

# catalog

## **Undergraduate and Graduate Catalog of the University of Rhode Island** *1998-99 Academic Year*



**University of Rhode Island  
Kingston, Rhode Island 02881  
401-874-1000**

# THE UNIVERSITY



**T**he University of Rhode Island is a medium-sized state university in the southern part of Rhode Island in the village of Kingston. In part because of its unique location near the ocean and six miles from Narragansett Bay, the University has developed strong marine programs and has been designated one of the national Sea Grant colleges.

The University enrolls about 10,320 undergraduate and 3,115 graduate students, and has a full-time teaching faculty of approximately 615.

**Mission Statement.** The University of Rhode Island is the principal public research and graduate institution in the State of Rhode Island with responsibilities for expanding knowledge, for transmitting it, and for fostering its application. Its status as a land grant, sea grant, and urban grant institution highlights its traditions of natural resource, marine, and urban related research. The University is committed to providing strong undergraduate programs to promote students' ethical development and capabilities as critical and independent thinkers. To meet student and societal

needs, it offers undergraduate professional education programs in a wide range of disciplines. Graduate programs provide rigorous advanced study and research opportunities for personal and professional development. With undergraduate and graduate programs in the liberal arts and sciences and focus programs in the areas of marine and environmental studies; health; children, families, and communities; and enterprise and advanced technology, the University strives to meet the rapidly changing needs of the State, the country, and the world.

To help achieve the teaching, research, and service objectives referred to above and to extend intellectual, cultural, and social horizons, the University offers a variety of special programs, including opportunities for learning outside the classroom and for community service. Committed to effective learning, the University encourages close student-faculty interaction. Distinctive programs such as interdisciplinary research partnerships involving faculty, students, and practitioners from within and outside the University are supported. It collaborates with governmental and other agencies, with other educational institutions, and with industry. It maintains extensive outreach and continuing education programs. The University sponsors an extensive array of concerts, performances, and exhibitions in music, theater, and other fine arts, and maintains significant recreational facilities and notable programs in intramural and intercollegiate athletics.

The University seeks talented undergraduate and graduate students, faculty, and staff from a wide array of cultural, economic, and ethnic backgrounds who collaborate in an intellectual and social community of mutual respect to learn, to be enriched, and to produce significant research and scholarly and creative works. Its students in all their diversity—from Rhode Island, across the country, and around the globe—are expected to be active participants both in and beyond the classroom. Their performance, potential, and commitment mark them as capable of advanced study and as future leaders.

To fulfill its special obligations to the State of Rhode Island, the University cooperates in offering programs with other Rhode Island institutions of higher education, public and private. It is committed, through cooperative governance, to an ongoing evaluation of programs, priorities, and processes in order to improve existing programs and to anticipate changing

# 1998–99 UNIVERSITY CALENDAR

## Fall Semester

### April 6–September 22

Registration period, Kingston-sponsored courses

### July 1–September 22

Registration period, Alan Shawn Feinstein College of Continuing Education (FCCE)

### September 7, Monday

Holiday, Labor Day

### September 8, Tuesday

Advising Day

### September 9, Wednesday

Classes begin, Kingston Campus and FCCE

### September 18, Friday

Final day for undergraduate students to drop courses designated "early drop"

### September 22, Tuesday

Final day to add courses and to add P-F option

*Fees will not be adjusted downward for courses dropped after this date.*

### October 12, Monday

Holiday, Columbus Day

### October 26, Monday

Midsemester

Final day for graduate students to drop courses

Final day to change from P-F option to grade

### November 4, Wednesday

Final day for undergraduate students to drop courses

### November 11, Wednesday

Holiday, Veterans Day

### November 26, Thursday

Thanksgiving recess begins, 8 a.m.

### November 30, Monday

Classes resume, 8 a.m.

### December 14, Monday

Classes end, Kingston Campus

### December 15–21

Final examinations, FCCE

### December 15–16

Reading days, Kingston Campus

### December 17–23

Final examinations, Kingston Campus

### December 28, Monday

Final grades due in the Office of the Registrar, 4 p.m.

## Spring Semester

### October 22–February 1

Registration period, Kingston-sponsored courses

### December 7–February 1

Registration period, FCCE

### January 18, Monday

Holiday, Martin Luther King's Birthday

### January 19, Tuesday

Classes begin, Kingston Campus and FCCE

### January 28, Thursday

Final day for undergraduate students to drop courses designated "early drop"

### February 1, Monday

Final day to add courses and to add P-F option

*Fees will not be adjusted downward for courses dropped after this date.*

### February 15, Monday

Classes will not meet

### February 16, Tuesday

Monday classes meet

### March 9, Tuesday

Midsemester

Final day for graduate students to drop courses

Final day to change from P-F option to grade

### March 15, Monday

Spring recess begins, 8 a.m.

### March 22, Monday

Classes resume, 8 a.m.

Final day for undergraduate students to drop courses

### May 4, Tuesday

Classes end, Kingston Campus

### May 5–6

Reading days, Kingston Campus

### May 5–11

Final examinations, FCCE

### May 7–14

Final examinations, Kingston Campus

### May 17, Monday

Final grades due in the Office of the Registrar, 4 p.m.

### May 22, Saturday

Graduate Commencement

### May 23, Sunday

Main Commencement

## Summer Session 1999

### May 24–June 26

First five-week session

### June 28–July 31

Second five-week session

Changes in the academic calendar due to major storms or other circumstances may be made when it is in the best interests of the institution, and without prior notice to the students.

*This calendar applies to undergraduate and graduate students enrolled at Kingston and FCCE.*

*For dates specific to candidates for graduate degrees, see "Graduate Admission and Registration," pages 110–111.*

needs and new challenges. Aspiring to have a quality and extent of influence beyond the state, with breadth of vision and boldness of approach, the University of Rhode Island strives for excellence for Rhode Island and for the country.

**Campuses.** The University has a spacious rural campus 30 miles south of Providence in the northeastern metropolitan corridor between New York and Boston. The center of campus is a quadrangle of handsome, old granite buildings surrounded by newer academic buildings, student residence halls, and fraternity and sorority houses. On the plain below Kingston Hill are gymnasiums, athletic fields, tennis courts, a freshwater pond, and agricultural fields.

In addition to the Kingston Campus, the University has three other campuses. The 165-acre Narragansett Bay Campus, six miles to the east overlooking the West Passage of Narragansett Bay, is the site of the Graduate School of Oceanography. The Alan Shawn Feinstein College of Continuing Education is located in Providence. In the western section of the state, 20 miles from Kingston, is the W. Alton Jones Campus. Its 2,300 acres of woods, fields, streams, and ponds is the site of environmental education, research, and conference facilities.

**History.** The University was chartered as the state's agricultural school in 1888. The Oliver Watson farm was purchased as a site for the school, and the old farmhouse, now restored, still stands on the campus. The school became the Rhode Island College of Agriculture and Mechanic Arts in 1892, and the first class of 17 members was graduated two years later.

The Morrill Act of 1862 provided for the sale of public lands. Income from these sales was to be used to create at least one college in each state with the principal purpose of teaching agriculture and mechanic arts. From this grant of land comes the term "land grant," which applied to the national system of state colleges. In a later adaptation of the concept, federal funds given to colleges for marine research and extension are called "sea grants."

In 1909 the name of the college was changed to Rhode Island State College, and the program of study was revised and expanded. In 1951 the college became the University of Rhode Island by an act of the General Assembly. The Board of Governors for Higher Education appointed by the governor became the governing body of the University in 1981. A historical outline can be found in the Appendix.

## Programs of Study

**Undergraduate Study.** All programs aim at a balance of studies of the natural and social sciences, the humanities, and professional subjects. The courses and programs of study have been approved by national accrediting agencies and are accepted for credit by other approved institutions of higher education (see "Accreditation," this section, page 9).

Undergraduate students can earn the following degrees:

Bachelor of Arts  
Bachelor of Science  
Bachelor of Fine Arts  
Bachelor of Landscape Architecture  
Bachelor of Music  
Bachelor of General Studies (Feinstein College of Continuing Education only)

All freshmen who enter the University to earn a bachelor's degree are first enrolled in University College. Undergraduates have a wide choice of programs from which to choose a major, and the advising program in University College provides help in making this decision and in choosing appropriate courses.

**Graduate Study.** Graduate study at the University was inaugurated in 1907 with Master of Science degrees in chemistry and engineering. The Master of Arts degree was first awarded in 1951, and in 1960 the University awarded its first Doctor of Philosophy degree. Graduate work for professional degrees was initiated in 1962, when the degree of Master of Public Administration was first awarded. Today, the master's degree is offered in 56 areas of study and the doctorate in 38 areas. To date, over

17,000 master's degrees and 2,000 doctoral degrees have been conferred. Students may earn the following degrees:

Master of Arts  
Master of Science  
Master of Business Administration  
Master of Community Planning  
Master of Library and Information Studies  
Master of Marine Affairs  
Master of Music  
Master of Oceanography  
Master of Public Administration  
Doctor of Philosophy

The Graduate School has primary responsibility for administering policies and procedures relating to advanced study at the University of Rhode Island. Graduate School policy is formulated by graduate faculty members, acting through their delegate body, the Graduate Council, which includes student members. Only the Graduate School or the Graduate Council can grant exceptions to the regulations for graduate study, which are explained in detail in the section "Graduate Programs."

The University graduate programs of study are listed on the following page. Work in a combination of special areas is often possible. Graduate-level course work applicable to a number of these programs is offered in several locations throughout the state by the Alan Shawn Feinstein College of Continuing Education. In most cases, however, a portion of the courses must be taken on the Kingston Campus.

Students with a bachelor's degree from this University or from another university with equivalent requirements and accreditation may be admitted for graduate study, providing that their credentials meet the standards set by the Graduate School and by the department in which they wish to study, and that facilities for study are available in their field of interest. Among the standards required for admission are an approximate undergraduate average of B or better and, where required, satisfactory scores on a nationally administered examination.

## Undergraduate Degrees

### College of Arts and Sciences

African and Afro-American Studies

(Joint URI-RIC): B.A.

Anthropology: B.A.

Applied Sociology: B.S.

Art: B.F.A.

Art History: B.A.

Art Studio: B.A.

Biological Sciences: B.S.

Biology: B.A.

Chemistry: B.A., B.S.

Chemistry and Chemical

Oceanography: B.S.

Classical Studies: B.A.

Communication Studies: B.A.

Comparative Literature Studies: B.A.

Computer Science: B.S.

Economics: B.A., B.S.

English: B.A.

Environmental Plant Biology: B.S.

French: B.A.

German: B.A.

History: B.A.

Italian: B.A.

Journalism: B.A.

Latin American Studies: B.A.

Marine Biology: B.S.

Mathematics: B.A., B.S.

Music: B.A.

Music Composition: B.M.

Music Education: B.M.

Music Performance: B.M.

Philosophy: B.A.

Physics: B.A., B.S.

Physics and Physical Oceanography: B.S.

Political Science: B.A.

Psychology: B.A.

Public Relations: B.A.

Sociology: B.A.

Spanish: B.A.

Theatre: B.F.A.

Women's Studies: B.A.

### College of Business Administration

Accounting: B.S.

Finance: B.S.

General Business Administration: B.S.

International Business: B.S.

Management: B.S.

Management Science and Information

Systems: B.S.

Marketing: B.S.

### Alan Shawn Feinstein

#### College of Continuing Education

Bachelor of General Studies: B.G.S.

### College of Engineering

Biomedical Engineering: B.S.

Chemical Engineering: B.S.

Chemical and Ocean Engineering: B.S.

Civil Engineering: B.S.

Computer Engineering: B.S.

Electrical Engineering: B.S.

Industrial Engineering: B.S.

Mechanical Engineering: B.S.

Ocean Engineering: B.S.

### College of the Environment and Life Sciences

Animal Science and Technology: B.S.

Aquaculture and Fishery

Technology: B.S.

Clinical Laboratory Science: B.S.

Dietetics: B.S.

Environmental Economics and

Management: B.S.

Environmental Plant Biology: B.S.

Environmental Science and

Management: B.S.

Food Science and Nutrition: B.S.

Geology: B.S.

Geology and Geological

Oceanography: B.S.

Landscape Architecture: B.L.A.

Marine Affairs: B.A., B.S.

Marine Resource Development: B.S.

Microbiology: B.S.

Resource Economics and

Commerce: B.S.

Urban Horticulture and Turfgrass

Management: B.S.

Water and Soil Science: B.S.

Wildlife Biology and Management: B.S.

### College of Human Science and Services

Communicative Disorders: B.S.

Consumer Affairs: B.S.

Dental Hygiene (Joint URI-CCRI or post-clinical): B.S.

Education: Elementary B.A.

Secondary B.S.

Human Development and Family

Studies: B.S.

Human Science and Services: B.S.

Physical Education: B.S.

Textile Marketing: B.S.

Textiles, Fashion Merchandising, and

Design: B.S.

### College of Nursing

Nursing: B.S.

### College of Pharmacy

Pharm.D. (six-year entry level)

## Graduate Degrees

### Master of Arts

Communication Studies

Education

•Adult

•Elementary

•Reading

•Secondary

English

History

Marine Affairs

Political Science

Spanish

### Master of Science

Accounting

Applied Pharmaceutical Sciences

Audiology

Biochemistry

Biological Sciences

Chemical Engineering

Chemistry

Civil and Environmental Engineering

Clinical Laboratory Science

Computer Science

Electrical Engineering

Environmental Sciences\*

•Entomology

•Geology

•Natural Resources Science

•Plant Sciences

Fisheries, Animal, and Veterinary Science

Food Science and Nutrition

Human Development and Family Studies

•Human Development and Family

Studies

•Marriage and Family Therapy

•College Student Personnel

Labor and Industrial Relations

Manufacturing Engineering

Mathematics

Mechanical Engineering and Applied

Mechanics

Medicinal Chemistry

Microbiology

Nursing

Ocean Engineering

Oceanography

Pharmacognosy

Pharmacology and Toxicology

Pharmacy Administration

Physical Education

Physical Therapy

Physics

Psychology: School

Resource Economics

Speech-Language Pathology

Statistics

Textiles, Fashion Merchandising, and

Design

### Doctor of Philosophy

Applied Mathematical Sciences

•Applied Mathematics

•Applied Probability

•Computer Science

•Operations Research

Applied Pharmaceutical Sciences

Biological Sciences

Business Administration

•Finance and Insurance

•Management

•Management Science

•Marketing

Chemical Engineering

Chemistry

Civil and Environmental Engineering

Education

Electrical Engineering

English

Environmental Sciences\*

•Entomology

•Fisheries, Animal, and

Veterinary Science

•Geology

•Natural Resources Science

•Plant Sciences

Food Science and Nutrition

Industrial and Manufacturing

Engineering

Marine Affairs

Mathematics

Mechanical Engineering and Applied

Mechanics

Medicinal Chemistry

Microbiology

Nursing

Ocean Engineering

Oceanography

Pharmacognosy

Pharmacology and Toxicology

Physics

Psychology

•Clinical

•Experimental

•School

Resource Economics

### Professional Degrees

Master of Business Administration

(M.B.A., Executive M.B.A.)

Master of Community Planning (M.C.P.)

Master of Library and Information

Studies (M.L.I.S.)

Master of Marine Affairs (M.M.A.)

Master of Music (M.M.)

Master of Oceanography (M.O.)

Master of Public Administration (M.P.A.)

\* Pending approval of the  
Board of Governors

## Research Resources

**University Libraries.** The library collection of 1,090,000 bound volumes and 1,510,000 microforms is housed in the University Library in Kingston, at the Alan Shawn Feinstein College of Continuing Education in Providence, and in the Pell Marine Science Library on the Narragansett Bay Campus. The latter was designated the National Sea Grant Depository in 1971.

The University Library, which holds the bulk of the collection, has open stacks that provide direct access to books, periodicals, documents, maps, microforms, and audiovisual materials. The Special Collections Department collects and maintains rare books, manuscripts, the University archives, and a variety of special interest materials. Service hours at the other libraries vary, but the University Library provides full reference, bibliographic, and circulation services during most of the 100 hours a week it is open.

The University is a member of the Higher Education Library Information Network (HELIN), which extends borrowing privileges to the faculty, staff, and students of the Community College of Rhode Island, Providence College, Rhode Island College, Roger Williams University, and the University of Rhode Island. Holdings of all these libraries are included in the on-line public access catalog.

**Office of Information Services.** The Office of Information Services (OIS) provides computational resources needed by the University community for instruction and research. Located in Tyler Hall on the Kingston Campus, the OIS maintains central computing facilities, student microcomputing resources, and the campus high-speed network. The OIS provides a variety of services to support these facilities and assists the campus community in their use. The computer network and related services have been expanding steadily since the center opened in 1959, and now a majority of the students, faculty, and staff use these resources. All students are

entitled to a computer account which enables them to use OIS facilities, including access to worldwide electronic mail services and the Internet.

The center has an IBM ES/9000 Model 320 mainframe computer running the VM/CMS operating system to provide computing support for interactive, batch, and client-server processor modes. A full complement of programming languages and packages is available. In addition, an IBM RISC System/6000 J40 running AIX 4.1.4 is available for Geographic Information System and for computer-intensive applications. Extensive facilities for computer graphics are also offered using both video display facilities and a color plotter for visualization. Several hundred personal computers and workstations are located in public work areas and private offices. These devices are connected to the University Ethernet network, which provides access to the OIS systems and remote independent computers. Also available are extensive dial-up facilities and external network access to the Internet and the Rhode Island State Network.

The OIS provides facilities management services for campus microcomputer laboratories featuring IBM PS/2s, Apple Macintoshes, and UNIX workstations. Numerous software application packages are available. The microcomputer laboratories are available for faculty research, teaching, and general student use. Fifteen computer classrooms are available.

**Other Research Facilities.** The Department of Computer Science and Statistics operates its own networked systems in support of its instructional and research mission. Its facilities include the EnVision Laboratory, a classroom laboratory equipped with a network of desktop computers dedicated to undergraduate instruction. A second lab space contains a network of machines used for instruction in computer graphics and other advanced topics. Additional personal computers and workstations are located in faculty and graduate student offices and are used principally for research.

The Narragansett Bay Campus has numerous computers linked in a distributed network. Its educational computer laboratory provides students and staff with access to Macintoshes, PCs, SUN workstations, and a variety of associated peripherals. The Bay Campus computer network is linked to the Kingston Campus network and to the Internet. The Bay Campus also supports a computer system used for ocean and atmospheric modeling, which consists of a Silicon Graphics Origin 2000 rack system with 10 parallel processors for computation and analysis (equivalent to the speed of a four-processor Cray C90), a six-processor Silicon Graphics Power Challenge computer server, and a dual-processor Silicon Graphics Power Onyx graphics workstation for data visualization.

The College of Engineering's Computer Center has a SUN Sparc Server 1000 supporting 20 SUN Sparc workstations and 50 IBM-compatible PCs (486 and Pentium-based) centered in the Kirk Engineering Building. These and all other departmental computers are linked together by a high-speed Ethernet network. The Department of Electrical and Computer Engineering has three main servers, including a six-processor SUN Ultra Enterprise 3000 with 1.5GB RAM, a dual-processor SUN Ultra Enterprise 450, and a SUN SPARCserver 1000 with combined high-speed disk storage of over 125 Gbytes. These use a fully-switched fast-Ethernet network to serve a dual-processor SGI Origin 200, two SGI Indy workstations, over 25 SUN Ultra SPARC and SPARC 5 workstations, 20 Xterminals, and a variety of PCs and Macintoshes. The Department of Mechanical Engineering has the Champlain Teaching lab with 25 Pentium PCs. The Department of Civil and Environmental Engineering has several small labs: the Senior Design Project room with five PCs (486-based), the Virtual Reality lab with one DEC Alpha machine (UNIX), and the AutoCAD Facility with six Pentium Pro PCs. The Department of Ocean Engineering has an undergraduate PC lab and a graduate lab with two SUN Sparc 5 workstations. Industrial and Manufacturing Engineering has two small

PC labs; the Design for Manufacturing and Assembly Lab and the Manufacturing Computation Lab.

The Department of Chemistry houses laboratories specializing in NMR, mass spectrometry, separations science, spectroscopy, and sensor development. Computing facilities within the department include a network of more than 100 computers, including personal computers, high-definition graphics workstations, and a large multi-processor machine.

Equipment available for marine research includes chambers for leak-testing equipment prior to deep-sea use, marine geotechnical laboratory facilities for sediment testing, a wave and towing tank, underwater acoustics test facilities, a 12,000-square-foot research aquarium, a marine ecosystem laboratory, and an oceanographic remote-sensing laboratory that processes sea surface data. The University also operates the Ocean Mapping Development Center for mapping the sea floor.

*Endeavor*, the University's research vessel operated by the Graduate School of Oceanography, is a 184-foot ship capable of working in all parts of the world's oceans. It can carry a scientific party of 16. Also part of the fleet is an 80-foot ocean engineering vessel, the *CT-1*, equipped with a fully integrated side-scan sonar mapping system. The University fisheries school operates a 52-foot-long training vessel, the *Cap'n Bert*. A number of smaller vessels are also available. In addition, the Graduate School of Oceanography has a fully equipped research diving facility.

A research reactor and associated facilities are available to University students at the Rhode Island Nuclear Science Center, located on the Narragansett Bay Campus. Constructed and operated by the state of Rhode Island, this open-pool reactor is extensively used for research by many departments of the University. The reactor, designed for 5 MW, is now operating at 2 MW. A program to upgrade the power level to 5 MW is now in progress. A high resolution, inductively coupled plasma mass-spectrometer (HR-ICP-MS) provides multi-element and isotopic analy-

ses of solutions to lower than parts per billion to trillion levels in a variety of matrices. Hot laboratories, counting equipment, neutron spectrometers (including a unique polarized-beam, small-angle instrument), and multichannel analyzers are also available.

The College of Nursing has practice laboratories with a variety of equipment, including a heart-sound simulator used by students in primary health care. The media center at White Hall contains various types of learning modules and microcomputers for research and instruction.

The Electron Microscope Facility is a core facility located in the Morrill Life Sciences Building at the Kingston Campus. The facility provides teaching and research services in electron microscopy and related techniques to a wide variety of scientific disciplines. It has a high-resolution JEOL-1200EX scanning/transmission electron microscope and a Zeiss EM-900 transmission electron microscope, and offers research services in transmission electron microscopy, scanning electron microscopy, cryo-transmission electron microscopy, energy dispersive X-ray microanalysis, and light microscopy. Other services provided include sample preparation as well as technical support using scientific photography. The facility is available for use by students, staff, and faculty for research projects and instruction.

The Department of Plant Sciences operates its own 15-acre turfgrass research station, home of the oldest turfgrass science program in the U.S. Also included in its facilities are five research laboratories, controlled environmental facilities, a greenhouse complex, and experimental farms for hands-on opportunities.

The entomology program has a biological quarantine laboratory, the only university-affiliated facility in the Northeast. Faculty and students search abroad for natural enemies of pest species and study them in the laboratory under secure conditions. The laboratory, certified by the U.S. Department of Agriculture as an insect-quarantine facility, is an important component of a long-standing program on

insect ecology and the development of environmentally sensitive pest-control measures.

The Physical Therapy Program in the Independence Square II facility has a clinical service and research unit that includes a computerized anatomical study center, BIODEX and KINCOM muscle performance dynamometry, METRECOM postural analysis, electromyography, and kinetic and kinematic analysis systems. SwimEx and Aqua Arc aquatic therapy devices are available for therapeutic and research activities. Research is currently conducted in the treatment and prevention of spine problems, muscular stiffness, and neuromuscular control mechanisms.

Also in Independence Square, the Department of Physical Education and Exercise Science has a Cardiac Rehabilitation Clinic; an Exercise Testing Laboratory with treadmill, ECG monitoring and metabolic testing equipment; a Biochemistry Laboratory, and an Electromicroscopy Lab. A Weight Management Clinic is located at the Briar Lane Building and a Fitness and Wellness Laboratory is located in the Tootell Physical Education Complex.

The Speech and Hearing Clinic has one-way vision and listening facilities and diagnostic equipment for speech and language testing. Sound-treated testing rooms meeting ANSI standards and audiometric equipment provide for audiologic evaluation and research.

**Writing Center.** The Writing Center provides assistance to anyone in the University community who needs help with any phase of writing a paper or thesis. The Writing Center is staffed by Department of English College Writing Program faculty and Department of English graduate students. The Writing Center also serves as a practicum facility for WRT/EDC 435 students. Tutoring is provided by appointment on an individual basis, but walk-in appointments are sometimes available.

The center helps students become better writers. Students can write with paper and pencil or use one of the center's Macintosh computers. Students can use an array of software, including word-

processing software, to produce their work with support from the center's staff. The computers and software in the Writing Center are compatible with those in other laboratories campus-wide.

The center is open approximately 40 hours per week, including daytime and evening hours. Appointments for tutoring can be made by calling 401-874-4690, or by visiting the center in Room 313, Independence Hall.

## Research

Since 1907, the University has held the major responsibility within the state system for graduate education, which is closely associated with a strong program of research. Research leads to the discovery of knowledge and its dissemination through teaching. Responsibilities for graduate education, embodied in the Graduate School, and the overseeing of research funding in the Research Office are assigned to the Office of Graduate Studies, Research, and Service. Research and public service projects are conducted in all departments and programs offering graduate degrees.

URI undergraduates are provided with a unique learning experience by participation in the research activities of Presidential Partnerships, which involve various disciplines and faculty from several departments and colleges. Current partnerships are in the areas of infectious disease control, health promotion, the coastal environment, and surface and sensors technology.

Research throughout the University is supported by an average of \$46 million per year. Support comes from foundations, commercial firms, federal and state agencies, and the University. The University ranks among the top five percent of the country's colleges and universities in the amount of research funding received.

Applications for research grants are approved by the University's Vice Provost for Graduate Studies, Research, and Outreach. He or she serves as the liaison officer for the president, the provost, the academic deans, the Council for Research, and the faculty in matters pertaining to research

and sponsored projects. The Research Office provides assistance to the University research community in all aspects of research and in the preparation of proposals.

In addition to the research conducted in the various departments, the University has established a number of research, extension, and technology transfer programs in the following specially defined areas:

- advanced sensor-based systems, including robotics
- agriculture experimentation and research
- anti-infective pharmacology
- aquaculture
- atmospheric chemistry studies
- basic and applied research in filtration and separation processes
- biology, ecology, and control of vector-borne diseases
- biotechnology
- business and economics
- cancer prevention through behavioral change
- child development
- consumer product safety
- distributed computing
- drug delivery and development
- early design analysis for improving product designs for ease of manufacture
- economic effects of marine policy
- environmental horticulture
- evaluation services and assistance to exercise and athletic programs
- family therapy
- family violence
- fault-tolerant digital circuits and systems
- food science and nutrition
- gerontology
- golf and sports turf management
- high-performance computer processor, memory, and input/output design
- historic costumes and textiles
- innovative programs in response to the needs of state government
- international aspects of business
- labor and industrial relations
- management of coastal resources
- marine ecosystems
- marine geological sampling and testing
- marine pathology

- market research
- medicinal chemistry
- nanotechnology
- nuclear magnetic resonance spectroscopy
- Pacific-Basin capital markets information
- physical therapy
- policy evaluation and analysis for public officials
- pollution prevention and technical assistance for New England industry
- process engineering
- product design
- research and support activities for the public and human service areas
- satellite remote sensing for terrestrial, coastal, and nearshore applications
- scientific criminal investigation
- sea floor mapping
- Sea Grant research, education, and marine advisory services
- sensors
- signal processing
- speech and hearing testing and diagnosis
- telecommunications and information marketing
- textile conservation
- textile performance testing
- thin film materials and sensors
- urban field research and technical assistance
- use of geographic database (GIS) information to solve environmental problems
- water resources research and training
- weight management through behavior modification
- writing skills and research

Additional information on the above areas of research and expertise can be obtained from the Research Office, 70 Lower College Road.

## Accreditation

The University of Rhode Island is accredited by the New England Association of Schools and Colleges. In addition, certain courses and programs of study have been approved by national accrediting agencies.



The New England Association of Schools and Colleges is a nongovernmental, nationally recognized organization whose affiliated institutions include elementary schools through collegiate institutions offering postgraduate instruction.

Accreditation of an institution by the New England Association indicates that it meets or exceeds criteria for the assessment of institutional quality periodically applied through a peer group review process. An accredited school or college is one that has the necessary resources available to achieve its stated purposes through appropriate educational programs, is substantially doing so, and gives reasonable evidence that it will continue to do so in the foreseeable future. Institutional integrity is also addressed through accreditation.

Accreditation by the New England Association is not partial, but applies to the University as a whole. As such, it is not a guarantee of the quality of every course or program offered, or of the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students who attend the University.

Inquiries regarding the status of an institution's accreditation by the New England Association should be directed to the administrative staff of the school or college. Individuals can also contact the association at 209 Burlington Road, Bedford, MA 01730. Phone: 617-271-0022.

The national accrediting agencies that have approved the quality of certain course offerings and programs of study include the AACSB—the International Association for Management Education, the American Association of Marriage and Family Therapy, the American Chemical Society, the American Council on Pharmaceutical Education, the American Institute of Certified Planners and Association of Collegiate Schools of Planning, the American Dietetic Association, the American Library Association, the American Physical Therapy Association, the American Psychological Association, the American Society for Landscape Architects, the American Speech-Language-Hearing Asso-

ciation, the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, the National Association of Schools of Music, the National Association of State Directors of Teacher Education and Certification, the National Council for Accreditation for Teacher Education, and the National League for Nursing. In addition, the University has been authorized under federal law to enroll nonimmigrant alien students.

The University is also an approved member institution of the American Association of University Women, the American Council on Education, the Council of Graduate Schools, the North American Association of Summer Sessions, the National Association of State Universities and Land-Grant Colleges, the Northeastern Association of Graduate Schools, and the National University Extension Association.

## The University Community

In addition to the student body, the University community is made up of faculty, administration, staff, and alumni. The *Faculty Senate* represents the faculty and was authorized in 1960 by the general faculty to conduct the business assigned to the faculty by law or by the Board of Governors for Higher Education. The *Graduate Council* is the representative body for the graduate faculty and determines the academic policies for graduate study. The office of *University Ombud* investigates complaints from students, faculty members, and administrative personnel that they have been unfairly dealt with in the normal channels of the administrative process. The ombud is a tenured or emeritus member of the faculty appointed by the Faculty Senate and is assisted by a student appointed by the President.

The *Instructional Development Program* (IDP) exists to help faculty members in their teaching responsibilities. Faculty members who want to increase their teaching effectiveness by improving their skills or developing new ones may work individually with IDP staff and participate in various workshops, colloquiums, and seminars on teaching.

The voice of the alumni is heard through the *Alumni Association*, which includes all those who have attended the University for two semesters or more and whose class has graduated. The organization, with about 80,000 members, promotes the interests of the University and helps keep alumni in touch with their *alma mater*. Through its office in Davis Hall and its network of chapters and affinity groups throughout the country, the Alumni Association maintains ties with its members through services, programs, special events, and the magazine *QUAD ANGLES*. An annual fund drive provides scholarship and other University aid.

The University receives less than 30 percent of its support from the state. The balance comes from student fees and tuition, federal grants, and auxiliary enterprises and other miscellaneous sources. The *University of Rhode Island Foundation* encourages and administers gifts from private sources to build a substantial endowment for continuing support of the University. It is concerned with the support of University activities for which adequate provision is not ordinarily made by appropriations from public funds.

**Academic and Social Codes.** Each student is a member of the University community, with all the rights, privileges, and responsibilities that go with such membership. The rights and privileges include full use of the educational opportunities and facilities offered on campus. The responsibilities include those of making proper use of these facilities in order to progress educationally, respecting the rights of others, and knowing and obeying the rules and regulations developed by the University community for the good of the total membership.

The University expects that all course papers, theses, and dissertations will be prepared, and all examinations taken, in conformance with accepted standards of academic integrity. This includes the proper citation and attribution of all material that is not the original product of the writer. It is the student's responsibility to determine the appropriate style used in his

or her discipline for presentation of material derived from other sources and to adhere to it scrupulously in all written presentations. (See "Cornerstones" below.)

**Affirmative Action and Nondiscrimination.** The University of Rhode Island prohibits discrimination on the basis of race, sex, religion, age, color, creed, national origin, disability, or sexual orientation, and discrimination against disabled and Vietnam era veterans in the recruitment, admission, or treatment of students, the recruitment, hiring, or treatment of faculty and staff, and the operation of its activities and programs. This is in compliance with state and federal laws, including Titles VI and VII of the Civil Rights Act of 1964, as amended, Title IX of the 1972 Education Amendments to the Higher Education Act, Executive Order 11246, as amended, Sections 503/504 of the Rehabilitation Act of 1973, as amended, Section 402 of the Vietnam Era Veterans Readjustment Assistance Act of 1974, the Americans with Disabilities Act of 1990, the Civil Rights Act of 1991, the Persian Gulf Benefits Act of 1991, Rhode Island General Law 28-5.1, as amended, Executive Order 95-11, and Executive Order 92-2.

The Dean of Admissions and Student Financial Aid, the Dean of the Graduate School, the director of Career Services, the director of the Counseling Center, and the director of the (undergraduate) Special Programs for Talent Development cooperate to provide information and guidance for economically and socially disadvantaged individuals seeking opportunities for study at the University. Inquiries may be directed to any of these offices.

With regard to scholarships and commissioning into the armed forces, the ROTC program, in accordance with the Department of Defense policy, does not comply with the University's policy on nondiscrimination based on sexual orientation.

Most buildings on campus are architecturally available to the disabled, and provision is made to ensure that no student is prevented from pursuing a course of study because of restricted access to buildings.

AIDS is one of the most tragic, life-threatening epidemics of modern times. Students, faculty, and staff at the University of Rhode Island must provide the compassion, understanding, and support necessary to help individuals with AIDS and HIV infection. As part of this responsibility, the University will vigorously enforce individual rights of confidentiality and freedom from discrimination. The rights of individuals with AIDS are covered under three University policies based on Section 504 of the Rehabilitation Act of 1973: "Reasonable Accommodation for Handicapped Employees," "Life-Threatening Illness," and "Handicapped Policy." Copies of these policies are available at the Office of Human Resource Administration, the front desk at Health Services, and the Disability Services office in the Memorial Union.

Inquiries concerning compliance with antidiscrimination laws should be addressed to the Affirmative Action Officer, Carlotti Administration Building; or to the Director, Office for Civil Rights, Department of Education, Region I. Questions

regarding provisions for students with disabilities should be directed to the Director of Disability Services in the Office of Student Life, 330 Memorial Union. Phone: 401-874-2098 (TT).

## Notice of Change

Rules, regulations, dates, tuition, fees, the availability and titles of programs and areas of specialization, their administrative location, and courses set forth in this catalog are subject to change without notice. Where a change in program requirements is made while a student is enrolled, the student may elect to complete the program under the requirements in effect at the time of matriculation or to shift entirely to the new requirements, but may not choose parts of each set. As a result of the ongoing reviews of all programs, certain offerings and specializations may be deleted or restructured between editions of the *Undergraduate and Graduate Catalog*.

## URI CORNERSTONES

The University of Rhode Island is a principled community guided by values. As members of this community, we subscribe to the following principles which form the foundation of our endeavors.

- we pursue knowledge with honesty, integrity, and courage.
- we promote independent choice, intellectual curiosity, open-mindedness, and free expression.
- we respect the rights and dignity of each individual and group. We reject prejudice and intolerance, and we work to understand differences.
- we accept personal responsibility for our actions and their consequences.
- we actively cooperate to improve the University, the State of Rhode Island, and the global community beyond our borders.
- we strive to be a community where the environment and property are treated respectfully.
- we seek to create and maintain an environment conducive to personal health and wellness.
- we work to develop skills which promote lifelong learning, leadership, and service.

*Developed by the Quality of Student Life Committee and endorsed by the Student Senate, University of Rhode Island, spring 1994.*

# STUDENT LIFE AND SERVICES

**A**n enriching college life includes a well-balanced mix of academic and extracurricular activities. The University offers a unique blend of student organizations and activities with an emphasis on student-run services and businesses.

## Undergraduate Student Orientation

Orientation programs that facilitate the students' entry into the campus community are administered by University College. New students are charged a fee to cover expenses such as room, meals, and materials associated with their orientation program.

**Summer Orientation Workshops.** All undergraduate students who are beginning University careers are encouraged to attend a two-day workshop to plan their academic programs, to register for fall classes, to learn about the University, and to begin to acquire the skills essential for successful transition from high school and home to the University community. These programs are planned to personalize the student's first experience with the University as each one participates, with a group of approximately 15 classmates, in workshop projects. Admitted students begin receiving workshop registration materials in April.

Special programs are planned for families of new students to coincide with the workshop dates.

**Transfer Orientation Programs.** Transfer orientation is optional, but undergraduate students transferring to the University from another institution with 24 credits or less are encouraged to attend the full summer orientation program. Those with 24 credits or more who are admitted into University College, rather than any of the academic colleges, are invited to attend Transfer Day Orientation. This full-day program is presented during summer orientation. The workshop is designed to acquaint transfer students with some of the unique features and procedures of the University.



## Orientation for International Students.

Programs held at the beginning of the academic year offer assistance with immigration regulations, registration, financial problems, housing, banking, and social and cultural differences. Staff are on hand to help students adjust to life in the United States and to the University.

## Lifestyles

**Undergraduate Housing.** Residence halls and boarding facilities are available to students during the regular academic year and during summer sessions. Some students prefer the option of living in a fraternity or sorority.

*Residence Halls and Dining Centers.* There are 19 residence halls on campus offering a variety of living accommodations including coeducational housing, one all-female hall, an honors community, an engineering com-

munity, a wellness hall (where students practice the five points of the Wellness Program developed in Stevens Point, Wisconsin), and a hall for first-year students. Priority consideration for residence hall assignments will be given to returning students who have submitted a housing application fee by the posted deadline. A notice will be forwarded to all residence hall students during the spring semester to inform them of the deadline and the housing application procedure. After returning students have been assigned, first-year students who have paid their housing application fee by May 1 will be given priority consideration for the remaining spaces. All other students will be assigned on a space-available basis. Assignments of incoming students are made in the order in which their housing application fees are received. Every effort is made to honor roommate requests. For rates and contracts, see "Fees, Expenses, and Financial Aid," page 20.

Applications for residence hall living can be obtained from the Department of Housing and Residential Life, Roger Williams Building. Phone: 401-874-4151.

Three dining centers, two cash restaurants, a convenience store, a bakery, and a warehouse shopping center offer a wide variety of food items and are operated by the University for the convenience of the students. The centers were constructed with bond funds. In order to guarantee payment of these bonds, the University requires that all students living in residence halls purchase a meal plan.

Students can obtain a Ram Card Account, which is an optional debit card account accessed through the student ID card. Students who participate in this program may spend their money at the URI Bookstore, the Ram's Den, the America's Cup Room, as well as other locations. A minimum deposit of \$50 is required. Unused dollars are transferable from semester to semester until graduation.

*Fraternities and Sororities.* About 1,500 students participate in the fraternity-sorority system, which sponsors 18 houses designed for congenial small-group living. The staff of the Office of Campus Life advises these groups. The Greek houses promote scholarship, citizenship, and small-group living. Purchasing and business management for these houses is provided by a private corporation controlled by the fraternity and sorority members.

**Graduate Housing.** Interested students should write to the Department of Housing and Residential Life information.

**Commuting from the Family Home.** Many undergraduate and graduate students commute to the University from their family home. The advantages of home cooking, privacy, and lower costs are balanced against numerous challenges and opportunities: acquiring information about all aspects of the University; coping with transportation problems; balancing old and new relationships; budgeting one's time between academics, work, and home; and taking advantage of evening events on campus. Various services are coordinated by the Office of Student Life to meet commuter needs. Dining Services offers special meal plans for commuters, and the Commuter Center provides information about University life. A car-pool matching service as well as maps, bus schedules, and student publications are available in the Memorial Union Commuter Lounge, Room 317. A brochure describing commuter services is available from the Commuter Center, 401-874-2828.

**Commuting from "Down-the-Line."** A number of students live in houses or apartments in the southern Rhode Island area known as "down-the-line." Juniors and seniors as well as graduate students often choose to live off campus within a 10-to-15-mile radius of the University where summer homes are rented to students for the school year. Typically, a student will pay from \$300 to \$350 a month, plus utilities, for each bedroom in a furnished house. The majority of winter residents in these down-the-line summer communities are students who patronize nearby supermarkets, laundries, restaurants, shopping centers, and recreational facilities.

Since most of these rentals are five miles or more from campus, people without cars should investigate the availability of public transportation. A local bus service connects the shopping and service areas in Wakefield with the University. Some of the outlying resort areas, including Narragansett Pier, Galilee, and Scarborough, are also included in the bus routes. Bus service is also available to the Amtrak railroad station and Green Airport, and to Newport and Providence.

Off-Campus Housing, part of the Commuter Center, provides a computerized listing of rooms, apartments, and houses in the community available to students. They also offer a roommate matching service and assist students with information on landlord-tenant issues. Phone: 401-874-2828.

**Older Students.** Over 900 undergraduate students on the Kingston Campus are over 25 years old. The Independent Student Organization (ISO) was formed for these men and women, who chose not to, or were unable to, attend college right after high school. Some are married, with family responsibilities. Some also have jobs and are part-time students. Some older students are attending school with G.I. Bill benefits. Some have retired from a first career and want to prepare for a second. The ISO plans a variety of social and educational programs and provides space in the Memorial Union for studying, taking breaks, or meeting with other students. Services coordinated by the Office of Student Life include individual support and workshops for nontraditional students. Phone: 401-874-2101.

**Women Students.** Women students make up more than half of the student population (undergraduate and graduate). A Women's Center, administered by the Office of Student Life, provides specific resources to help women grow to their full potential. In addition, it coordinates lectures, programs, and activities of special interest to women. The Women's Center is located on campus at the corner of Alumni Avenue and Plains Road and has a lounge, a library, and meeting rooms. Phone: 401-874-2097.

**Multicultural Students.** Approximately 800 students use a variety of services for multicultural students. African-American, Native American, Asian, Latino, and Cape Verdean students have formed special-interest groups to further meet their needs. The Multicultural Student Center, located near the Memorial Union, serves as a gathering place for leisure, meetings, workshops, and various cocurricular activities. Counseling, programming, and other services are provided by the director and staff of Multicultural Student Services. Phone: 401-874-2851.

**International Students.** Approximately 1,000 international undergraduate students, graduate students, visiting scholars, faculty, and their dependents are advised and served by the Office of International Students and Scholars, located at 37 Lower College Road. Assistance is provided in the social, personal, financial, housing, and immigration areas. All communications from international faculty and scholars concerning nonimmigrant visas are also handled by this office. A number of national student organizations provides students with the opportunity to participate in cultural activities, and the University's International Center serves as a meeting place for study, social events, and other cocurricular activities. Phone: 401-874-2395.

