizations prior to enrollment or during the first term of enrollment are not permitted to register for the following term. Requests for medical or religious exemptions must be made in writing.

Documentation of additional health requirements set by the College of Nursing policy includes:

1. Complete physical examination and laboratory tests.
2. A health history.
3. Tuberculin screening yearly (a negative chest X ray is required for a positive test).
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 for these requirements are sent by the College of Nursing but must be returned to Rutgers Student Health Services at Hurtado Health Center, Rutgers, The State University of New Jersey, 11 Bishop Place, New Brunswick, NJ 08901-1180, within one month of admission to the program.

Graduate Nurse Alliance

The Graduate Nurse Alliance (GNA) was formalized in 1984 and is open to all enrolled master's students. Students are expected to participate. The stated purposes of the GNA are to provide a medium of exchange between faculty and graduate students; to ensure graduate student representation on designated faculty committees; to advocate student participation in curriculum planning, implementation, and evaluation; and to act as a liaison with the Graduate School–Newark student government.

Nondegree Students

Nondegree status is designed for students who wish to pursue courses without enrolling in the degree program. The following procedures and policies apply for nondegree students:

1. Applications and catalogs for nondegree graduate nursing courses may be obtained from the Graduate School–Newark office, the admissions office, or the Office of Student Life and Services at the College of Nursing.
2. All students must be advised before registering for courses. The College of Nursing associate dean for student life and services is the adviser for all nondegree students.

3. No more than 9 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. The courses must normally form a part of the student's program of study.

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 change agent and evaluation of the effectiveness of nursing.

26:705:510. THEORY DEVELOPMENT (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 their relationship 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. Identification and conceptualization of a research problem relevant to nursing and the formulation of 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.

26:705:520. ADVANCED HEALTH ASSESSMENT (3)
Pre- or corequisite: 26:120:547.
Assessment competencies necessary for advanced practice nurses with emphasis on assessment skills and the client as an individual in 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 the 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.

26:705:570. INFORMATION SYSTEMS MANAGEMENT (3)
Pre- or corequisite: 26:705:512.
Management of quantitative data. Emphasis on application theory. Focus on assumptions underlying research designs, skill in statistical operations, and integration of results. Introduction to SPSSX computer package; basic concepts for creating and editing computer files (VAX).

Science Course

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

Adult and Aged Nursing: Primary or Acute Care

26:705:522. ADULTS AND 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.

Primary Care

26:705:523. ADULT AND AGED PRIMARY-CARE PRACTICUM 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 is examined.

26:705:532. PRIMARY CARE OF ADULTS AND THE AGED (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 AGED II (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 of acute illness in primary-care settings.

Acute Care

26:705:628. ADULTS AND AGED ACUTE-CARE PRACTICUM I (3)
Corequisite: 26:705:522.
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. ACUTE CARE OF ADULTS AND AGED (3)
Prerequisites: 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. ADULTS AND AGED ACUTE-CARE PRACTICUM II (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 a focus of acute care and advanced nursing practice roles.

Community Health Nursing

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 of health promotion and prevention in populations, groups, and individual/family 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; 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.

26:705:534. 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 with Childbearing Families

26:705:526. FAMILY NURSING 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 is individual's and family's expressions of primary health during childbearing and childrearing.

26:705:527. FAMILY 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 childbearing and childrearing families.

26:705:528. ADVANCED PRACTICE WITH HIGH-RISK CHILDBEARING FAMILIES (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 WITH HIGH-RISK CHILDBEARING FAMILIES (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

26:705:536. ADVANCED PRACTICE IN PEDIATRIC NURSING: THEORY (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 (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.

26:705:540. DIMENSIONS OF PRIMARY CARE (3)
   Prerequisite: Completion of specialty theory and practicum I courses.
Builds on graduate generic and specialty knowledge to promote cost-effective, quality primary health care where advanced practice nurses are the initial contact for the client within the health care system, promoting client wellness, diagnosing and treating common health deviations, maintaining stabilized chronic health problems, and referring patients to other providers.

Family Nurse Practitioner

26:705:526. FAMILY NURSING 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 is individual's and family's expressions of primary health during childbearing and childrearing.

26:705:527. FAMILY 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 childbearing and childrearing families.

26:705:530. PRIMARY CARE MANAGEMENT OF FAMILIES WITH EPISODIC HEALTH NEEDS (3)
   Prerequisites: 26:705:526, 527, 538, 540; 26:120:547.
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. FAMILY 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 mid-life family and to patterns related to health needs.

26:705:543. PRIMARY CARE MANAGEMENT OF FAMILIES WITH CHRONIC HEALTH PROBLEMS (3)
   Prerequisites: 26:705:530, 531.
Focus on patterns of response to chronic health problems across the life span and the contracting family. Principles of ongoing family and health assessment and delivery of primary care to children, adults, and families with chronic health problems are emphasized.

26:705:544. FAMILIES WITH CHRONIC HEALTH PROBLEMS PRACTICUM (3)
   Corequisite: 26:705:543.
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 are examined.

Psychiatric/Mental Health Nursing

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 are 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.

Electives

Electives may be taken within the College of Nursing. Courses are also 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.