**Disability Services for Students.** Disability Services for Students fosters a barrier-free environment to individuals with disabilities through education that focuses on inclusion, awareness, access, and knowledge of ADA and 504 compliance. The mission of the office is to encourage a sense of empowerment for students with disabilities by 1) providing a process that involves the student in the request for academic accommodations; 2) encouraging personal development through self-advocacy; 3) helping the student identify appropriate campus resources; and 4) encouraging and supporting a commitment to academic success.

Individuals who wish to discuss program and course accommodations and/or adaptive technology may contact the Director of Disability Services (DSS) in the Office of Student Life, 330 Memorial Union. Phone: 401-874-2098 (TT).

## Student Government

**Student Senate.** The Student Senate is a legislative body that represents the undergraduate students to the administration and the faculty and supervises extracurricular activities. It also distributes the Student Services fee among the various student organizations through its finance committee. Individual residence halls form their own governments. The Interfraternity Council supervises fraternity affairs and the Panhellenic Association governs sorority life.

### Graduate Student Association (GSA).

The GSA is a government body maintained by and for the graduate students of the University with the purpose of enhancing the academic, intellectual, and social opportunities of its members. Officers and members of the GSA Senate, which are elected annually from the entire graduate student body, distribute GSA funds and represent the graduate students to the University. The association has members on the Graduate Council. The GSA offices are located in the Memorial Union. Phone: 401-874-2339.

## University Student Discipline System

Administered by the Office of Student Life, the University Student Discipline System is designed to promote student growth and to preserve the atmosphere of learning necessary to the well-being of all students. Community standards of behavior and University policies for students are published in the *Student Handbook*. The Student Discipline System receives complaints or allegations from aggrieved parties, the available facts are gathered and evaluated, and the case may be referred for formal action to the University board or for administrative action. Sanctions range from "no further action" to suspension or dismissal from the University and may include education, counseling, fines, or other conditions relating to the nature of the violation.

## Student Involvement

### Student Programs and Organizations.

Social, recreational, cultural arts, and co-educational programs are sponsored by many different offices and student organizations at the University. These events are funded by student fees, and opportunities abound for students to become involved in selecting and coordinating them. Specifically, the Student Entertainment Committee sponsors an extensive series of social programs featuring concerts, local and regional musicians, other live entertainment, lectures, and films.

Approximately 80 student organizations exist in which students can get involved. Covering a wide range, these organizations may be social, political, academic, or media-related; several represent special-interest groups. Thousands of students participate in the activities coordinated by these organizations. For information, students are directed to Room 210 in the Memorial Union.

### The Office of Student Involvement and Experiential Learning.

Staff members in the Office of Student Involvement and Experiential Learning create special programs and workshops that foster student involvement and offer academic opportunities outside the classroom. They advise student organizations in all areas of group dynamics, leadership, personal growth and development, and program planning. In addition, they coordinate the popular weekly film series and sponsor the annual A. Robert Rainville Student Leadership banquet.

### The Center for Student Leadership Development.

The CSLD offers for-credit classes, positions, workshops, conferences, and programs designed to enhance students' leadership skills. The credit classes count toward the academic minor in leadership. Other academic opportunities include individually designed internships and the Peer Leaders for FLITE and Modern Leadership Issues classes. Popular programs and conferences include the First-Year Leadership Institute, the Outdoor Adventure Series, and the Real World Leadership Conference. In addition

leadership and group development consulting services are available to student organizations. For more information visit the Center in the Memorial Union, Room 210.

**Student-Run Businesses.** The Memorial Union offers students a number of opportunities to run businesses under full-time supervision but with a large amount of independence. Enterprises such as the flower shop, Memorial Union Technical Productions (sound and lighting), and the 193<sup>rd</sup> Coffee House allow for management training and for excellent work experience.

### Athletics and Recreation.

The Department of Athletics is committed to providing athletics and recreational opportunities to students, faculty, staff, and alumni. The department seeks to complement the University's academic goals by enhancing physical, emotional, and social well-being through leisure activities and lifetime involvement in sports.

The emphasis of the program is to provide opportunities that encourage the pursuit of lifetime activities, a sense of commitment and teamwork, and the development of personal character while maintaining an environment that values cultural diversity and gender equity among its student athletes and department staff.

The Athletic Complex provides a wide range of facilities in the Mackal Field House, Keaney Gymnasium, and Tootell Physical Education Center. Mackal Field House offers a six-lane, 200-meter indoor track; four multipurpose courts for basketball, tennis, and volleyball; motorized court-divider netting enabling simultaneous use of the track and courts; a gymnastics training center with two in-ground, foam-filled pits; and two fitness rooms containing a complete circuit of Cybex variable resistance weight training machines, plate-loading machines, Lifecycles, stair climbers, treadmills, and rowing machines. Keaney Gymnasium offers a 4,000-seat arena and men's and women's locker rooms. The Tootell Physical Education Center offers an aquatic center with competitive, instructional, and diving pools; East and West Gymnasiums with basketball, volleyball, and badminton courts; two varsity team weight rooms; and a dance studio.

Outdoor facilities include the 8,000-seat Meade Football Stadium, 12 tennis courts, softball and baseball fields, an all-weather track, a lighted varsity soccer game field, field hockey and soccer fields, two beach volleyball courts, and numerous practice fields for recreation, intramural, club sports, and intercollegiate athletic activities.

Women's intercollegiate teams participate in Division I basketball, crew, field hockey, gymnastics, soccer, softball, volleyball, cross country, indoor and outdoor track, swimming and diving, and tennis.

Men's intercollegiate teams participate in Division I-AA football, and in Division I baseball, basketball, golf, soccer, swimming, tennis, cross country, and indoor and outdoor track.

Competitive club sport teams participate in sailing, ice hockey, men's crew and volleyball, water polo, rugby, lacrosse, skiing, and equestrian riding. The Intramural Sports Program offers approximately 20 different sport activities and leagues throughout the year for all-male, all-female, and coeducational teams.

In addition to membership in the Atlantic 10 Conference, the University holds membership in the Atlantic 10 Football Conference, the National Collegiate Athletic Association, the Eastern College Athletic Conference, and the New England Intercollegiate Athletic Association.

**Honor Societies.** The University has chapters of a number of national honor societies, election to which is a recognition of accomplishment. The Society of the Sigma Xi is the scientific honor society, Phi Beta Kappa is a national liberal arts honor society, Phi Eta Sigma is a national honor society for freshmen, Phi Kappa Phi and the Golden Key are national honor societies for general scholarship, and Mortar Board recognizes scholarship and leadership. In more specialized areas are the following: Alpha Sigma Lambda (continuing education), Alpha Kappa Delta (sociology), Beta Alpha Psi (accounting), Beta Gamma Sigma (business), Beta Phi Mu (Beta Iota Chapter) (library science), Chi Epsilon (civil engineering national honor society), Delta Pi Epsilon (business education), Dobro Slovo (Slavic,

Epsilon Rho (continuing higher education), Eta Kappa Nu (electrical engineering), Financial Management Association (URI Chapter) (finance), Gamma Kappa Alpha (Italian), Kappa Delta Pi (education), Kappa Omicron Nu (O Alpha Mu Chapter) (family and consumer studies), Kappa Psi (pharmacy), Lambda Kappa Sigma (women's pharmacy), Lambda Pi Eta (Beta Gamma Chapter) (communication studies), Lambda Tau (medical technology), Omicron Delta Epsilon (economics), Order of Omega (fraternity/sorority), Phi Alpha Theta (history), Pi Kappa Lambda (Zeta Epsilon Chapter) (music), Phi Sigma Iota (foreign languages, literature, and linguistics), Pi Delta Phi (French), Pi Mu Epsilon (mathematics), Pi Sigma Alpha (Gamma Epsilon) (political science), Pi Tau Sigma (mechanical engineering), Psi Chi (psychology), Rho Chi (pharmacy), Sigma Delta Pi (Spanish), Sigma Iota Epsilon (management), Sigma Phi Alpha (dental hygiene), Sigma Pi Sigma (physics), Sigma Theta Tau (nursing), and Tau Beta Pi (engineering).

**Other Organizations.** In addition to intercollegiate athletic teams, a number of organizations represent the University in competition, exhibitions, and public performances. The University Band, Chorus, and Orchestra are under music department direction, and students may receive credit for participation in any one of these. The University Theatre, under the direction of the Theatre Department, presents several plays each year. The URI Debate Council is directed by members of the Department of Communication Studies and participates in intercollegiate debates. The Cheerleaders are active at varsity football and basketball games and rallies.

There are about 30 professional organizations on campus related to academic areas, and there are a number of groups serving social, recreational, cultural, religious, and political interests.

Students publish a newspaper four times a week, a monthly literary magazine, a monthly publication of political and social commentary, and a yearbook. Radio station WRIU, with local AM and FM reception that reaches all of Rhode Island and parts of

Connecticut and Massachusetts, is student-run and operates 365 days a year. Also, there is a 24-hour student-run ambulance service.

## Student Services

**Career Services.** Career Services, located in Room 228 in Roosevelt Hall, helps students assess goals, develop skills, and implement career objectives. All students, from freshmen to graduate students, may seek information and assistance at this office. It is staffed by professional career advisors and planning specialists who provide individual advising, noncredit workshops, and on-campus interviews with a broad range of potential employers. The Career Services staff helps students with exploration of majors and internships, job and career inquiries, resumé and cover letter writing, job search methods, and research concerning potential employers. Phone: 401-874-2311.

The Career Library at Career Services houses written materials, videotapes, self-assessment tools, computer programs, brochures, and company literature. A variety of materials provides information concerning specific careers, job openings, graduate programs, internships, and training programs. Individual publications are available upon request. Through Career Services, students may also attend special programs on careers and informational briefing sessions offered by employers. Each year, 200 to 250 companies and organizations conduct on-campus interviews for full-time jobs after graduation, and several hundred recruit at Job Fairs.

Students and employers can connect through the URI Career Services Telephone JobsLine. The JobsLine is a fast, effective, and free way for students to hear descriptions given by employers of new job openings 24 hours a day, seven days a week.

**Counseling Services.** The Counseling Center, located in Room 217, Roosevelt Hall, is staffed by professional counselors, psychologists, and social workers. It offers short-term individual counseling and a variety of skill-building and support groups to help undergraduate and graduate students cope successfully with demands. The Counseling

Center provides assistance to students in areas such as adjusting to university life, coping with stress, building satisfying relationships, and developing more self-esteem.

The Counseling Center also administers professional examinations such as the Miller Analogies Test, the Graduate Record Examinations, the Law School Admissions Test, the Medical College Admission Test, the National Teacher Examinations, and the Graduate Management Admission Test. The Center also offers preparation courses for many of these tests. Phone: 401-874-2288.

**University Chaplains.** The University chaplains are active in providing religious services and in counseling, advising campus groups, teaching, and programming. The chaplains are available to all students, staff, and faculty on a 24-hour basis. The six chaplains represent the Roman Catholic, Jewish, Episcopal, and Protestant communities; referrals are available to representatives of other faiths.

**Memorial Union.** The center for campus activities, the Memorial Union houses a wide variety of educational, social, cultural, and recreational services and facilities for both undergraduate and graduate students. These include meeting and conference rooms, lounges, a browsing room, study rooms, a darkroom, a radio station, campus newspaper offices, a games room, offices for student organizations, a scheduling and information office, a ballroom, a party room, an optical shop, a flower shop, a convenience store, a cafeteria, a restaurant, a pizza shop, the Underground Cafe, and an ice cream and pastry shop.

Among the services provided are a travel agency, a unisex hair salon, a credit union, a copy center, a bookstore, and the Memorial Union Technical Productions (which offers technical services in sound and lighting).

An undergraduate student board of directors working with the director and staff of the Memorial Union and Student Involvement Office determines policy for the Union and plans a full program of social, cultural, intellectual, and recreational activities.

**Health Services.** Located in the Potter Building, adjacent to the residence halls complex, University Health Services provides primary ambulatory care to the student community. Nurse practitioners and physicians see students by appointment Monday through Friday from 8 a.m. to 8 p.m. in the general medicine and women's clinics with laboratory, radiology, and pharmacy services available. Limited services with nursing, physician, and pharmacy are available on Saturdays, Sundays, and most holidays from 10 a.m. to 6 p.m.

Specialists in orthopedics, surgery, internal medicine, dermatology, gynecology, and psychiatry regularly hold clinics at the Potter Building. Allergy injections are given, provided the vaccines are supplied by the student. A travel/immunization clinic administers vaccines available from the pharmacy. The cost of care given in the Potter Building is through the mandatory health services fee supplemented by insurance reimbursement or direct billing for laboratory and radiology and a partial co-payment for pharmacy.

Hospital care is available in the local community, as is referral to specialists. All medical expenses incurred outside the University's Health Services are the responsibility of the student. Therefore, students are required to have adequate accident/sickness or health insurance. Students who choose a private physician assume responsibility for expenses incurred. See Accident/Sickness Insurance in the Fees, Expenses, and Financial Aid section for additional details or consult the Health Services brochure entitled "To Your Health."

Health educators provide a variety of services to promote and enhance personal health and well-being. Information on how to achieve a healthy lifestyle is provided through wellness clinics, outreach activities, awareness days, and dynamic peer education program workshops. A registered dietitian is available for nutrition education and counseling.

An Emergency Medical Service manned by student volunteer emergency medical technicians responds to campus emergency medical calls 24 hours a day and transports patients to Health Services or the South County Hospital Emergency Room.

**Learning Assistance Center.** The Learning Assistance Center, located in the basement of Roosevelt Hall, helps students improve their study techniques. Services are offered to students on an individual basis, in group workshops, and through peer tutoring. Individual sessions and workshops cover a range of topics including time management, strategies for improving reading and memory, test anxiety, and systems for taking notes. Peer tutoring in high-risk courses is offered at regularly scheduled times throughout the semester. The services of the center are offered primarily to undergraduates, but graduate students often rely on the center to renew former skills and for other forms of assistance. Phone: 401-874-2367.

## Confidentiality of Student Records

Procedures for the release and disclosure of student records maintained by the University are in large measure governed by state and federal laws. Where the law is silent, the University is guided by the principle that the privacy of an individual is of great importance and that as much information in a student's file as possible should be disclosed to the student on request. A current or former student has the right to inspect and review official records, files, and data directly related to that student. This right does not extend to applicants, those denied admission to the University, or those who were admitted but did not enroll. Some records are not available to students.

Third parties do not have access to personally identifiable records or information pertaining to a student without the written consent of the student who specifies that the records be released. Parents and spouses are considered third parties.

Detailed guidelines for the release and disclosure of information from the student records are available from the Office of Student Life. These guidelines comply with the legal requirements of the Family Educational Rights and Privacy Act of 1974, as amended.



# FEES, EXPENSES, AND FINANCIAL AID



## Determination of Tuition and Fees

*Tuition, fees, and policies set forth in this catalog are subject to change without notice. All charges are billed by the semester and are due and payable upon receipt of the bill or by the due date indicated on the bill.*

The amount of tuition and fees varies depending on whether the student is matriculated or nonmatriculated, whether the student is enrolled in full- or part-time study, whether the student is a legal resident of the state of Rhode Island, and by course sponsorship.

### Matriculated and Nonmatriculated Students.

All students who are seeking an undergraduate degree at the University must be admitted to *matriculated* status

by the Undergraduate Admissions Office. Students who have received their baccalaureate and who wish to earn a graduate degree at the University must be admitted by the Graduate School as *matriculated* students. Persons who wish to enroll for courses at the University but are not interested in pursuing a degree must register as *nonmatriculated* students. See the "Undergraduate Admission and Registration" and "Graduate Admission and Registration" sections for application procedures.

### Full-Time and Part-Time Students.

Matriculated undergraduate students enrolled in 12 or more credits per semester are considered *full-time students*. Matriculated graduate students enrolling in nine or more credits per semester and teaching and research assistants are also considered *full-time students*.

Matriculated undergraduate students enrolled in 1 to 11 credits are considered *part-time students*. Matriculated graduate students enrolled in 1 to 8 credits who are not teaching/research assistants are also considered *part-time students*.

### Resident, Nonresident, and Regional Student Status.

A student who is a *resident* of the state of Rhode Island pays the in-state fee, but a student from another state or a foreign country who is in Rhode Island primarily for educational purposes, even though he or she remains in the state during vacation periods, is considered a *nonresident* and pays the out-of-state fee.

The parents or legal guardians of a minor student must have been residents of the state for one year immediately preceding the first class day of the first term of a student's registration for that student to claim resident student status. A nonresident student who reaches 18 years of age while a student does not, by virtue of that fact alone, become a resident student.

An "emancipated student" must establish the same bona fide residency for in-

state tuition exemption. An emancipated student is one who has attained the age of 18, and whose parents have entirely surrendered the right to the care, custody, and earnings of the student and have not claimed the student as a dependent for tax purposes for two years. If any of these conditions is not met, he or she is presumed to be an unemancipated student.

A member of the armed forces (on active duty) or his or her spouse stationed in the state on military orders shall be entitled to classification as a resident student during any semester the first class day of which is encompassed by the orders.

Undergraduate students are classified as resident or nonresident by the Dean of Admissions, graduate students by the Dean of the Graduate School. A student may appeal the decision to the Board of Residency Review. The preceding information is a summary of the regulations governing student classifications for tuition purposes. The complete text of the regulations adopted by the Board of Governors for Higher Education can be obtained from the Office of Admissions and from the Graduate School Office.

A Certificate of Residence is included in the graduate self-managed application package.

*Regional status* is granted to students enrolled in the New England Regional Student Program, whereby students from other New England states may enroll in designated programs at URI that are not offered in their own states (see "New England Regional Student Program," in "Undergraduate Admission and Registration," page 29).

**Course Sponsorship.** Courses offered through the University's Kingston campus are considered Kingston-sponsored. CCE-sponsored courses are those courses offered through The Alan Shawn Feinstein College of Continuing Education at Kingston, Providence, and satellite locations.



**Matriculated Full-Time Students****Tuition Per Year***Undergraduate, CCE and Kingston*

Rhode Island residents	\$3,282
Out-of-state residents	11,286
Regional students	4,924

*Graduate, CCE and Kingston*

Rhode Island residents	\$3,446
Out-of-state residents	9,850
Regional students	5,170

**Mandatory Fees Per Year**

(1) Full-time undergraduate students enrolled in *seven or more Kingston-sponsored credits*, graduate students enrolled in *five or more Kingston-sponsored credits*, and graduate teaching and research assistants:

*Undergraduate*

Registration Fee	\$40
Student Health Services Fee	418
Memorial Union Fee	222
Library/Computing Fee	100
Student Services Fee	690
Accident/Sickness Insurance (may be waived)	514
<b>TOTAL</b>	<b>\$1,984</b>

*Graduate*

Registration Fee	\$40
Student Health Services Fee	418
Memorial Union Fee	162
Library/Computing Fee	100
Student Services Fee	556
Accident/Sickness Insurance (may be waived)	514
<b>TOTAL</b>	<b>\$1,790</b>

(2) Full-time undergraduate students enrolled in *less than seven Kingston-sponsored credits* and graduate students enrolled in *less than five Kingston-sponsored credits*, who are not teaching or research assistants:

*Undergraduates and Graduates*

Registration Fee	\$40
CCE Activity Fee	20
Arts & Culture Fee	66
Library/Computing Fee	100
<b>TOTAL</b>	<b>\$226</b>

**Matriculated Part-Time Students****Tuition Per Credit***Undergraduate, CCE and Kingston*

Rhode Island residents	\$137
Out-of-state residents	470
Regional students	205

*Graduate, CCE and Kingston*

Rhode Island residents	\$191
Out-of-state residents	547
Regional students	287

**Mandatory Fees Per Semester**

(1) Part-time undergraduate and graduate students enrolled in *only Kingston-sponsored courses*:

Registration Fee	\$20
Activity Fee	23
<i>(Undergraduate students only)</i>	
Graduate Tax <i>(Graduate students only)</i>	1

Memorial Union Fee	\$9 per credit
Library/Computing Fee	\$4 per credit
Student Services Fee	\$25 per credit

(2) Part-time undergraduate and graduate students enrolled in *only CCE-sponsored courses*:

CCE Activity Fee	\$10
Registration Fee	20
Arts & Culture Fee	\$3 per credit
Library/Computing Fee	\$4 per credit

(3) Part-time undergraduate and graduate students enrolled in *CCE and Kingston-sponsored courses*:

CCE Activity Fee	\$10
Registration Fee	20
Activity Fee	23

<i>(Undergraduate students only)</i>	
Graduate Tax <i>(Graduate students only)</i>	1
Library/Computing Fee	\$4 per credit
Memorial Union Fee	\$9 per credit
<i>(Kingston-sponsored courses only)</i>	
Student Services Fee	\$25 per credit
<i>(Kingston-sponsored courses only)</i>	
Arts & Culture Fee	\$3 per credit
<i>(CCE-sponsored courses only)</i>	

**Nonmatriculated Students****Tuition Per Credit**

	<i>Resident</i>	<i>Non-Resident</i>
001–499 Level Courses	\$137	\$470
500 and Above Level Courses	191	547

**Mandatory Fees Per Semester**

Registration Fee	\$20
Activity Tax	12
Library/Computing Fee	\$4 per credit
Arts & Culture Fee	\$3 per credit
<i>(CCE-sponsored courses only)</i>	
Memorial Union Fee	\$9 per credit
<i>(Kingston-sponsored courses only)</i>	
Student Services Fee	\$25 per credit
<i>(Kingston-sponsored courses only)</i>	

**Description of Mandatory Fees**

**Student Services Fee.** As part of the Student Services fee of \$690, each full-time undergraduate student is assessed \$92 per year, which is distributed to the Student Senate to support a wide variety of student programs and activities. The balance of the fee supports athletics, recreation, and arts and cultural programming, and the total budgets for Career Services, Multicultural Student Services, and the offices of the Vice President for Student Affairs, the Assistant Vice President for Campus Life, and the Director of Student Life. The \$556 Student Services fee paid by full-time graduates is used to support the above (except the undergraduate Student Senate assessment) as well as the Graduate Student Association.

**Memorial Union Fee.** A Memorial Union fee of \$222 is also assessed per year for undergraduates, \$162 for graduates.

**Student Health Services Fee.** The Student Health Services fee is mandatory for all full-time students. Part-time students at the Kingston Campus may elect to pay the fee. The fee is also charged for spouses when the University-sponsored Accident/Sickness insurance is taken. It covers outpatient care and other health services provided on campus with the exception of laboratory,

X-ray services, special OB/GYN procedures, orthopedic appliances, and certain pharmacy services. Outpatient care consists of all nursing, physician, and health education services, plus certain pharmacy services.

**Accident/Sickness Insurance.** It is the policy of the University of Rhode Island that all full-time students as well as international students and their dependents have current health insurance to provide coverage for unexpected, extended, and expensive care resulting from accidents and illnesses that are not covered by the Student Health Services fee. All full-time students and all international students and their dependents are required to pay this fee unless evidence of comparable coverage in another plan is provided to the University through a completed waiver form. Waiver forms are mailed out by Health Services. Students who did not receive a waiver form can pick one up from Health Services in the Potter Building or contact the Office of Health Services at 401-874-4755.

To waive the Accident/Sickness Insurance, a student must complete, sign, and return a hard-copy waiver to Health Services prior to the end of the add period (the first two weeks of classes). **Unless the fee is waived, the student will be billed.** The Accident/Sickness Insurance is optional for noninternational part-time students. However, students who elect insurance coverage through the University are required to pay the Health Services fee each semester they are registered students.

## Additional Fees

**Books and Supplies.** Both undergraduate and graduate students should expect extra expenses each academic year for books and supplies and should allow for additional expenditures for travel and personal needs.

**Credit Overload Fee.** A credit overload fee will be charged to all matriculated undergraduate students who register and/or

enroll in excess of 19 credits. This fee is equivalent to the per-credit rate given for part-time undergraduate students. Matriculated graduate students who register and/or enroll in excess of 15 credits will be billed at the per-credit rate given for graduate students. Students with combined enrollment at both the Kingston and CCE campuses will also be assessed the credit overload fee if enrollment exceeds the credit limits stated above.

**Enrollment Deposit.** An enrollment deposit is required from every undergraduate student accepted and is applied to the first-term bill. In-state students pay a \$150 deposit; out-of-state and regional students pay a \$300 deposit. The enrollment deposit is 100% refundable until May 1, 50 percent refundable until June 1, or 20 percent refundable until August 1, provided that the Admissions Office is notified in writing of the student's intention not to enroll.

**Returning Student Deposit.** Undergraduate students returning after an absence of one or more semesters are required to remit a nonrefundable returning student deposit of \$50.

**Off-Campus Study.** Undergraduate students taking courses at another institution for credit at URI pay a fee of \$157 per semester. (See "Off-Campus Study," in "Undergraduate Admission and Registration," page 30.)

**Graduate Continuous Registration Fee.** Graduate students maintaining continuous enrollment and registered for no credit (CRG 999) are required to pay a fee of \$211 per semester.

**Transcript Fee.** A transcript service fee of \$25 is assessed to all students in their first semester of enrollment at the University.

**Course Fees.** A laboratory/clinical fee of \$25 will be charged for each undergraduate and graduate laboratory or clinical course. Undergraduate engineering and pharmacy students will pay a program fee commencing in their third year: \$170 per

semester for full-time students, \$15 per credit for part-time students. Pharm.D. students will pay a program fee commencing in their fifth year of \$400.

Expenses connected with class trips and practice teaching are charged to the students concerned.

Students taking applied music courses, except for composition, are charged an additional fee of \$95 for a one-credit course (half hour of a private lesson per week) and \$190 for courses offering two, three, four, or six credits (one hour of a private lesson per week). Applied music courses for which students are charged an additional fee are MUS 110, 210, 310, 410, and 510.

Beginning in the sophomore year, student nurses must purchase authorized uniforms and nursing equipment. The approximate cost is \$300.

**Graduation Fee.** When near completion of studies, but prior to submitting a petition to graduate, each undergraduate student must pay a \$30 graduation fee. Graduate students must pay a \$30 graduation fee during their second semester of study. Master's degree candidates must pay a thesis-binding fee of \$18, and doctoral candidates must pay dissertation-binding and microfilming fees of \$83. These fees are due before candidates submit their theses or dissertations for approval by the Graduate School.

## Late Fees and Special Fees

**Late Registration Fee.** A late registration fee of \$55 is charged to students whose registration is not completed before the first Monday following the first day of classes.

**Late Payment Fee.** Unpaid balances following the term bill due date are subject to late payment/billing penalties which are based upon the outstanding amount due. The penalty is also applied to students who register late effective as of the end of the add period (first two weeks of classes) until date of registration and payment. The late

payment fee is not cancelled nor reduced without presentation of written evidence of University error signed by an official of the University. Late payment fees are: \$10 per month if the balance is over \$50 and under \$400; \$15 per month if the balance is between \$400 and \$999.99; \$25 per month if the balance is \$1,000 or more.

**Returned Check Fee.** A \$20 returned check fee is assessed with each check not accepted for deposit and returned by the bank.

**University Monthly Payment Plan.** The University offers a monthly payment plan to assist students and parents in meeting term bill obligations. A nonrefundable application fee is assessed upon enrollment. The application fee is \$30 per semester, or \$50 per academic year.

**Partial Payment Fee.** A \$30 fee is assessed when partial payments are received following the term bill due date.

**Collection Agencies.** Term bills which are not fully paid by the end of the semester are subject to collection activity by outside agencies.

**Reassessment of Fees Policy.** Fees are reassessed and adjusted according to credit enrollment, student status, residency, course level and course sponsorship. This results from drop/add transactions and status changes processed by the Registrar during the add period. The dropping of credits after the add period will not reduce term bills. Students anticipating fee adjustments must complete all drop/add transactions by the reassessment deadline. This policy pertains but is not limited to downward billing adjustments, including credit overload courses dropped; change in student status from full-time to part-time; part-time student dropping courses; and the assessment of program fees and lab/clinical fees, if charged.

**Tuition Waiver for Senior Citizens.** Any Rhode Island resident senior citizen who submits evidence of being 60 years of age or over, and of having a household income

of less than three times the federal poverty level, will be allowed to take courses at any public institution of higher education in the state with the tuition waived. However, students who qualify for waivers must apply for financial aid. Any aid received must be applied toward the amount waived. Admission into particular courses will be granted on a space-available basis and at the discretion of the receiving institution. All other costs of attendance are paid by the student.

**Tuition Waiver for Unemployed.** Any individual who submits evidence of currently receiving unemployment benefits from the State of Rhode Island, of having a household income of less than three times the federal poverty level, and of not being claimed as a dependent by a parent (or someone else) will be allowed to pursue course work at any public institution of higher education in Rhode Island with tuition and the registration fee waived. To be eligible for the waiver, the student must have been collecting benefits within 60 days before the first day of classes. However, students who qualify for waivers must apply for financial aid. Any aid received must be applied toward the amount waived. Individual students will be responsible for all other costs of attendance. Admission into particular courses will be granted on a space-available basis and at the discretion of the particular institution. This waiver also applies to any Rhode Island resident who submits evidence of residency and of currently receiving unemployment benefits in another state.

## Housing and Dining

**Following are the rates for University residence housing for undergraduates for the year 1998–99.** For complete information, write to the Director of Housing and Residential Life, Roger Williams Building. All rates are for double rooms. For single rooms, when available, \$178 per year is added to the double-room rate. Students living in residence halls are

required to purchase either a Board Plan or a Points Plan. For complete information, contact the Campus Access Office at 401-874-2055.

Room Rent per year:

\$3,462 Adams, Aldrich, Barlow, Bressler, Browning, Burnside, Butterfield, Coddington, Dorr, Ellery, Hopkins, Hutchinson, Merrow, Peck, Tucker, Weldin

\$3,782 Fayerweather, Gorham, Heathman

Meal Plans:

*Board Plans (per year)*

Any 19 meals (Mon.-Sun.)	\$2,704
Any 15 meals (Mon.-Sun.)	\$2,500
Any 10 meals (Mon.-Fri.)	\$2,270
Any 5 meals (Mon.-Sun.)	\$1,132

*Points Plans (per year)*

Level A (47,000 points)	\$2,338
Level B (61,400 points)	\$2,482
Level C (77,000 points)	\$2,638
Level D (92,400 points)	\$2,792

*Apartment Plan (per year)* \$1,132

*Commuter Plans*

Any 5 meals	
Plus 7,500 in Points (per year)	\$1,132
Any 16 meals	
with no term limit	\$150
Any 32 meals	
with no term limit	\$285

**Residence Hall and Dining Contract.** University housing is contracted for the *entire academic year*. A **nonrefundable** fee of \$100 is required at the time of application for a room. This application fee will be applied to the first-semester housing bill.

All residence hall rates are quoted for the period specified in the contract. Payments are due in full by the published term bill due date each semester or upon receipt of the bill from Housing and Residential Life. Checks are payable to the University of Rhode Island and should be remitted to the Office of the Bursar.

A student vacating his or her assigned quarters before the end of the period un-

der contract will be held responsible for the total charges for the entire period unless the move results from a withdrawal or leave of absence from the University. No refund will be given when a student moves from University quarters to a private home or decides to commute. Students who withdraw or take a leave of absence from the University mid-year may obtain Housing and Residential Life refunds based on the University refund policy.

The University is a nonsectarian institution, and resources are not available to construct special diet kitchens for religious, health, or personal reasons. Extreme medical problems are reviewed by a nutritionist. Some medical problems may be accommodated. Students requesting a medical variance from the meal plan must submit for approval a medical variance report from a physician to Dining Services prior to the first day of classes. Application forms may be obtained by contacting the Campus Access Office in the Memorial Union at 401-874-2055.

The University dining system operates on a computerized entry system using the student ID card. This card must be brought to all meals.

Students who withdraw from the residence halls may obtain Dining Services refunds based on the University refund policy posted in the Campus Access Office.

## University Refund Policies

Refund schedules for the fall semester are shown below. Refund schedules for the spring semester and examples of refund calculations are available at the Bursar's Office.

### Withdrawal of First-Time Students Receiving Title IV Federal Financial Aid.

First-time students (those who have never attended the University) receiving Title IV federal aid (Pell, SEOG, etc.) who withdraw from the University are subject to a federally regulated withdrawal refund policy. This policy may change as statutory and regulatory changes covering student financial assistance take effect. Under this

policy, the amount of tuition, fees, and room-and-board charges to be refunded is calculated according to the following schedule:

Attendance Period	% Refunded
9/9–9/18/98	90
9/19–9/29/98	80
9/30–10/9/98	70
10/10–10/20/98	60
10/21–10/30/98	50
10/31–11/10/98	40
11/11–End of Term	0

Amounts owed by the student and not paid by the withdrawal date are deducted from the residual bill amount when calculating the refund. An administrative fee of the lesser amount of either five percent of the term bill or \$100 is charged during September 9 through November 10.

### Withdrawal of Continuing Students.

Refunds of payments are made to continuing students or to first-time students who are not recipients of Federal Title IV Funds who officially withdraw from the University or take a leave of absence according to the following schedule:

Attendance Period	% Refunded
9/10–9/19/98	90
9/20–10/5/98	50
10/6–10/31/98	25
11/1–End of Term	0

Under this policy, registration, insurance, auxiliary, and similar fees are **not refundable** as of the first day of classes. Amounts owed by the student and not paid by the withdrawal date are deducted from the refund amount due the student. An administrative fee of the lesser amount of either five percent of the term bill or \$100 is charged during September 3 through September 9.

**Attendance Period.** For refund purposes under both policies, the attendance period begins on the first day of classes and ends on the official date of withdrawal or leave of absence. If an official date is not known, the last known date of attendance is used. Students who withdraw or take a leave of

absence during the add period (the first two weeks of classes) are assessed tuition and fees based upon the highest number of credits for which they are registered during this period.

The Accident/Sickness Insurance fee is not refundable unless the fee is waived, regardless of the date of withdrawal, since the student is covered for the entire academic year. The fee is cancelled, however, if the student withdraws prior to the first day of classes.

**Indebtedness to the University.** Failure to make full payment of all required fees or to resolve other debts to the University (for example, unreturned athletic equipment, overdue short-term or emergency loans, lost library books, debts to the Department of Housing and Residential Life for damages, and obligations required by the University Student Discipline System) may result in denial of registration for the following semester and/or disenrollment. Appropriate departments will provide the student with notice of the debt, reason for it, and a review, if requested. A student must fulfill all financial obligations to the University before receiving transcripts or a diploma.

## Financial Aid

Financial aid is money made available from federal, state, local, or private sources which helps students attend the post-secondary institutions of their choice. At the University of Rhode Island, these varied sources are administered by the Student Financial Aid Office in Roosevelt Hall. The financial aid programs are designed to serve students from the widest possible range of society, and all students are encouraged to apply.

In most cases, financial aid will be awarded in a "package" of grants (which do *not* have to be repaid), loans (which have to be repaid), and student employment opportunities (part-time jobs while attending school). The purpose is to assist the students in meeting the costs of attending the University. To continue receiv-

ing financial aid, it is necessary to reapply and demonstrate sufficient financial need each year as well as to maintain satisfactory academic progress.

Financial aid to students is awarded without regard to race, sex, religion, age, color, creed, national origin, disability, or sexual orientation, and without discrimination against disabled and Vietnam-era veterans.

**Financial Need.** A student does not have to be from a low-income family to qualify for financial aid, but does have to have "financial need." "Need" is the difference between what it costs to attend the University and what the student and family can contribute from financial resources. Parents, insofar as they are able, are expected to bear primary responsibility for financing a son's or daughter's college education, and the student is also expected to earn a portion of the resources for college expenses, usually through summer employment.

**Eligibility.** Only citizens, nationals, or permanent residents of the United States are eligible to apply for financial aid. Foreign students desiring information about financial assistance should contact the Office of International Students and Scholars at the University.

To be considered for financial aid, a person must have been accepted and enrolled at least half time (six credits for undergraduates, five for graduate students) as a matriculated student at the University. Enrolled students must be making satisfactory progress toward their degree according to the University's policy on satisfactory progress (see page 24, this section).

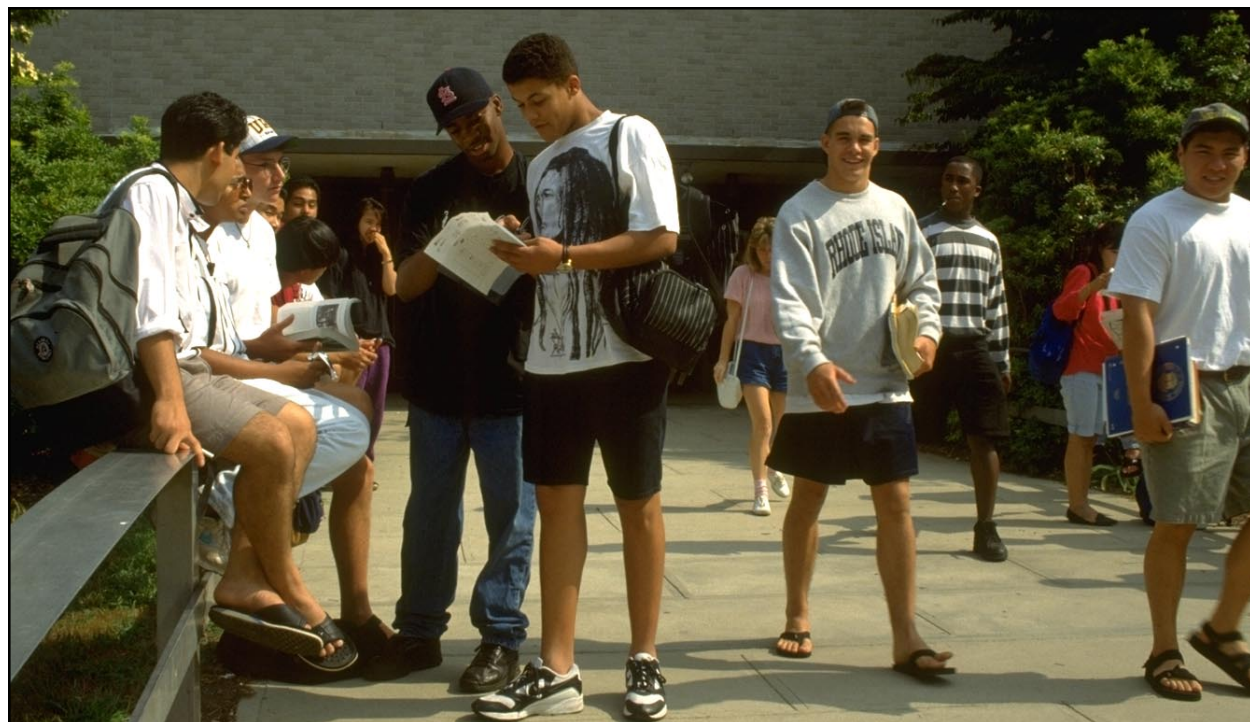
**Application Procedure.** All students are to complete a Free Application for Federal Student Aid (FAFSA). This form is also used to apply for most state scholarships, including those for Rhode Island and Massachusetts. Residents of other states should check with their state scholarship or grant authority to inquire if another form is needed to apply for state scholarship funds.

The awarding of financial aid for the current academic year may require validation and documentation of all information submitted to the Student Financial Aid Office. Therefore, students must provide signed copies of their own and their parents' last U.S. Income Tax Returns 1040/1040A/1040EZ. When and if requested by the Student Financial Aid Office, all tax schedules must also be included.

**Application Priority Dates.** The FAFSA should be mailed to Federal Student Aid Programs after January 1, and no later than March 1. Applications completed on or before the above priority dates will receive first consideration for financial aid awards; however, applications will be processed as long as funds remain available.

#### **Federal Aid Available**

*Federal Pell Grants.* The Pell Grant, available to undergraduates, is designed to form the foundation of all financial aid received. Each applicant is mailed a set of Student Aid Reports, which should be forwarded



to the Student Financial Aid Office. The amount of the Pell Grant is calculated according to the cost of attendance, the number of credits for which the student enrolls, and the Pell Grant Index printed on the Student Aid Report.

*Federal Supplemental Educational Opportunity Grant.* This program is intended to assist undergraduate students with financial need. First priority is given to students receiving Pell Grants. These awards are available in amounts ranging from \$100 to \$4,000 per year.

*Federal Perkins Loan.* Eligibility is based on exceptional financial need. Undergraduates may be eligible to borrow up to \$3,000 for each year of undergraduate study, with a maximum of \$15,000. Graduate students may be eligible to borrow up to \$5,000 for each year of graduate and professional study. All undergraduate and graduate loans are limited to a total of \$30,000. These loans have a simple interest rate of five percent annually. Interest does not accrue until nine months after graduation, termination of studies, or enrollment for less than half time. Minimum payments of \$90 per quarter are required, and the repayment period may extend up to 10 years. Deferments and cancellations of principal are allowed in certain circumstances.

*Nursing Student Loan Program.* This program is available to undergraduate students enrolled in the College of Nursing. The long-term, low-interest loans become due and payable nine months after graduation or termination of nursing studies. The loans are designed to assist financially needy students in attaining careers in nursing.

*Health Professions Student Loan Program.* This loan program is restricted to undergraduate students with financial need majoring in pharmacy.

*Federal Work-Study Program.* This federally supported program provides undergraduates with part-time employment during

the school term and full-time employment during vacation periods. The jobs may be either with University departments, or with off-campus, nonprofit, nonsectarian, and nonpolitical agencies. Other institutionally funded employment is also available. A listing of these jobs is maintained by the Student Financial Aid Office.

*Federal William D. Ford Direct Loan.* All students who complete the Free Application for Federal Student Aid can participate in the William D. Ford Direct Loan. Those students who meet the financial need criteria may receive in whole or in part a subsidized loan where the federal government pays all interest until six months after graduation, withdrawal, or a drop in enrollment status to less than half time. Unsubsidized loans are available for those students who do not qualify for the need-based subsidized William D. Ford loan. Those eligible to borrow under the unsubsidized William D. Ford Direct Loan program include independent undergraduate students, graduate and professional students, and certain dependent undergraduate students. The same terms and conditions as for subsidized William D. Ford loans apply, except that the borrower is responsible for the interest that accrues while the student is still in school. The annual loan limits are \$4,000 for first- and second-year undergraduates, and \$5,000 for undergraduates in their third year or higher. Graduate and professional students may borrow up to \$18,500. The aggregate loan limits (for full-time students) are: \$23,000 for undergraduates and \$73,000 for graduate and professional students.

*Federal William D. Ford Direct Loan for Parents.* Parents who have good credit may borrow up to the cost of education minus estimated and actual financial aid by submitting an application to the Student Financial Aid Office. If the loan is approved, it will be disbursed in multiple installments, usually at the beginning of each semester. The interest rate is variable; the current rate is 8.72 percent and can go no higher than 9 percent. A four percent origination

fee is deducted from loan proceeds at the time of disbursement.

*Family Education Loan (FEL).* Credit-worthy parents, an estimate based on debt-to-income ratio, may borrow up to \$15,000 for undergraduate students through this program. A fixed interest rate of 7.5 percent is charged, and parents can take up to 10 years to repay. A one-time \$25 processing fee is charged for each application. Eligible parents may also take advantage of the home equity options when applying for this loan.

### University Aid Available

*University Grant.* The University provides grants to over 1,000 undergraduate students. To be awarded a University Grant, the student must demonstrate financial need and a satisfactory academic record.

*Arthur L. Hardge Memorial Grant.* This grant is awarded to economically and socially disadvantaged undergraduate residents of Rhode Island who participate in the Special Programs for Talent Development.

*T.A. Suddard International Grant.* A limited number of partial tuition awards are made to undergraduate international students, based on financial need. Recipients are chosen by the International Scholarship Committee.

*University Scholarships.* Scholarship awards require not only financial need but evidence of high academic potential. Some scholarships have specific restrictions, such as place of residence, major, and class year. A list of available scholarships can be found in the Appendix.

*Athletic Grants.* These grants are made on the recommendation of the Department of Athletics to athletes who meet the established qualifications. These awards are based on athletic ability rather than on need. Students interested in such assistance should contact the Department of Athletics.

*Regular Student Employment.* Positions funded by the University are available to more than 1,500 undergraduate and graduate students. Job postings are available in the Student Financial Aid Office.

*University Loans.* Emergency loans ranging from \$10 to \$200 are available to full-time undergraduate and graduate students. These loans are short-term in nature (14–90 days), and can be made only when there is a means of repayment. Application forms are available in the Student Financial Aid Office.

### Other Sources of Aid

*Rhode Island State Scholarships and Grants.* Undergraduate residents of Rhode Island are encouraged to apply for Rhode Island State Scholarships or Grants. While both are based on need, the scholarships also require a strong academic record in high school. The Rhode Island State Scholarship and Grant Program is administered by the Rhode Island Higher Education Assistance Authority, 560 Jefferson Boulevard, Warwick, RI 02886. Other states offer similar programs; for more information, contact your state's scholarship agency.

There are many additional sources of financial aid available to students who qualify: scholarships from private organizations, clubs, labor unions, fraternities, sororities, and businesses. Students should apply directly to the source if they believe they qualify. See the Appendix for a list of loans, scholarships, and special awards available to undergraduate and graduate students.

**Policy on Satisfactory Academic Progress.** The Education Amendments of 1980, P.L. 96-374, October 3, 1980, state that “a student is eligible to receive funds from federal student financial aid programs at an institution of higher education if the student is maintaining satisfactory progress in the course of study he or she is pursuing according to the standards and practices of that institution.”

*For Undergraduate Students.* To maintain satisfactory progress as an undergraduate student at the University of Rhode Island for federal financial aid purposes, the student must be enrolled in a degree-granting program on at least a half-time basis (six credits) for each semester during which aid is received. Students enrolled full-time may receive aid for 10 semesters in completing what is normally a four-year program. Students completing what is normally a five-year program are permitted to receive aid for the equivalent of 12 full-time semesters. Part-time students may receive equivalent aid, with an accumulation of 12 credits corresponding to a full-time semester. Two full-time (six credits) summer sessions are considered the equivalent of one semester. The determination of a transfer student's eligibility includes the semesters of federal financial aid received prior to attendance at the University of Rhode Island.

Satisfactory progress standards will conform to the University's academic standards, as delineated in the *University Manual*. Students who are placed on academic probation will be notified of the possibility of their loss of federal financial aid eligibility. Students on academic probation for two consecutive semesters and students who are academically dismissed will be ineligible to receive federal financial aid. Criteria for probation and dismissal appear in the *University Manual*. A student who is declared ineligible to receive aid for not maintaining satisfactory academic progress may appeal the decision to the Satisfactory Progress Appeals Committee. Readmission to a program or removal from probation does not automatically constitute eligibility for federal financial aid.

Failure to maintain satisfactory progress for two consecutive semesters will result in the loss of eligibility for federal financial aid until the student is determined by the Student Financial Aid Office to be once again making satisfactory academic progress.

If there are unusual circumstances that result in the student's inability to make satisfactory progress, the student should write

a letter of appeal documenting the unusual circumstance(s) and submit the letter to the Satisfactory Progress Appeals Committee, c/o the Assistant Dean of Student Financial Aid.

*For Graduate Students.* To maintain satisfactory progress as a graduate student at the University of Rhode Island for federal financial aid purposes, the student must be enrolled in a degree-granting program on at least a half-time basis (i.e., five credits) for each semester during which aid is received. The courses must be at the graduate level and applicable to the student's approved program of study. Master's degree candidates have eight semesters to complete degree requirements on a full- or part-time basis. Students who are not in residence during the academic-year terms and who have received special permission from the Dean of the Graduate School have 14 summer sessions in which to complete requirements. Two summer sessions totaling at least five credits will be considered one part-time semester; two summer sessions totaling nine credits will be considered one full-time semester. Doctoral degree candidates have 14 semesters in which to complete their degrees, regardless of whether they matriculate with an earned master's degree.

Master's and doctoral students who have completed all course requirements including thesis research shall be considered to be making satisfactory progress at least at the half-time rate if they are registered for at least one thesis credit, or continuous registration for those in the non-thesis option. All students must be enrolled for consecutive semesters until graduation unless an official leave of absence has been approved. If students do not exercise the leave of absence option and fail to register, they are considered to have voluntarily withdrawn.

For further information, see the *Graduate Student Manual* or consult the Student Financial Aid Office.

## Graduate Fellowships, Assistantships, and Scholarships

Detailed information (stipends, allowances, tenure, etc.) on graduate fellowships, assistantships, and scholarships is available from the Graduate School Office. They are awarded by the Graduate School to students selected from nominations submitted by department chairpersons. Students are advised to request nomination for these awards by the chairperson of the department in which they plan to study or in which they are currently enrolled at the University.

Graduate students on URI fellowships, assistantships, and scholarships are expected to be full-time students (12 credits per semester) in good academic standing, and are not eligible for additional employment unless written permission is received from the Graduate School.

Graduate students have access to a national computerized database of fellowships and other financial assistance opportunities available to students pursuing advanced degrees, completing dissertation research, or seeking postdoctoral positions.

**Fellowships.** Fellowships are awarded to graduate students in recognition of their achievement and promise as scholars. They are intended to enable students to pursue graduate studies and research without rendering any service to the University.

*URI Diversity Graduate Fellowships* are awarded by the Graduate School to students from minority and underrepresented groups. *URI Foundation Minority Fellowships* are also available to students from minority and underrepresented groups, with nominations usually made by departments to the Graduate School.

*Special Fellowships* are supported by various industrial firms, private foundations, and individuals, and are usually restricted to students in particular areas of study and research. The stipends and supplemental allowances of these fellowships are not uniform.

URI Fellows receive a stipend of at least \$9,205 for the academic year and have tuition and the registration fee paid from University funds. URI Fellows are responsible for the remaining fees. Those wishing to be considered for fellowships must have their application file completed no later than February 1.

**Graduate Teaching Assistantships and Research Assistantships.** Assistantships are awarded to full-time graduate students to provide them with teaching and research training. Assistants may be required to provide service for up to 20 hours per week. Appointments are initiated by department chairpersons. To be eligible for such an appointment, students must first be admitted as degree candidates. Applications for assistantships should be completed by February 1. Appointments are announced in early April.

*Departmental Graduate Assistants* assist, under supervision, with instructional and/or research activities of a department. Not more than 10 hours per week will be in classroom contact. Graduate assistant stipends for the 1998–99 academic year range from \$9,205–\$10,085, depending upon qualifications. In addition, tuition and the registration fee (12 credits maximum) are paid from University funds for each semester of the academic year of the appointment. The student is responsible for the remaining fees. Additional remuneration is given for appointments during the summer, although this cannot be guaranteed. Stipends and tuition remissions for students appointed to partial assistantships will be prorated for the period of the appointment. The student will be responsible for the remainder of the full-time tuition and fees. The same policy applies to assistantships terminated during the academic year.

*Graduate Research Assistants* are assigned to individual research projects sponsored either by the University or by an outside agency. On supported research contracts and grants, the graduate research assistants are expected to devote

20 hours per week to research activities. For this they normally receive a stipend ranging from \$9,205–\$10,085 for nine months. In addition, tuition (12 credits maximum) and the registration fee are paid in each semester of the academic year of the appointment. The student is responsible for the remaining fees. Additional remuneration is given for appointments during the summer months. Stipends and tuition remissions for students appointed to partial assistantships will be prorated for the period of the appointment. The student will be responsible for the remainder of the full-time tuition and fees. The same policy applies to assistantships terminated during the academic year.

**Tuition Scholarships.** These scholarships cover tuition and registration fee and are awarded by the Graduate School from University funds. These scholarships are awarded to qualified students demonstrating financial need. Application forms are available in the Graduate School Office.



# UNDERGRADUATE ADMISSION AND REGISTRATION

Ideally, admission to the University is a process of mutual selection. It is hoped that those students who seek admission will also be the kind of students sought by the University: those who will benefit from the educational opportunities afforded by the University; those who will be stimulated and challenged by doing undergraduate work in an environment that includes scholarly research and graduate study; those who are committed to becoming contributing members of the University.

## Admission to the University

Students are selected for enrollment primarily on the basis of their academic competence and without regard to race, sex, religion, age, color, creed, national origin, disability, or sexual orientation, and without discrimination against disabled and Vietnam-era veterans.

The University has been authorized under federal law to enroll nonimmigrant foreign students.

All freshmen pursuing four- or six-year degree programs are admitted to University College, a college of advising and academic student services. Many students who are undecided about their choice of major use the year or two in which they remain in University College to explore their interests before declaring a major. Students who have identified their prospective majors are assigned faculty advisors in that area and follow their chosen course of study while in University College. The University evaluates applicants' credentials in terms of their stated prospective majors and the space available in professional programs with limited enrollments.

**Admission Requirements.** Admission to the University is competitive, and primary emphasis in the review process is placed on a student's high school record, the quality of courses taken, and the grades earned. Performance on standardized tests

(SAT or ACT), extracurricular activities, alumni tradition, and letters of recommendation are considered. The students offered admission for fall 1997 presented an average class rank in the top 30 percent of their high school class, with recentered SAT scores of approximately 1,100 combined.

SAT or ACT tests are required for freshman candidates, but transfer students from another college are assessed mainly on their earlier college records. Each candidate is given individual consideration; however, a minimum of 18 units of college preparatory work is expected: four units in English, three in algebra and plane geometry, two in a physical or natural science, two in history or a social science, two in a foreign language, and additional units that meet the requirements of the college in which the candidate expects to major. All students are encouraged to select their additional units from the arts, humanities and foreign languages, mathematics, social sciences, or laboratory sciences. Candidates for the College of Engineering, and majors in chemistry, computer science, and physics, must complete four units of mathematics (trigonometry). Candidates for the College of Engineering should also select chemistry and physics. Applicants to the Bachelor of Music degree program must audition and must contact the Department of Music for specific requirements. Candi-



dates with 23 or more transferable college credits are classified as transfer students.

Students presenting official GED results in lieu of a high school diploma must present secondary school or college records that show successful completion of all the admissions requirements listed here.

International candidates must submit certified copies of original documents (in the original language) and notarized translations in English. Candidates must meet the University's academic requirements. They must show that they possess funds for their first year and that funds for subsequent years will be available. If government or reserve bank permission is required to transfer funds from the student's country to the United States, a notarized copy of the permission is required. No financial aid is available to international students.

**Application Procedures.** Students should discuss their plans for study at the University with their academic counselors as early as possible to establish realistic goals and program selections. Admissions counselors at the University will be glad to correspond with students about individual problems.

Requests for application forms and information should be sent to the Undergraduate Admissions Office, University of Rhode Island, Green Hall, 8 Ranger Road, Kingston, RI 02881-2020.

Inquiries from international students concerning nonimmigrant visas, transfers, funding, etc., should be sent to the Office of International Students and Scholars, University of Rhode Island, 37 Lower College Road, Kingston, RI 02881-1966. Inquiries concerning housing should be sent to the Department of Housing and Residential Life (for on-campus residence) or to Off-Campus Housing.

Students are enrolled at the beginning of the fall semester in September and at the beginning of the spring semester in January. *Not all programs enroll new students in January.* High school seniors are urged to submit applications early in their final year of preparatory study, since the University reviews applications on a continuing basis as soon as complete credentials are submitted. Applicants are notified as soon as decisions are made. The closing date for fall term freshman applications is March 1; transfer applications are due by May 1. Most decisions are reported in February, March, and April. The closing date for spring term applications is November 1.

*Early action* is taken on the application of any freshman candidate who has established a superior academic record and above-average scores on the CEEB Scholastic Aptitude Test, and whose potential as a superior student is reflected in the secondary school endorsement. Applications meeting these qualifications which are clearly labeled "early action candidate" are considered on a priority basis if filed before December 15.

**Entrance Tests.** All freshman candidates for admission must take the Scholastic Aptitude Test (SAT) or the American College Testing Program Test (ACT). Applicants who have been away from formal studies for at least three years should contact the Undergraduate Admissions Office about entrance requirements.

Applicants are encouraged to take the SAT as early as possible in their senior year; delay beyond January reduces a candidate's prospects for a timely decision. Full information concerning this test may be obtained from local high schools or by writing to CEEB Headquarters at P.O. Box 592, Princeton, NJ 08540. Further information regarding the ACTs is available from the American College Testing Program, P.O. Box 168, Iowa City, IA 52243.

Students whose first language is not English are encouraged to submit their official Test of English as a Foreign Language (TOEFL) or English Language Placement Test (ELPT, an SAT II examination) results to supplement their SAT verbal scores. International candidates for whom English has not been the language of instruction must submit official TOEFL examination results of 550 or better or ELPT examination results of 965 or better. The TOEFL examination is administered by the Educational Testing Service, Princeton, NJ 08540. For information about the ELPT, write to CEEB Headquarters at P.O. Box 592, Princeton, NJ 08540.

**Interviews.** Personal interviews are recommended, but they are not required of all applicants. It would be impossible for the admissions staff to interview all candidates, but individual conferences can be arranged with professional staff and student interviewers on a space-available basis.

**Question and Answer Sessions.** These are scheduled each week during the year while school is in session. Students and their parents are invited to participate in these meetings to get acquainted with the University. Visitors are asked to phone ahead to confirm available dates. Call 401-874-7100.

**Campus Tours.** Students conduct daily tours of the campus for visitors, Monday through Saturday, while classes are in session. Group tours for high schools and other organizations may also be arranged. For more information, call 401-874-7100. Tours of the Narragansett Bay Campus and

the Graduate School of Oceanography may also be arranged. Call 401-874-6211 for details.

**Admissions Inquiry Line.** Candidates may check the status of their applications from a touch-tone telephone from November through May, Monday through Friday, from 8:30 a.m. to 4:30 p.m. Eastern time. Instructions are forwarded to candidates when applications are received.

**Early Enrollment (Early Admission).** Students who have completed their junior year of high school with superior records are eligible for early admission. A part-time study program may be arranged for students who wish to begin college study in their senior year while continuing their high school work. A full-time program may be arranged for those recommended for college admission without completion of the standard preparatory program.

Early admission students will normally have completed: three years of English, three years of mathematics, two years of foreign language, two to three years of social studies or history, and two years of natural or physical science. Students should be academically competitive within their high school class, have corresponding scores on the College Board PSAT, SAT, or equivalent tests, and the endorsement of their school.

Interested persons should plan with their high school counselor early in their junior year and direct further inquiries to the Undergraduate Admissions Office.

**Advanced Standing.** Advanced placement for freshmen is granted to students who have completed college-level courses in a high school participating in the Advanced Placement Program and have passed with a grade of 3.00 or better the CEEB Advanced Placement Examination in the following subject areas: art history, art studio (drawing and general), biology, chemistry, computer science (AB), English (language and composition; literature and composition), French (language and literature), German (language), history (European and United States), Latin (Vergil and Catullus-

Horace), mathematics (calculus AB and BC), music theory, physics (B; C, mechanics; and C, electricity and magnetism), Spanish (language and literature). For a current list of University courses considered equivalent to advanced placement classes, please contact the Undergraduate Admissions Office.

In addition, students can take proficiency examinations administered by departments of the University to be granted advanced placement. Entrance with advanced standing can accelerate the completion of degree requirements, or it can enrich the undergraduate program with greater scope for elective or advanced courses.

**Transfer Students.** Transfer students who have attended, or are attending, another college or university must have official transcripts sent directly from the institution, whether or not they expect or desire credit for such work; their high school record must also be submitted. Transfer candidates must be in good standing and eligible to return to the institutions they attended previously. Credit will not be awarded for course work taken prior to admission to the University which is disclosed after acceptance. Only grades of C or better will transfer.

Credit transferred from a community or junior college is limited only by the provision that the student must earn at least half the credits required for the University of Rhode Island degree at a baccalaureate-granting institution. No more than 60 credits from a two-year institution may be applied to a bachelor's degree.

Transfer candidates for the College of Pharmacy are admitted for the third year only. They must present credentials for the successful completion of the following courses: General Chemistry I and II (including labs), Calculus I, General Zoology (or Biology I and II), Anatomy, Physiology, Organic Chemistry I and II, Microbiology, Biochemistry, and Biostatistics (or Statistics).

A minimum cumulative quality point average of 2.50 is required, but most successful applicants have much higher quality point averages. Certain programs may require a higher quality point average or specific prerequisite courses. Candidates accepted with transfer credit are classified as freshmen, sophomores, juniors, or seniors according to the number of credits accepted for transfer. The transfer of General Education credits is described in "Undergraduate Program Requirements," page 31. Priority consideration will be given to applicants presenting 24 or more transferable credits. Students may apply to the teacher education programs only after acceptance by an academic department. Some colleges do not enroll new transfer students every semester.

**Proficiency Examinations.** Students who show evidence of advanced knowledge or who have taken "enriched" programs in high school may be exempt from certain courses and requirements if they take departmental proficiency examinations.

A student who successfully passes such an examination earns credits as well as exemption from the course. However, students who, by successfully passing proficiency examinations, have the General Education requirements waived in writing (Cw), mathematics (M), and/or foreign languages or culture (F) must still complete the specified number of credits for their degree programs.

Upperclass students interested in taking these exams should contact their academic dean. New students may obtain further information during orientation or from their assigned advisor in University College.

**College Level Examination Program.** Students who have not been pursuing formal studies for at least three years may take the *CLEP General Examinations* to demonstrate academically measurable learning acquired in nontraditional ways. URI students must secure prior approval from their academic dean to take the exams for credit, and the exams must be taken during the first semester of a student's enrollment. Transfer

students may receive credit from CLEP General Examinations taken prior to enrollment at URI provided that their scores meet URI standards and provided that their academic dean judges that the CLEP credit does not duplicate other transfer credit.

CLEP General Examinations may be taken in the following areas. URI credits for these are shown in parentheses.

	Minimum score
English Composition (English Composition elective, 3 credits)	460
Humanities (Fine Arts and Literature elective, 6 credits)	420
Natural Science (Natural Science elective, 6 credits)	410
Social Science (Social Science elective, 6 credits)	430
Mathematics (no credit)	

Academic departments may use *CLEP Subject Examinations* as proficiency exams to test students' mastery of the subjects taught by the department. A department that judges a CLEP Subject Examination to be a satisfactory proficiency exam decides what credit should be awarded within the department to students who pass the exam, establishes the minimum score for credit, decides whether students must answer the optional essay questions supplied by CLEP, and decides whether students must pass a supplementary department test, such as a lab exam. The following CLEP Subject Examinations are accepted by departments as proficiency examinations.

Subject (URI credit)	Minimum raw score	Minimum percentile
American Government (PSC 113)	47	38th
American History (HIS 141, 142)	45	40th
American Literature (ENG 241, 242)	46	37th

Analysis and Interpretation of Literature (ENG or WRT 103)	49	43rd
Biology (BIO 104A, 104B)	49	47th
College Algebra–Trigonometry (QBA 101)	49	50th
Educational Psychology (EDC 312)	47	40th
English Literature (ENG 251, 252)	46	38th
General Chemistry (CHM 101, 102, 112, 114)	47	45th
General Psychology (PSY 113)	47	39th
Human Growth and Development (HDF 200 or PSY 232)	47	38th
Introduction to Business Management (MGT 301)	50	50th
Introductory Accounting (ACC 201, 202)	N/A	50th
Introductory Business Law (BSL 333)	51	50th
Introductory Marketing (MKT 301)	50	50th
Introductory Sociology (SOC 100)	48	40th
Western Civilization I (100-level HIS elective)	46	52nd
Western Civilization II (100-level HIS elective)	47	52nd

**NOTE:** For English Composition, three additional credits may be earned by completing a writing sample test administered by the College Writing Program. For American History and Western Civilization I and II, essays are required.

**Health Questionnaire.** Every newly entering student is provided a health questionnaire from Health Services. These questionnaires must be completed and returned promptly. They provide Health Services with basic health information prior to the student's arrival on campus. Questionnaires are distributed only after admission to the University and play no part in the process of acceptance to the University.

Each entering student must also, in accordance with Section 16-38-2 of the General Laws of Rhode Island, provide a certificate signed by a licensed physician giving the dates of immunizations to protect against rubella (German measles) and rubeola (measles). This certificate is included with the questionnaire that is mailed to students. Students failing to comply with this requirement may face sanctions on registration.

**New England Regional Student Program.** Through a cooperative plan sponsored by the New England Board of Higher Education, students from other New England states may enroll in designated programs at the University of Rhode Island which are not offered in their own states. Certain programs at other New England state universities are open to Rhode Islanders on a reciprocal basis. Regional students at the University will be charged the in-state fee plus a surcharge of 50 percent. If at any time a student transfers out of the New England Regional Student Program, out-of-state fees will apply.

Details on the operation of this program are available on request from the New England Board of Higher Education, 45 Temple Place, Boston, MA 02111, or from high school guidance offices. All new undergraduate or graduate students apply for regional student status through the Undergraduate or Graduate Admissions Office as part of the application process. The Office of the Registrar provides information pertaining to this program for students who are already enrolled at the University.

Continuing or returning students claim eligibility by submitting a formal request to the Office of the Registrar prior to the end of the add period of the semester in which regional status is to be effective.

**Special Programs for Talent Development.** The University encourages the application of economically, socially, and culturally disadvantaged individuals from Rhode Island. To encourage and assist such applicants, the University has instituted recruiting and prematriculation programs. Financial aid is available for students accepted to

Talent Development; need is determined by the filing of a Free Application for Federal Student Aid (FAFSA) form.

Interested prospective students should apply to Special Programs for Talent Development during their senior year in high school. Those who have been out of high school for some time and those with an equivalency diploma are also encouraged to apply. Applications and all credentials should be sent to the Undergraduate Admissions Office, University of Rhode Island, Green Hall, 8 Ranger Road, Kingston, RI 02881-2020, during the application period beginning October 1 through March 1.

**Readmission.** Students formerly enrolled at the University and seeking re-entry may obtain applications for readmission at the Office of the Registrar. Readmitted students must make a \$50 advance deposit. All applications for readmission must be submitted to the Office of the Registrar no later than August 15 for the fall semester, and December 31 for the spring semester.

## Registration

All students must register for courses through the Office of the Registrar in order to be properly enrolled.

**Registration.** Matriculated (official degree-seeking) students who meet the eligibility requirements as defined in the *Schedule of Courses* generally register in April and October for the following semester. However, freshmen entering in the fall semester may register at specified dates during the summer as part of the summer orientation program.

Students are expected to register for courses before classes begin. Those who are unable to do so may enroll as late registrants at the Office of the Registrar during the first two weeks of classes. A late registration fee shall be charged to students whose registration is not completed before the first Monday following the first day of classes (see "Fees, Expenses, and Financial Aid," page 19).

Additional information is available from the Office of the Registrar.

**Nonmatriculating Students.** Such students must contact the Office of the Registrar for permission to enroll and for registration instructions. Registration for nonmatriculating students begins after matriculated students have registered.

**Schedule of Courses.** The *Schedule of Courses* is published in March for the fall semester and in October for the spring semester. It is available in the Office of the Registrar. The University reserves the right to cancel courses offered in the *Schedule of Courses*.

**Payment of Fees.** Arrangements must be made with the Bursar for complete and timely payment of tuition and/or fees. If during the semester it becomes apparent that a student has not met his or her financial responsibilities to the University, sanctions will be imposed. Sanctioned students may not be allowed to receive transcripts or register for future semesters.

**Drop and Add.** Students are permitted to continue to add courses through the first two weeks of classes only. Courses offered by the Alan Shawn Feinstein College of Continuing Education may be added, with approval of the instructor, by the prescribed University deadline.

Students may drop courses before midsemester according to official procedures determined by the Office of the Registrar. However, courses dropped after the end of the second week of classes will not affect the fees that have been assessed (see "Reassessment of Fees Policy" in "Fees, Expenses, and Financial Aid," page 20).

A student may drop a course after the end of the drop period only in exceptional circumstances and only with authorization of the dean of the college in which the student is enrolled.

**Auditing.** Auditors are persons who have permission to attend a course but are not taking the course for credit. Auditing is not permitted in noncredit courses. An auditor may be admitted to a class on a space-available basis with the consent of the instructor as indicated by the instructor's

signature on an audit authorization form; this form must be filed in the Office of the Registrar before the end of the "add" period. The course instructor will determine the extent to which an auditor may participate in class activities. An auditor's name will not appear on official class rosters, and the course will not be noted on the student's grade report or permanent academic record.

*A student must be enrolled in at least one other course to be permitted to audit a course without additional fees.*

**Off-Campus Study.** A full-time student who wishes to study at another college or university and use that course work to satisfy graduation requirements at the University of Rhode Island may register for off-campus study. The student must obtain signed approval for the off-campus courses from the dean of his or her college.

Off-campus study includes summer sessions, one or two semesters at another American university, or study abroad. A student may not ordinarily study off campus during the senior year. Students who wish to maintain registration eligibility while studying off campus must register for off-campus study for each semester of absence from the University of Rhode Island, or take an official leave of absence for that period.

**Veterans Administration Educational Benefits.** Full information describing these benefits can be obtained from your base education officer or from the Veterans Administration Regional Office, 380 Westminster Mall, Providence, RI 02903. The toll-free number for inquiries from within the United States is 1-800-827-1000.

Veterans enrolled in Kingston Campus courses who are eligible to receive VA educational benefits must notify the Office of the Registrar in person. In order to satisfy Veterans Administration regulations, students who receive VA educational benefits must report all changes in academic status to the veterans registration clerk in the Office of the Registrar. Veterans enrolled in courses through the Alan Shawn Feinstein

College of Continuing Education must be certified by that college.

Recipients of VA educational benefits are also governed by the same University policies as are all other students and therefore are responsible for completing those procedures described in the *Schedule of Courses* for effecting changes of status (such as the adding and dropping of courses, change of address, and withdrawal from the University).

**Transcripts.** Students can obtain a copy of their transcripts by submitting a written request to the Office of the Registrar. Transcripts will not be issued to students who have unpaid financial obligations to the University.

**Change of Address.** It is the responsibility of the student to report changes of local or home address to the Office of the Registrar. Students may make changes of address by telephone by dialing 401-874-2816 and following the instructional prompts.

**Required Identification.** In order to obtain a University ID card and to be certified for employment, students must have in their possession a photo identification card, such as a driver's license, and a certified copy of their birth certificate. A valid passport will serve both of these purposes.

# UNDERGRADUATE PROGRAM REQUIREMENTS

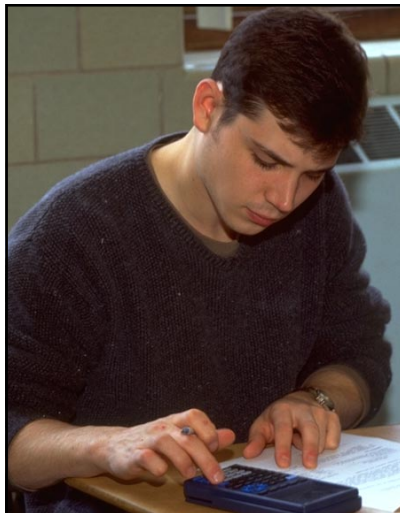
**C**onsistent with its policy of allowing the greatest latitude possible in course selection, the University offers a wide choice to fill its General Education requirements and encourages students to select free electives that cross departmental and college lines.

This section deals with academic requirements, regulations, and opportunities for undergraduates which are University-wide rather than college-related.

**NOTE:** The University administration may alter, abridge, or eliminate courses and programs of study. While every effort is made to keep this catalog current, not all courses and programs of study listed may be available at the time of the student's matriculation. Similarly, course and program requirements may be changed from time to time. In all cases, every effort will be made to accommodate individual students whose exceptional circumstances may make it difficult or impossible to meet the changed requirements. Changes in the academic calendar may also be made when deemed to be in the best interests of the institution.

## General Education Requirements

The University believes that all undergraduate students, regardless of their degree programs, need experience in the study of fundamentals which builds on the student's previous education and continues through the undergraduate years and beyond. All bachelor's degree students follow the same University-wide General Education requirements. In their first semester, all entering freshmen and new transfer students with less than 24 credits are required to take **URI 101 Traditions and Transformations: A Freshman Seminar**, including community service provided by the Feinstein Enriching America Program (see "Courses of Instruction," page 297).



General Education is that part of the undergraduate curriculum in which students explore a broad spectrum of intellectual subjects, approaches, and perspectives. The General Education component of the curriculum aims to help accomplish three goals: 1) to develop further the essential English communication abilities on which advanced studies depend; 2) to offer experience in five broad subject areas: fine arts and literature, letters, mathematics, natural sciences, and social sciences; and 3) to expose the student to a foreign language or culture.

Corresponding with these goals, the General Education program is divided into the following components:

**English Communication.** *Six credits* in English communication, at least three of which must be in a course designed specifically to improve written communication skills

**Fine Arts and Literature.** *Six credits* in courses related to historical and critical study of the arts and literature as well as creative activity

**Foreign Language or Culture.** *Six credits* or the equivalent in a foreign language or foreign culture

**Letters.** *Six credits* in courses that address fundamental questions about the human condition, human values, and ways of communicating these values

**Mathematics.** *Three credits* in a course specifically designed to provide training in college-level quantitative skills and their application

**Natural Sciences.** *Six credits* in courses in physical, chemical, or biological sciences

**Social Sciences.** *Six credits* in courses related to the study of the individual (development and behavior) and society.

*Specific courses that may be used to meet these requirements are listed in the following groups:*

**English Communication: Writing (Cw)**—BGS 100; CMS 101; ELS 112, 122; ENG 103; HPR 112; WRT 101, 103, 123, 201, 227, 235, 301, and 333. **General (C)**—CMS 101; COM 101 and 103; HPR 111; PHL 101.

**Fine Arts and Literature (A):** AAF 247, 248; ARH 120, 251, 252, 284, 285, 359, 364, 374; ART 101, 103, 203, 207, 215, 231, 233; CLA 391, 395, 396, 397; CLS 160, 250, 335; COM 231; ENG 160, 241, 242, 243, 247, 248, 251, 252, 260, 263, 264, 265, 280; FRN 391, 392, 393; GER 392; HPR 101, 105; ITL 325, 326, 391, 392, 395; LAR 201; MUS 101, 106, 111; PLS 233; RUS 325, 326, 391, 392; SPA 305, 306, 307, 308, 325, 391, 392, 393; THE 100, 181, 351, 352, 381, 382, 383.

**Foreign Language or Culture (F):** This requirement shall be fulfilled in one of the following ways: 1) a two-course sequence in a language previously studied for two or

more years in high school through at least the 103 level in a living language or 301 in a classical language appropriate to a student's level of competence (e.g., 102 and 103, 102 and 301; 131 and 103; 103 and 104; 301 and 302); 2) demonstration of competence through the intermediate level by a proficiency examination or by successfully completing the 104 level in a living language or the 302 level in a classical language (students who fulfill this requirement through an examination cannot earn course credit for graduation; students who earn less than six credits in fulfilling the requirement should apply credits to the elective or major areas); 3) course work in a language not previously studied (or studied for less than two years in high school) through the beginning level; 4) study abroad in an approved academic program for one semester; 5) majoring in a foreign language; 6) course work selected from one foreign culture cluster taken, if possible, in the same or successive semesters from the following list: *Africa*, AAF 250, APG 250, 313, HIS 388, PSC 408; *American Indian*, APG 303, 311, HIS 344; *Ancient Greece and Rome*, ARH 354, CLA 391, 395, 396, 397, ENG 366, GRK 109, 110, HIS 111, 303, PHL 321; *East Asia*, HIS 171, 374, 375, PHL 331, RLS 131; *France*, ARH 265, FRN 392, 393, HIS 330; *Germany*, GER 392, HIS 326, 327; *Ireland*, APG 325, IRE 391, 392, WMS 333; *Israel*, HIS 378, PSC 321; *Latin America*, APG 315, HIS 180, 381, 382, 384, 385, SPA 393; *Medieval Europe*, ARH 356, HIS 112, 304, ITL 395, PHL 322; *Middle East*, HIS 176, 177, 376, 377, PSC 321; *Modern British Civilization*, ENG 252, HIS 123; *Modern Europe (Early)*, ARH 359, HIS 113, 306, 307, 314, PHL 323; *Modern Europe*, ARH 363, HIS 114, 310, 311, PSC 401; *Renaissance in Europe*, ARH 365, HIS 305, ITL 391, SPA 391; *Russia and the Soviet Union*, HIS 132, 332, 333, RUS 391, 392, PSC 407; *URI in England*, ENG 397, HIS 397. In addition, HPR 106 may be used by students in the Honors Program to fulfill this requirement. *Formally registered international students and students with a recognized immigrant status will be exempt from the foreign language or foreign culture requirement.*

**Letters (L):** AAF 150; APG 327; BGS 392; CLS 235; COM 200, 205, 210; HIS 111, 112, 113, 114, 115, 116, 118, 123, 130, 132, 141, 142, 145, 150, 171, 176, 177, 180, 304, 305, 306, 307, 309, 310, 311, 314, 321, 323, 324, 327, 328, 332, 333, 340, 341, 346, 353, 354, 360, 376, 377, 381, 382, 384, 398; HPR 104, 107, 203; JOR 110; LAR 202; LET 151, 351; NES 200; NUR 360; PHL 103, 204, 210, 212, 217, 235, 314, 318, 321, 322, 323, 324, 325, 328, 331, 346, 355; PSC 240, 341, 342; PSY 310; RLS 111, 125, 126, 131; WMS 220, 333.

**Mathematics (M):** BAC 120; CSC 201; HPR 108; MTH 107, 108, 111, 131, 132, 141, 142; STA 220.

**Natural Sciences (N):** APG 201; AST 108; AVS 101; BCH 342; BGS 391; BIO 104A, 104B, 112, 113, 286; CHM 100, 101, 102, 103, 105, 112, 114, 124, 191, 192; FSN 207; GEL 100, 102, 103, 110; HPR 103, 109; MIC 102; NRS 212; OCG 110, 123, 131, 401; PHY 109, 110, 111, 112, 130, 140, 185, 186, 203, 204, 205, 213, 214, 273, 274, 275, 285, 286; PLS 150; TMD 113.

**Social Sciences (S):** APG 200, 202, 203, 220, 319; BGS 390; CNS 220; COM 220; ECN 100, 201, 202, 381; EDC 102, 312; ENG 232, 330; GEG 100, 101, 104; HDF 220; HLT 123; HPR 102, 110; HSS 350; LIN 200, 202, 220; MGT 110; NRS 100; NUR 150; PSC 113, 116, 201, 221, 288; PSY 103, 113, 232, 235, 254; REN 105; SOC 100, 102, 204, 206, 212, 214, 216, 224, 238, 240, 241, 242, 316, 330, 336; TMD 224; WMS 150.

Students in the Honors Program can receive General Education credit for honors sections of courses that have been approved for General Education credit.

Transfer students can receive General Education credit for courses taken at other institutions as long as such credits are in courses equivalent to courses given General Education credit at the University of Rhode Island.

**Students must meet the curricular requirements of the colleges in which they plan to earn their degrees. Some colleges require that students select**

**specific courses from the lists given for the various General Education Components. Therefore, students must refer to the requirements specified for their programs (see "Undergraduate Programs," page 43).**

In the Colleges of Arts and Sciences and Human Science and Services and for the Bachelor of General Studies, credits within a student's own major may not be counted toward General Education requirements in Fine Arts and Literature, Letters, Natural Sciences, or Social Sciences. In other colleges, credits within a student's professional college may not be counted toward any General Education requirements. However, courses that serve as prerequisites for a major can be used to fulfill the General Education requirements.

## Other Academic Requirements

Certain basic courses are required in many curriculums for transfer from University College into a degree-granting college in the junior year. These are listed in the curriculums of the individual colleges.

The responsibility for meeting all course and credit requirements for the degree must rest with each individual student.

Students who desire to accelerate their programs and receive credit for courses taken at other institutions or during Summer Session or in the Alan Shawn Feinstein College of Continuing Education must have prior approval from their academic deans.

## Minor Fields of Study

Undergraduate students may declare a "minor" field of study. Requirements for a minor may be satisfied by completing 18 or more credits in: 1) any one of the University-approved minors; 2) a curriculum other than the student's major; or 3) related studies from more than one department under the sponsorship of a qualified faculty member. Descriptions of approved interdepartmental minors follow. Descriptions of requirements for approved departmental minors may be found in the departmental sections.



To declare a minor, a student must have the approval of the department chairperson of the minor field of study and of the dean. Faculty sponsorship is required for the third option listed above. Students in the College of Business Administration need the approval of the Scholastic Standing Committee for the third option.

A minimum quality point average of 2.00 must be earned in the minor courses, and at least 12 of the 18 credits must be at the 200 level or above. At least half of the credits required for the minor must be earned at the University of Rhode Island. General Education requirements may be used for the minor, but no course may be used for both the major and minor field of study. Minor courses may not be taken on a pass-fail basis.

Application for the minor must be filed in the academic dean's office no later than the beginning of the student's final semester or term.

## Interdepartmental Study

Students are encouraged to develop interests across departmental lines. A number of such programs are available both as areas of interest or minors, and as degree programs. The interdepartmental minors are given in the following list; for interdepartmental majors in African and Afro-American studies, comparative literature studies, consumer affairs, environmental plant biology, human science and services, public relations, textile marketing, and women's studies, refer to the Index at the back of this catalog. For degree programs in marine and environmental studies, see page 35.

### African and Afro-American Studies.

Students who declare African and Afro-American studies as a minor are required to take two core courses: AAF 201 and 202 (six credits). In addition, students select four electives (12 credits) from the following: AAF 250, 360, 390, 410; APG 313; COM 333; ECN 404; ENG 247, 248, 362, 363, 364, 474; HIS 150, 384, 388; and PSC 408. Students who want to use other courses that have as their central focus

some aspect of the black experience may do so with permission from the program director.

**Biology.** Students who declare biology as a minor must take BIO 112; BIO 113; and MIC 211 or MIC 201. The remaining courses may be selected from BCH 311 and any BIO or MIC course. At least 18 credits are required; at least 12 of the 18 credits must be taken at the 200 level or above.

**Comparative Literature Studies.** Students who declare comparative literature studies as a minor must earn 18 credits distributed as follows: six credits in comparative literature studies at the 200 level or above; 12 credits from literature courses in comparative literature, English, or languages, of which six credits must be in one national literature either in the original language or in translation. Students majoring in English or languages may not count courses in their major toward this minor. For a description of the degree program in comparative literature studies, see "Undergraduate Programs."

**Consumer Affairs.** Students who declare a minor in consumer affairs are required to complete 18 credits including CNS 220, 320, and 420. The remaining nine credits can be selected from CNS 210, 321, 340, 342, 350, 415, 422, 440, 457, or other courses approved in consultation with CNS faculty. For a major in consumer affairs, see "Undergraduate Programs."

**Film Studies.** Students who declare a minor in film studies must complete 18 credit hours of courses in which film or video is the primary text of study, including a minimum of three credits in each of the three following approaches to film study: *Aesthetic* (ARH 374, ART 215, 316); *Cultural* (AAF 300H, HIS 358, ITL 315); and *Literary* (ENG 300, 346). ENG 302 and WMS 350 may be used to satisfy the requirement in any one of the three approaches above. Experimental and special topics or other irregular courses in film may be used to fulfill requirements for this minor in some particular way specified in writing by the instructor of the course.

**General Business.** Students who wish to gain some business career skills may declare general business as a minor. This minor requires 21 credits hours including ACC 201, BAC 110, ECN 201, and MGT 110. The remaining nine credits may be selected from any offerings in the College of Business Administration; however, six of the nine credits must be at the 300 or 400 level. Students are required to meet all prerequisites.

**Gerontology.** The program in gerontology is a University-wide program that promotes study, teaching, and research in aging. It also maintains relationships with state and local agencies serving the older population of Rhode Island. This affords opportunities for research, internships, and field experiences to students interested in the problems of aging.

The adulthood and aging option within the Bachelor of Science program in human development and family studies is the recommended major for gerontology. There is also the opportunity for students taking their major studies in a number of areas to do a less specialized study in aging by declaring a minor in gerontology. This must be done no later than the first semester of the senior year. It requires 18 or more credits in aging-related studies approved by the program in gerontology and the college in which the student is registered.

HDF 220 (Gerontology: Theory and Application) is required for either specialization. It also meets a social science requirement in General Education. Undergraduate gerontology courses include: CNS 342; DHY 462; FSN 395; HDF 221, 420, 431; and SOC 438. Also relevant are HDF 380, 421, 450; NUR 349, 360; BIO 242; and the University Year for Action.

It is important to take courses that fulfill degree requirements from the beginning. Students who wish to specialize in aging are advised to contact the program in gerontology early in their university studies.

**International Development.** The international development minor is available to undergraduates interested in employment overseas or in domestic enterprises with international operations.



Students choosing the international development minor must complete 18 credits, with a maximum of six credits at the 100 or 200 level. Students must complete the following: 1) RDV 300 (three credits); 2) language or culture (six to nine credits), to be met by the completion of at least six language credits through the intermediate level (103 or 104) or placement in the conversation and composition level (205 or 206) and completion of at least six credits in the same language or culture cluster. Placement for course work is determined by the Educational Testing Service exam as administered by the University's Department of Modern and Classical Languages and Literatures in the following languages: French, Spanish, German, and Russian. The University also offers Portuguese and selected other languages that, with permission, could satisfy the requirement. Six credits are allowed in the General Education requirements for language and culture; 3) an approved internship (three to six credits) providing international development experience during the junior or senior year (RDV 487); and RDV 495 (three credits) of an advanced-level seminar. See "Courses of Instruction" for descriptions of RDV 300, 487, and 495.

The College of the Environment and Life Sciences administers the program; interested students should contact Professor David Abedon, Rodman Hall, or Professor Donald McCreight, Woodward Hall.