26:705:566. CURRICULUM AND TEACHING IN NURSING (3)
   Prerequisite: 26:705:506.
Provides a basic structure to enable teachers to abstract theoretical constructs. Critique of various philosophies of nursing and education and articulation of individual philosophy. Survey of curriculum designs through the evaluation process.

26:705:568. NURSING ADMINISTRATION (3)
   Prerequisite: 26:705:506.
Exploration of a conceptual model of an organization in which professional nurses function. The model fosters analytical thinking, is applicable to any organization, and facilitates integration of knowledge from many disciplines.

26:705:620. THEORIES OF AGING (3)
Explores bio-psycho-social theories postulated to enhance understanding of the aged.

26:705:638. ANALYSIS AND DEVELOPMENT OF COMPUTER PROGRAMS IN NURSING (3)
Focus on the 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 continuing creation, clarification, and refinement of nursing knowledge. The purpose of the program is to prepare nurse scientists who will advance the discipline of nursing through research and theory development. Graduates will be expected to provide leadership for the advancement of the discipline in the scientific community and in academic and service institutions.

   The objectives for the doctoral program in nursing provide the graduate with an opportunity to:

1. Evaluate the theoretical, philosophical, and historical underpinnings of nursing knowledge.
2. Evaluate the multiple dimensions of contemporary nursing research and analyze their relationships.
3. Use scientific methods to identify, name, and classify phenomena relevant to nursing for the generation and testing of theory.

4. Design and conduct original research that is consistent with the theoretical development of a particular investigation.
5. Provide leadership in the creation and dissemination of new knowledge that makes the discipline of nursing more explicit.

The Ph.D. curriculum requires 59 credits, 20 of which are in nursing. The nursing courses include 12 credits in theory development and research, 6 credits in dissertation proposal seminars and 2 credits in contemporary issues in nursing. Three additional credits may be taken in a special topics course in nursing related to the student's area of investigation.

In addition, 18–21 credits are required in the following areas: research methodology, statistics, and cognate courses. Eighteen credits are for dissertation research.

The doctoral program in nursing requires completion of 59 hours of study; a qualifying examination for admission to candidacy given after students have completed 26:705:678 Theory Development and Research in Nursing II and the major portion of the course requirements; dissertation proposal; and a dissertation and oral defense of original research on a significant aspect of nursing. Both Dissertation Seminar I (26:705:701) and Dissertation Seminar II (26:705:702) are offered routinely in the spring term of the academic year. If a student completes Dissertation Seminar I in the spring with a *Pass,* and then progresses to the dissertation proposal review the following fall, he or she does not have to take Dissertation Seminar II the *following* spring. However, he or she must register for 3 credits of dissertation research instead of Dissertation Seminar II. In the early stages of dissertation work, students should take no more than 6 credits of dissertation research per term. Importantly, each student should work with his or her chairperson to map out the number of credits taken per term for dissertation research. The faculty believes that dissertation research should either generate theory using qualitative research methods or test theory using quantitative research methods and that at the Ph.D. level, theory development is an integral component of the research process.

Students entering the doctoral study program are expected to have passed a master's level course in nursing theory and nursing research prior to enrolling in the courses in the nursing sequence. In addition, students must show evidence of having successfully completed a basic statistics course.

A course in information systems management must be completed prior to admission or as an initial course. This course may be waived by achieving a passing grade on an equivalency test offered by the College of Nursing. The credits for this course do not count toward the Ph.D. credit requirements.

Time Limit. Requirements for the Ph.D. degree must be completed within eight years.

Admission

Requirements for admission to the Ph.D. program are as follows:

1. Baccalaureate degree in nursing from a program accredited by the National League for Nursing.
2. Master's degree with a major in nursing from a program accredited by the National League for Nursing.
3. 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. Personal interview (a telephone interview, when appropriate may be arranged).
6. Submission of the following materials:
   a. Current Registered Nurse licensure.
   b. 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; two from nurse academicians, which speak to the applicant's ability to succeed in the doctoral program.
   f. Two official transcripts of all previous college work.
   g. Completed application form in duplicate.

Doctoral Study Courses

26:705:675. Evolution of Nursing Knowledge (3)
The 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.

26:705:680. Special Topics (3)
Topics include substantive knowledge in the areas of faculty research. Topics change each term.

26:705:701. Dissertation Seminar I (3)
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. Demonstration of significance of research problems to the discipline.

26:705:702. Dissertation Seminar II (3)
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.

26:705:703. Dissertation Research (BA)
Corequisite: 26:705:701.
Research under supervision of faculty member.