**Justice, Law, and Society.** Students declaring a minor in justice, law, and society must complete a minimum of 18 credits from among the courses listed below. At least three credits must be completed in each of the three groups. The courses marked with an asterisk have prerequisites not included in this program; students are responsible for completing these prerequisites prior to enrolling in the course. Other courses, such as topics courses, may be approved for credit by the program coordinator. Interested students should contact Professor Leo Carroll, Department of Sociology and Anthropology, Chafee Hall. Law: APG 326; ECN 337, 415; PHL 430;\*

PSC 288,\* 369,\* 471,\* 472.\* *Social Justice*: AAF 201; APG 311, 322; ECN 305,\* 381; HIS/AAF 150; HIS 328, 344, 346, 349, 351,\* 352,\* PHL 210, 217, 314,\* 318,\* PSY 480,\* SOC 240, 242, 316,\* 413,\* 428,\* 438,\* 472,\* WMS 150, 310. *Criminal Justice*: ECN 403; HDF/SOC 437,\* PSC/SOC 474,\* PSY 254,\* 261, 335,\* 460, 465,\* 466; SOC 314,\* 330,\* 331,\* 420.\*

**Leadership Studies.** The minor in leadership studies is based on a broad cross-disciplinary philosophy of leadership. The goal is to prepare students for leadership roles and responsibilities. The minor will provide students with opportunities to develop and enhance a personal philosophy of leadership that includes understanding of self, others, and community as well as the acceptance of responsibility inherent in community membership. The curriculum is focused on expanding students' knowledge, skills, and understanding of specific leadership theories, concepts, and models in applied settings.

The minor includes the following three areas: education which consists of exposure to leadership theories, concepts, and models (Core); leadership training which is directed at skill areas in leadership (Skills); developmental aspects which require academic and co-academic experiences and reflection intended to empower students to mature and develop greater levels of leadership complexity, integration, and proficiency (Application).

To declare a minor in leadership studies, a student must inform the academic advisor, and then file an enrollment form through the Department of Human Development and Family Studies. A member of the Advisory Committee will then be assigned to work with that student and academic advisor in the capacity of a "program advisor." The program advisor will facilitate the student's progress through the minor and will help ensure that both courses and minor requirements are completed.

Sponsored by a program advisor from the Leadership Advisory Committee, a student must complete 18 or more credits

related to leadership offered by more than one department. Requirements include: a core of nine credits as follows: 1) a choice of an introductory course (HDF 298A or HDF 298W); 2) a choice of a capstone course (MGT 402 or HDF 498); 3) a two-credit internship with specific requirements including conceptual understanding; skill development through experience and feedback; and personal awareness, assessment, and growth. Each internship credit requires 40 hours of fieldwork (80 hours total). The specific internship course will depend on the student's particular major or depend on the specific supervisor and/or advisor for the internship site. 4) a one-credit portfolio course, which will be directed by the instructor(s) of the capstone course. The portfolios are multi-dimensional collections of work that reflect the students' experiences in and out of the classroom as they relate to leadership knowledge, training, and experiences. The goals of the portfolios will be discussed when a student decides to choose the leadership studies minor and will be assessed as part of the capstone course experience. Each student's program advisor will work with the student on the development of the portfolio as an ongoing project. All entries should be directly related to the student's goals regarding individually desired knowledge, skill development, and experiences. Reflection is an important part of the portfolio as well. Therefore students will consider the strengths and weaknesses of their particular accumulation of skills and knowledge in each area and their assessment of how to improve their overall learning.

Students will also choose nine elective credits from the following approved courses. Other courses may be appropriate and may be added to this list with the approval of the Leadership Advisory Committee: AAF 300L; COM 101, 103, 210, 220, 302, 400, 415, 450, 460; HDF 498A, 498W; MGT 300, 301/302, 303, 306, 401, 407, 408; PHL 212; PSC 304, 369, 504; THE 221, 341; WMS 150, 310, 350T, 350Y, 350U/SOC 300P.

*Leadership Advisory Committee:* Jayne Richmond, (University College and New Student Programs), *acting program head;* John Boulmetis (Education); Victor Capellan (Center for Student Involvement and Leadership Studies); Bruce Hamilton (Director of Memorial Union); Geoff Leatham (Communication Studies); Ann Morrissey (PDLOT); Jerry Schaffran (Human Development and Family Studies); Rick Scholl (Management); Christine Wilson (Center for Student Involvement and Leadership Studies); Stephen Wood (Communication Studies).

**New England Studies.** Students who declare New England studies as a minor must take either NES 200 or 300 and elect at least one course from each of the following four categories. *Aesthetic Dimensions:* ART 263; ENG 340, 347. *Cultural Patterns:* APG 317; ENG 337; PSC 221. *Historical Dimensions:* HIS 335, 346, 362. *Physical Dimensions:* BIO 323, BIO 418; GEL 101; NRS 301, 302. Permission can be obtained from the Committee for New England Studies to use any rotating topics course, seminar, etc., whose focus is on some aspect of New England as a substitute for any of the above courses.

**Public Relations.** Students can minor in public relations by completing one statistics course and 18 credits of courses from communication studies, journalism, and marketing, as specified. Applicable statistics courses are STA 220, 308, 409 and BAC 201. Communication studies majors take JOR 220, 340, 345, MKT 301, and two additional MKT courses. Journalism majors take COM 210, 302, 320, MKT 301, and two additional MKT courses. Marketing majors take JOR 220, 340, 345 and COM 210, 302, 320. Other majors take two applicable courses in communication studies, journalism, and marketing. The minor in public relations is coordinated by the Department of Journalism. Interested students should contact Professor Barbara Luebke, Chafee Hall.

**Special Populations.** This interdepartmental minor gives students the opportunity to explore the theory and gain practical experience through working with people who

have special needs. This includes people who are handicapped (physically, emotionally, mentally, or educationally) or are different (socioeconomically, behaviorally, culturally) and as a result have special needs.

A minimum of 18 credits may be earned by taking the required courses (HDF 200 or PSY 232; PSY 442), a minimum of three credits in supervised field experience, and a minimum of nine credits of selected electives.

Courses are chosen in consultation with an advisor from one of the participating departments: Communication Studies; Education; Food Science and Nutrition; Human Development and Family Studies; Nursing; Physical Education and Exercise Science; Psychology; Sociology and Anthropology; Textiles, Fashion Merchandising, and Design; or Theatre. The College of Human Science and Services administers the program. For information, interested students should contact Associate Dean Leo O'Donnell, acting program head.

## Marine and Environment-Related Programs

Interest in marine science and oceanography at the University dates back to the mid-1930s. Over the past three decades, this strong emphasis on marine studies has extended to environmental topics, developing into an array of undergraduate programs in the natural, physical, and social sciences.

There are over 20 majors with a marine or environmental focus offered by departments in three of the colleges of the University. In the College of Arts and Sciences, the majors are biological sciences, biology, chemistry and chemical oceanography, environmental plant biology (offered jointly with the College of the Environment and Life Sciences), marine biology, and physics and physical oceanography. In the College of Engineering, the majors are chemical engineering, chemical and ocean engineering, and ocean engineering. In the College of the Environment and Life Sciences, the majors are aquaculture and fish-

ery technology, environmental economics and management, environmental plant biology, environmental science and management, food science and nutrition, geology, geology and geological oceanography, marine affairs, marine resource development, microbiology, resource economics and commerce, water and soil science, and wildlife biology and management. Several of the majors are offered jointly with the Graduate School of Oceanography.

Working with academic advisors, students can identify their majors and select the courses best suited to their individual academic objectives and career goals. A list of relevant courses appears under the heading "Marine and Environmental Topics" in the section "Courses of Instruction."

## Preprofessional Preparation

Competition for places in graduate professional schools is keen, and a superior academic record throughout college is necessary for admission to these schools. Since requirements for the professional schools vary in their "essential" and "recommended" subjects, the student should consult the catalog of the professional school and then plan his or her undergraduate program accordingly.

Those seeking careers as social workers can enroll as majors in sociology, including in their curriculum the social welfare courses. A basic foundation for graduate study, whether directed toward college teaching or research careers, can be provided through any of the liberal arts or science majors. The Bachelor of Arts curriculum provides specific majors for those planning to become journalists or public school teachers.

**Prelaw Studies.** For students who plan professional study of law, guidance and program advice are provided by departmental advisors assigned in University College and by major advisors within various departments and colleges.

Students interested in law school should consult the *Prelaw Handbook*, prepared by the Association of American Law Schools and the Law School Admissions

Council. The association finds it inappropriate, given the wide range of a lawyer's tasks, to prescribe either a set of prerequisite courses for prelaw students or preferred major departments. Rather, it recommends that students choose their majors according to their own individual intellectual interests and "the quality of undergraduate education" provided by various departments and colleges. "Shortly stated, what the law schools seek in their entering students is ... accomplishment in understanding, the capacity to think for themselves, and the ability to express their thoughts with clarity and force." The association emphasizes that "the development of these fundamental capacities is not the monopoly of any one subject-matter area, department, or division."

**Plan for Early Contingent Admission to the Master of Science (M.S.) Degree Program in Physical Therapy.** This plan incorporates the prerequisites for the master's degree in physical therapy in anatomy, chemistry, mathematics, physics, physiology, and psychology with bachelor's degree requirements in a related discipline during the first three years of study. With a proper use of electives, students can complete all physical therapy prerequisites and first-year physical therapy courses as part of a participating B.A. or B.S. degree program. This plan is currently available for the B.S. degree programs in human science and services and physical education.

According to this plan, application to the master's program in physical therapy may occur in the third undergraduate year. Successful applicants are selected for contingent admission to the physical therapy program at the beginning of the fourth undergraduate year, with course work taken in the fourth year applied to the B.A. or B.S. degree. A bachelor's degree and a 3.00 average in physical therapy courses are required to attain full graduate status and continue in the physical therapy program. Admission to the physical therapy program is highly competitive, and students are advised to maintain close contact with a pre-physical therapy advisor. Stu-

dents interested in graduate programs in physical therapy at other institutions should consult with those institutions regarding admission requirements. Additional information concerning all admissions requirements for the program in physical therapy is available in the section "Graduate Programs."

**Teacher Education Programs.** The University of Rhode Island offers a variety of academic programs leading to teacher certification at both the undergraduate and the graduate levels. Undergraduate teacher education programs are offered by departments in the College of Arts and Sciences and the College of Human Science and Services. The Council for Teacher Education, through the Office of Teacher Education, provides the coordination, planning, evaluation, and promotion of all teacher education programs at the University. The following programs are offered at the undergraduate level: early childhood education, elementary education, physical education, music education, and secondary education. To find specific program descriptions and information, refer to the Index at the back of this catalog.

*Admission to the Teacher Education Programs.* Students interested in undergraduate teacher education programs are required to apply for admission to the Office of Teacher Education. Applications for admission to teacher education programs are normally submitted during the sophomore year. For early childhood, elementary, and secondary education, students develop an application portfolio. Applications will be reviewed by a departmental screening committee based on the following criteria: 1) recommendations from faculty and others who have knowledge of the candidate's experience or interest in working in education; 2) a writing sample expressing career goals, experience in working with children, and expectations as a teacher; 3) scores on a standardized test(s) of basic skills; 4) the student's academic record, including a cumulative quality point average of 2.50 or better and grades in the academic major or specialization averaging 2.50 or better. Individual departments or programs may also require an interview.

Transfer students should be advised that academic work completed at the University of Rhode Island is a primary factor in the admission decision. Therefore, students must complete one year of work at the University before they can be considered for admission to the teacher education programs. This may extend the time required for degree completion.

Admission to some programs is competitive, and applicants meeting the minimum criteria described above may not be admitted because of limited space. For additional information, students should consult as early as possible with the specific department in which they wish to enroll or with their University College advisor.

Students denied admission can petition the department for a review of the decision. In such cases, the departmental screening committee meets to consider the appeal. Only exceptional circumstances will lead the appeal committee to override the academic record criteria (2.50 cumulative quality point average and 2.50 in the academic major or specialization).

Applicants who fail to gain admission should seek counsel from an appropriate advisor. Students may reapply for admission to a teacher education program but should understand that this may delay their anticipated graduation date.

Admissions to teacher education programs at the graduate level are governed by the Graduate School in consultation with academic departments. Students with a bachelor's degree should consult the section "Graduate Programs" in this catalog and departments regarding individual program requirements.

*Teacher Certification.* A teaching certificate is, for all practical purposes, a license to teach in a given state, at a specific level, and in a certain type of job. Rhode Island, like other states, requires its public elementary and secondary teachers to hold certificates to ensure that students are taught only by persons who meet specified standards of preparation, health, citizenship, and moral character.

Graduates of a state-approved teacher education program at the University are eligible to receive an initial teaching certificate in Rhode Island and in over 40 other states through the Interstate Certification Compact (ICC). However, states will grant certification through the ICC only for certifications offered by the state. For example, a state that does not have a certification program in early childhood education (nursery school through Grade 2) will not grant a certificate in that area to a graduate of the University's program in early childhood education without reviewing the student's transcript to see if it meets that state's guidelines for elementary education. Therefore, students interested in applying for certification in states other than Rhode Island should always contact the Department of Education in that state and ask: 1) if the state has the area of certification the student is interested in pursuing at URI; and 2) if the state grants initial teacher certification under the ICC to students who have graduated from a Rhode Island state-approved teacher education program. Also, the student should ask the department to mail the state's application materials for certification. If the state is a member of the ICC, graduates of URI are generally entitled to initial certification for a period of five years following their date of graduation. After receiving another state's certification application, the applicant should read the directions for certification carefully and submit all required documentation.

If the state in which the applicant is requesting certification is not a member of the ICC or does not have certification for the applicant's area of study, he or she should ask that state's Office of Teacher Certification to evaluate his or her transcript and indicate any courses or experiences the applicant would need for certification in that state.

**Premedical, Predental, and Preveterinary Programs.** The URI Health Professions Advisory Committee (HPAC), also known as the Premedical, Predental, and Preveterinary Advisory Committee, oversees these programs. The URI health professions

advisor (HPA) acts as the committee chairperson. Committee members offer students academic counseling and information on the admissions process. In addition, the HPAC and the HPA periodically review students' progress, assessing their prospects for admission.

It is advisable for students to select their undergraduate majors based on their own interests and abilities. Students should select their undergraduate majors carefully with appropriate advice from the HPAC. Students should also make sure that their undergraduate majors provide a foundation of knowledge necessary for the pursuit of several career alternatives. It is not advisable for students to select their undergraduate majors solely or primarily to enhance their chances of being accepted by a professional school.

Students interested in studying in any of the following programs must register with the HPAC secretary, Biological Sciences Building, Room B106.

*General Requirements.* For students preparing to apply to postgraduate colleges of medicine, dentistry, or veterinary medicine, the program of study includes courses in the humanities, English and literature, the basic sciences, mathematics, the social sciences, and communication. These courses will fulfill the basic admissions requirements.

It is strongly recommended that students complete the required course work at the same time they meet undergraduate degree requirements. Any major or concentration is acceptable, providing that the minimum requirements for admission into a professional school are fulfilled. Ideally, these requirements should be substantially completed before a student takes the national admission test (either the MCAT, DAT, VAT, or GRE) in the spring semester of the junior year.

Most students in these programs major in animal biology or in a related field, such as microbiology, chemistry, pharmacy, or another health-related science. Students choose these majors primarily because these are the subjects that interest them most, but also because, nationally, stu-

dents with these majors represent the largest number of accepted applicants. However, other majors are acceptable.

Many of the course requirements can be met by fulfilling the General Education or Bachelor of Liberal Studies requirements, but professional schools are usually rather specific concerning minimum requirements in the basic sciences and mathematics.

Recommended courses for fulfilling the basic admissions requirements follow. Only the minimum required number of credits is shown.

English and Literature: 12 credits, including one writing course (e.g., WRT 101) and one year of literature.

Animal Biology: 8–10 credits chosen from among the following courses (or their equivalents). Chordate anatomy (BIO 204), general zoology (BIO 113), general animal physiology (BIO 201), animal development (BIO 202), basic genetics (BIO 206 or BIO 352 or ASP 352), and vertebrate histology (BIO 327 and 329).

Chemistry: 16 credits, including general inorganic (CHM 101, 102, and lab, CHM 112, 114) and organic (CHM 227, 228, and lab, CHM 226, or their equivalents).

Physics: eight credits, including PHY 111, 185, 112, 186, or PHY 213, 285, 214, 286, or their equivalents.

Mathematics: six credits through calculus, MTH 131 and 132, or MTH 141.

Social and Behavioral Studies: six credits in sociology (SOC 100, 300, or 424) and psychology (PSY 113, 232, or 300).

Modern Foreign Languages: completed through the intermediate level.

Electives: eight credits. These optional courses may be selected from upper-level science courses that might have relevance to a professional school's curriculum or they may be selected from humanities courses. Because of the structured and particularized nature of the professional curriculum, upper-level courses in the humanities will help to balance the scientific portion of the undergraduate pro-

gram. Courses in philosophy, history, fine arts, theater, economics, mathematics, and foreign language and culture are helpful in developing problem-solving and communication skills. They are all educationally fulfilling, and are crucial to the success of an educated person pursuing a professional career.

*Applying to Professional Schools.* Prior to submitting an application to a professional school, each candidate's credentials are evaluated by the Health Professions Advisory Committee. By the first semester of the junior year, each applicant must provide the HPAC with the following items in writing:

1. A request from the applicant to the HPAC for a letter of evaluation in support of his or her application to a medical, dental, or veterinary school.
2. An official report of the applicant's SAT scores from the testing agency or from his or her high school or other secondary school.
3. Official, recent academic transcripts of all college courses taken at URI and elsewhere.
4. Official reports of scores on the appropriate admission test (MCAT, DAT, VAT, or GRE) sent directly to the HPAC from the testing agency.
5. An autobiography that includes a commentary on the way the applicant's career goals have developed.
6. A description of all extracurricular activities.
7. A description of all honors bestowed on the student.
8. A description of volunteer hospital, dental, veterinary, or other health-related work.
9. A minimum of three letters of evaluation written by persons who can evaluate candidly the applicant's experience and ability to engage in professional and scientific study.

In addition, a series of personal interviews with members of the HPAC in the spring semester of the junior year must be included in the final evaluation of the applicant's candidacy. As a result of this evaluation, which takes place in the spring

semester of the junior year, the HPAC decides either to write a letter of evaluation in support of a candidate's application or to advise the candidate on an alternative plan.

*Premedical Studies.* Approximately 85 percent of URI applicants recommended by the HPAC are admitted into medical schools of their choice.

The average admission rate to medical schools in the United States is only about 40 percent. Competition is very strong, and it is wise to plan for an alternate career. Candidates should become familiar with the requirements for admission to the medical schools to which they expect to apply. These are listed in *Medical School Admission Requirements*, published annually by the Association of American Medical Colleges. Copies of this reference and the requirements of certain medical schools are available from the HPAC secretary, Biological Sciences Building, Room B106. Phone: 401-874-2670.

Medical schools generally require at least a 3.00 quality point average and high scores on the required Medical College Admission Test (MCAT), taken preferably in the spring semester of the third undergraduate year.

All candidates must have personal interviews with the HPAC. Normally these interviews take place during the spring semester of the third undergraduate year.

*The University of Rhode Island–Brown University Early Identification Program for Sophomores.* This is a plan for the early identification and acceptance of URI students into the School of Medicine at Brown University. These students must be Rhode Island residents who are highly motivated, exceptionally qualified, and interested in studying medicine at Brown. An eligible sophomore must have a cumulative quality point average of at least 3.30 after having completed not more than three semesters of academic work at URI.

In December of each year, all eligible students must apply in writing to the URI Health Professions Advisory Committee for nomination to this program. In early February, the HPAC conducts a careful

evaluation of each applicant's academic and personal qualifications. The committee then nominates as many as three individuals from this group of applicants on the basis of an excellent record, exceptional promise as a URI premedical student, Rhode Island residency, and a desire to study medicine at Brown.

For each nominated student, a completed application and the committee's letter of evaluation are forwarded to the Dean of Medicine at Brown University. Final decisions to accept applications are made by the admissions committee at the Brown School of Medicine.

When URI candidates are accepted into the program, they assume the same status as their Brown counterparts, and they continue their studies at URI. They are free to major in any field of study, so long as they continue to show academic excellence while they complete the required premedical courses. As URI undergraduates, they are invited to take one or two of their premedical courses on the Brown campus with their future classmates, and are included in colloquiums and various social events sponsored by the Brown Medical Student Society.

In the spring of their senior year, before students in the program graduate from URI, they are considered for promotion into the first year of medical studies at Brown. This is the same promotion process that is required of all Brown medical students. Academic performance, interviews with members of the admissions committee, and recommendations from faculty and others are reviewed at this time. When they receive their promotion, students in the program become first-year medical students at Brown University.

In order to obtain a letter of evaluation in support of an application, each candidate must have personal interviews with the HPAC. Normally these interviews take place during the spring semester of the third undergraduate year. Competition for admission into schools of veterinary medicine is exceptionally strong. Therefore, evidence of high motivation and an outstanding academic record are absolutely essential.

*URI Postbaccalaureate Preprofessional Programs.* There are two nondegree programs at URI for potential premedical, pre dental, or preveterinary candidates who have already earned degrees, either from URI or from other colleges or universities.

Candidates must first consult with the URI health professions advisor. The HPAC secretary will arrange for an appointment (Room B106, Biological Sciences Building, 401-874-2670). Candidates must register in writing at the secretary's office.

Program A (one to three years) is designed for students who made a late decision to enter professional school and wish to complete the basic admission requirements prior to submitting an application.

Program B (two to four semesters) is designed for the applicant who has completed the basic admissions requirements and has not yet earned grades that are competitive with other applicants. The individual's specific needs will be met by courses selected in consultation with the health professions advisor.

In order to complete the course work in either of these programs, a candidate should register with the URI Office of the Registrar as a nondegree postbaccalaureate student.

## Special Academic Opportunities

**English as a Second or Foreign Language.** At the University, English as a Second or Foreign Language is not remedial. Nonnative-speaking students who want to continue to perfect their English so as to enhance their chances of success in their studies may do so by taking English Language Studies 112 and 122, two regularly offered courses that count toward the written communication requirement in the General Education program. Students who need these courses are strongly urged to take them in their freshman year.

In addition to these two three-credit courses, the University offers one-credit, content-based English language study sections (ELS 201), under the auspices of the English Language Fellows Project. These one-credit sections may be repeated, in

conjunction with other courses, for a total of 12 times. Thus, it is possible for students who speak other languages to continue studying English, for credit, throughout their years as undergraduates.

For more information about English language studies, contact the Department of English, Independence Hall. Phone: 401-874-4686.

**The Feinstein Center for Service Learning and University Year for Action.** This Center is a combination of the existing resources related to service learning at URI, including the University Year for Action (UYA), the URI Clearinghouse for Volunteers, and the Feinstein Enriching America Program. Funded by a grant from Alan Shawn Feinstein, it will continue to provide credit and noncredit service learning opportunities for students.

*University Year for Action (UYA).* The UYA Internship Program is an academic program that provides undergraduate students with opportunities for professional development and field study during the academic year as well as the summer. It is especially designed for the motivated student who wishes to apply classroom learning to a field experience in a career-related setting. Students from any undergraduate curriculum may apply for 15 credits in free or professional electives.

Students work full-time under the supervision of qualified professionals in carefully selected settings. A weekly seminar brings interns together to discuss issues that emerge during the internship. The program offers students a choice of more than 550 placements that include the categories of law, counseling, government, administration, public relations, communications, alternative education, health, nutrition, marketing, management, marine affairs, environmental science, and medical research.

Internships also are available for selected students in Washington, D.C., through the Washington Center and in Dublin, Ireland, through the Internships in Dublin Program.

To apply for all internship programs, students must have a minimum quality

point average of 2.50 and junior or senior standing.

*URI Clearinghouse for Volunteers.* The Clearinghouse for Volunteers is a service that matches prospective volunteers with positions in Rhode Island's human service agencies. It gives students opportunities to explore career options and provide needed services.

*The Feinstein Enriching America Program.* In their first semester, all freshmen and new transfer students with less than 24 credits are required to take **URI 101 Traditions and Transformations: A Freshman Seminar**, including community service provided by the Feinstein Enriching America Program.

**Honors Program.** The University Honors Program offers motivated students opportunities to broaden their intellectual development and to strengthen their preparation in major fields of study. The program consists of courses in analytical thinking skills which prepare academically talented students to get the most from classes throughout their undergraduate years, a colloquium that brings distinguished authorities to campus from across the nation, special tutorials in major concentrations of study, and independent research projects under the guidance of a faculty sponsor. Honors courses at the 100 and 200 levels treat general topics and usually count for General Education credit in particular divisions. Those at the 300 and 400 levels are more specialized and often are used to fulfill the requirements of a major.

Eligibility standards are established by the Honors Program and Visiting Scholars Committee. Students may take honors work if they meet the following standards: freshmen must have graduated in the upper 10 percent of their high school class or must submit a letter of recommendation from their high school principal or guidance counselor; sophomores, juniors, and seniors must have earned at least a 3.20 cumulative quality point average. (Under special circumstances, these eligibility requirements may be modified with the permission of the Honors Program director.)

Eligible students may participate in the Honors Program in one of two ways: they may take honors courses on an occasional basis, registering for any number or pattern of courses that interest them; or they may do honors work on a regular basis, meeting the specific requirements to receive the transcript notation "Completed the University Honors Program." In the latter case, a student must begin honors work no later than the beginning of the sophomore year and must complete a minimum of 15 honors course credits that meet the following requirements: 1) three credits at the 100 level; 2) three Honors Colloquium credits (HPR 201 or 202); 3) three credits at the 300 level (tutorial); 4) six credits at the 400 level, which may be either six credits of the Senior Honors Project (HPR 401, 402) or three credits of the Senior Honors Project (HPR 401) and three credits of the Senior Honors Seminar (HPR 411); and 5) a 3.20 quality point average for honors courses and a 3.20 cumulative quality point average.

See "Courses of Instruction" for a list of HPR courses.

#### **National Student Exchange Program.**

The National Student Exchange (NSE) program offers URI students the opportunity to study at more than 135 participating state colleges and universities in 50 states and U.S. territories paying in-state rates or URI tuition while maintaining their status as URI students. NSE offers the opportunity to explore new geographical areas, experience academic diversity, and study under different educational and social circumstances in various parts of the United States. Financial aid is available to participants in this program. For further information, contact the Office of International Education and National Student Exchange, Taft Hall.

#### **New England Land-Grant Student**

**Exchange Program.** Students with special academic interests can take advantage of the talent and resources available at the region's state universities without having to become a degree candidate at another institution. Under a cooperative agree-

ment, URI students can study for one or two semesters at the other New England land-grant institutions if they wish to take a course, a sequence of courses, or part of a program not available at URI. Students participating in this program pay their normal URI tuition and fees and maintain their status as URI students. Advisors and members of the University College staff have more information about this program and its requirements.

**Ocean Studies.** Undergraduates are encouraged to explore opportunities at the Narragansett Bay Campus for active participation in the oceanographic sciences. Juniors and seniors may spend an entire semester at the Bay Campus pursuing their individual marine interests, for which they receive full academic credit. They work as part of a research team in the laboratory and in the field under the direct guidance of the Graduate School of Oceanography faculty.

#### **Rhode Island Interinstitutional Exchange.**

Full-time students matriculated at one of the public institutions of higher education in Rhode Island may enroll for a maximum of seven credits of their full-time schedule per semester for study at one of the other public institutions at no additional expense. Each institution will determine and maintain the integrity of the degree to be awarded. Students will be subject to the course selection process applicable at the receiving institution. Summer Session and Continuing Education registrants are not covered under this program. Students interested in this arrangement should contact the Office of the Registrar.

**Study Abroad.** The Office of International Education and National Student Exchange sponsors University programs abroad, helps students make arrangements for foreign study, and maintains information about overseas study programs. The office also assists in the evaluation of credits from study abroad. The University sponsors exchange programs with universities in Austria, England, France, Indonesia, Japan, Korea, Mexico, Spain, and Venezuela and is a member of several consortiums that enable URI students to participate in pro-

grams throughout the world. The University also participates in the New England–Quebec and New England–Nova Scotia exchange programs making study available on an exchange basis at any of the 21 English- and French-speaking universities in these provinces.

Many of these exchange programs make study abroad available to URI students at a modest cost. The study abroad director and advisor help students who wish to participate in these or other approved academic programs in choosing the appropriate programs, obtaining prior approval for courses to be taken abroad, and retaining matriculated status at the University of Rhode Island during their absence from campus. Most forms of financial aid are applicable to study abroad. For further information, contact the Office of International Education and National Student Exchange, Taft Hall.

#### **Army Reserve Officers Training Corps (ROTC)**

Army Reserve Officers Training Corps (ROTC) is offered by the University and is available to all male and female students. Physically qualified American citizens who complete the entire four-year program are eligible to be commissioned in the U.S. Army. Delayed entry into active service for the purpose of graduate study is available. Military science is designed to complement other instruction offered at the University. Emphasis throughout is on the development of individual leadership abilities and preparation of the student for future important leadership roles in the Army. Professional military education skills in written communication, human behavior, military history, mathematical reasoning, and computer literacy are fulfilled through required University General Education courses and the military science curriculum. Three variations of ROTC are available.

During the four-year program, students participate in required military science courses and activities. Attendance at a five-week advanced training camp is required between the third and fourth year.

The two-year ROTC program begins with a six-week Camp Challenge summer training session (with pay and six credits). After successful completion of Camp Challenge, the student enters the third year of ROTC and attends advanced camp during the next summer. As an alternative, an enlisted member of the Army National Guard or Army Reserve who has completed basic training can qualify for the two-year ROTC Simultaneous Membership Program.

The third variation consists of a three-year program for students who wish to enter ROTC in their sophomore year or who intend to complete their academic studies in three years. This program compresses the Basic Course requirements into one year.

All Basic Course (freshman and sophomore) military science courses are an excellent medium for personal enrichment. Significant scholarship opportunities are available.

Completion of the four-year military science program qualifies students to petition their college for a minor in military science.

Enrollment in any military science course allows a student to compete for off-campus training at the following U.S. Army schools: Airborne, Air Assault, Northern Warfare School, and Nurse Summer Training in Europe.

## Grades

**Grades and Points.** Student grades are reported as A-, A, B+, B, C+, C, D+, D, and F. The unqualified letter grades represent the following standing: A, superior; B, good; C, fair; D, low grade, passing; F, failure; S, satisfactory; U, unsatisfactory.

Grades are given quality point values as follows: A, 4.00 points; A-, 3.70 points; B+, 3.30 points; B, 3.00 points; B-, 2.70 points; C+, 2.30 points; C, 2.00 points; C-, 1.70 points; D+, 1.30 points; D, 1.00 points; F and U, 0 points. P and S are not calculated in the quality point average.

Grade reports are mailed to all students at their home addresses at the end of each semester. Midsemester grade reports are mailed to all freshmen at their local ad-

resses at the midpoint of each semester. These midterm reports are intended to alert freshmen to their academic status and to aid in advising. Midterm grades are not recorded on permanent academic records nor are they figured into quality point averages.

A grade may be reported as "incomplete" only when course work has been passing but not completed due to illness or another reason that in the opinion of the instructor justifies the report of incomplete. Incomplete grades not removed from an undergraduate student's record by the following midsemester will remain on the student's permanent record.

Students are required to make up failures in required courses. The course should be repeated when next offered. No limit is placed on the number of times a course may be repeated, but the credit requirement for graduation is increased by the number of credits repeated. Students are not required to make up failures in elective courses.

Certain courses do not lend themselves to precise grading, and for these courses only S (satisfactory) or U (unsatisfactory) will be given to all students enrolled. S/U courses are labeled as such in the course descriptions in this catalog. S/U courses are not counted as courses taken under the Pass-Fail option.

**Pass-Fail Grading Option.** This plan encourages undergraduate matriculated students to increase their intellectual breadth and discover aptitudes in new areas of knowledge. A student above the freshman level who is not on probation may register under this plan for courses considered to be free, unattached electives by the college in which he or she is enrolled. Courses designated in the student's curriculum as degree requirements, General Education requirements, and military science courses may not be included.

A student choosing to take a course under this plan must notify his or her advisor, academic dean, and the Office of the Registrar, in writing, prior to the end of the add period of each semester. The instructor is not informed.

Grades will be P (pass) or F (fail). The P grade is credited toward degree requirements but not included in the quality point average. The F grade is calculated in the same manner as any other failure. A student may change from the P-F option to grade by notifying the Office of the Registrar in writing before mid-semester.

A student may elect not more than three P-F courses a semester and not more than two P-F courses during a summer.

**Second Grade Option.** Students may exercise a second grade option by repeating a course in which the student earned a C- or lower. Only courses that fall within the student's first 30 attempted credits taken at the University may be selected for this option. Students must exercise this option no later than the next two semesters for which the student registers after completing 30 credits. Transfer students may exercise the second grade option for courses taken during their initial semester at the University. This option must be exercised during the next two semesters for which they register after their initial semester. Only the grade earned when the course was repeated will be used in the calculation of a student's quality point average and only the credits earned for the repeated course will apply toward the graduation requirements. All grades earned for a given course shall remain on a student's permanent academic record. To take advantage of this option, students must obtain approval from their academic deans and submit the appropriate form to the Office of the Registrar prior to midterm of the semester in which the course is being repeated. The second grade option may be used only once per course.

## Dean's List

Undergraduate matriculated students who have achieved certain levels of academic excellence in any semester are honored at the end of that semester by inclusion of their names on the Dean's List. The Office of the Registrar will publish lists of students who have attained the required quality point average.



A full-time student may qualify for the Dean's List if he or she has completed 12 or more credits for letter grades and achieved a 3.30 quality point average.

A part-time student may qualify for the Dean's List if he or she has accumulated 12 or more credits for letter grades and achieved a 3.30 quality point average.

## Probation and Dismissal

A student will be placed on scholastic probation if the student's overall cumulative quality point average falls below 2.00. For purposes of determining dismissal of part-time students, scholastic standing committees will consider an accumulation of 12 credits as the minimum standard for one semester's work.

A student will be dismissed for scholastic reasons when he or she has a deficiency of eight or more quality points below a 2.00 average after being on probation for the previous semester. A student on probation for the second successive semester who has a deficiency of eight or fewer quality points below a 2.00 average will continue on probation. At the end of the third semester of probation, a student will be dismissed. Students who obtain less than a 1.00 average in their first semester will be dismissed automatically.

A student subject to dismissal will be so notified by the dean, after which he or she will have five days to file a written appeal with the dean.

Students are expected to be honest in all academic work. Instructors will have the explicit duty to take action in known cases of cheating or plagiarism. For details, consult the *University Manual*.

## Leave of Absence

Occasionally, students are forced to take a semester or two off because of circumstances beyond their control. Others find they simply need a break from studying. For these students taking a leave of absence might be wise. Students who have an approved leave of absence for a semester or a year may register for the semester in which they plan to return without

applying for readmission. Undergraduate students can apply for a leave of absence through the Office of the Registrar.

## Withdrawal from the University

A student who wishes to withdraw from the University prior to the end of the semester or summer session shall do so according to procedures established by the Office of the Registrar. If the withdrawal process is completed satisfactorily and the student has cleared all financial obligations to the University, the date of withdrawal will be noted on the student's permanent academic record. No grades for the current semester will be recorded.

Students who withdraw from the University after the last day of classes but before a semester ends will be graded in all courses for which they are officially registered. If a student withdraws from the University after midsemester, grades will be recorded for any course that has an officially specified completion date prior to the date of withdrawal.

A student who withdraws from the University after midsemester and who seeks readmission for the next semester will be readmitted only with approval of the Scholastic Standing Committee for the college or school in which registration is desired.

## Graduation Requirements

To graduate, a student must have completed the work for, and must have achieved the minimum quality point average established by, the curriculum in which he or she is enrolled and earned at least a 2.00 quality point average. In addition, students must abide by community standards as defined in the *University Manual* and the *Student Handbook*.

The work of the senior year has to be completed at the University of Rhode Island. Exceptions must be approved by the faculty of the college in which the student is enrolled.

Any student who has met the requirements for a second bachelor's degree and has completed an additional 30 hours of credit beyond the minimum requirements

for the initial degree may be granted two bachelor's degrees.

Any student who has met the requirements for two separate majors within any single bachelor's curriculum has earned a double major and may have both fields listed on his or her permanent record.

Students who complete at least 60 credits of their work at the University are eligible to graduate with distinction. Grades in all courses attempted at the University will be included in the calculation of the quality point average. Those who attain a cumulative quality point average at the time of graduation of at least 3.30 are recognized as graduating "with distinction." Those who achieve a cumulative quality point average of at least 3.50 graduate "with high distinction," and those who attain a cumulative quality point average of at least 3.70 graduate "with highest distinction."

## University Manual

University regulations governing matters such as conduct, grading, probation and dismissal, academic integrity, withdrawal from the University, and graduation requirements are fully explained in the *University Manual*. Copies of the *University Manual* are available for reference in the library and in the deans' offices.

Such rights and responsibilities are also described in the *Student Handbook*, which is available from the Office of Student Life.

## UNDERGRADUATE PROGRAMS

**T**he University attempts to provide the successful student with a range of knowledge and skills which can, with appropriate motivation and initiative, be used in a variety of ways after graduation.

The following undergraduate programs offered at the University of Rhode Island are presented by college.

Study options vary from the traditional liberal education to programs that are heavily vocationally oriented. Successful completion of any course of study at the University, however, does not guarantee that the student will find either a specific kind or level of employment.

Students interested in the career opportunities related to particular programs of study are encouraged to consult University College advisors, the appropriate department chairperson, or Career Services. For students who are uncertain about their career choices, the Counseling Center also offers help.







## UNIVERSITY COLLEGE

Jayne Richmond, *Interim Dean*

Sarah H. Rockett, *Assistant Dean*

Christine Peterson, *Academic Counselor*

Winifred P. Kelley, *Academic Counselor,  
Athletes*

Michelle A. Eaker, *Coordinator, University  
College*

Sandra L. Pearlman, *Coordinator, Learning  
Assistance Center*

University College offers incoming students a broad range of advising services and the opportunity to explore the variety of courses and programs available at the University before they commit themselves to a major in a degree-granting college. All first-year students are enrolled in University College except registered nurses. Through its strong program of academic advising by faculty, University College's purpose is to assist new students in making a smooth transition to the University and to provide

special assistance, programs, and events for freshmen and sophomores.

Advisors, who have regular office hours at University College in Roosevelt Hall, are faculty members who represent each of the majors in the degree-granting colleges. Each student is assigned an academic advisor who is a specialist in the area in which the student intends to major or who has a particular interest in working with students who are undecided about their choice of major. Advisors help students select and schedule the right courses, become familiar with University procedures and programs, and obtain whatever assistance they need.

If more students seek access to a program than can be accommodated due to limited facilities or faculty, those students who have shown the highest promise for academic success in the program will be admitted first. Where such limitations exist, the student must apply for acceptance in the program under conditions established

by the specific department or college. This applies specifically to programs that have been declared "oversubscribed" by the Vice President for Academic Affairs. Students who cannot be admitted to the program of their first choice can request entry into another program for which they have satisfied the entrance requirements, or they can spend one or two additional semesters in University College preparing to qualify for another program.

## COLLEGE OF ARTS AND SCIENCES

Winifred E. Brownell, *Interim Dean*  
 Wilfred Dvorak, *Associate Dean*  
 John T. Montgomery, *Acting Associate Dean*  
 Joyce Allen Cain, *Assistant Dean for Instruction*  
 Jonathan L. Blaney, *Business Manager*

The College of Arts and Sciences has two main objectives: first, to enable all students to understand our intellectual heritage, the physical and biological world in which we live, and our social, economic, and political development; and, second, to provide programs of professional education in selected fields as well as a strong foundation for graduate study.

The college has programs of study leading to the following degrees: Bachelor of Arts, Bachelor of Science, Bachelor of Fine Arts, and Bachelor of Music.

For information on prelaw, pre-physical therapy, premedical, pre dental, pre-veterinary, and teacher education programs, see "Undergraduate Program Requirements," pages 35–38.

## Curriculum Requirements

In order to earn a degree in the College of Arts and Sciences, the student must meet requirements in three main areas: 1) the major, 2) Basic Liberal Studies, and 3) electives. A description of these areas follows.

**1. The Major.** Every student is required to specialize in a particular area or discipline; this area of specialization is called the major. The requirements for each major vary from field to field, and are described in this section. Any student who has met the requirements for two separate majors within the Bachelor of Arts, the Bachelor of Science, Bachelor of Fine Arts, or the Bachelor of Music degree programs in the College of Arts and Sciences has earned a double major and may have both fields listed on the transcript.

A student must maintain a 2.00 quality point average in his or her major to meet graduation requirements. One-half of the total number of credits needed in a given major must be earned at the University of Rhode Island.

**Curricular Modifications.** In consultation with the advisor, and with the approval of the department chairperson and the Dean, a student will be permitted to modify the normal requirements of the department in which the student is majoring. Students may modify any curricular requirement except course level and the Basic Liberal Studies requirements. These may be modified only with approval of the Scholastic Standing and Petitions Committee of the College of Arts and Sciences. Petition forms are available in the Office of the Dean. Minimum quality point average and total credit requirements are not petitionable.

**2. Basic Liberal Studies.** In the College of Arts and Sciences, General Education requirements are called Basic Liberal Studies, and are required of all students. This series of courses is intended to ensure that students have educational experiences that will help them to become informed and responsible participants in society and contribute to the full development of their individual capabilities. The Basic Liberal Studies program embodies the philosophy and fundamental knowledge that characterizes an arts and sciences education.

The following courses are approved by the College of Arts and Sciences to fulfill Basic Liberal Studies requirements.

### *Fine Arts and Literature*

**Fine Arts:** ARH 120, 251, 252, 284, 285, 359, 364, 374; ART 101, 103, 203, 207, 215, 231, 233; COM 231; HPR 101, 105; LAR 201; MUS 101, 106, 111; THE 100, 181, 351, 352, 381, 382, 383.

**Literature:** AAF 247, 248; CLA 391, 395, 396, 397; CLS 160, 250, 335; ENG 160, 241, 242, 243, 247, 248, 251, 252, 260, 263, 264, 265, 280, 335; FRN 391, 392, 393; GER 392; ITL 325, 326, 391, 392,

395; RUS 325, 326, 391, 392; SPA 305, 306, 307, 308, 325, 391, 392, 393.

### *Letters*

AAF 150; APG 327; CLS 235; COM 200, 205, 210; HIS 111, 112, 113, 114, 115, 116, 118, 123, 130, 132, 141, 142, 145, 150, 171, 176, 177, 180, 304, 305, 306, 307, 309, 310, 311, 314, 321, 323, 324, 327, 328, 332, 333, 340, 341, 346, 353, 354, 360, 376, 377, 381, 382, 384, 398; HPR 104, 107, 203; JOR 110; LAR 202; LET 151, 351; NES 200; PHL 103, 204, 210, 212, 217, 235, 314, 318, 321, 322, 323, 324, 325, 328, 331, 346, 355; PSC 240, 341, 342; PSY 310; RLS 111, 125, 126, 131; WMS 220, 333.

### *Natural Sciences*

APG 201; AST 108; AVS 101; BCH 342; BIO 104A, 104B, 112, 113, 286; CHM 100, 101, 102, 103, 105, 112, 114, 124, 191, 192; FSN 207; GEL 100, 102, 103; HPR 103, 109; MIC 102; OCG 110, 123, 131; PHY 109, 110, 111, 112, 130, 140, 185, 186, 203, 204, 205, 213, 214, 273, 274, 275, 285, 286; PLS 150; TMD 113.

### *Social Sciences*

APG 200, 202, 203, 220, 319; COM 220; CNS 220; ECN 100, 201, 202, 381; EDC 102, 312; ENG 330, 332; GEG 100, 101, 104; HPR 102, 110; HDF 220; LIN 200, 202, 220; MGT 110; NRS 100; NUR 150; PSC 113, 116, 201, 221, 288; PSY 103, 113, 232, 235, 254; REN 105; SOC 100, 102, 204, 206, 212, 214, 216, 224, 238, 240, 241, 242, 316, 330, 336; WMS 150.

### *Mathematics*

BAC 120; CSC 201; HPR 108; MTH 107, 108, 111, 131, 132, 141, 142; STA 220.

### *English Communication*

**Writing (Cw)**—CMS 101; ELS 112, 122; ENG 103; HPR 112; WRT 101, 103, 123, 201, 227, 235, 301, 333. **General (C)**—CMS 101; COM 101 and 103; HPR 111; PHL 101.

### *Foreign Language and Culture*

See chart on page 46.

## Basic Liberal Studies Requirements

Courses used to fulfill these requirements must be selected from the list approved by the College of Arts and Sciences. Basic Liberal Studies requirements are designed only for students in the College of Arts and Sciences, but they also fulfill the University's General Education requirements.

Courses in a student's major may not be used to fulfill requirements in Fine Arts and Literature, Letters, Natural Sciences, and Social Sciences. Students completing a double major, however, may use courses from one major of their choice to fulfill these requirements.

<i>Basic Liberal Studies Requirements</i>	<i>BACHELOR OF ARTS</i>	<i>BACHELOR OF SCIENCE BACHELOR OF FINE ARTS BACHELOR OF MUSIC</i>
<b>Fine Arts and Literature</b>	6 credits (3 in Fine Arts; 3 in Literature)	6 credits (3 in Fine Arts; 3 in Literature)
<b>Letters</b>	6 credits*	6 credits
<b>Natural Sciences</b>	6 credits*	6 credits
<b>Social Sciences</b>	6 credits*	6 credits
<b>Mathematics</b>	3 credits	3 credits
<b>English Communication</b>	6 credits (3 must be in a writing course; the other 3 may be in another writing course or may be selected from the general communication courses)	6 credits (3 must be in a writing course; the other 3 may be in another writing course or may be selected from the general communication courses)
<b>Foreign Language and Culture</b>	<p><i>Choose one of the following options:</i></p> <ul style="list-style-type: none"> <li>• Two-course sequence in a language studied for two or more years in high school through at least the 103 level in a modern language or 301 in a classical language</li> <li>• Demonstration of competence through the intermediate level by examination or by successful completion of 104 in a modern language or 302 in a classical language</li> <li>• Course work in a language not previously studied (or studied for less than two years in high school) through the beginning level (102)</li> <li>• Study abroad in an approved academic program. Summer programs, including the URI in England program, will not satisfy this requirement.</li> </ul>	<p><i>Choose one of the following options:</i></p> <ul style="list-style-type: none"> <li>• Two-course sequence in a language studied for two or more years in high school through at least the 103 level in a modern language or 301 in a classical language</li> <li>• Demonstration of competence through the intermediate level by examination or by successful completion of 104 in a modern language or 302 in a classical language</li> <li>• Course work in a language not previously studied (or studied for less than two years in high school) through the beginning level (102)</li> <li>• Study abroad in an approved academic program. Summer programs will not satisfy this requirement.</li> <li>• Two courses selected from <i>within a single culture cluster</i> taken, if possible, in the same or consecutive semesters. See page 31 for a list of approved culture clusters.</li> </ul>

\* Students may use only *one course per discipline* (as identified by the course code) to fulfill requirements in Letters, Natural Sciences, and Social Sciences.

**3. Electives.** Electives are courses not included in the Basic Liberal Studies or major requirements which students may freely select to earn the total number of credits required for graduation. Many students use their elective credits to develop a second major or a minor field of study (see "Undergraduate Program Requirements," page 32).

**Course Load.** No student may take more than 19 credits per semester without permission from the Dean.

**Repeating Courses for Credit.** Unless otherwise stated in the course description, a course cannot be repeated for credit. Credit can be counted only once toward the total credits required for graduation.

**Graduation.** It is the responsibility of the student to be familiar with University and College requirements and to file for graduation with the Office of the Dean. Deadlines for filing are as follows:

May Graduation—November 1

August Graduation—April 1

December Graduation—August 1

Seniors completing their final course work off campus must file a Senior Off-Campus Study Form with the Office of the Dean and they should file for graduation before leaving campus.

## Bachelor of Arts

The Bachelor of Arts curriculums provide a general cultural background and an opportunity to major in any one of 27 fields of study.

**Curriculum Requirements.** Each candidate for a Bachelor of Arts degree must meet certain minimum curricular requirements in quantity and quality. These requirements include: at least 120 passed credits, with at least 42 credits in courses numbered 300 or above, and an overall quality point average of at least 2.00.

In addition to meeting the requirements of the Basic Liberal Studies program, each candidate must complete a major

and a number of elective courses. The major totals 27–36 credits.

**B.A. Major.** The major is the discipline or subject area in which the degree is granted. It may include not only required courses within the major department but also courses in related subjects. The student should declare this major before the end of the fourth semester.

The major comprises no fewer than 27 nor more than 36 credits. These, however, are exclusive of any credits that are outside the major department but may be required by that department as prerequisites. Including such prerequisites, the major may not exceed 39 credits.

The student may earn up to 45 credits in course work offered by the major department as identified by the course code, counting as electives those credits earned in excess of the major requirements. Any credits in excess of 45 earned in the major department will not count toward the 120 credits required for graduation.

At least half of the credits in the major must be earned at the University of Rhode Island.

*Majors include:* African and Afro-American studies, anthropology, art (history and studio), biology, chemistry, classical studies, communication studies, comparative literature studies, economics, English, French, German, history, Italian, journalism, Latin American studies, mathematics, music, philosophy, physics, political science, psychology, public relations, sociology, Spanish, and women's studies.

## Bachelor of Science

The Bachelor of Science curriculums are professionally oriented and, in general, meet the accreditation standards of national professional associations.

**Curriculum Requirements.** All candidates for the Bachelor of Science degree must fulfill the requirements of the Basic Liberal Studies program and complete a major of 30–45<sup>1</sup> credits within a department or pro-

gram. In addition, a department may require for its major certain courses in other departments, with the stipulation that this will not preclude their application to the Basic Liberal Studies program requirements. Students must earn an overall quality point average of at least 2.00. No more than 130 credits can be required in a program.

At least half the credits in the major must be earned at the University of Rhode Island.

Each major within the B.S. curriculum has certain more specific requirements, as listed on the following pages.

*Majors include:* applied sociology, biological sciences, chemistry, chemistry and chemical oceanography, computer science, economics, environmental plant biology, marine biology, mathematics, physics, and physics and physical oceanography.

## Bachelor of Fine Arts

The Bachelor of Fine Arts curriculums provide the opportunity to discover and develop creative capacities in the fine arts. The emphasis is on richness of program and quality of experience rather than the development of isolated skills. Applicants registering for work toward the Bachelor of Fine Arts degree must receive permission of their major department by arranging for an interview with a departmental representative. Further details and appointments may be obtained through the Undergraduate Admissions Office.

**Curriculum Requirements.** All candidates for the Bachelor of Fine Arts degree are required to meet the requirements of the Basic Liberal Studies program and to earn an overall quality point average of at least 2.00.

At least half the credits in the major must be earned at the University of Rhode Island.

*Majors include:* art and theatre.

## Bachelor of Music

The Bachelor of Music curriculum is designed to prepare qualified students for careers in the field of music. Students may select one of three majors depending on their aims and abilities. Admission requirements for teacher education programs are described in "Undergraduate Program Requirements," page 36.

**Curriculum Requirements.** All candidates for the Bachelor of Music degree are required to meet the requirements of the Basic Liberal Studies program and to earn an overall quality point average of at least 2.00. At least half the credits in the major must be earned at the University of Rhode Island. Students are expected to attend department-sponsored events each semester.

*Majors include:* music composition, music education, and music performance (see page 58).

All areas provide for a good background in academic subjects, and each curriculum contains courses for the development of sound musicianship and excellence in performance. An audition conducted by members of the Music Department is required for permission to register for work toward the Bachelor of Music degree.

The music education curriculum includes courses in educational psychology, conducting, and methods, and a teaching internship that leads to state certification for teachers.

The total number of credits required for graduation is 129 for music composition, 131 for music education, and 129 for music performance.

## African and Afro-American Studies

URI and Rhode Island College offer a joint Bachelor of Arts (B.A.) degree in African and Afro-American Studies.

*Director:* Associate Professor Hamilton

For information about the URI requirements, please contact the African and Afro-American Studies Office. Rhode Island College program requirements are listed in the RIC catalog.

The African and Afro-American studies program is an interdisciplinary program. Its objective is to broaden students' intellectual and global experiences through the study of Africa and the African diaspora.

A minor in African and Afro-American Studies is also available (see page 33).

## Anthropology

The Department of Sociology and Anthropology offers the degree of Bachelor of Arts (B.A.) in anthropology.

*Faculty:* Professor Carroll, *chairperson*. Professors Loy, Poggie, Pollnac, and Turnbaugh; Associate Professor LaVelle.

Students desiring to major in anthropology must complete a total of 30–31 credits (maximum 45 credits) in anthropology including *introductory courses*: APG 200, 201, 202, and 203 (12 credits); *methods courses*: three to four credits from APG 300 (4), 302 (3), 317 (3), or 412 (3); *theory courses*: APG 401 (3) and three credits from APG 317 or 327 (3), for a total of six credits. **Note: APG 317 may be taken to fulfill either the methods or theory requirement, but not both.** The remaining eight to nine credits may be any APG course.

It is strongly recommended that anthropology majors take at least one course in inferential statistics (e.g., STA 308 or 409), complete a foreign language through the intermediate level, and gain computer proficiency. Early in the junior year, students who plan to go on to graduate school should meet with their advisor for curricular counseling.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Applied Sociology

See Sociology.

## Art

The Department of Art offers a Bachelor of Arts (B.A.) degree with a major in either art history or art studio, and a Bachelor of Fine Arts (B.F.A.) degree in studio.

*Faculty:* Professor Holmes, *chairperson*. Professors Calabro, Klenk, Onorato, Pagh, Richman, and Roworth; Associate Professors Dilworth and Hollinshead; Assistant Professor Wills; Professors Emeriti Fraenkel, Leete, Parker, and Rohm.

## BACHELOR OF ARTS

**Art History.** It is recommended that students intending to major in art history plan to complete a minimum of six credits in the history of art by the end of the sophomore year. For graduation, students must complete a minimum of 30 credits (maximum 45 credits) in art history, including ARH 251 and 252 (6). At least 12 credits must be taken from ARH 354, 356, 359, 363, 365. An additional six credits must be taken from the preceding group or one or more of the following: ARH 284, 285, 364, 374, 375. An additional six credits must be taken at the 400 level. At least three of these credits must be taken from ARH 461, 462, 480. It is recommended that students who expect to pursue graduate studies in art history take ARH 469 or 470.

It is recommended that students majoring in art history achieve intermediate-level proficiency in at least one foreign language. Students anticipating graduate study in art history may need proficiency in a second foreign language. Students are also encouraged to enroll in courses in art studio, history, literature, music, and philosophy.

A total of 120 credits is required for graduation. Students must fulfill the requirements of the Basic Liberal Studies program and take 30–45 credits in art history. Students may use courses in art studio to satisfy Basic Liberal Studies requirements. Of the 120 credits required for graduation, 42 credits must be in courses numbered 300 or above.

**Art Studio.** It is recommended that students intending to major in art studio plan to complete foundation courses in the freshman year (ART 101, 103, 207 and ARH 120, section 02). For graduation, a minimum of 33 credits in art (maximum 45 credits) must be completed, including: the studio courses ART 101, 103, and 207; the art history courses ARH 120, 251, 252; and one art history elective at the 200 level or above.

During the first semester of the sophomore year, all B.A. studio majors and B.F.A. candidates must participate in ART 002 Sophomore Review. To participate, students must have a 2.30 grade point average in the foundation courses (ART 101, 103, 207 and ARH 120) and submit a one-page statement of purpose.

An additional six credits must be selected from one of the following sequences of studio courses: ART 213, 314; 215, 316; 221, 322; 231, 332; 233, 334; 243, 344. This sequence must be completed by the end of the junior year.

In the senior year, an additional six credits must be selected from 300- or 400-level studio courses (except 309 and 310).

It is recommended that art majors elect at least three credits in the allied fields of music or theatre.

A total of 120 credits is required for graduation. Students must fulfill the requirements of the Basic Liberal Studies program and take 21–36 credits in art studio and 12 credits in art history. Students may use additional approved BLS courses in art history to satisfy Basic Liberal Studies requirements. Of the 120 credits required for graduation, 42 credits must be in courses numbered 300 or above.

## BACHELOR OF FINE ARTS

It is recommended that students intending to enter the B.F.A. program in art plan to complete ARH 120 in the freshman year and to have completed an additional three credits in art history and a minimum of 24 credits in studio by the end of the sophomore year.

Students in the B.F.A. program must complete a minimum of 72 credits in art. Studio courses required of all majors include: ART 101 (3), 103 (3), 207 (3), 208 (3), either 213 or 215 (3), 405 (3), and 406 (3).

An additional 12 credits must be selected from 200-level studio courses, and an additional 21 credits must be selected from 300-level studio courses.

During the first semester of the sophomore year, all B.A. studio majors and B.F.A. candidates must participate in ART 002 Sophomore Review. To participate, students must have a 2.30 grade point average in the foundation courses (ART 101, 103, 207 and ARH 120) and submit a one-page statement of purpose.

ARH 120 is required of all students, and an additional nine credits must be selected in art history, three credits of which must be numbered 300 or above.

An additional six credits of art electives must be selected at the 300 level or above in either studio or art history.

A minimum of 120 credits is required for graduation, including the following: major requirements in studio (54), art history (12), and studio and/or art history electives (6). Students must meet the requirements of the Basic Liberal Studies program.

## Biological Sciences

Programs in biological sciences are administered by the Department of Biological Sciences. A student may earn either the Bachelor of Arts (B.A.) degree in biology or the Bachelor of Science (B.S.) degree in biological sciences, environmental plant biology, or marine biology. The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in biological sciences.

*Biological Sciences Faculty:* Professor Harlin, *acting chairperson*. Professors Bibb, Bullock, Cobb, Costantino, Goldsmith, Hargraves, Heppner, Hill, Kass-Simon, Killingbeck, and Koske; Associate Professors J.H. Norris, A. Roberts, and Twombly; Assistant Professor Bell; Adjunct Professors Chomet, Harvey,

Miller, and Turner; Adjunct Associate Professors Hammen-Winn, Ho, Sharma, and Thursby; Adjunct Assistant Professors Gemma and E. Roberts; Professors Emeriti Albert, Beckman, Caroselli, Goertemiller, Goos, Hammen, Harrison, Hauke, Lepper, and Shoop; Associate Professors Emeriti Krueger and Mathewson.

## BACHELOR OF ARTS

Students selecting a major in biology must complete a minimum of 28 credits (maximum 45 credits) in biological sciences including the following basic courses: BIO 112 and 113 (8), and MIC 211 (4).

Students must complete a minimum of three credits from each of the three lists (A, B, and C) below.

The remaining nine credits can be selected from courses in biology and/or microbiology. Students in this major must elect a year of chemistry with laboratories. Those wishing to prepare for a professional career in the life sciences should enroll in a B.S. program described below.

A total of 120 credits is required in the B.A. program. At least 42 credits must be in courses numbered 300 or above.

List A: (Botanical) BIO 311, 321, 323, 418, 432, 447, 458.

List B: (Zoological) BIO 121, 141, 201, 202, 204, 205, 242, 244, 327, 329, 331, 355, 381, 382, 441, 442, 446, 447, 464, 466, 467.

List C: (Combination of Botanical and Zoological) BIO 203, 206, 262, 341, 352, 437, 451, 453, 454, 455, 457, 458, 460.

## BACHELOR OF SCIENCE

This curriculum provides a foundation in the fundamental principles of biology and marine biology, and is concerned with the application of biological science to problems of modern life. It also provides preparation for graduate work in biological fields including aquatic, environmental, and marine studies, molecular, cellular, and developmental biology, biological oceanography, genetics, limnology, and



physiology, and preparation for admission to professional schools of medicine, dentistry, and veterinary medicine.

Students who know their professional goals are encouraged to declare a major as soon as possible to take advantage of help from department advisors. Students *must* declare their major when leaving University College.

#### *Freshman Year*

*First semester: 17–18 credits*

Introductory biology requirement (BIO 112 or 113), CHM 101, 102 (4), math requirement (3–4); modern language or elective (3), and Basic Liberal Studies requirement or free elective (3).

*Second semester: 17–18 credits*

Introductory biology requirement (BIO 113 or 112), CHM 112, 114 (4), math requirement (3–4); modern language or elective (3), and Basic Liberal Studies requirement or free elective (3).

#### *Sophomore Year*

*First semester: 16 credits*

MIC 211 (4), CHM 227 (3),<sup>2</sup> and nine credits of biology, Basic Liberal Studies, or electives<sup>3</sup>.

*Second semester: 17–18 credits*

Biology, Basic Liberal Studies, or electives (12–13), and the remaining chemistry requirements CHM 226,<sup>4</sup> 228 (5).<sup>2</sup>

**Biological Sciences.** A minimum of 35 credits in biology is required and must include BIO 112 and 113. Students must select one course from at least four of the six following areas: Cell and Development (BIO 202, 453); Ecology (BIO 206, 262); Genetics (BIO 352); Molecular Biology (BIO 437); Organismal Diversity (BIO 204, 311, 321, 464, 466); Physiology (BIO 201, 242/244, 447). The additional 15 credits must be chosen from Lists A, B, or C (below) and must include at least three credits from List A and at least three credits from List B. In addition, the student must take CHM 101, 102, 112, 114, 226<sup>4</sup>, 227, 228 or 124, 126, and BCH 311; MIC 211; MTH 131, 132 or 141, 142; PHY 111, 112, 185, and 186 or PHY 213, 214, 285, 286; and

either six credits of a modern foreign language, or study of a modern foreign language through the intermediate (104) level. The requirement for a modern foreign language is not met by study abroad or by a culture cluster.

Students are encouraged to become involved in the department's varied research activities by arranging to register for assigned work for Special Problems (491, 492).

List A: (Botanical) BIO 311, 321, 323, 418, 432, 447, 458.

List B: (Zoological) BIO 121, 141, 201, 202, 204, 205, 242, 244, 327, 329, 331, 355, 381, 382, 441, 442, 446, 447, 464, 466, 467.

List C: (Combination of Botanical and Zoological) BIO 203, 206, 262, 341, 352, 437, 451, 453, 454, 455, 457, 458, 460.

Students are strongly urged to consult the biological sciences advisors and obtain from them detailed programs of the various subdisciplinary paths through the department most suited to their particular career goals.

A total of 130 credits is required for graduation.

**Environmental Plant Biology.** The Environmental Plant Biology program is jointly offered by the Department of Biological Sciences in the College of Arts and Sciences and the Department of Plant Sciences in the College of the Environment and Life Sciences.

A minimum of 31 credits is required including BIO 112 (4); BIO/PLS 107 (1); PLS 205 (4); BIO 262 (3); BIO 323 (4) or BIO 311 (3) or BIO 321 (3); BIO/PLS 332 (4) or BIO 432 (4) or BIO 465 (3); PLS 250 (4) or BIO 352 (3) or ASP 352 (3) or BIO 447 (3) or PLS 476 (3).

In addition, students are required to take a minimum of 9–11 credits of 300- and 400-level courses in the major. Students will be encouraged to specialize in one of three concentration areas that have been identified as strengths in the Biological Sciences and Plant Sciences Departments: Biology of Plant Communities,

Symbiology, or Plant Molecular Biology. Lists of suggested courses for each concentration area are listed below. Students with more general or more specific interests in other areas of plant biology may develop their own concentration program (at least 9–11 credits) with an advisor. The Arts and Sciences Dean's Office must be notified of such individual program requirements.

**Specialization in Biology of Plant Communities:** Nine to eleven credits selected from BIO 321 (3), BIO 418 (3), BIO 524 (3), NRS 212 (3), NRS 301 (3), PLS/NRS 475 (4), PLS 476 (3).

**Specialization in Symbiology:** Nine to eleven credits selected from BIO 432 (4); BIO/MIC 453 (4); ENT 385, 386/BIO 381, 382 (4); PLS 463 (3); PLS 472 (3); PLS 511 (3).

**Specialization in Plant Molecular Biology:** Nine to eleven credits selected from BCH 312 (2), BIO 437 (3); BIO 453 (4); PLS 471 (3), PLS 472 (3), PLS 511 (3).

Students majoring in environmental plant biology must also complete CHM 101, 102, 112, 114, 124, and 126; BCH 311; MIC 211; BIO 113; MTH 131 (a second course in mathematical sciences is recommended); PHY 109, 110 or PHY 111, 185; PHY 112, 186.

Students will satisfy the general education requirements of their chosen college, either Arts and Sciences or Environment and Life Sciences. A modern language is recommended.

A total of 130 credits is required for graduation.

**Marine Biology.** A minimum of 29 credits in biological sciences is required and must include BIO 112; either BIO 113 or BIO 205; and BIO 130. Of the remaining 21 credits, 12 credits must be earned by selecting one course from at least four of the following six areas: Physiology (BIO 447 or BIO 201); Organismal Diversity (BIO 321 or BIO 311 or BIO 464); Ecology (BIO 262 or BIO 206); Genetics (PLS 352 or BIO 352); Cell and Developmental Biology (BIO 453 or BIO 202); Molecular Biology (BIO 437). The remaining nine credits must be

selected from the following, with no more than three credits of Special Problems to be applied to this requirement: BIO 355, 418, 441, 455, 457, 464, 465. In addition, the student must take CHM 101, 102, 112, 114, and either CHM 226, 227, and 228 or CHM 124, 126, and BCH 311; MTH 131 or 141 and 132 or 142; MIC 211; OCG 401; PHY 111, 112, 185, 186, or 213, 214, 285, 286; and either six credits of a modern foreign language, or study of a modern foreign language through the intermediate (104) level. The requirement for a modern foreign language is not met by study abroad or by a culture cluster.

## Biology

See Biological Sciences.

## Chemistry

The Department of Chemistry offers a Bachelor of Arts (B.A.) degree and a Bachelor of Science (B.S.) degree. The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in chemistry.

*Faculty:* Professor W. Nelson, *chairperson*. Professors C. Brown, P. Brown, Dain, Euler, Fasching, Fisher, Freeman, Kirschenbaum, W. Rosen, Traficante, Vittimberga, and S. Yang; Associate Professor Zoski; Adjunct Professor Mostafa; Professors Emeriti Abell and Cheer.

### BACHELOR OF ARTS

Students selecting this program must complete a minimum of 29 credits (maximum 45 credits) in chemistry by taking either 10 credits as CHM 191, 192; or 12 credits as CHM 101, 102, 112, 114, and 212; and 16 credits as CHM 291, 292, 335, 431, and 432. One additional course must be chosen from CHM 401, 412, or 427. CHM 226, 227, 228 may be substituted for the 291, 292 sequence. CHM 191 can be substituted for CHM 101 and 102.

MTH 141 and 142 and one year of physics (PHY 213, 214, 285, and 286,

or PHY 111, 112, 185, and 186, or PHY 203, 204, 273, and 274) are required.

A total of 120 credits is required for the B.A. degree. At least 42 of these must be in courses numbered 300 or above.

### BACHELOR OF SCIENCE

Designed to prepare the student for a career in chemistry, this curriculum provides a thorough training in both theory and practice in the fields of analytical, physical, organic, and inorganic chemistry. Those who complete this curriculum are prepared to practice as a chemist, pursue graduate studies in chemistry, or enroll in a professional school in a related area such as medicine, dentistry, or pharmacy. Pre-professional studies can be focused through the use of electives.

The curriculum has been approved by the American Chemical Society Committee on the Professional Training of Chemists. Graduates receive a certification card issued by the society and are eligible for senior membership after two years of experience in the field of chemistry. It is strongly recommended that WRT 101 or 201 be taken in the freshman year. CHM 425, 427 should be taken in the junior year by students planning research or advanced course work in organic chemistry.

Bachelor of Science students desiring the American Chemical Society option in chemistry/biochemistry must take BCH 481, 482 or BCH 581, 582. Six additional credits in undergraduate research (either CHM 353 and/or 354) are also required to satisfy requirements for advanced laboratory. CHM 353, 354 will be supervised by faculty with expertise in biochemistry. Students electing the chemistry/biochemistry option may wish to take additional courses in molecular biology as electives.

A total of 130 credits is required for the B.S. degree.

#### *Freshman Year*

*First semester: 17 credits*

CHM 191 (5) (or CHM 101, 102), MTH 141 (4), language<sup>5</sup> or free elective (3), Basic Liberal Studies requirements (5).

*Second semester: 17 credits*

CHM 192 (5) (or CHM 112, 114), MTH 142 (4), language<sup>5</sup> or free elective (3), Basic Liberal Studies requirements (5).

#### *Sophomore Year*

*First semester: 17 credits*

CHM 291 (4) (or CHM 227), CHM 212 (4) (if CHM 112, 114 chosen), MTH 243 (3), PHY 213, 285 or PHY 203, 273 (4), language<sup>5</sup> or Basic Liberal Studies requirements (2).

*Second semester: 17 credits*

CHM 292 (4) (or CHM 228, 226), MTH 244 (3), PHY 214, 286 or PHY 204, 274 (4), language<sup>5</sup> or Basic Liberal Studies requirements (6).

#### *Junior Year<sup>6</sup>*

*First semester: 14 credits*

CHM 431 (3), 335 (2), physics elective (3) (PHY 205, 275 recommended), Basic Liberal Studies requirement (3), free elective (3).

*Second semester: 17 credits*

CHM 432 (3), 412 (3), 414 (2), Basic Liberal Studies requirements (6), free elective (3).

#### *Senior Year*

*First semester: 16 credits*

CHM 401 (3), 425 (2), 427 (3), curriculum<sup>7</sup> requirements (3–5), free electives (3–5).

*Second semester: 15 credits*

CHM 492 (1), 402 (2), curriculum<sup>7</sup> requirement (1–3), free electives (9–11).

## Chemistry and Chemical Oceanography

The Department of Chemistry and the Graduate School of Oceanography offer a Bachelor of Science (B.S.) degree in chemistry and chemical oceanography.

*Coordinator:* Professor W. Nelson (Chemistry).

The faculty consists of the members of the Department of Chemistry and the

chemical oceanography faculty of the Graduate School of Oceanography.

The program is designed to prepare the student for a career either in chemistry or in chemical oceanography. This curriculum provides a thorough training in both theory and practice in the fields of analytical, physical, organic, inorganic, and oceanographic chemistry. Those who complete this curriculum are prepared to continue with graduate study leading to an advanced degree in chemistry or in chemical oceanography, to teach, or to enter specialized fields in development, control, technical sales, and research in the chemical or oceanographic industries.

The curriculum has been approved by the American Chemical Society Committee on the Professional Training of Chemists. Graduates receive a certification card issued by the society and are eligible for senior membership after two years of experience in the field of chemistry. It is strongly recommended that WRT 101 or WRT 201 be taken in the freshman year.

A total of 130 credits is required for graduation.

#### *Freshman Year*

*First semester: 17 credits*

CHM 191 (5) (or CHM 101, 102), MTH 141 (4), language<sup>5</sup> or free elective (3), Basic Liberal Studies requirements (5).

*Second semester: 17 credits*

CHM 192 (5) (or CHM 112, 114), MTH 142 (4), language<sup>5</sup> or free elective (3), Basic Liberal Studies requirements (5).

#### *Sophomore Year*

*First semester: 17 credits*

CHM 291 (4) (or CHM 227), CHM 212 (4) (if CHM 112, 114 were chosen), MTH 243 (3), PHY 213, 285 or PHY 203, 273 (4), language<sup>5</sup> or Basic Liberal Studies requirements (2).

*Second semester: 17 credits*

CHM 292 (4) (or CHM 228, 226), MTH 244 (3), PHY 214, 286 or PHY 204, 274

(4), language<sup>5</sup> or Basic Liberal Studies requirements (6).

#### *Junior Year*

*First semester: 14 credits*

CHM 431 (3), 335 (2), OCG 451 (3), Basic Liberal Studies requirement (3), free elective (3).

*Second semester: 15 credits*

CHM 432 (3), OCG 494 (3), Basic Liberal Studies requirements (6), free elective (3).

#### *Senior Year*

*First semester: 16 credits*

CHM 401 (3), 425 (2), 427 (3), OCG 493 (3), free electives (5).

*Second semester: 17 credits*

CHM 412 (3), 414 (2), OCG 521 (3), free electives (9).

## Classical Studies

The Department of Modern and Classical Languages and Literatures offers the Bachelor of Arts (B.A.) degree with a major in classical studies.

*Faculty:* Associate Professor Suter, *section head.*

Students selecting classical studies as a major complete a minimum of 30 credits:

a) 18 credits from either LAT 301, 302, 497, 498 or GRK 301, 302, 497, 498; b) six credits from the other language at any level; c) six additional credits from the following: ARH 354; CLA 391, 395, 396, 397; HIS 300, 303; PHL 321. Either the LAT 101, 102 or the GRK 101, 102 sequence may count toward the major; the other 100-level sequence, not counting toward the major, will serve as a prerequisite for advanced courses.

Certification in secondary education in Latin is available through the Department of Education.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Communication Studies

The Department of Communication Studies offers the Bachelor of Arts (B.A.) degree in communication studies.

*Faculty:* Professor S. Wood, *chairperson.* Professors Anderson, Brownell, Devlin, Doody, Ketrow, and Mundorf; Associate Professor G. Chen; Assistant Professors Derbyshire, Leatham, McClure, and Quainoo; Director of Debate J. Devine; Instructor S. Brown.

The program in communication studies provides maximum flexibility in planning for a variety of academic and occupational goals. The curriculum is personalized for each student. Although the student will play an important role in curriculum planning, his or her program is closely supervised by the advisor. Specific curricular, extracurricular, and internship programs are planned as integral parts of each student's program. Departmentally approved courses provide the student diversity or a more focused approach, depending on the student's needs and goals. Courses outside the department that relate to the student's needs and goals are also encouraged.

Courses in communication studies also can count as an option area in the B.S. degree program in the College of Human Science and Services. Other courses can count toward a minor in public relations when taken in conjunction with specific journalism and marketing courses.

Students selecting this major may pursue studies in business and professional communication, communication theory, oral interpretation, rhetoric and public address, or public relations.

The program requires a minimum of 36 credits (maximum 45 credits) in the major, including COM 101, 103, 206, and 306. The remaining 24 credits will be distributed as follows: at least two courses at the 200 level (excluding 216); three courses at the 300 level; and three courses at the 400 level (excluding COM 471, 472 and 491, 492). The student and an advisor will design an appropriate selection of courses.

Communication studies majors interested in a communication/music related career may complete a second major in music. Contact Professor Wood for more information.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Comparative Literature Studies

The Department of English and the Department of Modern and Classical Languages and Literatures offer jointly the Bachelor of Arts (B.A.) degree in comparative literature studies.

*Coordinator:* Professor Manteiga (Modern and Classical Languages and Literatures).

The choice of courses in a student's major and in the area of special interest must have both sufficient range (genre, period, and at least two literatures) and a specific focus. It must be approved by an advisor and filed with the Office of the Dean.

Students in the comparative literature studies program fulfill the Basic Liberal Studies Fine Arts and Literature requirement by taking six credits in Fine Arts and three credits in Literature which are over and above their major literature requirements.

Students must complete a minimum of 30 credits in one of the following major options.

**English and One Foreign Literature in the Original Language.** Nine credits in English and/or American literature, 300 level or above; nine credits in one foreign literature; three credits in literary theory or criticism (CLS 350). The remaining credits are to be taken from the comparative literature core courses or the literature courses in the Department of English or the Department of Modern and Classical Languages and Literatures.

**Two Foreign Literatures in the Original Language.** Nine credits in each of two foreign literatures; three credits in literary theory or criticism (CLS 350). The remaining courses are to be taken from the com-

parative literature core courses or the literature courses in the Department of English or the Department of Modern and Classical Languages and Literatures.

**World Literature in English Translation.** Three credits in the nature of language from APG/LIN 200 or APG/LIN 220; three credits in literary theory or criticism (CLS 350); at least one foreign literature in translation course. In addition, the student must take 12 credits in a language beyond the 102 level. The remaining credits are to be taken from the comparative literature core courses and/or the literature courses offered by the Department of English and the Department of Modern and Classical Languages and Literatures.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Computer Science

The Department of Computer Science and Statistics offers the Bachelor of Science (B.S.) degree in computer science. The department also co-sponsors the B.S. in computer engineering (described in the College of Engineering section). In addition, the department offers the Master of Science (M.S.) degree in computer science and the Doctor of Philosophy (Ph.D.) in applied mathematical sciences with a specialization in computer science.

*Faculty:* Professor Lamagna, *chairperson*. Professor Carrano; Associate Professors Baudet, Fay Wolfe, J. Kowalski, Peckham, and Ravikumar; Adjunct Associate Professor Strauss; Adjunct Assistant Professors DiPippo and Ravenscroft; Professor Emeritus Carney.

The curriculum is designed to provide a broad introduction to the fundamentals of computer science including software and systems, programming languages, machine architecture, and theoretical foundations of computing. The required mathematics preparation provides a basis for advanced work. Students will be well prepared for graduate study in computer science.

Students in the computer science curriculum must complete a minimum of 56 credits as follows: CSC 110 (4), 211 (4), 212 (4), 301 (4), 305 (4), 340 (4), 411 (4), 412 (4), 440 (4), 499 (8); 12 additional credits chosen from CSC 320 (4), 350 (4), 402 (4), 406 (4), 415 (4), 436 (4), 445 (4), 481 (4), including either CSC 350 or 445.

Students will also complete MTH 141 (4), 142 (4), 215 (3), 243 (3); PHY 213, 285 (4), 214, 286 (4), or PHY 203, 273 (4), 204, 274 (4); one COM course (3); and two WRT courses from among WRT 101, 201, 301, or 333 (6).

Students majoring in computer science who leave the University and are subsequently readmitted must follow the computer science curriculum requirements in effect at the time of their readmission, unless an exception is granted by the department chairperson and approved by the Dean.

A total of 129 credits is required for graduation. A possible course of studies follows.

### *Freshman Year*

*First semester: 15 credits*

CSC 110 (4), MTH 141 (4), URI 101 (1), WRT 101 (3), Basic Liberal Studies requirements or electives (3).

*Second semester: 17 credits*

COM 101 (3), CSC 211 (4), MTH 142 (4), Basic Liberal Studies requirements (3), electives (3).

### *Sophomore Year*

*First semester: 17 credits*

CSC 212 (4), MTH 243 (3), PHY 203, 273, (4), Basic Liberal Studies requirements or electives (6).

*Second semester: 17 credits*

CSC 301 (4), MTH 215 (3), PHY 204, 274, (4), WRT 333 (3), Basic Liberal Studies requirements or electives (3).

### *Junior Year*

*First semester: 15 credits*

CSC 305 (4), 411 (4), CSC elective (4), Basic Liberal Studies requirement (3).

*Second semester: 15 credits*

CSC 340 (4), 412 (4), CSC elective (4), Basic Liberal Studies requirement (3).

*Senior Year*

*First semester: 17 credits*

CSC 440 (4), 499 (4), Basic Liberal Studies requirement (3), electives (6).

*Second semester: 16 credits*

CSC 499 (4), CSC elective (4), electives (8).

**Minor in Computer Science.** Students who wish to declare a minor in computer science must earn 20 credits including CSC 211 (4), 212 (4), 301 (4), and two other CSC courses at the 300 level or above. In addition, students are expected to complete MTH 141.

## Economics

The Department of Economics offers a Bachelor of Arts (B.A.) and a Bachelor of Science (B.S.) degree in economics.

*Faculty:* Professor Mead, *chairperson*. Professors H. Barnett, Burkett, Lardaro, McIntyre, Mead, Ramsay, Ramstad, Sharif, and Starkey; Associate Professors C. Miller and Suzawa.

## BACHELOR OF ARTS

Students selecting this field must complete a minimum of 33 credits (maximum 45 credits) in economics, including ECN 201 and 202 (6), 305 and 306 (6), 327, 328 (6), and 445 (3).

In addition, at least 12 credits must be completed from economics courses numbered 300 or above. Students may substitute up to six credits from other departments; three credits from statistics—BAC 201 (3), 202 (3), STA 308 (3), 409 (3), or 412 (3)—and three credits from another related course approved by the department chairperson. These substitutions must be filed with the Office of the Dean.

Students planning to do graduate work in economics are encouraged to take ECN 375, 376 and at least one semester of statistics.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## BACHELOR OF SCIENCE

Students in this curriculum may elect one of two options: *economic theory and methods* or *applied economics*. A student must inform the Dean's Office of the option he or she is choosing.

**Economic Theory and Methods.** A minimum of 30 credits in economics including ECN 201, 202, 305, 327, and 328. In addition, students must complete MTH 141, 142, 215, 243, 307, and 435. This option is recommended for students preparing for graduate study in economics.

**Applied Economics.** A minimum of 30 credits in economics including ECN 201, 202, 305, 327, 328, 375, 376, and 445. In addition, students must complete COM 101; BAC 202 or MTH 451 or STA 308.

A total of 120 credits is required for graduation.

## English

The Department of English offers a Bachelor of Arts (B.A.) degree. The department also offers the Master of Arts (M.A.) and Doctor of Philosophy (Ph.D.) in English.

The Department of English offers jointly with the Department of Modern and Classical Languages and Literatures the Bachelor of Arts degree in comparative literature studies (see page 53).

*Faculty:* Professor Donnelly, *chairperson*. Professors Arakelian, Barker, Burke, J. Campbell, Cuddy, Dvorak, Jacobs, Kunz, Leo, Neuse, Okeke-Ezigbo, Pearlman, Schwegler, Seigel, Shamoony, and K. Stein; Associate Professors Cane, Cappello, Gititi, C. Martin, Reeves, Reynolds, Schoonover, Shugar, Swan, Vaughn, and Walton; Assistant Professors Barber, Cook, Mensel, and Riss; Adjunct Professor Strommer; Instructor Miles.

Students selecting this field must complete a minimum of 30 credits (maximum 45 credits), including ENG 241, 251, and 252. Of the remaining 21 credits, three credits must be selected from each of the following groups: *Literature or Language Theory* (302, 310, 330, 332, 336, 337, 350); *Genre* (243, 263, 264, 265, 362, 364, 366, 367, 446, 447, 448, 458, 468, 469, 477, 488); *Major Figure* (280, 380, 384, 472, 485, 486); *Historical Period* (242, 270, 340, 347, 348, 349, 370, 371, 372, 374, 376, 377, 379); *Parallel Studies* (205, 247, 248, 260, 300, 305, 335, 346, 360, 385, 397, 445, 474, 494; WRT 301, 333); and six credits from any ENG course. At least 18 credits in ENG courses must be taken at the 300 level or above.

Note: Freshman are not admitted to 300- or 400-level courses except by permission of the instructor. Sophomores are discouraged from taking 100-level courses.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Environmental Plant Biology

See Biological Sciences.

## French

The Department of Modern and Classical Languages and Literatures offers the Bachelor of Arts (B.A.) degree with a major in French.

*Faculty:* Professor Morello, *section head*. Professors Chartier and K. Rogers; Associate Professors Hammadou and Toloudis.

Students selecting this field are required to complete at least 30 credits (maximum 45 credits) in French, not including FRN 101, 102, 391, 392, 393, or 394. They must elect a minimum of three credits from FRN 412, 473, or 474.

Additionally, students with proven competence in French language and literature, with permission of the advisor, the section head, the department chairperson,

and the Dean of the College of Arts and Sciences, may take courses toward their concentration in related fields such as history, linguistics, art, or philosophy.

Students in secondary education (see pages 97–98, College of Human Science and Services section) with an academic sequence in French must take 36 credits and cannot count FRN 101, 102, 391, 392, 393, 394, or any course in linguistics other than 220, which may be taken if approved by the French Studies Section.

Approval must be filed with the Office of the Dean.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## German

The Department of Modern and Classical Languages and Literatures offers the Bachelor of Arts (B.A.) degree with a major in German.

*Faculty:* Professor Grandin, *section head*. Associate Professor Hedderich; Assistant Professors Kirchner and von Reinhart; Visiting Assistant Professor Rarick.

Students selecting this major complete at least 30 credits (maximum 45 credits) in German, not including GER 101, 102, or 392. At least six credits must be taken at the 400 level in literature.

Students in secondary education (see pages 97–98, College of Human Science and Services section) must take 36 credits in German.

Students in the International Engineering Program may use three credits of German literature toward the Fine Arts and Literature Basic Liberal Studies requirement. In addition, students in this program are exempt from the one-course-per-discipline rule in Letters, Social Sciences, and Natural Sciences.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## History

The Department of History offers a Bachelor of Arts (B.A.) degree. The department also offers the Master of Arts (M.A.) degree in history.

*Faculty:* Associate Professor Honhart, *chairperson*. Professors Briggs, J.A. Cohen, Findlay, Klein, Strom, Thurston, and Weisbord; Assistant Professors Mather, Pegueros, Rollo-Koster, and Schwartz; Adjunct Associate Professor Klyberg.

Students selecting this field must complete a minimum of 30 credits (maximum 45 credits) in history, including a minimum of six and a maximum of 12 credits in courses numbered 100 to 299.

The balance of required credits is in courses numbered 300 or above, (including HIS 401 or 441 or 481) and HIS 495. When possible, the two 400-level courses should be taken in consecutive semesters with the same instructor. Under unusual circumstances, with permission of the department chairperson, a student may substitute, in place of the seminar, HIS 391 leading to a substantial research paper.

Undergraduates wishing to take courses on the 500 level must secure the permission of the chairperson.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Italian

The Department of Modern and Classical Languages and Literatures offers the Bachelor of Arts (B.A.) degree with a major in Italian.

*Faculty:* Professor Trivelli, *section head*. Professor Viglionese; Assistant Professor Sama.

Students selecting this major must complete at least 30 credits (maximum 45 credits), not including ITL 101, 102, 391, 392, or 395. ITL 325, 326 are required for the major.