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), e-mail: 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
Ronald Gautreau, *NJIT; Ph.D., Stevens Institute of Technology*
   Relativity and relativistic cosmology
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 spectroscopy 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 physics
Earl D. Shaw, *FAS–N; Ph.D., California (Berkeley)*
   Free electron laser research

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., The Weizmann Institute of Science (Israel)*
   Optoelectronics
Yuan Li, *FAS-N; Ph.D., Indiana*
   Theoretical and computational physics
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
H. Wang, *NJIT; Ph.D., California Polytechnic Institute*
   Solar physics
Zhen Wu, *FAS-N; Ph.D., Columbia*
   Atomic and molecular physics; laser spectroscopy and surface science

Assistant Professors:

Hubert Burke, *FAS–N; Ph.D., Columbia*
   Free-electron laser development and spectroscopy
Trevor Tyson, *NJIT; Ph.D., Stanford*
   Theoretical and experimental X-ray absorption spectroscopy

Programs and Facilities

Students in the program in applied physics have access to many
resources, including far-infrared free electron laser, laser spectros-
copy laboratory, surface science laboratory, biosensor laboratory,
Microelectronics Research Center with class 10 clean room facility

for CMOS technology and micromachining research, 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 opto-
electronic phenomena, ultra-thin film and microelectromechanical
systems (MEMS), Electronic Imaging Center, rapid thermal anneal-
ing, infrared optoelectronic device laboratory, and various materials
and device characterization facilities.

Interdisciplinary applied physics research is carried out in col-
laboration with electrical engineering, chemistry, biological sciences,
and geological sciences faculty as well as with the University of
Medicine and Dentistry of New Jersey (UMDNJ). There is also
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. Course work comprises
24 credits, of which 18 credits are in physics courses (including
mathematical physics or applied mathematics), and 6 credits are
in electives. Four graduate physics courses, 26:755:611 Classical
Mechanics, 26:755:621 Classical Electrodynamics I, 26:755:631
Quantum Mechanics I, and 26:755:641 Statistical Mechanics, are
mandatory. Thesis research for 6 credits completes the 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. Course work comprises 39 credits and 36 credits
are in dissertation research. Course work includes 24 credits in
physics courses (including mathematical physics or applied
mathematics), and the remaining 15 credits are in electives. Among
the 24 credits of physics courses, 26:755:611 Classical Mechanics,
26:755:621 Classical Electrodynamics I, 26:755:631 Quantum
Mechanics I, and 26:755:641 Statistical Mechanics, 26:755:721
Classical Electrodynamics II, and 26:755:731 Quantum Mechanics II
are mandatory. No less than 12 credits must be at or above the
700 level. A cumulative grade-point average of 3.0 is required in
course work. Course work may include graduate courses in electrical
engineering, bioscience, chemistry, or other areas, depending on 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 (includ-
ing mathematical physics or applied mathematics), and the remaining
9 credits are in electives. No less than 12 credits must be at or above
the 700 level. A cumulative grade-point average of 3.0 is required
in course work. Course work may include graduate courses in elec-
trical engineering, bioscience, chemistry, or other areas, depending
on the student's field of research.

Qualifying examinations, both written and oral, are required for
the Ph.D. Qualifying examinations are given in August/September
of each academic year. Examinations must be taken by the end of
the first year. A second attempt at passing may be made if a student
fails the qualifying examinations on the first attempt. 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.
Chemistry and other related areas will be accepted.

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* Distinguished Professor of New Jersey Institute of Technology

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.

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 (3)
Spring term. Prerequisite: 26:755:611.
Limits to classical physics; wave mechanics and the Schrodinger 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 687 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.
An extensive paper involving experimental or theoretical investigation of a topic in microelectronics or other applied physics area is required. Cooperative projects with industry or government agencies may be acceptable. The project is 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. Prerequisite: 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 electron-phonon 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., New York*
   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
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 Professor:

Elizabeth Hull, *FAS–N; Ph.D., New School for Social Research*
   Constitutional politics; American government

Assistant Professors:

Rey Koslowski, *FAS–N; Ph.D., Pennsylvania*
   International relations; theories of global politics; international organization;
   regional integration; European politics
Rosemary Nossiff, *FAS–N; Ph.D., Cornell*
   American government; public policy; women and politics
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 began in the fall
of 1972. This program focuses on the study of public policy and
works closely with the M.P.A. program, 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,
and the Center for Global Change and Governance.

Areas of major specialization are the American political system
and international relations. Courses are also available in comparative
political systems and political theory and methodology. Require-
ments for the M.A. degree include the completion of 30 credits,
including two core courses—26:790:510 Policy Analysis and
26:790:533 Research Methods in Political Science, and a compre-
hensive examination in one area. A thesis option is also available.

The School of Law–Newark and the Graduate School–Newark
offer a concurrent Juris Doctor/Master of Arts degree in political
science. The master's degree in political science requires a minimum
of 30 credits and a comprehensive examination. Up to 12 credits for
the M.A. degree may be satisfied by approved courses in the law
school. In addition, with the approval of the law school, a law
student may take up to 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. POLICY MAKING IN THE AMERICAN POLITICAL
   SYSTEM (3)**
Survey of political and governmental institutions and policy-
making 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 policy making in different political
systems. Includes case studies.

26:790:505,506. CONTEMPORARY CONSTITUTIONAL ISSUES (3,3)
An 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.
Focuses on approaches to the analysis of the policy-making
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 issues
of 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
policy-making 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 environ-
mental issues in both global and domestic contexts.

26:790:533. RESEARCH METHODS IN POLITICAL SCIENCE (3)
   Core course.
A 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. RECENT INTERNATIONAL RELATIONS: GLOBAL GOVERNANCE (3)
The 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. RECENT INTERNATIONAL RELATIONS: 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 country-wide 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.

26:790:543,544. PROBLEMS OF COMPARATIVE POLITICS (3,3)
Selected political, social, and economic problems comparing the U.S. and relevant developed and less developed countries. Analytical approaches that focus on the interactions between economic and political systems.

26:790:546. HUMAN RESOURCES POLICY (3)
An 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 policy-making 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)
The basic legal concepts affecting the administrative process; a historical overview; examination of discretionary powers, rule-making, and legislative delegation of powers.

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.

26:790:701,702. RESEARCH IN POLITICAL SCIENCE (3,3)
M.A. thesis research.

PSYCHOLOGY 830

Degree Programs Offered: Master of Arts, Doctor of Philosophy
Director of Graduate Programs: Professor Colin Beer,
　Room 4-103, Smith Hall (973/353-5440, ext. 5854)

Members of the Graduate Faculty

Professors:

Colin Beer, *FAS–N; D.Phil., Oxford*
　Ethology, history, and philosophical aspects of ethology; comparative psychology
John Ceraso, *FAS–N; Ph.D., New School for Social Research*
　Organization and memory; learning, forgetting, reasoning
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
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

Associate Professors:

Stephen J. Hanson, *FAS–N; Ph.D., Arizona State*
　Cognitive sciences; connectionist models; concepts and categorization
Maggie Shiffrar, *FAS–N; Ph.D., Stanford*
　Perception
Harold Siegel, *FAS–N; Ph.D., Rutgers*
　Development of maternal responsiveness

Professors Emeriti:

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

Under the jurisdiction of the Graduate School–Newark, the graduate program in psychology offers comprehensive courses of study leading to the Master of Arts and the Doctor of Philosophy degrees. Concentrations are available in both cognitive science and systems neuroscience (emotion and adaptive systems), each of which includes training in the classical problems of learning and memory, perception, neuroethology, and hormones and behavior. There is a strong emphasis on research from the very beginning of graduate study.

　The graduate program in psychology administers the comprehensive examination every September during the first week of classes. For the examination, students are required to pass a written

examination in two areas out of their specialty. In addition, in their specialty, students are required to submit a grant proposal, a course outline, and a literature review.

The dissertation committee is formed after the student has passed the comprehensive examination but before conducting final dissertation research. At the same time the student must secure approval from the dissertation committee of a dissertation proposal, the nature of which is at the discretion of the committee. 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 by agreement of the committee chair and the program director.

When the dissertation is complete an oral defense is to be scheduled, the date of which is to be worked out by the student and the chairperson, in consultation with the other committee members. The date must be approved by the program director at least four weeks before the defense, to which all members of the graduate faculty are invited. Every attempt is made by the members of the dissertation committee to reach a unanimous decision, but in case this cannot be achieved, the student can pass with the approval of three of the four members.

Graduate Courses

26:830:507. PARENTAL BEHAVIOR IN MAMMALS (3)
Rosenblatt
The evolution of parental behavior and the reproductive mechanisms underlying it among the mammals. Analysis of the physiological and behavioral bases for the establishment of parental behavior, its maintenance, and parent-young interaction.

26:830:522. (F) COMPUTER APPLICATIONS IN PSYCHOLOGY (3)
Knowledge of computers and higher mathematics not required.
Computerized data handling and analysis in the sciences with emphasis determined by the class. Focus on available computer facilities and development of programming skill.

26:830:525. (F) DEVELOPMENTAL SURVEY I (3)
Prerequisite: Permission of instructor.
Comprehensive review of theory and empirical work in infancy and early development. Stresses an integration of clinical, psychoanalytic, cognitive, and linguistic theories.

26:830:526. (S) DEVELOPMENTAL SURVEY II (3)
Prerequisite: Undergraduate course in psychology or equivalent.
Comprehensive review of theory, data, and methods in developmental psychology. Covers development from school age through adolescence.

26:830:560. INTRODUCTION TO NEUROENDOCRINOLOGY (3)
H. 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 the 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
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
An advanced seminar on selected topics in human visual perception.

26:830:578. (S) SEMINAR: HUMAN MEMORY AND LEARNING (3)
Ceraso
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
A 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)
Hansen. Prerequisite: Undergraduate statistics or design course.
A seminar which 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 viscero-somatic integration.

26:830:613. CONFLICT AND RESOLUTION (3)
Kressel
Focuses 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)
An individual research apprenticeship in psychology with a member of the faculty.

26:830:663. EVOLUTION OF SOCIAL BEHAVIOR (3)
Chaiken
A 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.