Students in secondary education (see pages 97–98, College of Human Science and Services section) must take 36 credits.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Journalism

The Department of Journalism offers the Bachelor of Arts (B.A.) degree.

*Faculty:* Associate Professor Silvia, *chairperson*. Professor Luebke, Associate Professor Levin.

The study and practice of journalism require the acquisition and application of a broad base of knowledge, and therefore journalism majors at the University of Rhode Island pursue a professional course of study that is strongly grounded in the liberal arts. Along with Basic Liberal Studies and elective courses from other disciplines, the major requires students to explore the concepts and practices of contemporary American journalism. Within a social, historical, legal, and ethical context, students acquire skills in gathering and synthesizing factual information and communicating it clearly to a variety of audiences. Journalism course work, through individual and collaborative assignments, focuses on reporting, writing, editing, and producing news for publication or broadcast.

Students who choose journalism as a minor can focus on public relations or media issues, on print or broadcasting. For students majoring in other fields, the department offers courses that provide a forum on the role of mass media in society.

Students majoring in journalism must complete a minimum of 30 credits (maximum 45 credits) in journalism. All journalism majors must complete JOR 115, 220, 310, and 410. In addition, students must select nine credits from skills courses: JOR 230, 320, 321, 330, 331, 340, 341, 342, 420, 430, 441; and three credits from conceptual courses: JOR 210, 211, 311, 313, 415. Any journalism courses may be chosen for the remaining six credits. Students

are encouraged to consult with their advisors about the mix of journalism courses that best meets their goals.

Journalism majors must fulfill some of their Basic Liberal Studies requirements by choosing from the following list of courses. The department has identified these courses as important preparation for students to both study and practice journalism.

*Fine Arts and Literature:* ARH 120 or MUS 101 or THE 100 and ENG 160 or 241 or 242 or 251 or 252 or 280.

*Letters:* HIS 142 or 341 or 354 and PSC 240 or 341 or 342 or PHL 103 or 204 or 217.

*Natural Sciences*<sup>8</sup>: BIO 104A or 104B or 112 or 113 or CHM 101 and 102 or GEL 103 or PHY 111 and 185 or PHY 112 and 186.

*Social Sciences:* PSC 113 or 116 or 201 and SOC 102 or 240 or 242 or 336 or WMS 150.

*Communication Skills*<sup>8</sup>: PHL 101.

The only journalism courses open to freshmen are JOR 110 (for nonmajors), JOR 115 (for majors), and JOR 220. Journalism majors are urged to concentrate on their Basic Liberal Studies requirements during their freshman and sophomore years. In addition to the aforementioned required courses, other Basic Liberal Studies courses are recommended as useful for journalism majors. Students should consult with their advisors about complete Basic Liberal Studies requirements and about other courses that meet their individual goals.

Students must earn a grade of C or better in a "skills" course (including JOR 220) to enroll in the next-level course. Only three credits of JOR 220 may be used to satisfy graduation requirements.

Students majoring in journalism are encouraged to pursue a minor. The Department of Journalism, in conjunction with the Department of Communication Studies and the Department of Marketing, has developed a minor in public relations.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Languages

See Modern and Classical Languages and Literatures.

## Latin American Studies

The Departments of Sociology and Anthropology, History, and Modern and Classical Languages and Literatures offer a Bachelor of Arts (B.A.) degree in Latin American studies.

*Faculty:* Associate Professor Morin, *LAS Committee chairperson*. *LAS Committee members:* Professors McNab and Poggie; Associate Professors Gititi and C. White; Assistant Professor Pegueros.

Some faculty members in the College of Arts and Sciences who do not appear as members of the LAS Committee also offer courses acceptable in fulfilling the requirements leading to the B.A. in Latin American studies.

Students selecting this field must complete a minimum of 36 credits as follows: APG 315, HIS 381, 382, and one additional history course dealing with the major; six credits in Spanish or Portuguese from the approved list; LAS 397; PSC 201; ECN 363; and nine credits of electives from the approved list of courses.

Students must file their program of study with the Office of the Dean.

Credits leading to the B.A. in Latin American studies may also be taken at foreign universities or other universities in the United States that offer programs in Latin American studies with the approval of the Latin American Studies Committee, as long as 15 credits in the major are taken at the University of Rhode Island.

Students are highly encouraged to participate in study abroad programs in Latin America.

A list of courses acceptable for this program can be found in "Courses of Instruction." Courses not listed are not necessarily excluded from this program, provided that the subject matter deals in some way with Latin America. The Latin American Studies Committee must

approve the student's program including any course substitutions.

The Latin American Studies Committee will assist students in the formulation and approval of their programs. The current coordinator is Thomas Morin, associate professor of Hispanic studies in the Department of Modern and Classical Languages and Literatures.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Linguistics

Admission to the B.A. program in linguistics is currently suspended.

The Department of Modern and Classical Languages and Literatures offers a number of undergraduate courses in linguistics. The minor in linguistics is still available.

*Faculty:* Professor K. Rogers, *section head*.

## Marine Biology

See Biological Sciences.

## Mathematics

The Department of Mathematics offers a Bachelor of Arts (B.A.) degree and a Bachelor of Science (B.S.) degree. The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees.

*Faculty:* Professor Finizio, *chairperson*. Professors Beauregard, Clark, Datta, Driver, Fraleigh, Grove, Kaskosz, Ladas, Lewis, Montgomery, Pakula, Suryanarayan, and Verma; Associate Professors N. Eaton and Merino; Assistant Professor Liu; Professors Emeriti Roxin and Schwartzman; Assistant Professor Emeritus Barron.

## BACHELOR OF ARTS

Students in this curriculum may tailor a program to suit their individual needs and interests. They should meet with their advisor no later than the end of the first semester of the sophomore year to plan a

complete program. This program, and any subsequent changes in it, must be approved by the advisor and the department chairperson. It must contain at least 32 credits (maximum 45 credits) in mathematics, and include MTH 141, 142, 215, 243, and 316, plus 15 or more additional credits in mathematics, at least three credits of which should be at the 400 level.

MTH 107, 108, and 111 may not be taken by students majoring in mathematics.

A total of 120 credits is required in the B.A. curriculum. At least 42 of these must be in courses numbered 300 or above.

## BACHELOR OF SCIENCE

Students in this curriculum may elect either the general program or the applied mathematics option.

**General Program.** This program stresses basic theories and techniques, and includes an introduction to the principal areas of mathematics. It is recommended for students considering graduate study in mathematics.

Students in this program must complete MTH 141, 142, 215, and 243. These courses should normally be taken in the freshman and sophomore years. Students must complete an additional 27 credits in mathematics, including MTH 316, 425, 435, 436, and 462. MTH 107, 108, and 111 may not be taken by students majoring in mathematics. The student must take CSC 211 and 212.

**Applied Mathematics Option.** This program is intended for the student who anticipates a career as an applied mathematician or mathematical consultant with an organization such as an industrial or engineering firm or with a research laboratory. The student learns the mathematical ideas and techniques most often encountered in such work. Although a theoretical foundation is developed, the applications are emphasized.

The student must take MTH 141, 142, 215, and 243, preferably by the end of the sophomore year. The student must complete MTH 307 and 435, 436 or 437, 438, and also CSC 211, 212. In addition, the

student must select nine credits from Group I (Mathematics), and nine credits from Group II (Applications).

*Group I:* MTH 244, 316, 322, 418, 441, 442, 444, 451, 452, 456, 461, 462, 471, and 472. Other courses may be used for this group with prior permission of the chairperson.

*Group II:* BIO 460; CSC 301, 411, 450; ECN 323, 324, 375, and 376; ELE 210; IME 432, 433; MCE 262, 263; PHY 322, 331, 341; STA 409, 412. Other courses may be used for this group with prior permission of the chairperson.

The Office of the Dean must be informed of any substitutions.

Both programs require 130 credits for graduation.

**Minor in Mathematics.** Students who wish to declare a minor in mathematics must earn credit for MTH 141, 142, 243, or MTH 131, 132, 244; MTH 215; and two three-credit mathematics courses chosen from MTH 307, 316, 322, or any 400-level course.

## Military Science (Army ROTC)

The Department of Military Science conducts the Reserve Officer Training Corps (ROTC) program for students who desire to earn commissions as officers in the United States Army. Students must complete the equivalent of eight semesters of military science subjects. Completion of the four-year military science program qualifies students to petition their academic college for a minor in military science. Participation in the program during the first two years (freshman and sophomore) is without any obligation to the military unless the student is on a scholarship contract. Students can enter the program as freshmen or sophomores and in exceptional cases approved by the chairperson, as juniors. After completing University degree requirements and departmental requirements, students are eligible to be commissioned as Second Lieutenants in the United States Army in either the Active Army, Army Reserve, or National Guard.

*Faculty:* Professor Smith (Lt. Col. U.S. Army), *chairperson*. Assistant Professors Accetta, Lamb, Sandercock, and Tricarico.

## Modern and Classical Languages and Literatures

The Department of Modern and Classical Languages and Literatures offers the Bachelor of Arts (B.A.) degree in classical studies, French, German, Italian, and Spanish, which are described in alphabetical order, as well as minors in linguistics, Portuguese, and Russian, and courses in Hebrew and Japanese.

The department offers jointly with the Department of English the Bachelor of Arts (B.A.) degree in comparative literature studies (see page 53, this section).

*Faculty:* Professor Morello, *chairperson*.

## Music

The Department of Music offers a Bachelor of Arts (B.A.) degree, a Bachelor of Music (B.M.) degree, and a program with the Department of Communication Studies which results in a B.A. degree with a double major in music and communication studies. The department also offers the Master of Music (M.M.) degree.

*Faculty:* Professor R. Lee, *chairperson*. Professors Dempsey, Fuchs, Gibbs, Kent, Ladewig, Pollart, and Rankin; Associate Professor Livingston; Assistant Professors Danis and Parrillo; Instructor Smith; Artist Instructors Buttery, Ceo, Cobb, de la Garza, Dean-Gates, Djokic, Murray, Noreen, Salazar, Sparks, Stabile, Swanson, Thomas, Towne, and Vinson; Music Listening Lab Coordinator Bissett; Visiting Assistant Professor Conley.

## BACHELOR OF ARTS

Students selecting music as a major have two options: *music* and *music history and literature*.

**Music.** Students selecting this option must complete 36 credits (maximum 48) in musicianship, performance, and music electives, as follows:



**Musicianship:** MUS 131 (3); 121, 122, 225, 226, 227, 228 (12); 221, 222 (6); 322 or upper-division music history course (3); 280 (0) and 480 (1). Students who are deficient in keyboard skills must take MUS 171 (1).

**Performance:** four semesters of the principal applied music area, at least two credits per semester (8); three semesters of ensembles appropriate to the principal applied music area (3); seven semesters of MUS 250 (0). A successful audition is required prior to study in the principal applied music area.

**Electives:** the department strongly recommends that 12 credit hours of electives be taken in music. At least six of these credits should be in upper-division music courses.

Transfer credits in music theory, music history, and performance must be validated by placement examination.

Music majors interested in a career in communication studies and music may also complete a second major in communication studies. Contact Professor Lee for more information.

Music majors interested in a career in business and the arts should complete the business minor for nonbusiness students described on page 66, College of Business Administration section.

A total of 120 credits is required for graduation. At least 42 of these must be at the 300 level or above.

**Music History and Literature.** Students choosing this option must complete 43 credits (maximum 55) in musicianship, performance, and music electives, as follows:

**usicianship:** MUS 131 (3); 121, 122, 225, 226, 227, 228 (12); 221, 222, 322 (9); three upper-division music history courses (9); 280 (0) and 480 (1). Students who are deficient in keyboard skills must take MUS 171 (1).

**Performance:** four semesters of the principal applied music area, at one credit for two semesters and two credits for two semesters (6); three semesters of ensembles

appropriate to the principal applied music area (3); seven semesters of MUS 250 (0). A successful audition is required prior to study in the principal applied music area.

**Electives:** the Department strongly recommends that 12 credit hours of electives be taken in music. At least six of these credits should be in upper-division music courses.

**Other:** nine credits of foreign language and proficiency through 103 in either French or German.

Transfer credits in music history and literature, music theory, and performance must be validated by placement examination.

A total of 127 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## BACHELOR OF MUSIC

Students can be admitted to the Bachelor of Music degree program only after a successful audition and should contact the Department of Music for specific requirements.

Transfer credits in music theory, music history, and performance must be validated by placement examination.

All Bachelor of Music students will take a piano proficiency examination at the conclusion of one year of study or by the end of the second semester of the sophomore year. Students who have not passed the piano proficiency examination by the end of MUS 172 will be expected to take MUS 271 as needed. Failure to pass the proficiency examination or any portion of it requires re-examination in succeeding semesters. No one will graduate with a Bachelor of Music degree until this requirement is fulfilled.

No student should participate in more than three major ensembles in a single semester.

In addition, students select one of the following majors.

**Music Composition.** Students selecting music composition must complete the following. Seven semesters of applied composition (110V, 210V, 310V, 410V), one or

two credits per semester (10). Seven semesters of the principal applied music area, two credits per semester (14). Seven semesters of MUS 250 (0). Four semesters of secondary applied music areas, one credit per semester (4); MUS 171 and 172 are required as secondary applied music areas. Students may meet the requirement of MUS 172 by passing the piano proficiency examination before accumulating 60 credits. Six semesters of major ensembles appropriate to the principal applied music area (6). MUS 131(3); 121, 122, 225, 226, 227, 228, 416 (15); 221, 222, 322 (9); 235 (3) and 311 (2); 417, 420, and 421 (9). (For students wishing to specialize in studio composition, three credits of MUS 323 may be substituted for MUS 420). An upper-division music history course (3). MUS 450 Senior Composition Recital (0). MUS 280 (0) and 480 (2). Nine credits of free electives, at least three of which should be in upper-division music courses.

A total of 129 credits is required for graduation.

**Music Education.** See page 97, College of Human Science and Services section, for admission requirements for teacher education programs. Students majoring in music education must complete 89 credit hours in *Studies in Music* and *Professional Education*, as follows:

**Studies in Music** (65 credits): seven semesters of the principal applied music area, two credits per semester (14). Seven semesters of MUS 250 (0); senior recital MUS 450 (0). Four semesters of secondary applied music areas, one credit per semester (4); MUS 171 and 172 are required as secondary applied music areas. Students may meet the requirement of MUS 172 by passing the piano proficiency examination before accumulating 60 credits. Seven semesters of major ensembles appropriate to the principal applied music area, at 0 or one credit per semester (6). MUS 131 (3); 121, 122, 225, 226, 227, 228 (12); 416 or 417 (3); 221, 222, 322 (9). MUS 169, 170, 173, 175, 177, 179 at a minimum of one credit each (6); 235 (3); 311, 312 (5).

*Professional Education* (24 credits): MUS 280 (0), 480 (2); MUS 238, 339, 340 (9); EDC 250 (1), 484 (12). PSY 113 and EDC 312 (6) are required as *Professional Education* courses but are also counted toward the Social Science requirement in the Basic Liberal Studies program. The piano proficiency examination and all courses listed above, with the exception of MUS 480, must be completed before supervised student teaching (EDC 484).

*Free electives*: three credits.

A total of 131 credits is required for graduation.

**Music Performance.** All students in this degree program must take the following music courses: eight semesters of MUS 250 (0); MUS 350 and 450 (0); 131 (3); 121, 122, 225, 226, 227, 228, 416 (15); 221, 222, 322 (9). MUS 235 (3) and 442 (2); 311 (2); 280 (0); 480 (2).

A total of 129 credits is required for graduation.

In addition, students must select one of the following four options.

*Classical Guitar*: eight semesters of the principal applied music area. Two semesters of MUS 110 at two credits in the first semester and three credits in the second (5); two semesters of MUS 210 at three credits each (6); two semesters of 310 and 410 at four credits each (16). MUS 171 and 172 (2). Students may meet the requirement of MUS 172 by passing the piano proficiency examination before accumulating 60 credits. Four semesters of major ensembles (4). Four semesters of guitar ensemble (MUS 399G) and three semesters of playing guitar in chamber music ensembles (MUS 399) (7). An upper-division music history course (3); an upper-division music theory course (3). Seven credits of free electives, at least three of which should be in upper-division music courses.

*Orchestral Instrument*: eight semesters of the principal applied music area. Two semesters of MUS 110 at two credits in the first semester and three credits in the sec-

ond (5); two semesters of MUS 210 at three credits each (6); two semesters of 310 and 410 at four credits each (16). MUS 171 and 172 (2). Students may meet the requirement of MUS 172 by passing the piano proficiency examination before accumulating 60 credits. Eight semesters of major ensembles appropriate to the principal applied music area (8). Three semesters of secondary or chamber music ensembles (3). An upper-division music history course (3); an upper-division music theory course (3). Seven credits of free electives, at least three of which should be in upper-division music courses.

*Piano or Organ*: eight semesters of the principal applied music area. Two semesters of MUS 110 and 210 at three credits each (12); two semesters of 310 and 410 at four credits each (16). Four semesters of major ensembles (4). Six semesters of piano accompanying (MUS 371) or playing piano in chamber music ensembles (MUS 399) (6). MUS 420 (3). An upper-division music history course (3). Nine credits of free electives, at least six of which should be in upper-division music courses.

*Voice*: eight semesters of the principal applied music area. Two semesters of MUS 110 at two credits in the first semester and three credits in the second (5); two semesters of MUS 210 at three credits each (6); two semesters of 310 and 410 at four credits each (16). MUS 171, 172, two semesters of 271 (4). Eight semesters of major ensembles appropriate to the principal applied music area at zero or one credit per semester (7). Two semesters of secondary or chamber music ensembles (2). MUS 283 (3). Seven credits of free electives, at least three of which should be in upper-division music courses.

Students selecting voice must also take nine credits of foreign language in any two or more languages. This requirement may be modified or satisfied by advanced placement.

**Minor in Music.** Students who wish to declare a minor in music must earn credit for MUS 121, 122, 131, 171, and 250 for a

minimum of two semesters, and two three-credit music history and literature courses at the 200 level or higher. Additionally, students must earn a minimum of four credits in their principal applied music area and four credits in major ensembles appropriate to the principal applied music area.

Students have the option of designing and developing their music minor program under the advisement and sponsorship of a full-time music faculty member. Petitions outlining and justifying the desired music minor program must be presented by the faculty sponsor to the music faculty for approval. A minimum of 18 credits including at least 12 credits at the 200 level or above is required. Petitions must be submitted as early as possible in a student's undergraduate program, and will not be accepted after a student has completed six credits in music courses.

## Philosophy

The Department of Philosophy offers a Bachelor of Arts (B.A.) degree.

*Faculty*: Professor Pasquerella, *chairperson*. Professors G. Johnson, Y. Kim, J. Peterson, Schwarz, Wenisch, and Zeyl; Associate Professors C. Foster and J. Kowalski; Assistant Professor Ariew.

Students selecting this field must complete no less than 30 credits (maximum 45 credits) in philosophy. Students must take at least one course from each of the following: logic (101, 451) and ethics (212, 314, 414). They must take both metaphysics (341) and epistemology (342), plus at least two history of philosophy courses (321–325), and at least one course at the 400 level or above. The remaining nine credits may be chosen freely from the list of PHL courses offered by the department. However, students planning graduate work are advised to take PHL 451 and language studies in French or German.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Physics

The Department of Physics offers a Bachelor of Arts (B.A.) degree and a Bachelor of Science (B.S.) degree. The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees.

*Faculty:* Professor Malik, *chairperson*. Professors Hartt, Heskett, Kahn, Kaufman, Letcher, Meyerovich, Muller, Nightingale, Northby, Nunes, and Steyerl; Adjunct Professors Goodman and McCorkle; Adjunct Associate Professor Bozyan; Adjunct Assistant Professor Briere; Professors Emeriti Cuomo, Desjardins, Penhallow, Pickart, Stone, and J. Willis.

### BACHELOR OF ARTS

Students selecting this program must complete a minimum of 42 credits (maximum 45 credits) in physics, mathematics, and computer science, including: PHY 203, 204, 205, 273, 274, 275 (12), 322 (3), 331 (3), 381, 382 (6), 401 or 402 (1), 451 (3), 491, 492 (3), MTH 244 (3), CSC 201 or 211, 212 (8).

It is strongly recommended that students take MTH 141 and 142 in the freshman year. If the student is considering graduate study, it is recommended that courses in French, German, or Russian be elected.

Students in this program are encouraged to broaden their opportunities by using the block of electives to minor in business, education, engineering, medicine and molecular biology, language, or other physics-related interdisciplinary areas as listed under the B.S. program.

A total of 120 credits is required in the B.A. program. At least 42 of these must be in courses numbered 300 or above.

### BACHELOR OF SCIENCE

This curriculum provides a general background in both theoretical and experimental physics. It forms a foundation for further study at the graduate level toward

an advanced degree, and also prepares the student for a career as a professional physicist in industry or government.

Initiative, independent solution of laboratory problems, and research are encouraged in the advanced laboratory courses.

In addition to the major, students are encouraged to use the large block of elective credits to develop a program of study as a minor (described on page 32, "Undergraduate Program Requirements") in applied or interdisciplinary fields, such as acoustics, geophysics, optics, energy, astronomy/astrophysics, atmospheric science, computational physics, mathematical physics, physics education, chemical physics, ocean physics, and engineering physics. As with all minors, it will be recorded on the student's final transcript.

The following courses are required for the B.S., but exceptions and/or substitutions are possible, and can be arranged by consulting the department chairperson. For example, a well-prepared student can enroll for physics in the first semester of the freshman year, or courses in a related discipline may be taken instead of physics courses.

A total of 129 credits is required for graduation.

#### *Freshman Year*

*First semester: 15 credits*

MTH 141 (4), PHY 203, 273 (4), and Basic Liberal Studies requirements and electives (7).

*Second semester: 17 credits*

MTH 142 (4), PHY 204, 274 (4), CSC 211 (4), Basic Liberal Studies requirements and electives (5).

#### *Sophomore Year*

*First semester: 17 credits*

MTH 243 (3), PHY 205, 275 (4), CSC 212 (4), Basic Liberal Studies requirements (6).

*Second semester: 15 credits*

MTH 244 (3), PHY 331 (3) and 306 (3), and Basic Liberal Studies requirements (6).

#### *Junior Year*

*First semester: 18 credits*

PHY 322 (3) and 381 (3), MTH 215 (3), Basic Liberal Studies requirements (6), and free electives (3).

*Second semester: 16 credits*

Mathematics elective at the 300 or 400 level (3), PHY 382 (3) and 420 (3), and free electives (7).

#### *Senior Year*

*First semester: 15 credits*

PHY 451 (3), 483 (3), MTH 461 (3), and free electives (6).

*Second semester: 16 credits*

PHY 402 (1), 452 (3), 455 (3), 484 (3), and free electives (6).

## Physics and Physical Oceanography

The Department of Physics and the Graduate School of Oceanography offer a Bachelor of Science (B.S.) degree in physics and physical oceanography.

*Coordinator:* Professor Malik (Physics). The faculty consists of the members of the Department of Physics and the physical oceanography faculty of the Graduate School of Oceanography.

This program includes a comprehensive background in physics and a solid introduction to physical oceanography. The curriculum includes a full set of physics and mathematics courses required for a B.S. in physics, with extra emphasis on classical physics, plus additional upper-division or graduate-level courses in fluid dynamics and physical oceanography.

The senior physics research project (PHY 483 and 484) will be undertaken in the Graduate School of Oceanography under the supervision of a GSO faculty member. In addition, students may find summer employment or participate in oceanographic research cruises after their junior year.

Students graduating in this course of study will be well prepared to pursue careers either in conventional physics or in physical oceanography. Technical positions in private or government oceanographic research laboratories are available for physical oceanographers at the B.S. level. Students who continue on to graduate studies should expect to find high demand for physical oceanographers with advanced degrees. It is recommended that students planning to attend an oceanography graduate school take PHY 520 (Classical Dynamical Theory); students wishing to keep open the option of physics at the graduate level should take PHY 452 (Quantum Mechanics). Students entering the URI Graduate School of Oceanography from this program will have a significant head start compared to those entering from most other undergraduate institutions.

A total of 129 credits is required for graduation.

#### *Freshman Year*

*First semester: 15–16 credits*

MTH 141 (4), PHY 203, 273 (4), CHM 101, 102 (4), Basic Liberal Studies requirements (3–4).

*Second semester: 18 credits*

MTH 142 (4), PHY 204, 274 (4), CSC 211 (4), Basic Liberal Studies requirements (6).

#### *Sophomore Year*

*First semester: 17 credits*

MTH 243 (3), PHY 205, 275 (4), CSC 212 (4), Basic Liberal Studies requirements (6).

*Second semester: 15–18 credits*

MTH 244 (3), PHY 306 (3), 331 (3), Basic Liberal Studies requirements (6–9).

#### *Junior Year*

*First semester: 18 credits*

PHY 322 (3), 381 (3), 425 (3), MTH 215 (3), 461 (3), STA 409 (3).

*Second semester: 15 credits*

MCE 354 (3), MTH elective at the 300 or 400 level (3), PHY 382 (3) and 420 (3), free elective (3).

#### *Senior Year*

*First semester: 18 credits*

OCG 501 (3), PHY 451 (3), 483 (3), 520 (3) (optional), free electives (6).

*Second semester: 13–16 credits*

OCG 510 (3), PHY 402 (1), 452 (3) (optional), 455 (3), 484 (3), free elective (3).

## Political Science

The Department of Political Science offers the Bachelor of Arts (B.A.) degree. The department also offers the Master of Arts (M.A.) in political science and the Master of Public Administration (M.P.A.).

*Faculty:* Professor Tyler, *chairperson*.

Professors Hennessey, Killilea, Leduc, L.E. Rothstein, A. Stein, and Zucker; Associate Professors Genest, Hamilton, Moakley, and Petro; Professors Emeriti Milburn, Warren, and S.B. Wood.

Students selecting this field must complete a minimum of 30 credits (maximum 45 credits) in political science, including PSC 113 (3) and 116 (3).

The remaining 24 credits will reflect the student's emphasis, though at least one course must be selected in each of the following three subfields: American politics, world politics, and political theory.

Students completing both the Bachelor of Arts degree in political science and the Bachelor of Science degree in engineering may use courses in the political science major to satisfy Basic Liberal Studies requirements for the Bachelor of Arts degree. The College of Engineering and the Department of Political Science have established a curriculum that allows for the completion of the two degrees and a public-sector internship in five years.

A total of 120 credits is required for the B.A. in political science. At least 42 of these must be in courses numbered 300 or above.

## Portuguese

The Department of Modern and Classical Languages and Literatures offers a number of undergraduate courses in Portuguese.

*Faculty:* Professor McNab, *section head*.

## Psychology

The Department of Psychology offers the Bachelor of Arts (B.A.) degree. The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees.

*Faculty:* Professor Collyer, *chairperson*.

Professors Berman, Biller, Brady, J.L. Cohen, Faust, Florin, Gelles, Grebstein, Gross, Harlow, Kulberg, Morokoff, Prochaska, Quina, Silverstein, N. Smith, Stevenson, Valentino, Velicer, W.G. Willis, and Willoughby; Associate Professors de Mesquita, S. Harris, and Ruggiero; PCC Interim Director Varna Garis; Professors Emeriti A. Lott, B. Lott, Merenda, and Vosburgh.

Psychology majors are required to complete a minimum of 30 (maximum of 45) credits in psychology courses to be distributed as follows: PSY 113 (with a grade of C or better); a minimum of two courses from PSY 232, 235, and 254 (the average grade in the best two of these courses must be a C or better); both PSY 300 and PSY 301 (the average grade for these courses must be a C or better); a minimum of three topics courses from PSY 310 335, 361, 381, 384, 385, 388, 391, 432, 434, 464, 470, 479 (selected topics), and 480 (the average in the three courses must be C or better); a minimum of one course in the applied knowledge area to be selected from PSY 103, 261, 334, 442, 460, 465, 466, 471, and 479 (selected topics) (with a grade of C or better); a minimum of one course (three credits) from the experiential practice and/or internships area selected from PSY 305, 371, 382, 456, 473, 489, and 499 (with a grade of C or better); and additional courses from the enrichment

group for a minimum total of 30 credits (note that PSY 499 does not count toward the first 30 credits in the psychology major). Majors may take up to 45 credits in psychology.

Students who must repeat a course to meet the minimum grade requirement may use only three credits of a particular course toward the 120 credits required for graduation.

Students majoring in psychology may pursue either a career at the B.A. level or graduate study leading to an advanced degree. In both cases, students should consult the department's "Undergraduate Majors Manual" and their academic advisor to select appropriate courses for their interests and goals.

*Note:* A student must have a C or better in PSY 113; a C or better in one of the courses PSY 232, 235, and 254; and a C or better in PSY 300 before transferring from University College to the College of Arts and Sciences as a psychology major (or being coded as a psychology major in the College of Arts and Sciences).

A total of 120 credits is required for graduation. At least 42 of these credits must be in courses numbered 300 or above.

## Public Relations

The Departments of Communication Studies and Journalism offer the Bachelor of Arts (B.A.) degree in public relations.

*Coordinators:* Stephen Wood, Communication Studies and Antone Silva, Journalism.

The interdepartmental major in public relations combines a liberal arts education with the skills important to a career in public relations. Working with an advisor from Communications Studies or Journalism, students will develop a specific program of studies.

Students must complete the following courses before being accepted into the public relations major: COM 101, 210, JOR 220 (with a grade of C or better); MTH 107 or STA 220. *Note:* COM 101 and MTH 107 or STA 220 may be used toward fulfill-

ing requirements in the Basic Liberal Studies Program in English communication and mathematics, respectively.

The public relations major requires 33 credits including PRS 340, 441, 491; COM 306; JOR 341 (15). Students must complete six courses (18) from the following including at least one course from each category: Category A: JOR 321, WRT 301, 333; Category B: MKT 301, 331, 405; Category C: COM 302, 320, 415, 450; Category D: JOR 342, 410, PSY 335.

A total of 121 credits is required for graduation. At least 42 of these must be at the 300 level or above.

A minor in public relations is also available (see page 35).

## Russian

Admission to the Bachelor of Arts (B.A.) program in Russian is currently suspended.

The Department of Modern and Classical Languages and Literatures offers a number of courses in Russian. The minor in Russian is still available.

*Faculty:* Professor Aronian, *section head*. Professor K. Rogers.

## Sociology

The Department of Sociology and Anthropology offers the Bachelor of Arts (B.A.) degree in sociology and the Bachelor of Science (B.S.) degree in applied sociology.

*Faculty:* Professor Carroll, *chairperson*. Professors Albert, Gelles, Peters, Poggie, and Reilly; Associate Professors Danesh, Mederer, and Travisano; Assistant Professors Cunnigen and Shea.

## BACHELOR OF ARTS

Students selecting this curriculum must complete a minimum of 30 credits (maximum 45 credits) in sociology, including: SOC 100, 301, 401, 495, and two courses selected from SOC 240, 242, 336, 413, 428, and 452. At least 18 of the 30 credits must be at the 300 level or above.

SOC 495 is to be taken during the senior year. SOC 102 may not be taken for major credit. Students interested in anthropology are referred to the anthropology major previously described in this catalog.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## BACHELOR OF SCIENCE IN APPLIED SOCIOLOGY

Students in this curriculum may elect either the public policy option or the organizational analysis option. Students must notify the Office of the Dean of the option they are choosing.

**Public Policy Option.** A minimum of 30 credits in sociology is required including SOC 100, 301, 401, 402, 505 (15); one 400-level sociology course; and six credits in sociology at the 300 level or above.

In addition, students selecting this option must complete ECN 201 and 202 (6); MTH 107 or 108 or 111 or BAC 102 (3); STA 308 and 412 (6); CSC 201 (4);<sup>9</sup> WRT 333 (3); HSS 350 (3); PSC 113 (3); PSC 221 and 422 or PSC 304 and 466 (6); PSC 369 and 483 (6).

A total of 126 credits is required for graduation.

**Organizational Analysis Option.** A minimum of 30 credits in sociology is required including SOC 100, 301, 320, 350, 401 (15); one 400-level sociology course; and six credits in sociology at the 300 level or above.

In addition, students selecting this option must complete ECN 201 and 202 (6); MTH 107 or 108 or 111 or BAC 102 (3); STA 308 and 412 (6); CSC 201 (4);<sup>9</sup> WRT 333 (3); MGT 301, 302, 306, 380, 407, and either BSL 333 or MGT 408 or MGT 453 (18).

Due to limited staff and facilities, admission to the organizational analysis option is open to only 15 students per graduating class. Applications for admission will be reviewed only once each year, usually on or about March 1. Students must apply by the end of February by

submitting their names to the University College advisor for sociology or to the chairperson of the Department of Sociology and Anthropology. To be considered for the organizational analysis option, students must have earned a minimum of 45 credits by the application deadline and must have at least a 2.00 quality point average. Preference for admission will be given to those individuals with the highest quality point averages.

A total of 126 credits is required for graduation.

## Spanish

The Department of Modern and Classical Languages and Literatures offers the Bachelor of Arts (B.A.) degree with a major in Spanish. The department also offers the Master of Arts (M.A.) program in Spanish.

*Faculty:* Professor Gitlitz, *section head*. Professors Manteiga and Trubiano; Associate Professors Morin and C. White; Assistant Professor Susana de los Heros.

For the Spanish major, students will complete a minimum of 30 credits (maximum 45 credits), including SPA 325 and three 400-level courses (excluding SPA 421). SPA 421 may be used as part of the remaining 18 required credits. SPA 101, 102, 131, 391, 392, and 393 cannot be counted toward the major. In addition, students must spend a minimum of one semester (12 credits) in an approved study abroad program in a Spanish-speaking country. Summer programs will not satisfy this requirement. Students who receive a waiver of the study abroad requirement for personal or academic reasons will complete SPA 315.

Students may also include LIN 202 and 220; they may also include, with permission of the advisor, the section head, the department chairperson, and the Dean, courses in allied fields such as history, art, and anthropology. These requirements are the same for the secondary education major.

A summer field workshop (SPA 310) in Spain or Spanish America is occasionally

offered for three to six credits. For information, see the section head.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

## Speech Communication

See Communication Studies.

## Statistical Science

Admission to the B.S. program in statistical science is currently suspended.

**Minor in Statistics.** Students who wish to declare a minor in statistics must earn credit for STA 409 (3), 412 (3), MTH 451 (3), and three three-credit statistics courses chosen with prior approval of the chairperson of the Department of Computer Science and Statistics.

## Theatre

The Department of Theatre offers a Bachelor of Fine Arts (B.F.A.) degree. Permission to register for work toward the B.F.A. area of specialization in theatre must be obtained through a departmental review.

*Faculty:* Professor John F. Stevenson, *acting chairperson*. Professors J. Emery and J. Swift; Associate Professors G. Armstrong, McGlasson, and Wittwer. *Staff:* Technical Director Galgoczy and Costume Shop Manager Tschantz-Dwyer. Guest artists supplement the regular faculty in all areas of theatre.

Productions at the University cover the range of theatre forms, ancient to modern, with an emphasis on contemporary and experimental work. All members of the University community may participate in productions.

## BACHELOR OF ARTS

Enrollment in this program is currently suspended, with the exception of students enrolled in the elementary education program. Elementary education students who do not complete the elementary education

program must switch to the B.F.A. program in order to earn a degree in theatre.

Students must fulfill the elementary education requirements as well as a total of 33 credits (maximum 45 credits) as follows: THE 111 (3), 117 (3), 161 (3), 181 (3), 221 (3), 250 (3), 261 (3), 321 (3), 381 and 382 (6), 383 or 384 or 481 (3). Potential B.A. candidates are urged to complete THE 111, 117, 161, and 181 by the end of their freshman year. B.A. candidates may elect up to 12 more credits in theatre with the approval of their department advisor.

A total of 120 credits is required for graduation. At Least 42 of these must be in courses numbered 300 or above.

## BACHELOR OF FINE ARTS

The B.F.A. program in theatre is intended for highly motivated students who wish their education to emphasize a major theatrical field of interest. The program offers concentrated study in acting, design and theatre technology, directing, and stage management. Admission into one of the B.F.A. concentrations is contingent upon departmental approval and is based on the following: 1) completion of 15 hours in the B.F.A. core curriculum; and 2) selection of a B.F.A. area of specialization in consultation with the student's departmental academic advisor. Specific requirements of these areas are flexible to suit students' individual needs.

All B.F.A. students are required to complete 34 hours in core courses distributed as follows: THE 111 (3), 161 (3), 181 (3), 221 (3), 250 (3), 261 (3), 291 (2), 321 (3), 351 or 352 (3); two courses from 381 (3), 382 (3), 383 or 384 or 481 (3) to total six credits; and 391 (2). All B.F.A. candidates are urged to select a course from ENG 362, 366, 446, 472, or 477, and to complete THE 111, 161, and 181 by the end of their freshman year. Entrance into the B.F.A. program requires approval from the department chairperson.

In addition to the core requirements, each student selects one of the following areas of specialization. Students must notify the Office of the Dean of the area of specialization they have selected.

**Acting.** Students selecting acting must complete an additional 38 credits distributed as follows: THE 117 (3), 211 and 212 (4), 213 and 214 (2), 300 or 301 (3), 311 and 312 (6), 313 and 314 (2), 350 (1), 400 or 401 (3), 411 and 412 (6), 417 and 418 (2). Select six credits from THE 217, 227, and 413. Recommended electives include courses in related fields such as anthropology, art, communication studies, history, literature, music, psychology, and sociology.

### **Design and Theatre Technology.**

Students selecting design and theatre technology must complete an additional 31 credits distributed as follows: THE 300 (3), 301 (3), 351 or 352 (3) to complete the sequence begun in the core curriculum; 350 (1), 355 (3), 365 (3), 371 (3); and 12 credits selected from 362 (3), 400 (3), 401 (3), 415 (12), 451 (3), 455 (3), 463 (3), 465 (3), 475 (3). Recommended electives include ARH 251, 252, ART 207, and courses in related fields.

**Directing.** Students selecting directing must complete an additional 33 or 35 credits distributed as follows: THE 300 or 301 (3), 322 (3), 331 (3), 341 (3), 355 or 365 or 371 (3), 400 or 401 (3), 413 (3), 420 (3), 481 or 482 or 483 or 484 (3). They must also complete a one-year sequence in acting selected from the following options:

1. 211 (2), 213 (1), 212 (2), and 214 (1), to total (6)
2. 411 (3), 417 (1), 412 (3), and 418 (1), to total (8)

Recommended electives include courses in anthropology, art history, history, literature, music, psychology, and sociology.

**Stage Management.** Students selecting stage management must complete an additional 30 credits distributed as follows: COM 320 (3); MGT 300 (3); THE 300 (3), 301 (3), 341 (3), 355 or 365 (3), 371 (3), 400 (3), 401 (3), 441 (3).

B.F.A. students selected for an internship program may substitute up to 12 credits from theatre courses in their area of specialization, subject to departmental approval. Transfer students, late entries into the theatre major, and others wishing to modify this schedule of B.F.A. requirements may do so in consultation with their faculty advisor and with permission of the department chairperson.

A total of 130 credits is required for graduation.

### **Urban Affairs**

Enrollment in this program is currently suspended.

### **Women's Studies**

This interdepartmental program in the College of Arts and Sciences leads to a Bachelor of Arts (B.A.) degree in women's studies. The aim of the program is to provide an option for students who are interested in the interdisciplinary study of the culture and experiences of women.

*Faculty:* Professor Hughes, *director*. Associate Professors Reilly and Shugar.

The women's studies program requires 30 credits for a major. Five required courses are: WMS 210, 300, 310, 330, 400. Five courses needed to complete the concentration may be selected from: ARH 285; CNS 401; ECN 404; ENG 260, 385; HDF 230, 430, 432, 433, 437, 505, 559; HIS 118, 145, 308, 351, 352, 376; MGT 401; NUR 150; PEX 375; PHL 210; PSY 430, 466, 480; SOC 212, 242, 316, 413, 420, 430; WMS 150, 220, 333, 350, 351, 450, 490. In addition to this list, there are special courses offered by various departments each year that may be selected with prior approval of the Women's Studies Advisory Committee and some additional preapproved topics courses not offered on a regular basis.

Students must file a program of study with the Office of the Dean.

The Women's Studies Advisory Committee also strongly recommends that majors take an additional 18 credits in a specialized area as a minor.

A total of 120 credits is required for graduation. At least 42 of these must be in courses numbered 300 or above.

<sup>1</sup> The student majoring in chemistry, for ACS accreditation purposes, will be allowed 48 credits.

<sup>2</sup> Biological Sciences majors may take CHM 124, 126 and BCH 311 instead of CHM 226, 227, and 228. Students should consult an advisor.

<sup>3</sup> Biological Sciences majors are strongly advised to begin taking required major courses at this time.

<sup>4</sup> CHM 229, 230, which is offered in the summer only, may be substituted for CHM 226.

<sup>5</sup> Students planning to attend graduate school should take Russian, French, Japanese, Chinese, or German through the intermediate level.

<sup>6</sup> CHM 425, 427 should be taken in the junior year by students planning research or advanced course work in organic chemistry.

<sup>7</sup> CHM 353, 354, or with permission of department, any 500-level chemistry course. Credit may be given for an off-campus research project with supervision by a faculty member of the Department of Chemistry.

<sup>8</sup> Students must complete all additional Basic Liberal Studies requirements with courses approved by the College of Arts and Sciences (see page 46, this section).

<sup>9</sup> BAC 201 and 202 may be substituted for STA 308 and 412, and BAC 207 may be substituted for CSC 201 if these courses are already completed when the student transfers into the B.S. program.

## COLLEGE OF BUSINESS ADMINISTRATION

Edward M. Mazze, *Dean*  
Jane M. Stich, *Assistant Dean*

The seven majors in the College of Business Administration allow the student to develop competence in a special field of interest and prepare him or her to meet the changing complexities of life and leadership in the business community. Majors are offered in accounting, finance, general business administration, international business, management, management science and information systems, and marketing.

Basic courses required of all undergraduates at the University introduce the student to the humanities, social sciences, physical and biological sciences, letters, foreign language and culture, and the arts. The business curriculums develop the student's professional capabilities through a broad group of business courses with specialization in one area of study. Business programs provide a strong foundation in accounting, information systems, finance, marketing, organization and management theory, operations management, and statistics. The college emphasizes behavioral studies and computer technology to meet the needs of the business community and society as a whole. Emphasis is placed on the total business environment as a part of the national and world economic structure. Theory, analysis, and decision making are stressed in all areas of learning.

The College of Business Administration is a professional school with courses in lower and upper divisions. The lower-division courses constitute those taught in the freshman and sophomore years; the upper-division courses constitute those taught in the junior and senior years. Courses taken by transfer students at the lower-division level may be applied to satisfying upper-division requirements only after successful completion of a validating examination. All 500- and 600-level courses in the college are open to matriculated graduate students only.

A student enrolled in this college must complete the curriculum in one of the majors and must obtain a cumulative quality point average of 2.00 or better for all required courses in the major. Students wishing permission to substitute required courses or waive other requirements may petition the college's Scholastic Standing Committee. Petition forms are available in the Office of the Dean.