26:830:674. (S) SEMINAR: SELECTED TOPICS IN HUMAN LEARNING (3)
Ceraso
An 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. PROSEMINAR: NEUROENDOCRINOLOGY AND BEHAVIOR (3)
Komisaruk, H. 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 of Department: Professor Marcia L. Whicker, Room 703, Hill Hall (973/353-5093, ext. 13)
Director of M.P.A. Program: Professor Jerry P. Schofer, Room 730, Hill Hall (973/353-5093, ext. 25)
Director of Executive M.P.A. Program: Professor Maria Canino, Room 706, Hill Hall (973/353-5093, ext. 16)
Director of Ph.D. Program: Professor Marc Holzer, Room 724, Hill Hall (973/353-1351, 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
Marc Holzer, *FAS–N; Ph.D., Michigan*
  Public sector productivity; ethics
Robert Klein, *FAS–N; M.A., Columbia*
  Local government budgeting and urban politics
Marcia L. Whicker, *FAS–N; Ph.D., Kentucky*
  Analytical methods; public finance; leadership

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
Dorothy Olshfski, *FAS–N; Ph.D., Temple*
  Management theory and assessment practice
Jerry P. Schofer, *FAS–N; Ph.D., Pennsylvania State*
  Quantitative methods; urban geography and planning
Evan Stark, *FAS–N; Ph.D., SUNY (Binghamton)*
  Human resources; organizational development

Assistant Professors:

Lynn Burbridge, *FAS–N; Ph.D., Stanford*
  Political economy; policy and program assessment
Michel Gelobter, *FAS–N; Ph.D., California (Los Angeles, Berkeley)*
  Environmental policy and justice; regulatory and urban policy; methodology

Extension Specialist:

George McDonough, *FAS–N; M.P.A., Rutgers*
  Information systems and technology management

Adjunct Members of the Graduate Faculty:

Robert Goertz, *FAS–N; Ph.D., CUNY*
  State/local finance; government; budgeting
Alma Joseph, *FAS–N; Ed.D., Rutgers*
  Human resources administration; leadership; analytical methods
Donald Lemma, *FAS–N; M.P.A., Rutgers*
  Information systems and technology management
Arthur Maurice, *FAS–N; M.P.A., Arizona State*
  Public policy; budgeting and public/private partnerships
Alan Zalkind *FAS–N; M.P.A., New York*
  Human resources administration and management

Programs

Master of Public Administration

The department offers the M.P.A. degree program 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).

Public administration is an interdisciplinary and interinstitutional program of professional training for those working in or preparing for careers in the public and nonprofit sectors. Courses offered by the Department of Public Administration of the Graduate School–Newark are supplemented by 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 courses are available from the New Jersey Institute of Technology and the University of Medicine and Dentistry of New Jersey.

The objectives of the program are to provide the student with basic professional competencies in the context of a broad understanding of the field—the complexities of urban and suburban problems, the operation of public and nonprofit organizations, the responsibilities of management, and the expectations and rights of their clients. The competencies of the professional in this field include the ability to define public problems, to analyze quantitative and qualitative data, to develop and communicate creative solutions, and to implement ethical and practical courses of action.

To achieve these goals, candidates for the M.P.A. degree must complete a core curriculum of 30 credits, plus 12 credits of electives for a total curriculum of 42 credits. The degree requirements include a capstone course with a project in policy and program assessment. 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, under the guidance and supervision of a faculty member and a supervisor at the agency. Care is taken to ensure that the internship is relevant both to the specific educational needs of the student and to the actual operating needs of the agency.

Most of the students entering this program are already working in the public sector. Attending part time, students can finish the degree program in about three years. Credit may be granted for past or present public service at the professional level. In addition, previously earned graduate credit, received as part of a formal graduate degree program at an accredited institution, may be transferred, when directly equivalent to degree requirements in the M.P.A. program. There is a 12-credit limit on the total amount of advanced standing that might be awarded from the combination of both transfer credits and professional experience; although no more than 12 credits may be awarded for either transfer credits or professional experience alone.

The department operates fully equipped microcomputer facilities at both locations of the program.

Core Curriculum for the M.P.A. M.P.A. students must complete each of ten 3-credit core courses (30 credits) from three clusters. Whenever possible, courses from cluster one should be taken before those in cluster two. Courses in cluster three are taken toward the end of the master's coursework.

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
26:834:522 Public Organizations (3)
26:834:523 Human Resources Administration (3)
26:834:542 Government Budgeting Systems (3)
26:834:562 Policy and Program Assessment (3)

Core Curriculum Cluster Three
26:790:512 Ethical Issues in Public Policy and Administration (3)
26:834:563 Project in Policy and Program Assessment (3)

Electives for the M.P.A. After core curriculum cluster one is completed, electives may be sequenced throughout a student's program. Four 3-credit courses (12 credits) are required to complete the 42-credit curriculum. Students may select electives from the following courses. With the approval of their advisers, students may also 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)
26:834:506 Urban Geography (3)
26:834:507 Leadership (3)
26:834:703 Internship in Public Administration (3)
26:834:704 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)
26:834:527 Cases in Public and Nonprofit Productivity (3)
26:834:528 Information Systems and Public Administration (3)

Electives in Economics, Budgeting, and Finance
26:834:543 Public Financial Management (3)
26:834:544 Municipal Financial Administration (3)
26:834:545 Capital Budgeting (3)
26:834:546 Infrastructure Finance (3)
26:834:547 Government Revenue Systems (3)

Electives in Analytic Techniques
26:834:564 Analytic Methods II (3)

Electives in Health Care and Environmental Health
26:834:581 Introduction to Health-Care Systems (3)
26:834:582 Health-Care Management (3)
26:834:583 Epidemiology (3)
26:834:584 Health-Care Finance (3)
26:834:585 Health-Care Policy (3)
26:834:586 Violence in the U.S. (3)

Doctor of Philosophy

The doctor of philosophy program in public administration seeks to train prospective faculty, researchers, and public sector leaders. Applicants must have received an M.P.A. degree or other relevant master's degree prior to enrollment. In addition to public administration, applicants are considered from a range of advanced degree areas, such as political science, social work, education, law, or public health. Areas of possible concentration include productive public management; environmental policy and management; and comparative public administration and global governance. Specialized courses are also 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, Tuesday, and Thursday afternoons. However, electives and courses offered through the Department of Economics typically meet in the early evening. 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 on an open basis thereafter. 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 prior to consideration of their application.