All students are initially enrolled in University College, where they complete General Education and business core courses. Core requirements include accounting, economics, management science and information systems, mathematics, and statistics. Students apply for transfer after the completion of 45 credits; therefore, the earliest a student may apply is the second semester of the sophomore year. Students who have not satisfied entrance requirements may petition the Scholastic Standing Committee of the college for a waiver of those requirements during their fourth or succeeding semesters. Students in the University College business programs who have not met entrance requirements to the College of Business Administration are permitted to enroll only in 100- and 200-level business courses and in nonbusiness courses.

To ensure that business majors have access to required courses, a strict registration policy will be followed with regard to business courses. Highest priority will be given to students for whom a course is a program requirement, as stated in this catalog, followed by any student in the College of Business Administration.

### Curriculum Requirements

The following two years are common to all majors.

*Freshman-Year Program:* 16 credits in the first semester and 15 credits in the second semester. BAC 110 and 120 are taken in alternate semesters. MGT 110 may be completed in either semester with the balance of credits in General Education. Students majoring in international business are required to complete Let 1510 and PSC 116.

*Sophomore-Year Program:* 15 credits in each semester. The ACC 201, 202, ECN 201, 202, and BAC 201, 202 sequences are begun in the first semester and completed in the second. WRT 227 may be taken in either semester. The balance of credits is made up of General Education requirements and free electives.

**General Education Requirements.** Students are required to select and pass 39 credits of course work from the General Education requirements as listed in "Undergraduate Program Requirements," pages 31–32. Specific requirements of the College of Business Administration in each group follow.

*Group A.* A minimum of three credits in literature.

*Groups F, L, and N.* Any course for which prerequisites have been met.

*Group M.* BAC 120 in the freshman year.

*Group S.* ECN 201, 202 in the sophomore year.

*Group C.* COM 101; WRT 101, 103, 201, or 333 in the freshman year; WRT 227 (Group Cw) in the sophomore year.

**Electives.** Professional electives are upper-level courses offered by departments in the College of Business Administration and by the Department of Economics. Liberal electives are courses offered by departments outside the College of Business Administration.

Free electives may be either professional or liberal electives.

**Minors.** College of Business Administration majors are encouraged to develop a non-business minor. Special permission may be given for business majors to pursue a business minor as long as the number of credits for the business minor falls within the 50 percent rule of the AACSB—the International Association for Management Education. This rule requires that 50 percent of a student's curriculum is chosen from General Education requirements or courses in colleges other than the College of Business Administration.



**International Business Studies Minor.** In cooperation with the Department of Modern and Classical Languages and Literatures, the College of Business Administration offers an opportunity for students to include an international emphasis within their undergraduate business major. The business requirements include a major in finance, general business administration, management, or marketing with professional electives in multinational finance, international dimensions of business, and international marketing. The student also develops a language component, choosing from French, German, Italian, or Spanish. In addition, studies in international politics, European history, and courses in history and literature of the target country are included. Following the junior or senior year, students have the opportunity to compete for professional internship positions with international firms.

#### **Business Minor for Nonbusiness**

**Students.** The College of Business Administration offers a minor for nonbusiness students. The minor includes basic foundation courses that must be completed by all students, and upper-level courses selected from the various functional areas. Foundation courses include ACC 201, BAC 110, ECN 201 and MGT 110. Three other three-credit courses from the College of Business Administration are required; two of these must be at the 300 or 400 level. Students must meet all prerequisites.

### **Accounting**

The Department of Accounting offers a curriculum leading to the Bachelor of Science (B.S.) degree in accounting. The department also offers the Master of Science (M.S.) degree, which provides the education recommended by the American Institute of Certified Public Accountants for the practice of public accounting.

*Faculty:* Professor Schwarzbach, *chairperson*. Professors S. Martin, Matoney, and Vangermeersch; Associate Professors Beckman, Boyle, Geiger, Hazera, and Higgins.

The increased scope of governmental and business activities has greatly extended the field of accounting and has created an unprecedented demand for accountants in both government and industry. This curriculum has been designed to meet that demand.

In addition to providing a general cultural and business background, the curriculum offers specialized training in the fields of general accounting, cost accounting, and public accounting. It offers specific, basic training to students who wish to become industrial accountants, cost analysts, auditors, credit analysts, controllers, income tax consultants, teachers of specialized business subjects, certified public accountants, government cost inspectors, or government auditors.

The broad scope of the courses offers fundamental training in the accounting field of the student's choice, whether this training is to be used as an aid to living or as a basis for graduate study.

#### *Junior Year*

*First semester: 15 credits*

ACC 311 (3) and 321 (3), FIN 301 (3), MGT 301 (3), and one free elective (3).

#### *Second semester: 15 credits*

ACC 312 (3), 443 (3), MKT 301 (3), MSI 309 (3), and one professional elective (3).

#### *Senior Year*

*First semester: 15 credits*

ACC 431 (3) and 461 (3), BSL 333 (3), one professional elective (3), and one free elective (3).

#### *Second semester: 15 credits*

ACC 415 (3), MGT 410 (3), one professional elective (3), and two free electives (6).

*Note:* All accounting majors are required to complete a minimum of three credit hours in each of the following areas. *Behavioral Science:* fulfilled by taking PSY 113, SOC 100, 102, or 204 as a free elective. *Ethical Foundations:* fulfilled by taking PHL 212 as a Letters General Education requirement or as a free elective; or MGT 380 as either a professional elective or a free elective.

*Political Foundations:* fulfilled by taking PSC 113, 116, or GEG 104 as a free elective.

### **Finance**

The Department of Finance and Insurance offers a curriculum leading to the Bachelor of Science (B.S.) degree in finance. The department also offers the Master of Business Administration (M.B.A.) degree with an opportunity for specialization in finance and the Doctor of Philosophy (Ph.D.) degree.

*Faculty:* Professor Lai, *chairperson*. Professors Chang, McLeavey, and Rhee; Associate Professors Dash, Y. Lee, Lord, and Oppenheimer; Assistant Professor Jacqueline Faught.

A major in finance prepares the student for managerial positions in the private, public, and nonprofit sectors. The curriculum emphasizes both financial decision making and implementation.

Careers in finance are found in: 1) commercial banking and other financial institutions; 2) security analysis, portfolio, and related investment management; 3) corporate financial management leading to positions as treasurer, controller, and other financial administrative positions; 4) financial administration tasks in federal and state agencies as well as in the nonprofit sector in hospitals, nursing homes, and educational institutions.

#### *Junior Year*

*First semester: 15 credits*

FIN 301 (3) and 331 (3), MGT 301 (3), MSI 309 (3), and one liberal elective (3).

#### *Second semester: 15 credits*

BSL 333 (3), FIN 322 (3), MKT 301 (3), one professional elective (3), and one liberal elective (3).

#### *Senior Year*

*First semester: 15 credits*

Two finance electives (6),<sup>1</sup> FIN 452 (3), one professional elective (3), and one liberal elective (3).

#### *Second semester: 15 credits*

One finance elective (3),<sup>1</sup> MGT 410 (3), two professional electives (6), and one free elective (3).

## General Business Administration

The College of Business Administration offers a curriculum leading to the Bachelor of Science (B.S.) degree in general business administration. This curriculum offers the student an opportunity to study all phases of business operation. It is particularly suitable for: 1) those students who are planning to operate their own businesses and are seeking a broad business background; 2) those who are preparing for positions in large organizations with training programs in which specialization is taught after employment; and 3) those who desire a general business background at the undergraduate level prior to taking more specialized graduate work.

Students who major in general business administration will be limited to a maximum of nine credits of professional electives in a specific business or economics major. A general business administration student should take a broad spectrum of courses and not concentrate in one special field of study. For students interested in courses offered outside the College of Business Administration, four professional electives may be taken from the 300- and 400-level courses offered in other colleges.

All general business administration majors are strongly encouraged to include in their program of study one of the following: three to six credits of internship, a three-credit course in community service or another course outside the Department of Management that offers collaborative experience, a study abroad experience, or a minor.

### Junior Year

#### First semester: 15 credits

FIN 301 (3), MGT 301 (3), MKT 301 (3), MSI 309 (3), and one free elective (3).

#### Second semester: 15 credits

BSL 333 (3), FIN elective (3), INS 301 (3), MKT elective (3), and one free elective (3).

### Senior Year

#### First semester: 15 credits

MGT 380 (3), two professional electives (6), and two free electives (6).

### Second semester: 15 credits

MGT 410 (3), three professional electives (9), and one free elective (3).

*Note:* One professional elective must be chosen from ECN 338, 344, FIN 452, MGT 453, or MKT 451.

## International Business

The College of Business Administration offers a curriculum leading to the Bachelor of Science (B.S.) degree in international business. The curriculum is designed to prepare students to meet the challenges of an international career by achieving a high degree of proficiency in the language of another country as well as a background in its history, economy, politics, culture, and arts. In addition to the common body of knowledge required of all business students, international business majors will study business principles taught from a global perspective. A required internship and/or study abroad experience is an essential part of the program.

Students are strongly encouraged to use professional and free electives to develop a specialization in one of the functional business areas such as accounting, finance, management, marketing, or management science and information systems.

### Junior Year

#### First semester: 15 credits

FIN 301 (3), MKT 301 (3), MGT 301 (3), MSI 309 (3), and one foreign language or culture course (3).

#### Second semester: 15 credits

Two professional electives (6), and three electives (9). (Study Abroad).

### Senior Year

#### First semester: 15 credits

BSL 333 (3), FIN 452 (3), MKT 451 (3), one international business elective (3), and one course that is part of both the Letters and Foreign Culture General Education divisions (3).

### Second semester: 15 credits

MGT 410 (3), one international business elective (3), two professional electives (6), and one free elective (3).

*Note:* International business electives must be chosen from BUS 354; COM 337; ECN 338, 344; FIN 455; MGT 453.

## Management

The Department of Management offers a curriculum leading to the Bachelor of Science (B.S.) degree in management. The department also offers the Master of Business Administration (M.B.A.) degree with an opportunity for specialization in management and the Doctor of Philosophy (Ph.D.) degree.

*Faculty:* Associate Professor Dugal, *chairperson*. Professors Comerford, deLodzia, Hickox, Laviano, Overton, Schmidt, Scholl, and Sink; Associate Professors Beauvais, Cooper, Disney, and Dunn; Assistant Professor Randall.

This curriculum is intended to provide the student with a background in the conceptual, analytical, and applied aspects of the management of organizations. The areas of study focus on decision making from the perspective of the policy sciences. Courses tend to cluster in the areas of behavioral science, including organizational theory, business law, general business administration and policy, and industrial and labor relations. Courses are carefully integrated to include an overall introduction to business administration, with a number of complementary areas of study in organizational theory and behavior, the management of human resources, industrial and labor relations, personnel administration, general business administration, and business law.

Careers in business, government, hospitals, and other organizations are open to students who have successfully completed the curriculum. These studies also provide a good background for graduate programs in management.

All management majors are strongly encouraged to include in their program of study one of the following: three to six credits of internship, a three-credit course in community service or another course outside the Department of Management that offers collaborative experience, a study abroad experience, or a minor.

#### *Junior Year*

*First semester: 15 credits*

MGT 301 (3), MKT 301 (3), MSI 309 (3), one liberal elective (3), and one free elective (3).

*Second semester: 15 credits*

FIN 301 (3), MGT 302 (3), 303 (3), one liberal elective (3), and one professional elective (3).

#### *Senior Year*

*First semester: 15 credits*

BSL 333 (3), MGT 306 (3), 380 (3), and 407 (3), and one free elective (3).

*Second semester: 15 credits*

MGT 410 (3), 423 (3), one professional elective (3), one free elective (3), and one liberal elective (3).

*Note:* One professional elective must be selected from ECN 338, FIN 452, MGT 453, or MKT 451.

## Management Science and Information Systems

The Department of Management Science and Information Systems offers a curriculum leading to the Bachelor of Science (B.S.) degree in management science and information systems. The department also offers the Master of Business Administration (M.B.A.) degree with an opportunity for specialization in management science and information systems and the Doctor of Philosophy (Ph.D.) degree.

*Faculty:* Professor Ebrahimpour, *chairperson*. Professors C. Armstrong, Budnick, Chen, Humphrey, Jarrett, C. Kim, Koza, Mangiameli, Mojena, Narasimhan, and Westin; Associate Professor Ageloff; Instructor Rampal.

The management science and information systems major reflects the advanced technologies used in business and industry today. Graduates earn a B.S. in business administration with an emphasis on computer applications, information management, and data analysis. Graduates will possess skills in the application of micro-computer software and related tools. They will understand the value of "information" and the various technologies used to help organizations use information. Graduates will have a solid grounding in methodologies of data analysis to support business decision making.

#### *Junior Year*

*First semester: 15 credits*

BSL 333 (3), FIN 301 (3), MSI 310 (3), 309 (3), and one liberal elective (3).

*Second semester: 15 credits*

MGT 301 (3), MSI 320 (3), 350 (3), MKT 301 (3), and one professional elective (3).

#### *Senior Year*

*First semester: 15 credits*

Major electives (6),<sup>2</sup> professional electives (6), and one liberal elective (3).

*Second semester: 15 credits*

MGT 410 (3), one major elective (3),<sup>2</sup> one professional elective (3), and two free electives (6).

## Marketing

The Department of Marketing offers a curriculum leading to the Bachelor of Science (B.S.) degree in marketing. Elective courses in the department expose students to career opportunities in advertising, product management, sales management, marketing research, and other facets of marketing management. The department also offers the Master of Business Administration (M.B.A.) degree with an opportunity for specialization in marketing and the Doctor of Philosophy (Ph.D.) degree.

*Faculty:* Professor Della Bitta, *chairperson*. Professors N. Dholakia, R. Dholakia, E. Johnson, and Venkatesan; Associate Profes-

sors Harlam, J. Schroeder, and Surprenant; Assistant Professor D. Rosen.

A major focus of marketing is determining product and service needs of consumers and industries. Marketing research, information systems, and analysis are used in the development and management of products and services, as well as the design and execution of communications, pricing, and distribution channels. Three unspecified but required marketing electives allow students to plan, in consultation with their advisors, an arrangement of courses to meet individual career objectives. With prior permission of the advisor and chairperson, one marketing elective may be replaced by a course outside the department to enhance career objectives.

#### *Junior Year*

*First semester: 15 credits*

MGT 301 (3), MKT 301 (3), MSI 309 (3), one free elective (3), and one liberal elective (3).

*Second semester: 15 credits*

BSL 333 (3), FIN 301 (3), MKT 311 (3), 415 (3), and one free elective (3).

#### *Senior Year*

*First semester: 15 credits*

MKT 409 (3), one MKT elective (3), two professional electives (6), and one liberal elective (3).

*Second semester: 15 credits*

MGT 410 (3), two MKT electives (6), one professional elective (3), and one liberal elective (3).

*Note:* One liberal elective is to be selected from the following: APG 203; COM 103, 200, 210, 220; PHL 212; PSY 113; SOC 100, 102, 204; WRT 300 and 333. One professional elective must be selected from ECN 338, 344, FIN 452, MGT 453, or MKT 451.

<sup>1</sup> Finance electives must be drawn from FIN 401, 420, 425, 433, 441, 452, and 460.

<sup>2</sup> Major electives: MSI 410, 420, 430, 440, 450, 455, 460, 465, 470, 480, 491, 492, 493, and 495.

## COLLEGE OF CONTINUING EDUCATION (named for Alan Shawn Feinstein)

Walter A. Crocker Jr., *Dean*

The Alan Shawn Feinstein College of Continuing Education offers courses and degree programs designed for adults whose family or work responsibilities have caused an interruption in their formal post-high-school education. Academic programs lead to Bachelor of Science degrees in general business administration; dietetics; food science and nutrition; human development and family studies; industrial and manufacturing engineering; and textiles, fashion merchandising, and design. Bachelor of Arts degrees may be obtained in economics, English, history, and psychology. The Bachelor of General Studies degree offers majors in applied communications, business institutions, health services administration, and human studies. Graduate-level programs include Master of Business Administration, Master of Arts in adult education, Master of Library and Information Studies, Master of Marine Affairs, Master of Public Administration, Master of Science in clinical laboratory science, Master of Science in labor and industrial relations, and advanced and graduate-level courses in computer science, electrical engineering, and mechanical engineering and applied mechanics through special arrangement with several high-technology firms in the state. For curriculum requirements, refer to the appropriate sections in this catalog.

Certification programs for various professions as well as individual credit and noncredit Continuing Education Unit (CEU) courses are also offered. In addition, institutes and special courses are planned for business, industry, labor, and government professions.

Courses are offered on weekday mornings, afternoons, and evenings, and on Saturdays in the fall, spring, and summer. The college also offers distance learning

courses through interactive video, the Internet, and by e-mail. Students enrolling in a degree program may attend at times most convenient for them. The college also operates community centers in Kingston and Middletown.

**Summer Sessions.** The Alan Shawn Feinstein College of Continuing Education has administrative responsibility for developing, scheduling, and coordinating all summer offerings of the University of Rhode Island. Day and evening courses are offered in two five-week sessions at Kingston and in Providence. In addition, a number of special programs, including study in foreign countries, are offered at varying dates in the alternate session. Students may attend either or both campuses and enroll in day or evening courses offered in any summer session. Students expecting to apply summer credit to an academic degree program are advised to obtain prior approval from their academic dean before registering. Maximum course load is seven credits per summer session including simultaneous courses in the alternate session. Exceptions are allowed with permission of the student's academic dean.

### Bachelor of General Studies

The Alan Shawn Feinstein College of Continuing Education's own degree program, the Bachelor of General Studies (B.G.S.), is a special undergraduate program for adults who have had no formal schooling for at least five years. The B.G.S. program is useful both for students who have never been to college and for those who dropped out of college at some point in the past. For the latter group, B.G.S. offers a creative approach to bringing forward previous educational experience and applying it to this adult degree program. Because there are several ways to meet admission requirements for the program, the admissions process begins with an interview with a B.G.S. advisor in the Academic Programs Office of the Alan Shawn Feinstein College of Continuing Education.

The B.G.S. program consists of the following five required sections: 1) the Pro-Seminar, 2) General Education requirements, 3) the major curriculum, 4) electives, and 5) senior project.

**Pro-Seminar for Returning Students** (4 credits). BGS 100 Pro-Seminar (3 credits) is the required entry course that introduces the returning students to the college environment. It builds self-confidence and helps students to identify their scholastic strengths and interests. Limited to 16 people, the Pro-Seminar opens the door to the University and helps returning students adjust to academic life. The instructors are carefully selected and all have prior experience in teaching adults. Students concurrently enroll in URI 101 Traditions and Transformations (1 credit). This is a University-wide seminar to help new students develop goals and define issues.

While enrolled in the Pro-Seminar, B.G.S. students are encouraged to take the College Level Examination Program (CLEP) test which measures their academic knowledge acquired through prior experience. Credits gained through this test are applied to the General Education requirements.

### General Education Requirements

(40 credits). Students in the B.G.S. program must meet the University's General Education requirements<sup>1</sup> as explained in "Undergraduate Program Requirements" (pages 31–32), including the URI 101 requirement. B.G.S. students use Senior Seminars BGS 390, 391, and 392 to fulfill General Education requirements. Students should consult frequently with B.G.S. advisors.

**Senior Seminars.** Senior Seminars are a distinctive feature of the B.G.S. program. These three six-credit seminars are interdisciplinary in nature and enable students to integrate and synthesize their educational experiences. The seminars are normally begun when students have completed their other General Education courses and most of the courses required for their major.

**Major Curriculum (45 credits).** B.G.S. students can choose from the following majors: applied communications, business institutions, health services administration, and human studies. These majors allow students to take courses in several disciplines to meet their educational goals in a nontraditional way. A major may be made up of a carefully prescribed set of courses or it may be flexible in its requirements, allowing students to work creatively with an advisor to design an individualized major that meets both the student's needs and the general goals of the B.G.S. program.

#### *APPLIED COMMUNICATIONS MAJOR*

Students interested in the broad field of applied communications will be interested in this major. It allows a student, working with an advisor, to design an individual major that must then be approved by the program coordinator.

*Communications Core (24 credits).* These courses, all at or above the 200 level, must be chosen from communication studies, journalism, and writing (or ENG 205, 305, or 310), with 12 credits from one department and six credits from each of the other two. Prerequisite communications courses are COM 101 and WRT 101.

*Methodology Course (3 credits).* Students may select either COM 206, HSS 320, PSY 300, or STA 308.

*Major Seminar (3 credits).* Upon achieving senior status, students must take BGS 398.

*Area of Emphasis (15 credits).* With the help of an advisor, students select 15 credits that will comprise an area of emphasis, which may be used either to further develop skills in communications or for study in related areas. This area of emphasis must be approved by an advisor and the program coordinator by the beginning of the student's junior year.

#### *BUSINESS INSTITUTIONS MAJOR*

This is a fully prescribed major with a specific list of required courses:

ACC 201	Elementary Accounting I
ACC 202	Elementary Accounting II
BAC 110	Business Computing Applications (or CSC 101 Computing Concepts)
BAC 120	Introduction to Business Analysis and Applications (or MTH 131 Applied Calculus I)
BAC 201	Managerial Statistics I (or STA 308 Introductory Statistics)
BSL 333	Legal and Ethical Environment of Business I
ECN 201	Principles of Economics: Microeconomics
ECN 202	Principles of Economics: Macroeconomics
FIN 301	Financial Management
MGT 301	Organization and Management Theory I
MKT 301	Marketing Principles
MSI 309	Operations Management
WRT 227	Business Communications
Business Elective (3 credits)	

In addition to the above required courses, students must elect one liberal elective course offered by a department outside their major. Most courses that fulfill these major requirements are available in Providence in the evening. With careful planning, however, it is possible for students to complete approximately two-thirds of the program's requirements in evening courses at the Kingston Campus.

#### *HEALTH SERVICES ADMINISTRATION MAJOR*

Like the major in business institutions, the major in health services administration has prescribed courses. These fall into three parts:

##### *Core (13 credits)*

CSC 101	Computing Concepts
NUR 103	Professional Practice in Health and Illness
HDF 357	Family and Community Health

HSS 320 Introduction to Research in Human Science and Services

##### *Administration (15 credits)*

ACC 201	Elementary Accounting I
ACC 202	Elementary Accounting II
ECN 201	Principles of Economics: Microeconomics
ECN 202	Principles of Economics: Macroeconomics
PHL 314	Ethical Problems in Society and Medicine

##### *Experiential Seminars (15 credits)*

HSA 360	Health Services Administration
HSA 380	Introductory Practicum in Health Services Administration
HSA 480	Advanced Practicum in Health Services Administration

##### *Professional Elective (3 credits)*

#### *HUMAN STUDIES MAJOR*

Students interested in the wide range of human studies or human services will be attracted to this major. It permits the student, working with an advisor, to design a major that will meet both personal and career goals. All human studies majors must have their program design approved in advance by an academic advisor and the program coordinator. It must include the following four parts:

*Social Science Core (24 credits).* Students are required to select 24 credits from three of the following social science departments in the College of Arts and Sciences: economics, history, marine affairs, political science, psychology, and sociology and anthropology; or marine affairs from the College of the Environment and Life Sciences. These departments determine which of their courses are suitable for the B.G.S. major.

The 24 credits must be distributed as follows: four courses from one department, two courses from a second department, and two courses from a third department. Only two prerequisite or introductory-level courses are allowed in the major. Students

should meet with an advisor for more information regarding these courses.

**Methodology Course** (3 credits). Students are strongly advised to fulfill this requirement by taking HSS 320. This course is offered in Providence during the spring semester only and is usually offered only every second year. Students are advised to plan accordingly. In exceptional cases students may be allowed to meet the methods requirement by taking one of the following courses: HIS 395, PSY 300, SOC 301, or STA 220.

**Major Seminar** (BGS 397, 3 credits). Students will take this course near the end of their degree program. It will give them an opportunity to review and evaluate the skills and knowledge they have acquired through their major. It is offered each year, usually in the fall semester.

**Area of Emphasis** (15 credits). The area of emphasis provides the student with an opportunity to select a group of courses that focus on a particular problem or population of interest. Once a particular focus is identified, students select 15 credits from the following list. All 15 credits must be at or above the 300 level.

African and Afro-American Studies  
Business Law<sup>2</sup>  
Communication Studies  
Community Planning  
Computer Science  
Consumer Affairs<sup>2</sup>  
Economics  
Education<sup>2</sup>  
Food Science and Nutrition<sup>2</sup>  
Health<sup>2</sup>  
History  
Human Development and Family Studies  
Human Science and Services  
Journalism  
Languages (French, Portuguese, Spanish)  
Management<sup>2</sup>  
Marine Affairs  
Marketing<sup>2</sup>  
Nursing<sup>2</sup>  
Political Science  
Psychology  
Sociology and Anthropology  
Urban Affairs  
Women's Studies

**Electives** (27 credits). The electives permit students to complete the B.G.S. degree in a number of creative ways, either through carefully designed work experience internships, or through previous but relevant educational experience, or both. Up to 15 credits may be taken in the University Year for Action program, or students may choose to take courses to fulfill this requirement. BGS 390, 391, and 392 may be counted as electives if they are not used to fulfill General Education requirements.

**Senior Project** (3 credits). All B.G.S. students must complete the BGS 399 Senior Project or a departmentally directed study. Students are required to meet with a B.G.S. advisor to plan a project proposal. This written proposal must meet with the approval of both an appropriate faculty advisor and the B.G.S. coordinator before the student can register for BGS 399.

A total of 118 credits is required for the Bachelor of General Studies degree.

## Fees and Finances

Tuition and fees for Continuing Education students are given on page 18 of this catalog. They may also be found in the course schedules for the current term. The registration fee is not refundable except when a course is cancelled or closed by the University. The Student Services Fee supports a student government, career services, and various lectures and cultural events determined by an activities board of elected continuing education students. Fees for Special Programs courses vary (consult the course schedule or contact the Special Programs Office). For information on refunds, refer to the "University Refund Policies" on page 21 of the Fees, Expenses, and Financial Aid section of this catalog.

**Financial Aid.** Only matriculated students enrolled on at least a half-time basis (six credits) may be considered for an award. The Student Financial Aid Office determines eligibility for all grants, loans, and employment, which are awarded on an academic-year basis. Financial aid will be

awarded only after a student has applied for a Pell Grant and has submitted a Pell Student Eligibility Report to the Student Financial Aid Office. For more detailed information, contact a peer counselor.

## Services for Students

The Alan Shawn Feinstein College of Continuing Education provides a number of services for students in Providence and the community centers. Among these are free academic advising, peer counseling, health education, and, at minimal cost, a testing service. Advisors are available to answer questions about registration, admissions, degree programs, and the College Level Examination Program. The peer counseling service provides students with the opportunity to meet with other adult students who have been trained to help in problem solving, including issues of minority groups and of the disabled. In testing services, a staff of certified psychologists administers a number of psychological tests and evaluations to individuals and groups to help them make personal or career decisions.

The college also has at its Providence location a bookstore and library, plus a comfortable student center where students and faculty can meet, talk, and relax.

## Registration and Admission

Enrollment in University courses offered by the college is accomplished through telephone registration prior to the beginning of each semester. Being enrolled in a course is not the same as being admitted to the University. To apply for admission to an undergraduate degree program, a student must follow the application procedure stated below. However, credits earned through successful completion of courses may eventually be applied toward a degree program after a student is accepted as a degree candidate.

Beginning students who have been away from school for some time and have little or no course work beyond high school are encouraged to register in the

special entry course: BGS 100, the Pro-Seminar.

Any adult may enroll as a nonmatriculated student in the Alan Shawn Feinstein College of Continuing Education. All courses at the University are open to nonmatriculated students; however, day courses at the Kingston Campus are open only on a space-available basis.

All information and forms necessary for registration are included in the semester course list printed two to three weeks before each term begins. The lists, containing

up-to-date course offerings and fees, are available during the registration periods, or they may be obtained through written or telephone request.

**Application Procedures.** A student wishing to enroll in an undergraduate degree program in the Alan Shawn Feinstein College of Continuing Education does so through the Advising and Admissions Office. An initial interview is recommended so that program options may be explored as well as the student's capabilities. A stu-

dent then files an application for an undergraduate degree and provides this office with official transcripts.

Students admitted to undergraduate degree programs should consult with the appropriate faculty coordinator concerning their major. A worksheet of courses is prepared and maintained as a checklist toward graduation requirements. It is the strict responsibility of the student to file an Intent to Graduate form with the Advising and Admissions Office three semesters in advance of the contemplated date.

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<sup>1</sup> Students majoring in health services administration must take MTH 107 or STA 220 as the mathematics requirement.

<sup>2</sup> In these departments, only certain courses are appropriate for the human studies major. See an advisor for details.

## COLLEGE OF ENGINEERING

Thomas J. Kim, *Dean*  
Harold N. Knickle, *Associate Dean*  
Richard M. Vandeputte, *Assistant Dean*

The College of Engineering offers undergraduate majors in biomedical, chemical, chemical and ocean, civil, computer, electrical, industrial, mechanical, and ocean engineering. In addition, an ocean option is available in mechanical engineering. Because the same fundamental concepts underlie all branches of engineering, the freshman-year courses are quite similar for all curriculums, and the choice of a specific branch of engineering may be delayed until the beginning of either the second term or the second year of study. Students electing one of the programs that include ocean options follow the curriculum for chemical or mechanical engineering for two or three years and enroll in many ocean engineering courses in the junior and senior year.

All of the engineering curriculums are based on an intense study of mathematics, the basic sciences, and the engineering sciences common to all branches of the profession. On this base is built the in-depth study of the important principles and concepts of each separate discipline. These principles are applied to the understanding and solution of problems of current interest and importance in the field. Each curriculum is designed to provide the knowledge and ability necessary for practice as a professional engineer, or for successful graduate study, which may include law, business administration, or medicine as well as the normal engineering and science disciplines.

The goal of the college is to stimulate the students to become creative, responsible engineers, aware of the social implications of their work, and flexible enough to adjust to the rapid changes taking place in all branches of engineering. Engineers from all fields are heavily involved in the solution of technological and sociotech-

nological problems. The needs of industry are for balanced teams of both men and women from the different engineering areas.

Entering students who have chosen a specific major should follow the particular program listed below. Those who have decided to major in engineering but have not selected a specific program should select the following courses: CHM 101 and 102, EGR 105, MTH 141, PHY 203 and 273, and a General Education requirement.

Students who are undecided about engineering but who wish to keep it open as an option should take note that MTH 141, 142; PHY 203, 204 and 273, 274; and a course in chemistry are required for graduation from the College of Engineering, and are prerequisites for many engineering courses. They must be taken before transferring from University College to the College of Engineering.

To transfer from University College to the College of Engineering, students must not only have completed 24 credits with a quality point average of 2.00 or better, they must also have completed all of the required mathematics, science, and engineering courses of the freshman year with a quality point average of 2.00 or better.

To meet graduation requirements, students enrolled in the College of Engineering must satisfactorily complete all courses of the curriculum in which they are registered and must obtain a quality point average of 2.00 or better in all required science, mathematics, and engineering courses (including professional electives).

**International Engineering Program.** The College of Engineering also offers a five-year International Engineering Program (IEP) in which students earn two degrees: a Bachelor of Science in engineering and a Bachelor of Arts in a foreign language. The foreign languages currently available as part of the IEP are German and French. In addition to their engineering courses, students study the foreign language, business, and culture. They spend six months abroad in a professional internship in Austria, France, Germany, or Switzerland. Upon graduation, students are well pre-

pared to compete in the global marketplace.

To enroll, a student simply registers for the appropriate language course for engineering students, and follows the recommended outline of courses. In 1992, the IEP was selected as the recipient of the Award for Educational Innovation by ABET, the national Accreditation Board for Engineering and Technology.

### **Cooperative Education Program.**

Optional for juniors and seniors in all engineering departments, the Cooperative Education Program offers placements for part-time or full-time work directly related to a student's field of study. Enrollment information may be obtained from the Dean's Office, 102 Bliss Hall.

**Engineering and M.B.A. Program.** This five-year program offers students the opportunity to earn a Bachelor of Science in engineering and a Master of Business Administration. Students who have a 3.00 or better grade point average may enroll during their senior year with successful completion of the Graduate Management Admissions Test.

**General Education Requirements.** Engineering students must meet the University's General Education requirements listed in "Undergraduate Program Requirements," pages 31–32, except that only three credits are required in the foreign language or culture component. In these courses, students are exposed to and challenged by concepts from the humanities and social sciences to ensure that the social relevance of their engineering activities will never be forgotten. In selecting courses to satisfy these requirements, students should consult with their advisors to be certain that they have chosen courses that satisfy the University requirements. The requirements in mathematics and natural sciences are satisfied by required courses in the engineering curriculums. Three credits must be taken in the Foreign Language or Culture group, and six credits each in English Communication, Fine Arts and Literature, Letters, and Social Sciences.



**Freshman Year.** All engineering curriculums have similar programs during the freshman year. This provides some degree of flexibility to those students who are uncertain about their choice of curriculum. Except for the major in computer engineering, all engineering students take the following 16 credits in the first semester.

- 3 CHM 101 General Chemistry Lecture I
- 1 CHM 102 Laboratory for Chemistry 101
- 4 MTH 141 Introductory Calculus with Analytic Geometry
- 3 PHY 203 Elementary Physics I
- 1 PHY 273 Elementary Physics Laboratory I
- 1 EGR 105 Foundations of Engineering I
- 3 General Education requirement

Students who are still undecided about their choice of major after completing the first semester should review their choice of courses for the second semester with their advisor to be certain that they meet the prerequisites for the sophomore year.

**Computers.** See Research Resources, page 7.

**Accreditation.** The curriculums in chemical, civil, computer, electrical, industrial, mechanical, and ocean engineering are currently accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

## Biomedical Engineering

The Bachelor of Science (B.S.) degree in biomedical engineering is offered by the Department of Electrical and Computer Engineering. Specialization in biomedical engineering is also available within the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) programs in electrical engineering.

**Coordinator:** Associate Professor Sun (Electrical and Computer Engineering). Professors Boudreaux-Bartels, Jackson, Kumaresan, Lindgren, Mardix, Ohley, and Tufts; Adjunct Professors Aaron and Gerwitz; Professor Emeritus Polk.

Biomedical engineering is an interdisciplinary area in which engineering techniques are applied to problem solving in the life sciences and medicine. Biomedical engineers design medical instruments for diagnosis and the treatment of various diseases as well as for research in biology. Examples of instruments for diagnosis include electrocardiographs, electroencephalographs, automatic blood analyzers, and medical imaging systems such as X-ray imaging, radio-nuclide imaging, ultrasound imaging, computer-assisted tomography, and magnetic resonance imaging. Examples of instruments for treatment include radiotherapy machines, pacemakers, cardiac-assist devices, intelligent drug delivery systems, and lasers for surgery. Biomedical engineers also develop artificial organs for prosthesis and various computer software and hardware systems to help provide high-quality, cost-effective health care.

Biomedical engineers are employed in: 1) the medical instrument industry, where they invent, design, manufacture, sell, and service medical equipment; 2) hospitals, where they evaluate, select, maintain, and provide training for the use of complex medical equipment; and 3) medical and biological research institutes, where they use their unique analytical ability and instrumentation skills to conduct advanced research.

The biomedical engineering program combines study in the biological sciences with the areas of engineering that are particularly important for the application of modern technology to medicine. *This curriculum is designed to provide students with not only a general background in biomedical engineering but also a special focus on the skills in electrical engineering necessary for developing medical devices.* With a few minor elective changes, the program also satisfies the entrance requirements of most medical schools, but students who plan to go on to medical school should consult the premedical advisor and the coordinator of the biomedical engineering program.

For transfer from University College to the College of Engineering in the biomedical

engineering program, students must have completed *all science, mathematics, and engineering courses required during the first two semesters* with a quality point average of 2.00 or better.

The major requires 135–136 credits.

### Minimum Requirements

**Humanities and Social Sciences** (27 credits): see the General Education requirements for the College of Engineering on page 73 of this section. Students should consult with their advisors regarding distribution of credits and approved courses.

**Mathematics** (17 credits): MTH 141, 142, 243, 362, three credits of an MTH elective (215 or any 300- to 500-level mathematics course except MTH 381).

**Basic Sciences** (23 credits): CHM 101, 102, 124; PHY 203, 273, 204, 274; BIO 121, 442, 444.

**Computer Science** (4 credits): CSC 200.

**Engineering Sciences and Design** (61–62 credits): EGR 105, 106, ELE 201, 202, 205, 212, 215, 282, 305, 313, 314, 322, 342, 343, 382, 400, 482, 488, 489; two engineering electives (chosen from CHE 333, 347, 541, 574; CVE 220, 374; ELE 331, 423; IME 404, 411, 412; MCE 323, 341, or 354); two electrical engineering electives (chosen from ELE 401, 405, 408, 427, 432, 436, 437, 444, 447, 457, or 458).

**Free Elective:** 3 credits.

### Freshman Year

*First semester: 16 credits*

- 3 CHM 101 General Chemistry Lecture I
- 1 CHM 102 Laboratory for Chemistry 101
- 1 EGR 105 Foundations of Engineering I
- 4 MTH 141 Introductory Calculus with Analytic Geometry
- 3 PHY 203 Elementary Physics I
- 1 PHY 273 Elementary Physics Laboratory I
- 3 General Education requirement

*Second semester: 17 credits*

- 3 ECN 201 Principles of Economics: Microeconomics

- 2 EGR 106 Foundations of Engineering II
- 4 MTH 142 Intermediate Calculus with Analytic Geometry
- 3 PHY 204 Elementary Physics II
- 1 PHY 274 Elementary Physics Laboratory II
- 4 BIO 121 Human Anatomy

#### *Sophomore Year*

*First semester: 17 credits*

- 3 CHM 124 Introduction to Organic Chemistry
- 4 CSC 200 Computer Problem Solving for Science and Engineering
- 3 ELE 201 Digital Circuits Design
- 1 ELE 202 Digital Circuits Design Laboratory
- 3 MTH 243 Calculus for Functions of Several Variables
- 3 General Education requirement

*Second semester: 18 credits*

- 3 ELE 205 Microprocessor Laboratory
- 3 ELE 212 Linear Circuit Theory
- 2 ELE 215 Linear Circuit Laboratory
- 1 ELE 282 Biomedical Engineering Seminar I
- 3 MTH 362 Advanced Engineering Mathematics I
- 6 General Education requirements

#### *Junior Year*

*First semester: 18 credits*

- 3 ELE 313 Linear Systems
- 4 ELE 342 Electronics I
- 3 ELE 305 Introduction to Computer Architecture
- 1 ELE 382 Biomedical Engineering Seminar II
- 3 BIO 442 Mammalian Physiology
- 1 BIO 444 Experimental Physiology
- 3 General Education requirement

*Second semester: 18 credits*

- 3 ELE 314 Linear Systems and Signals
- 5 ELE 343 Electronics II
- 1 ELE 482 Biomedical Engineering Seminar III
- 3 Engineering elective<sup>1</sup>
- 3 ELE 322 Electromagnetic Fields I
- 3 General Education requirement

#### *Senior Year*

*First semester: 16–17 credits*

- 4 ELE 488 Biomedical Engineering I
- 3–4 Electrical engineering design elective<sup>2</sup>
- 3 Engineering elective<sup>1</sup>
- 3 Mathematics elective<sup>3</sup>
- 3 General Education requirement

*Second semester: 15 credits*

- 1 ELE 400 Introduction to Professional Practice
- 4 ELE 489 Biomedical Engineering II
- 4 Electrical engineering design elective<sup>2</sup>
- 3 Free elective
- 3 General Education requirement

## Chemical Engineering

The Department of Chemical Engineering offers a curriculum leading to the Bachelor of Science (B.S.) degree in chemical engineering that is accredited by ABET.<sup>4</sup> In cooperation with the Department of Ocean Engineering, the department offers a curriculum leading to the Bachelor of Science degree in chemical and ocean engineering (unaccredited). The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees.

*Faculty:* Professors S. Barnett, Bose, R. Brown, Gregory, Knickle, Lucia, Rockett, and Rose; Associate Professors Gray and Rivero-Hudec; Adjunct Research Professor Baboian; Assistant Research Professor Park; Adjunct Assistant Professors Crisman, Gow, Serdakowski, and Trevino.

The chemical engineer is concerned with the application and control of processes leading to changes in composition. These processes are most frequently associated with the production of useful products (chemicals, fuels, metals, foods, pharmaceuticals, paper, plastics, and the like), but also include such seemingly unrelated matters as removal of toxic components from the blood by an artificial kidney, environmental cleanup, and semiconductor processing. The chemical engineer's domain includes more efficient production

and use of energy, processing of wastes, and protection of the environment.

Chemical engineers have a strong foundation in chemistry, physics, mathematics, and basic engineering. Chemical engineering courses include the use of digital computers, thermodynamics, transport phenomena, mass transfer operations, metallurgy, materials engineering, process dynamics and control, kinetics, and plant design. The student has the opportunity to operate small-scale equipment to determine efficiencies and operating characteristics, and to visit local industry. Intensive work in the solution of complex problems is given in which economics and optimization of engineering design are emphasized.

A chemical engineer with a background in both chemistry and engineering can apply knowledge of research and development, design, production, and manufacturing not only to the areas listed above, but to many others such as textiles, dyes, petroleum, ceramics, paint, and rubber, as well as to biomedical, biochemical, ocean, space, nuclear energy, and environmental problems and processes.

About 25 percent of graduates work in each of the following areas: Chemical/Energy, Environment/Ocean, Biotechnology/Pharmaceuticals, and Materials. Many are employed as undergraduates by the department's Pollution Prevention, Thin Film and Interfacial Research, and Process Engineering Centers on projects with industry.

The major requires 131–133 credits.