Approximately twelve to fifteen students are accepted each year, and all are required to complete a residency, i.e, carry a full-time course load during at least two consecutive terms of their four terms prior to sitting for the examinations. Although the residency requirement is normally fulfilled during the first two terms, some students opt to complete it between years one and two (spring-fall) or during year two.

The academic requirements for the doctorate include at least 48 credits of course work beyond the master's degree 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.

Doctoral Core Curriculum in Public Administration

Theoretical Foundations (9 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)

Performance Applications (9 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)

Research Methodology
- 26:220:506   Statistical Analysis (3) *
- 26:220:507   Econometrics I (3)
- 26:834:607   Doctoral Research Methods I (3)
- 26:834:608   Doctoral Research Methods II (3)
- 26:834:609   Qualitative Methods in Public Administration (3)

Area of Specialization (15 credits)
1) Productive Public Management
2) Environmental Policy and Management
3) Comparative Public Administration and Global Governance

Dissertation Research (24 credits)

Public Service and Professional Education Activities. In addition to degree activities, faculty contribute to a variety of government and public and nonprofit management education activities. Prominent among these is the National Center for Public Productivity. Funded by national corporations and foundations, the center advances research and training devoted to measuring and improving public agency productivity. The center's mission is illustrated by the annual Exemplary Awards in State and Local Government program and the *Public Productivity and Management Review,* a quarterly journal published in association with the Management Science Section of the American Society for Public Administration. Professional development is served through a variety of nondegree activities, including a Medical Practice Manager Program for managers of health-care practices.

Certificate of Advanced Professional Training in Public Administration

Students who successfully complete an 18-credit sequence of designated courses (generally drawn from the core curriculum) are awarded a certificate of advanced professional training. The certificate program has particular utility 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, including 26:834:501 Introduction to Public Administration, 26:834:542 Government Budgeting Systems, 26:834:522 Public Organizations, and 26:834:541 Political Economy and Public Administration. Six elective credits from among the M.P.A. core requirements complete the certificate program.

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. 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)
An examination of selected issues and problems in public sector administration and management. The specific area within which issues are presented varies, and 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.

26:834:506. URBAN GEOGRAPHY (3)
Geographic aspects of urbanization and their implications for public administration. Includes theories of contemporary urban geography and their applications to urban patterns and public service delivery systems.

* Required for students without adequate preparation in statistical skills; may be waived for students with significant quantitative background.

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, mobilizing resources, etc.; leadership in organizational and political settings; the role of followership; and the impact of diversity upon leaders and leadership.

26:834:703,704. INTERNSHIP IN PUBLIC ADMINISTRATION (3,3)
Participation in the activities of an agency or institution, under the 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, including organizational authority systems, relationships between public and private organizations, the development and fulfillment of organizational mandates in the public sector, and the 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 AND MANAGEMENT (3)
Strategic planning and management in the public and nonprofit sectors, including methods that facilitate the achievement of organizational goals in a changing environment. Attention is 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)
Focuses on practical management information systems application in the public sector through case studies and implementation strategies, including topics such as databases, system architecture, data normalization, benefit-cost analysis, and an introduction to programming. General familiarity with personal computers is required.

Economics, Budgeting, and Finance

26:834:541. POLITICAL ECONOMY AND PUBLIC ADMINISTRATION (3)
Explores basic economic concepts and applies them to issues relevant to public administration, including 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, financial reporting, and brief mention of budgeting and revenues in the context of fiscal policy making.

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.

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.

Analytic Techniques

26:834:561. ANALYTIC 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. POLICY AND PROGRAM ASSESSMENT (3)
Examines research methodologies and techniques employed in policy and program assessment. Includes social indicators, quantitative and qualitative methods, and experimental and quasi-experimental designs as used in applied policy and program research.

26:834:563. PROJECT IN POLICY AND PROGRAM ASSESSMENT (3)
Students conduct a project in policy or program assessment, and write a policy paper, using one of five study approaches: a quantitative study using aggregate data to assess the effectiveness of an existing policy; a policy matrix comparing alternative policies not yet adopted by prespecified criteria; a needs assessment analysis; an implementation study of time and resources needed to convert a policy into an operational program; or program evaluation of an existing program.

26:834:564. ANALYTIC METHODS II (3)
Multivariate statistical models as they apply to public and non-profit sector problems. 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)
Focuses on the major social and political issues involved in the organization, delivery, and management of health-care systems.

26:834:583. EPIDEMIOLOGY (3)
Epidemiologic methods for administrators, policy analysts, and planners in health-care agencies and institutions. Includes an introduction to studies of infectious and chronic diseases and conditions that affect groups of people; data collection and analysis; survey methods; clinical trials; cohort and case controls.

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.

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; 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. DOCTORAL RESEARCH METHODS (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. PRACTICUM IN PUBLIC ADMINISTRATION (3)
Course designed to get students out in the field, to begin in a serious way the work of a university level researcher. Begins with a structured format (assigned readings and class activities) and advances to self-directed activity (research proposals and research projects). The final product is a publishable research paper.

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.

Governance of the University

Administrative Officers

University-wide

Francis L. Lawrence, *Ph.D., President*
Raphael J. Caprio, *Ph.D., Vice President for Continuous Education and Outreach*
James L. Flanagan, *Ph.D., Vice President for Research*
Susan G. Forman, *Ph.D., Vice President for Undergraduate Education*
Marianne I. Gaunt, *M.L.S., University Librarian*
Christine M. Haska, *Ph.D., Vice President for Institutional Research and Planning
   and University Communications*
Richard M. Norman, *M.B.A., Vice President for Administration and
   Associate Treasurer*
Mildred R. Schildkamp, *B.S., Secretary of the University/Assistant
   to the President*
David R. Scott, *J.D., M.A., University Counsel*
Joseph J. Seneca, *Ph.D., University Vice President for Academic Affairs*
Joseph P. Whiteside, *M.B.A., CPA, Senior Vice President and Treasurer*
Roselle L. Wilson, *Ph.D., Vice President for Student Affairs*
Nancy S. Winterbauer, *Ph.D., Vice President for University Budgeting*

Camden

Roger J. Dennis, *Ph.D., Provost*
Rory P. Maradonna, *M.B.A., Associate Provost for Student Life*
David Wilson, *Ed.D., Associate Provost*

Newark

Norman Samuels, *Ph.D., Provost*
Harvey H. Feder, *Ph.D., Associate Provost for Academic Relations*
Donald L. McCabe, *Ph.D., Associate Provost for Campus Development and
   External Relations*
Norman J. Schnayer, *Ph.D., Associate Provost for Personnel*
Raymond T. Smith, *Ph.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 five thousand 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
   Andrew Lees, *Ph.D., Acting 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
   Andrew Lees, *Ph.D., Acting 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
   Andrew Lees, *Ph.D., Acting Dean*

University College–Camden is an evening college of liberal arts and professional studies serving part-time students since 1950.

Graduate School–Camden

Andrew Lees, *Ph.D., Acting 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

Jay M. Feinman, *J.D., Acting 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 Venebles, *Ph.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 ten thousand students, it offers strong academic programs, excellent facilities, and an outstanding faculty.

Faculty of Arts and Sciences–Newark

David Hosford, *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

David Hosford, *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

David Hosford, *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.

Faculty of Management

P. George Benson, *Ph.D., Dean*

Established in 1993, the Faculty of Management encompasses the Graduate School of Management and the School of Management. The School of Management is an upper-division undergraduate school, founded in 1993, that 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. The Graduate School of Management, founded in 1929 as the Seth Boyden School of Business and incorporated into Rutgers in 1946, offers three programs. Two of these programs, management and professional accounting, lead to the Master of Business Administration degree. The third program offers the Ph.D. degree in management jointly with the Graduate School–Newark and the 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

Ronald V. Clarke, *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

Roger I. Abrams, *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

Charline Russo, *Ph.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.

New Brunswick

The New Brunswick campus is the largest and most diversified of the university's three campuses with fifteen academic units, eighteen hundred faculty, and thirty-three thousand students enrolled in undergraduate and graduate programs.

Faculty of Arts and Sciences–New Brunswick
Richard F. Foley, *Ph.D., 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
Barbara Shailor, *Ph.D., 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 which 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
Bruce C. Carlton, *Ph.D., Dean*

A coeducational and residential college, Cook offers undergraduate programs in various applied disciplines with 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.

College of Engineering
Ellis H. Dill, *Ph.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 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.

College of Pharmacy
John L. Colaizzi, *Ph.D., Dean*

First organized in 1892 and incorporated into the state university in 1927, the College of Pharmacy offers a five-year professional program leading to the Bachelor of Science degree and a graduate program leading to the Pharm.D. degree. Other graduate programs leading to advanced degrees through the Graduate School–New Brunswick are also available. In addition, the college sponsors an extension program for the benefit of practicing pharmacists throughout the state.

Mason Gross School of the Arts
Marilyn Feller Somville, *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.

School of Business–New Brunswick
P. George Benson, *Ph.D., Dean*

Approved by the New Jersey Department of Higher Education in 1986, the School of Business–New Brunswick offers both undergraduate and graduate degrees. On the undergraduate level, it is a two-year, upper-division school offering programs in accounting, finance, management, and marketing. The school admits students from Douglass, Livingston, Rutgers, and University colleges in their junior year. The Bachelor of Science degree is jointly awarded by the School of Business–New Brunswick and the undergraduate college. The school's graduate program offers the Master of Accounting degree.

School of Communication, Information and Library Studies
Todd Hunt, *Ph.D., Acting 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, to the Doctor of Philosophy degree. Courses for in-service librarians are also provided.

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 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-Robert Wood Johnson Medical School. 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. Programs are also offered that lead to the Master of Science and Doctor of Philosophy degrees in urban planning and policy development; these latter two degrees are conferred by the Graduate School–New Brunswick.

School of Management and Labor Relations
John F. Burton, *Ph.D., Dean*

The School of Management and Labor Relations, formed in 1994, provides undergraduate instruction in labor studies. 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 Industrial Relations, and Doctor of Philosophy in Industrial Relations and Human Resources.

Graduate School–New Brunswick
Richard F. Foley, *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
Sandra L. Harris, *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. As of October 1996, the GSAPP will award 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. Food Science Building, Cook Campus

Agricultural Experiment Station, New Jersey. Martin Hall, Cook Campus

Agricultural Molecular Biology, Center for. Cook Campus

Alcohol Studies, Center of. Smithers Hall, Busch Campus

American Affordable Housing Institute. 33 Livingston Avenue, College Avenue Campus

American Woman and Politics, Center for the. Wood Lawn, Douglass Campus

Animal Behavior, Institute of. Smith Hall, Newark 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

Ceramic Research, Center for. Engineering Building, Busch Campus

Coastal and Environmental Studies, Center for. Doolittle Hall, Busch Campus

Computer Aids for Industrial Productivity, Center for. Hill Center, 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. Hill Center, Busch Campus

Eagleton Institute of Politics. Wood Lawn, Douglass Campus

Economic Research, Bureau of. New Jersey Hall, College Avenue Campus

Edison Papers, Thomas A. Van Dyck Hall, College Avenue Campus

Engineered Materials, Institute for. Engineering Building, Busch Campus

Engineering Research, Bureau of. Engineering Building, Busch Campus

Fiber Optic Materials Research Program. Engineering Building, Busch Campus

Fisheries and Aquaculture Technology Extension Center. Martin Hall, Cook Campus

Government Research, Bureau of. Building 4053, Livingston Campus

Health, Health Care Policy, and Aging Research, Institute for. 30 College Avenue, College Avenue Campus

Historical Analysis, Center for. 88 College Avenue, 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 Programs. Parker House, College Avenue Campus

Jazz Studies, Institute of. Bradley Hall, Newark Campus

Jewish Life, Center for the Study of. 12 College Avenue, College Avenue Campus

Journalism Resources Institute. 185 College Avenue, College Avenue Campus

Management and Labor Relations, Institute of. Labor Education Center, Cook Campus

Marine and Coastal Sciences, Institute of. Martin Hall, 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

Molecular and Behavioral Neuroscience, Center for. Newark Campus

Negotiation and Conflict Resolution, Center for. 15 Washington Street, Newark Campus

Operations Research, Center for. Hill Center, Busch Campus

Packaging Engineering, Center for. Engineering Building, Busch Campus

Physics Research, Bureau of. Serin Physics Laboratories, Busch Campus

Plastics Recycling Research, Center for. Engineering Building, Busch Campus

Policy Research in Education, Center for. Wood Lawn, Douglass Campus

Rutgers Cooperative Extension. Martin Hall, Cook Campus

State Politics and Public Policy, Center for. Wood Lawn, Douglass Campus

Surface Modification, Laboratory for. Serin Physics Laboratories, Busch Campus

Urban Policy Research, Center for. Building 4051, Livingston Campus

Waksman Institute of Microbiology. Hoes Lane, 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. Voorhees Chapel, Douglass Campus

Centers Operated Jointly

Biotechnology and Medicine, Center for Advanced.

Environmental and Occupational Health Sciences Institute.

Hazardous Substance Management Research Center.

UNIVERSITY LIBRARY SYSTEM

Archibald Stevens Alexander Library. College Avenue, College Avenue Campus

Art Library. Voorhees Hall, College Avenue Campus

Blanche and Irving Laurie Music Library. Mabel Smith Douglass Library, Chapel Drive, Douglass Campus

Camden Arts and Sciences Library. 300 North 4th Street, Camden Campus

Center for Urban Policy Research Library. Building 4051, Livingston Campus

Center of Alcohol Studies Library. Smithers Hall, Busch Campus

Chemistry Library. Wright Chemistry Building, Busch Campus

East Asian Library. 169 College Avenue, College Avenue Campus

Entomology Library. Georges Road Laboratories, Cook Campus

Institute of Management and Labor Relations Library. Labor Education Center, Cook Campus

John Cotton Dana Library. 185 University Avenue, Newark Campus

Justice Henry Ackerson Library of Law and Criminal Justice. 15 Washington Street, Newark Campus

Kilmer Area Library. Livingston Campus

Library of Science and Medicine. Busch Campus

Mabel Smith Douglass Library. Chapel Drive, Douglass Campus

Mathematical Sciences Library. Hill Center, Busch Campus

*Physics Library. S*erin Physics Laboratories, Busch Campus

School of Law–Camden Library. 5th and Penn Streets, Camden Campus

Stephen S. and Lucy D. Chang Science Library. Foran Hall, Cook Campus

Waksman Institute of Microbiology Library. Busch Campus

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