#### *Freshman Year*

*First semester: 16 credits*

- 3 CHM 101 General Chemistry Lecture I<sup>5</sup>
- 1 CHM 102 Laboratory for Chemistry 101<sup>5</sup>
- 1 EGR 105 Foundations of Engineering I
- 4 MTH 141 Introductory Calculus with Analytic Geometry
- 3 PHY 203 Elementary Physics I
- 1 PHY 273 Elementary Physics Laboratory I
- 3 General Education requirements<sup>6</sup> (WRT 101 strongly recommended)

*Second semester: 17 credits*

- 3 CHM 112 General Chemistry Lecture II<sup>5</sup>
- 1 CHM 114 Laboratory for Chemistry 112<sup>5</sup>
- 2 EGR 106 Foundation of Engineering II
- 4 MTH 142 Intermediate Calculus with Analytic Geometry
- 3 PHY 204 Elementary Physics II
- 1 PHY 274 Elementary Physics Laboratory II
- 3 ECN 201 Principles of Economics: Microeconomics

*Sophomore Year**First semester: 15–16 credits*

- 3 CHE 212 Chemical Process Calculations
- 4 CHM 291 Organic Chemistry **or** 3 CHM 227 Organic Chemistry Lecture I
- 3 MTH 243 Calculus for Functions of Several Variables
- 6 General Education requirements<sup>6</sup>

*Second semester: 15–16 credits*

- 3 CHE 272 Introduction to Chemical Engineering
- 3 CHE 332 Physical Metallurgy
- 4 CHM 292 Organic Chemistry **or** 3 an approved advanced chemistry course
- 3 MTH 244 Differential Equations **or** 3 MTH 362 Advanced Engineering Mathematics I
- 3 General Education requirement<sup>6</sup>

*Junior Year**First semester: 17 credits*

- 3 CHE 313 Chemical Engineering Thermodynamics
- 3 CHE 347 Transfer Operations I
- 3 CHM 431 Physical Chemistry
- 2 CHM 335 Physical Chemistry Laboratory
- 3 Approved mathematics elective
- 3 General Education requirement<sup>6</sup>

*Second semester: 17 credits*

- 3 CHE 314 Chemical Engineering Thermodynamics
- 2 CHE 322 Chemical Engineering Microlaboratory
- 3 CHE 348 Transfer Operations II
- 3 CHE 425 Process Dynamics and Control
- 3 CHM 432 Physical Chemistry **or** approved department elective<sup>7</sup>
- 3 General Education requirement<sup>6</sup>

*Senior Year**First semester: 17 credits*

- 1 CHE 328 Industrial Plants
- 2 CHE 345 Chemical Engineering Laboratory
- 2 CHE 349 Transfer Operations III
- 3 CHE 351 Plant Design and Economics
- 3 CHE 464 Industrial Reaction Kinetics
- 3 ELE 220 Passive and Active Circuits
- 3 Approved professional elective

*Second semester: 17 credits*

- 2 CHE 346 Chemical Engineering Laboratory
- 3 CHE 352 Plant Design and Economics
- 3 CVE 220 Mechanics of Materials **or** approved professional elective
- 3 Approved professional elective
- 6 General Education requirements<sup>6</sup>

**Chemical and Ocean Engineering.** Students enrolled in this curriculum will follow the program of study for chemical engineering during the freshman, sophomore, and junior years. The senior year curriculum follows.

The major requires 134–136 credits.

*Senior Year**First semester: 18 credits*

- 1 CHE 328 Industrial Plants
- 2 CHE 349 Transfer Operations III
- 3 CHE 351 Plant Design and Economics
- 3 CHE 403 Introduction to Ocean Engineering Processes I
- 3 CHE 464 Industrial Reaction Kinetics
- 3 ELE 220 Passive and Active Circuits
- 3 Approved professional elective

*Second semester: 19 credits*

- 3 CHE 352 Plant Design and Economics
- 3 CHE 404 Introduction to Ocean Engineering Processes II
- 3 CHE 534 Corrosion and Corrosion Control
- 4 OCE 311 Coastal Measurements and Applications
- 6 General Education requirements<sup>6</sup>

**Chemical and Ocean Engineering**

See Chemical Engineering.

**Civil Engineering**

The Department of Civil and Environmental Engineering offers a curriculum leading to the Bachelor of Science (B.S.) degree in civil engineering. The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in civil and environmental engineering.

The Bachelor of Science program in civil engineering is accredited by the Accreditation Board for Engineering and Technology.

*Faculty:* Professor R. Wright, *chairperson*. Professors Kovacs, K. Lee, Poon, Silva, Tsiatas, and Urish; Associate Professors Karamanlidis, Marcus, Thiem, and Veyera; Adjunct Professors Harr, Jaworski, R.B. Shaw, and T. Wright; Adjunct Associate Professor Huston; Adjunct Assistant Professors Alkhatib, Badorek, Bundy, and Mogawer; Professor Emeritus McEwen.

Civil engineers are responsible for researching, developing, planning, designing, constructing, and managing many of the complex systems and facilities essential to our modern civilization. These include: water supply and pollution control systems; all types of transportation systems, from pipelines to city streets; and structural systems from residential buildings to city skyscrapers, power plants, and offshore platforms. Civil and environmental engineers play important roles in planning and administration with government agencies at all levels, especially those dealing with public works, transportation, environmental control, water supply, and energy.

The curriculum provides the students with sufficient background to pursue graduate study or to enter directly into professional practice in industry or government after graduation. The first two years are devoted largely to courses in mathematics, chemistry, physics, and engineering science common to all engineering curriculums. In their last two years, students have a large degree of flexibility in developing their own programs to meet their own professional goals through the selection of professional electives in envi-

ronmental engineering, soil mechanics and foundations, structural engineering, and transportation and construction.

No later than the first midsemester of the junior year, each student is required to file a proposed plan of study which has been approved by the faculty advisor and the department chairperson. Professional electives must be selected in consultation with the advisor to satisfy the Accreditation Board for Engineering and Technology accreditation requirements.

The major requires 131 credits.

#### *Freshman Year*

*First semester: 16 credits*

- 3 CHM 101 General Chemistry Lecture I
- 1 CHM 102 Laboratory for Chemistry 101
- 1 EGR 105 Foundations of Engineering I
- 4 MTH 141 Introductory Calculus with Analytic Geometry
- 3 PHY 203 Elementary Physics I
- 1 PHY 273 Elementary Physics Laboratory I
- 3 General Education requirement (COM 101 or WRT 101 recommended)

*Second semester: 16 credits*

- 2 EGR 106 Foundations of Engineering II
- 4 MTH 142 Intermediate Calculus with Analytic Geometry
- 3 PHY 204 Elementary Physics II
- 1 PHY 274 Elementary Physics Laboratory II
- 3 ECN 201 Principles of Economics: Microeconomics
- 3 General Education requirement

#### *Sophomore Year*

*First semester: 17 credits*

- 3 MTH 243 Calculus for Functions of Several Variables
- 3 MCE 262 Statics
- 3 PHY 205 Elementary Physics III
- 1 PHY 275 Elementary Physics Laboratory III
- 4 CVE 250 Introduction to CADD for Civil Engineers
- 3 General Education requirement

*Second semester: 17 credits*

- 3 MTH 244 Differential Equations
- 3 CVE 220 Mechanics of Materials

- 1 CVE 221 Mechanics of Materials Laboratory
- 3 MCE 263 Dynamics
- 4 GEL 103 Physical Geology
- 3 General Education requirement

*Note:* Students can take CVE 220, 221 or CVE 250 in either the fall or the spring semester of their sophomore year.

#### *Junior Year*

*First semester: 17 credits*

- 3 General Education requirement
- 3 MCE 354 Fluid Mechanics
- 3 CVE 352 Structural Analysis I
- 4 CVE 374 Environmental Engineering
- 4 CVE 381 Geotechnical Engineering

*Second semester: 18 credits*

- 1 CVE 397 Introduction to Civil Engineering Design
- 4 CVE 347 Highway Engineering
- 3 CVE 353 Structural Analysis II
- 4 CVE 370 Hydraulic Engineering
- 3 STA 409 Statistical Methods in Research I
- 3 General Education requirement

#### *Senior Year*

*First semester: 15 credits*

- 3 CVE 465 Analysis and Design of Concrete Structures
- 1 CVE 466 Structural Concrete Laboratory
- 2 CVE 497 Civil Engineering Design I
- 6 Professional electives
- 3 General Education requirement

*Second semester: 15 credits*

- 3 CVE 498 Civil Engineering Design II
- 6 Professional electives
- 3 Free elective
- 3 General Education requirement

*Professional Electives.* Nine of the 12 credits required for professional electives must be in the Department of Civil and Environmental Engineering and must include at least five design credits. A list of courses and their design credits is available from the Department of Civil and Environmental Engineering.

## Computer Engineering

The Bachelor of Science (B.S.) degree in computer engineering is offered by the Department of Electrical and Computer Engineering and is accredited by the Accreditation Board for Engineering and Technology. Specialization in computer engineering is also available within the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) programs in electrical engineering.

*Coordinator:* Professor Daly (Electrical and Computer Engineering). Professors Fischer, Ohley, Sadasiv, Tufts, and Yang; Associate Professors Lo, Sun, and Uht.

Computers and other digital systems have transformed society. They are used in almost every device manufactured, from teraflop multicomputers to cell phones to greeting cards. Other examples are signal-processing functions in numerically controlled machine tooling, computer-aided machine design, tomography (CAT scans) and medical imaging (ultrasounds), speech analysis and synthesis, and picture and data communication. The Internet and the World Wide Web are possible due to the rapid advances in computing and communication made in the last two to three decades.

Computer engineering is concerned with the design, efficient use, and research of all sizes and manner of computers and digital systems. The computer engineer must understand the fundamentals of computer logic and programming, as well as the fundamentals of electronics and general engineering-mathematics, mechanics, electricity and magnetism, and heat transfer. Engineers use all of this knowledge to create new devices and systems that satisfy human needs.

The URI computer engineering program offers a unique experience for those students desiring hardware and software computer engineering design skills, as well as the underlying theoretical knowledge to create richly complex and competitive digital systems.

Graduates from the program go on to positions at both major and smaller com-

panies, or enter graduate school for further study or to pursue research. Many computer engineering undergraduate students work with faculty on research projects before entering graduate school.

A key ingredient to successful digital system design is making appropriate design tradeoffs among the hardware and software components of the system to achieve a suitably-performing cost-effective design. The exact nature of the latter varies from problem to problem.

Design is a major component of the new Integrated Computer Engineering Design curriculum (ICED) at URI. ICED provides a unified thrust for the computer engineering student, tying together what is traditionally unrelated content from different courses. Over the duration of studies, a student will design and build an actual complete, working computer including both the processor and the compiler. Thus, the computer will be able to execute high level language programs. Several students' computers are connected together in a network as part of the final system design.

The design tasks to achieve these aims are distributed among the following required core courses: ELE 201/202, 305, 405, 408, 437, and CSC 402. Students may also incorporate work from CSC 412 and ELE 447 in the overall project. By arrangement with major design companies, industrial computer-aided design tools are used throughout the student's computer design process. State-of-the-art computers and laboratory equipment, including logic analyzers, are also used.

ICED is partially funded by the National Science Foundation and is offered with the support of the Department of Computer Science and Statistics and the Instructional Development program. More information is available via the departmental World Wide Web site at: <http://www.ele.uri.edu/>

To transfer from University College to the College of Engineering in the computer engineering program, students must have completed *all science, mathematics, and engineering courses required during the first two semesters* with a quality point average of 2.00 or better.

### Minimum Requirements

*Humanities and Social Sciences* (27 credits): see the General Education requirements for the College of Engineering, listed on page 73 of this section. Students should consult their advisors regarding distribution of credits and approved courses. (ECN 201 is included in the 27 credit total.)

*Mathematics* (17 credits): MTH 141, 142, 243, 362, 447.

*Basic Sciences* (16 credits): CHM 101, 102; PHY 203, 273, 204, 274, 205, 275.

*Computer Science* (20 credits): CSC 211, 212, 301, 402, 412.

*Engineering Sciences and Design* (42 credits): ELE 201, 202, 205, 212, 215, 305, 342, 405, 408, 437; IME 411 or MTH 451; engineering elective,<sup>8</sup> computer engineering electives.<sup>9</sup>

The major requires 129–131 credits.

#### Freshman Year

*First semester: 17 credits*

- 4 CSC 211 Introductory Programming and Design
- 4 MTH 141 Introductory Calculus with Analytic Geometry
- 3 CHM 101 General Chemistry Lecture I
- 1 CHM 102 Laboratory for Chemistry 101
- 3 PHY 203 Elementary Physics I
- 1 PHY 273 Elementary Physics Laboratory I
- 1 EGR 105 Foundations of Engineering I

*Second semester: 17 credits*

- 4 CSC 212 Data Structures and Abstractions
- 4 MTH 142 Intermediate Calculus with Analytic Geometry
- 3 PHY 204 Elementary Physics II
- 1 PHY 274 Elementary Physics Laboratory II
- 3 ECN 201 Principles of Economics: Microeconomics
- 2 EGR 106 Foundations of Engineering II

#### Sophomore Year

*First semester: 14 credits*

- 3 ELE 201 Digital Circuit Design
- 1 ELE 202 Digital Circuit Design Laboratory

- 3 MTH 243 Calculus for Functions of Several Variables
- 3 PHY 205 Elementary Physics III
- 1 PHY 275 Elementary Physics Laboratory III
- 3 General Education requirement

*Second semester: 17 credits*

- 3 ELE 205 Microprocessor Laboratory
- 3 ELE 212 Linear Circuit Theory
- 2 ELE 215 Linear Circuits Laboratory
- 3 MTH 362 Advanced Engineering Mathematics I
- 6 General Education requirements

#### Junior Year

*First semester: 16 credits*

- 3 ELE 305 Introduction to Computer Architecture
- 4 ELE 342 Electronics I
- 3 IME 411 Probability and Statistics for Engineers  
or 3 MTH 451 Introduction to Probability and Statistics
- 6 General Education requirements

*Second semester: 17 credits*

- 4 ELE 405 Digital Computer Design
- 3 ELE 437 Computer Communications
- 3 MTH/CSC 447 Discrete Mathematical Structures
- 4 CSC 301 Fundamentals of Programming Languages
- 3 General Education requirement

#### Senior Year

*First semester: 16–17 credits*

- 4 CSC 402 Compiler Design
- 3–4 Computer Engineering elective
- 3 Engineering elective
- 3 Free elective
- 3 General Education requirement

*Second semester: 15–16 credits*

- 4 ELE 408 Computer Organization Laboratory
- 4 CSC 412 Operating Systems and Networks
- 3–4 Computer Engineering elective
- 1 ELE 400 Introduction to Professional Practice
- 3 General Education requirement

## Electrical Engineering

The Department of Electrical and Computer Engineering offers a curriculum leading to the Bachelor of Science (B.S.) degree. The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees.

*Faculty:* Professor Ohley, *chairperson*. Professors Boudreaux-Bartels, Daly, Fischer, L. Jackson, Kay, Kumaresan, Lengyel, Lindgren, Mardix, Mitra, Sadasiv, Sunak, Tufts, Vaccaro, and Q. Yang; Associate Professors Lo, Sun, Swaszek, and Uht; Adjunct Professors Aaron, Banerjee, Cooley, Gerwitz, Middleton, Most, Titlebaum, and Turtle; Adjunct Assistant Professors Common, McCullough, and H. White.

Electrical engineers work in all areas in which electrical phenomena are involved. These areas include communication systems, computers, control systems, quantum electronics, microelectronics, electro-optics, electro-acoustics, energy conversion, antennas and radio propagation, design of electronic devices, and bioengineering.

Since electrical instrumentation is at the heart of modern science and technology, electrical engineers are not only employed in the computer, electronics, communications, and power industries, but may also be found in diverse enterprises such as transportation, the chemical industry, large hospitals, medical schools, and government laboratories. By carefully selecting elective courses, the student should be able to enter any of these fields after graduation or be prepared for graduate study in engineering or physics.

The curriculum emphasizes the scientific basis of electrical engineering and the application of mathematical analysis to engineering problems. Work is required in network and systems theory, atomic physics and solid state, electromagnetic theory, and electronics. Creative use of scientific principles in problems of engineering design is stressed, particularly in the senior year. The development of computer hardware and software is a part of many electrical engineering courses.

Extensive laboratory work with electrical and optical devices serves to bridge the gap between mathematical analysis and the real world of "hardware." Separate undergraduate laboratories are available for electrical measurements, electronics, pulse and digital circuits, microprocessors, computer graphics, microwaves and quantum electronics, optics, materials, energy conversion, and systems. Selected students participate in advanced projects, including microelectronics, investigation of optical properties of solids, optical and radio propagation, acoustics, computers, robotics, and biological instrumentation.

Electrical engineering students should note that the four-year electrical engineering curriculum allows for three credits of completely free electives that do not have to satisfy any of the General Education requirements. Although the natural science requirement will be satisfied automatically by courses specified in the electrical engineering curriculum, it is recommended that students take some additional courses in mathematics or physics for which the prerequisites have been satisfied.

To transfer from University College to the College of Engineering in the electrical engineering program, students must have completed *all science, mathematics, and engineering courses required during the first two semesters* with a quality point average of 2.00 or better.

### Minimum Requirements

*Humanities and Social Sciences* (27 credits): see the General Education requirements for the College of Engineering, listed on page 73 of this section. Students should consult with their advisors regarding distribution of credits and approved courses.

*Mathematics* (17 credits): MTH 141, 142, 243, 362; three credits of an MTH elective (215 or any 300- to 500-level mathematics course except MTH 381).

*Basic Sciences* (19 credits): CHM 101, 102; PHY 203, 273, 204, 274, 205, 275, 306.

*Computer Science* (4 credits): CSC 200.

*Engineering Sciences and Design* (61–63 credits): EGR 105, 106; ELE 201, 202, 205, 212, 215, 305, 313, 314, 322, 331, 342, 343, 400; one engineering elective (chosen from CHE 332, 437; CVE 220; IME 404, 411, 412; MCE 323, 341, 354; or OCE 410); five electrical engineering design electives (chosen from ELE 401, 405, 408, 423, 427, 432, 436, 437, 444, 447, 457, 458, 488, 489; two of these courses must be chosen from ELE 408, 427, 444, 447, 458, or 489).

*Free Elective:* 3 credits.

The major requires 131–133 credits.

### Freshman Year

*First semester: 16 credits*

- 1 EGR 105 Foundations of Engineering I
- 3 CHM 101 General Chemistry Lecture I
- 1 CHM 102 Laboratory for Chemistry 101
- 4 MTH 141 Introductory Calculus with Analytic Geometry
- 3 PHY 203 Elementary Physics I
- 1 PHY 273 Elementary Physics Laboratory I
- 3 General Education requirement

*Second semester: 17 credits*

- 2 EGR 106 Foundations of Engineering II
- 3 ECN 201 Principles of Economics: Microeconomics
- 4 MTH 142 Intermediate Calculus with Analytic Geometry
- 3 PHY 204 Elementary Physics II
- 1 PHY 274 Elementary Physics Laboratory II
- 4 CSC 200 Computer Problem Solving for Science and Engineering

### Sophomore Year

*First semester: 17 credits*

- 3 MTH 243 Calculus for Functions of Several Variables
- 3 PHY 205 Elementary Physics III
- 1 PHY 275 Elementary Physics Laboratory III
- 3 ELE 201 Digital Circuits Design
- 1 ELE 202 Digital Circuits Design Laboratory
- 6 General Education requirements

*Second semester: 17 credits*

- 3 MTH 362 Advanced Engineering Mathematics I
- 3 PHY 306 Elementary Modern Physics
- 3 ELE 212 Linear Circuit Theory
- 2 ELE 215 Linear Circuits Laboratory
- 3 ELE 205 Microprocessor Laboratory
- 3 General Education requirement

*Junior Year**First semester: 16 credits*

- 4 ELE 342 Electronics I
- 3 ELE 313 Linear Systems
- 3 ELE 305 Introduction to Computer Architecture
- 3 ELE 331 Introduction to Solid State Devices
- 3 General Education requirement

*Second semester: 17 credits*

- 3 ELE 314 Linear Systems and Signals
- 3 ELE 322 Electromagnetic Fields I
- 5 ELE 343 Electronics II
- 3 General Education requirement
- 3 Mathematics elective<sup>10</sup>

*Senior Year<sup>11</sup>**Total credits for two semesters: 31–33*

- 1 ELE 400 Introduction to Professional Practice
- 3 Engineering elective<sup>12</sup>
- 6 General Education requirements
- 3 Free elective
- 18–20 Electrical engineering design electives<sup>13</sup>

**Industrial Engineering**

The Department of Industrial and Manufacturing Engineering offers an ABET-accredited curriculum leading to the Bachelor of Science (B.S.) degree in industrial engineering. The department also offers the Master of Science (M.S.) degree in manufacturing engineering and the Doctor of Philosophy (Ph.D.) in industrial and manufacturing engineering.

*Faculty:* Professor Knight, *chairperson*. Professors G. Boothroyd and Dewhurst; Associate Professors Shao and Sodhi; Assistant Professor Wang; Adjunct Professor Reynolds; Adjunct Associate Professor David Olson; Professor Emeritus Nichols.

The industrial and manufacturing engineering curriculum is designed to provide significant strength in mathematics, basic science, and engineering science, together with a carefully coordinated set of courses of particular importance to the professional industrial or manufacturing engineer. Mathematical modeling of production systems and fundamental treatments of important manufacturing processes and assembly are included. Robotics, computer-aided manufacturing, and product design for manufacturability and assembly are areas that receive considerable attention.

Students are amply prepared to pursue careers in industrial or manufacturing engineering—areas that are becoming increasingly important in efforts to improve industrial productivity in the United States.

The curriculum also provides an excellent background for further formal study at an advanced level.

The major requires 128 credits.

*Freshman Year**First semester: 16 credits*

- 3 CHM 101 General Chemistry Lecture I
- 1 CHM 102 Laboratory for Chemistry 101
- 3 PHY 203 Elementary Physics I
- 1 PHY 273 Elementary Physics Laboratory I
- 1 EGR 105 Foundations of Engineering I
- 4 MTH 141 Introductory Calculus with Analytic Geometry
- 3 General Education requirement

*Second semester: 16 credits*

- 3 ECN 201 Principles of Economics: Microeconomics
- 4 MTH 142 Intermediate Calculus with Analytic Geometry
- 3 PHY 204 Elementary Physics II
- 1 PHY 274 Elementary Physics Laboratory II
- 2 EGR 106 Foundations of Engineering II
- 3 General Education requirement

*Sophomore Year**First semester: 15 credits*

- 3 ECN 202 Principles of Economics: Macroeconomics

- 3 IME 220 Introduction to Industrial Engineering
- 3 IME 325 Computer Solutions in Industrial and Manufacturing Engineering
- 3 MCE 262 Statics
- 3 MTH 243 Calculus for Functions of Several Variables

*Second semester: 15 credits*

- 3 CVE 220 Mechanics of Materials
- 3 ELE 220 Passive and Active Circuits
- 3 IME 240 Manufacturing Processes
- 3 MCE 263 Dynamics
- 3 MTH 362 Advanced Engineering Mathematics I

*Junior Year**First semester: 18 credits*

- 3 CHE 333 Engineering Materials or CHE 437 Materials Engineering
- 3 IME 404 Engineering Economy
- 3 IME 411 Probability and Statistics for Engineers
- 3 IME 432 Operations Research: Deterministic Models
- 3 MCE 341 Thermodynamics
- 3 General Education requirement

*Second semester: 15 credits*

- 3 ACC 201 Elementary Accounting I
- 3 IME 412 Statistical Methods for Engineers
- 3 IME 433 Operations Research: Stochastic Models
- 3 Approved science elective<sup>14</sup>
- 3 General Education elective

*Senior Year**First semester: 18 credits*

- 3 IME 444 Assembly and Handling Automation
- 3 IME 449 Product Design for Manufacture
- 3 Professional elective
- 3 Free elective
- 6 General Education requirements

*Second semester: 15 credits*

- 3 IME 446 Metal Deformation Processes
- 3 IME 451 Industrial Engineering Systems
- 6 Professional electives
- 3 General Education requirement

General Education indicated in several places above refers to one of the electives in the University's General Education program, required in all curriculums leading to a bachelor's degree.

## Mechanical Engineering

The Department of Mechanical Engineering and Applied Mechanics offers a curriculum leading to the Bachelor of Science (B.S.) degree in mechanical engineering and, in cooperation with the Department of Ocean Engineering, offers a curriculum leading to the Bachelor of Science (B.S.) degree in mechanical engineering with an ocean engineering option, both accredited by the Accreditation Board for Engineering and Technology. The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in mechanical engineering and applied mechanics.

*Faculty:* Professor M. Sadd, *chairperson*. Professors P. Datsoris, M. Faghri, H. Ghonem, T. Kim, R. Lessmann, W. Palm, and A. Shukla; Associate Professors O. Ibrahim, M. Jouaneh, D. Taggart, and Z. Zhang; Assistant Professor D. Pence; Adjunct Assistant Professors W. Tucker and G. Vallee.

This curriculum provides a thorough and well-rounded foundation in basic science, mathematics, engineering science, and general education to prepare the graduate to enter a professional engineering career. The curriculum is also excellent preparation for graduate school. The program is strong in providing a background in design, solid and fluid mechanics, systems engineering, and the thermal sciences, including energy and energy transfer. Computer applications are stressed throughout the curriculum. All undergraduates are invited and encouraged to join the Student Section of the American Society of Mechanical Engineers, which sponsors industrial plant visits, special lectures, and other activities. Students may also join chapters of the Society of Automotive Engineers, the American

Society of Heating, Refrigerating, and Air Conditioning Engineers, and the Society for Experimental Mechanics.

The work in the first two years consists of basic courses in science (mathematics, physics, chemistry), applied science (mechanics, electricity and magnetism, basic computer literacy and computer-aided problem solving), and General Education requirements (humanities, social sciences, English communication). A pair of introductory engineering courses are included in the freshman year.

The junior year concentrates on fundamental courses in mechanical engineering (thermodynamics, fluid mechanics, systems engineering, engineering analysis), materials sciences, and design of machines. Further General Education studies are also covered.

The senior year in mechanical engineering includes heat transfer, manufacturing processes, mechanical systems design, thermal systems design, and a wide variety of professional electives such as mechanical control systems, advanced fluid mechanics, advanced mechanics of materials, microprocessor applications, internal combustion engines, alternate energy systems including solar and wind energy, power plants, air conditioning, heating and ventilation, vibrations, finite element method, and experimental stress analysis. The program also includes three laboratory courses in the junior and senior years, which introduce experimental techniques and provide practical experience with the engineering phenomena covered in the classroom.

Computer techniques are integrated throughout the curriculum. Computational facilities including personal computers and workstations are available in the College of Engineering's Computer Center and the University's Office of Information Services. The department's computer classroom provides state-of-the-art hardware and software for simulation, design, and product development.

To receive the Bachelor of Science degree in mechanical engineering, the student must satisfactorily complete all the courses in the following curriculum, which requires 129 credits.

### *Freshman Year*

#### *First semester: 16 credits*

- 3 CHM 101 General Chemistry Lecture I
- 1 CHM 102 Laboratory for Chemistry 101
- 4 MTH 141 Introductory Calculus with Analytic Geometry
- 3 PHY 203 Elementary Physics I
- 1 PHY 273 Elementary Physics Laboratory I
- 1 EGR 105 Foundations of Engineering I
- 3 General Education requirement

#### *Second semester: 16 credits*

- 3 ECN 201 Principles of Economics: Microeconomics
- 4 MTH 142 Intermediate Calculus with Analytic Geometry
- 2 EGR 106 Foundations of Engineering II
- 3 PHY 204 Elementary Physics II
- 1 PHY 274 Elementary Physics Laboratory II
- 3 General Education requirement

### *Sophomore Year*

#### *First semester: 16 credits*

- 3 MTH 243 Calculus for Functions of Several Variables
- 3 MCE 262 Statics
- 3 PHY 205 Elementary Physics III
- 1 PHY 275 Elementary Physics Laboratory III
- 3 MCE 201 Graphics for Mechanical Engineering
- 3 General Education requirement

#### *Second semester: 15 credits*

- 3 ELE 220 Passive and Active Circuits
- 3 MTH 244 Differential Equations
- 3 MCE 263 Dynamics
- 3 CVE 220 Mechanics of Materials
- 3 General Education requirement

### *Junior Year*

#### *First semester: 17 credits*

- 3 CHE 333 Engineering Materials
- 3 MCE 301 Application of Mechanics in Design
- 2 MCE 313 Introduction to Mechanical Engineering Experimentation
- 3 MCE 341 Fundamentals of Thermodynamics
- 3 MCE 372 Engineering Analysis
- 3 General Education requirement



*Second semester: 17 credits*

- 3 MCE 302 Design of Machinery
- 2 MCE 314 Experimental Problems in Solid Mechanics
- 3 MCE 354 Fluid Mechanics
- 3 MCE 366 System Dynamics
- 6 General Education requirements

*Senior Year**First semester: 17 credits*

- 3 IME 340 Materials Processing and Metrology I
- 3 MCE 401 Mechanical System Design
- 2 MCE 415 Experimentation in Fluid Mechanics and Thermal Science
- 3 MCE 448 Heat and Mass Transfer
- 6 Professional electives<sup>15</sup>

*Second semester: 15 credits*

- 3 MCE 402 Thermal Systems Design
- 6 Professional electives<sup>15</sup>
- 3 Free elective
- 3 General Education requirement

**Mechanical Engineering with an Ocean Engineering Option.** Students enrolled in this curriculum will follow the program of study for mechanical engineering during the freshman and sophomore years. The curriculum for the junior and senior years follows.

This major requires 132 credits.

*Junior Year**First semester: 17 credits*

- 3 CHE 333 Engineering Materials
- 3 MCE 301 Application of Mechanics in Design
- 2 MCE 313 Introduction to Mechanical Engineering Experimentation
- 3 MCE 341 Fundamentals of Thermodynamics
- 3 MCE 354 Fluid Mechanics
- 3 MCE 372 Engineering Analysis

*Second semester: 16 credits*

- 3 MCE 302 Design of Machinery
- 3 MCE 366 System Dynamics
- 3 OCE 307 Coastal Engineering Design
- 4 OCE 311 Basic Coastal Measurements
- 3 OCG 451 Oceanographic Science

*Senior Year**First semester: 18 credits*

- 3 IME 340 Materials Processing and Metrology I
- 3 MCE 401 Mechanical System Design
- 3 MCE 448 Heat and Mass Transfer
- 3 OCE elective<sup>16</sup>
- 6 General Education requirements

*Second semester: 18 credits*

- 3 MCE 402 Thermal Systems Design
- 3 OCE 471 Underwater Acoustics
- 3 Professional elective<sup>17</sup>
- 3 Free elective
- 6 General Education requirements

## Ocean Engineering

The Department of Ocean Engineering offers a curriculum leading to the Bachelor of Science (B.S.) degree in ocean engineering. The department is nationally and internationally recognized as one of the leaders in ocean engineering. The B.S. program is accredited by the Accreditation Board for Engineering and Technology and is open to qualified students under the New England Regional Student Program. The department also offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees.

*Faculty:* Professor Spaulding, *chairperson*. Professors Grilli, Silva, Stepanishen, and Tyce; Associate Professors Hu and Miller; Adjunct Professors Hall, Methot, Shonting, and Sullivan; Adjunct Associate Professors Mayer and Uhlman; Professors Emeriti T. Kowalski, Middleton, and Sheets.

This curriculum provides a basic ocean engineering program that will prepare students for direct entry into a professional career or for continued study toward a graduate degree. The curriculum gives students a firm footing in engineering fundamentals. The required ocean engineering courses begin at the freshman level and include laboratory, analysis, and design courses. The total design component must include at least 17 credits. There is a strong emphasis on the application of scientific principles in the ocean environment gained through laboratory courses.

Experiments covering several basic areas are employed and provide an integrated approach to investigations into ocean phenomena and processes. Students are involved in the planning and execution of experiments, including collection and analysis of data and the reporting of results. This hands-on experience provides graduates with an understanding of ocean engineering activities in scientific and industrial fields. Three ocean engineering professional elective courses are also required. The program is broad-based and exposes students to the following topics: ocean instrumentation and data analysis, underwater and subbottom acoustics, marine hydrodynamics, coastal and nearshore processes, marine geomechanics, coastal and offshore structures, and corrosion.

To ensure that each student gains an in-depth knowledge of one of the ocean engineering disciplines, the curriculum includes sequences of courses in hydrodynamics, structures, geomechanics, acoustics, instrumentation, and data analysis. An Ocean Systems Design Project course in the senior year integrates previously obtained knowledge in a comprehensive design project. This experience may be obtained through an on-campus course, by participating in an ongoing research project, or through an off-campus summer internship in an ocean-oriented private company or government laboratory. The internship allows interested students to take advantage of the many opportunities available in the region.

The Department of Ocean Engineering has its headquarters in the Sheets Building and has laboratory facilities in the Middleton Building, both on the Narragansett Bay Campus. These buildings house most of the department's experimental facilities. Computational facilities include personal computer and workstation rooms networked and connected to the Engineering Computer Laboratory and the Office of Information Services.

Extensive laboratory facilities are available. The department operates an 80-foot research vessel equipped with a fully integrated side-scan sonar mapping system.

This vessel, the *R/V CT-1*, is used for both laboratory courses and research. A 100-foot tow tank and a large acoustics tank are located on the Bay Campus, as well as an electronics shop, a diving locker, a machine shop, a corrosion/materials laboratory, and the Marine Geomechanics Laboratory.

The major requires 126–127 credits.

#### Freshman Year

*First semester: 16 credits*

- 1 EGR 105 Foundations of Engineering I
- 3 CHM 101 General Chemistry Lecture I
- 1 CHM 102 Laboratory for Chemistry 101
- 4 MTH 141 Introductory Calculus with Analytic Geometry
- 3 PHY 203 Elementary Physics I
- 1 PHY 273 Elementary Physics Laboratory I
- 3 General Education requirement

*Second semester: 17 credits*

- 2 EGR 106 Foundations of Engineering II
- 4 MTH 142 Intermediate Calculus with Analytic Geometry
- 3 PHY 204 Elementary Physics II
- 1 PHY 274 Elementary Physics Laboratory II

- 1 OCE 101 Introduction to Ocean Engineering
- 3 ECN 201 Principles of Economics: Microeconomics
- 3 MCE 262 Statics

#### Sophomore Year

*First semester: 16 credits*

- 3 MCE 263 Dynamics
- 3 MTH 243 Calculus for Functions of Several Variables
- 3 PHY 205 Elementary Physics III
- 1 OCE 215 Ocean Engineering Seminar
- 6 General Education requirements

*Second semester: 16 credits*

- 3 CVE 220 Mechanics of Materials
- 3 MTH 244 Differential Equations
- 3 ELE 220 Passive and Active Circuits
- 3 OCG 451 Oceanographic Science
- 1 OCE 216 Introduction to Ocean Engineering Design
- 3 General Education requirement

#### Junior Year

*First semester: 15–16 credits*

- 3 CHE 333 Engineering Materials or CVE 381 Geotechnical Engineering (4 credits)

- 3 MCE 372 Engineering Analysis
- 3 MCE 354 Fluid Mechanics
- 3 OCE 310 Basic Ocean Measurements
- 3 Professional elective<sup>18</sup>

*Second semester: 14 credits*

- 3 OCE 471 Underwater Acoustics
- 3 OCE 307 Coastal Engineering Design
- 4 OCE 311 Coastal Measurements and Applications
- 1 OCE 395 Ocean Systems Design Proposal
- 3 General Education requirement

#### Senior Year

*First semester: 17 credits*

- 1 OCE 416 Ocean Engineering Seminar
- 4 OCE 495 Ocean Systems Design Project<sup>19</sup>
- 3 IME 411 Probability and Statistics for Engineers
- 3 OCE 421 Marine Structure Design
- 3 Professional elective<sup>18</sup>
- 3 General Education requirement

*Second semester: 15 credits*

- 6 Professional electives<sup>18</sup>
- 3 Free elective
- 6 General Education requirements

<sup>1</sup> Engineering electives for this curriculum may be chosen from any two of the following courses: CHE 333, 347, 541, 574; CVE 220, 374; ELE 331, 423; IME 404, 411, 412; MCE 323, 341, or 354. At least one course must be outside of ELE.

<sup>2</sup> Electrical engineering design electives for this curriculum may be chosen from any two of the following courses: ELE 401, 405, 408, 427, 432, 436, 437, 444, 447, 457, or 458.

<sup>3</sup> A mathematics elective is MTH 215 or any 300- to 500-level mathematics course except MTH 381. MTH 451 is recommended as a mathematics elective.

<sup>4</sup> Accreditation Board for Engineering and Technology through its Engineering Accreditation Commission in cooperation with the Committee on Education and Accreditation of the American Institute of Chemical Engineers.

<sup>5</sup> CHM 191, 192 (10 credits) may be substituted for CHM 101, 102, 112, and 114 (8 credits).

<sup>6</sup> In order to meet accreditation requirements, these courses, together with at least 18 credits of the General Education requirements, must be chosen from a group approved by the chairperson, with the approval of an advisor designated by the chairperson.

<sup>7</sup> The elective must meet accreditation requirements. OCG 451 required for chemical and ocean engineering majors.

<sup>8</sup> An engineering elective for this curriculum is one of the following engineering science courses: CHE 332, 437; CVE 220; IME 404, 412; MCE 323, 341, 354; and OCE 410.

<sup>9</sup> Computer Engineering elective—six or more credits from a list approved by the ELE Department; (4) ELE 444 Advanced Electronic Design; (4) ELE 447 VLSI Design and Simulation; (4) ELE 543 Computer Networks; (4) ELE 545 Design of Digital Circuits; (4) ELE 548 Computer Architecture.

<sup>10</sup> A mathematics elective is MTH 215 or any 300- to 500-level mathematics course except MTH 381. MTH 451 is recommended as a mathematics elective.

<sup>11</sup> See your advisor for help in preparing a suitable senior-year program.

<sup>12</sup> An engineering elective for this curriculum is one of the following engineering science courses: CHE 332, 437; CVE 220; IME 404, 411, 412; MCE 323, 341, 354; and OCE 410.

<sup>13</sup> Electrical engineering design electives may be chosen from any five of the following courses: ELE 401, 405, 408, 423, 427, 432, 436, 437, 444, 447, 457, 458, 488, 489. However, two of the courses must be chosen from ELE 408, 427, 444, 447, 458, or 489.

<sup>14</sup> Any course for which the prerequisite is met by CHM 101, including PHY 205, 223, and 275; any physics course at or above the 300 level; or any course in astronomy, biochemistry, biology, botany, geology, microbiology, or zoology. Any other course must be approved by an advisor.

<sup>15</sup> Professional electives must be satisfied by a minimum of three three-credit elective courses in mechanical engineering. The fourth course may be a 300-, 400-, or 500-level course offered by: the College of Engineering (except OCE 346 and 347); or the Departments of Chemistry, Computer Science and Statistics, or Physics; or the Department of Mathematics (one 400- or 500-level course).

<sup>16</sup> One course must be selected from OCE 421, 495, 510, 522, 534, or 561.

<sup>17</sup> The professional elective requirement may be satisfied by any 400-level mechanical engineering course.

<sup>18</sup> The requirement for professional electives must be satisfied by a minimum of two approved three-credit elective courses at the 300, 400, or 500 level in engineering and two approved three-credit courses in ocean engineering.

<sup>19</sup> An approved off-campus experience between the junior and senior years can be substituted for OCE 495.

## COLLEGE OF THE ENVIRONMENT AND LIFE SCIENCES

Margaret S. Leinen, *Interim Dean*  
William R. Wright, *Associate Dean*

The College of the Environment and Life Sciences offers undergraduate majors leading to three degrees: the Bachelor of Science (B.S.), the Bachelor of Arts (B.A.), and the Bachelor of Landscape Architecture (B.L.A.). The following majors are offered within the B.S. degree program: animal science and technology, aquaculture and fishery technology, clinical laboratory science, dietetics, environmental economics and management, environmental plant biology, environmental science and management, food science and nutrition, geology, geology and geological oceanography, marine affairs, marine resource development, microbiology, resource economics and commerce, urban horticulture and turfgrass management, water and soil science, and wildlife biology and management. Students may obtain a B.A. in marine affairs.

Graduate programs leading to the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees are offered in many departments. The Department of Community Planning and Area Development offers a professional degree of Master of Community Planning (M.C.P.). See "Graduate Programs" for detailed descriptions of these programs.

Options have been developed within certain majors to help students prepare for specific graduate study, further professional training, or specialized careers. Entering freshmen and transfer students with fewer than 24 credits are admitted to University College, and may choose a major in the College of the Environment and Life Sciences at that time. Students may choose an option when they transfer to the College of the Environment and Life Sciences or at a later time.

Undergraduate students from any college may develop a minor from one of the majors offered by the College of the

Environment and Life Sciences. Details can be worked out with an appropriate faculty advisor. In addition, most departments have an internship program for combining hands-on professional experience with academic credit.

The Department of Community Planning and Area Development offers a minor in community planning. The minor includes 18 credits. Nine credits are required and include CPL 210, 410, and 498. The other nine credits are elective courses which cannot be courses that would also count toward the student's major. The electives should be chosen from an approved list of courses in consultation with an advisor from the department.

### Faculty

Many faculty members hold a joint appointment with the Rhode Island Agricultural Experiment Station and the Rhode Island Cooperative Extension. These units represent the formal research and public service functions of the college and are funded with federal and state monies.

#### *Biochemistry, Microbiology, and Molecular Genetics:*

Clinical Laboratory Science—Professor Sperry, chairperson; Adjunct Associate Professor Paquette, *director*. Adjunct Clinical Professors Allegra and Kenney; Adjunct Clinical Associate Professors Kessimian and Schwartz; Adjunct Clinical Assistant Professors Campbell, Gmuer, Goddu, Heelan, Ingersoll, Lewandowski, and Mello.

Microbiology—Professors Bradley, P. Cohen, Goldsmith, Hufnagel, Laux, D. Nelson, and Tremblay; Associate Professors Chandlee, Fischl, Krul, Mottinger, and J.H. Norris; Professors Emeriti Cabelli, Carpenter, Hartman, Traxler, and N. Wood.

*Community Planning and Area Development:* Associate Professor Atash, *director*. Professor Feld; Associate Professors Feldman, H. Foster, and Jensen; Adjunct Professor Thomas; Adjunct Associate Professors Abedon, Flynn, Kumekawa, Ruggerio, R.B. Shaw, and Westcott; Adjunct Assistant Professors Motte, Parella, Schatz, and Winsor.

*Environmental and Natural Resource Economics:* Associate Professor Wessells, *chairperson*. Professors James L. Anderson, Gates, Grigalunas, Opaluch, Sutinen, and Tyrrell; Associate Professors Swallow and Wichelns; Adjunct Professors Agüero, D. Brown, and Shogren; Adjunct Assistant Professors Andersen and Johnston.

*Fisheries, Animal and Veterinary Science:* Professor Rhodes, *chairperson*. Professors Bradley, DeAlteris, McCreight, Nippo, and Wolke; Associate Professors Bengtson, Mallilo, Recksiek, Rice, and Wing (equiv.); Assistant Professors Gomez-Chiarri and Whitworth; Adjunct Associate Professors Bodammer, Fleming, and Pechenik; Adjunct Assistant Professors Balmforth, Blott, Ganz, and Kaiser; Adjunct Clinical Professor Serra.

*Food Science and Nutrition:* Professor Caldwell, *chairperson*. Professors Constantinides, C. Lee, and Rand; Associate Professors English, Fischl, Gerber, Greene, and Patnoid; Assistant Professor Fey-Yensan; Adjunct Professor Josephson; Adjunct Associate Professor Sebelia; Adjunct Assistant Professor Gianquitti.

*Geology:* Professor Hermes, *chairperson*. Professors J. Boothroyd, Cain, Fastovsky, and Murray; Associate Professors Frohlich and Veeger; Adjunct Associate Professors Burks, Civco, and Fischer.

*Geology and Geological Oceanography:* Professor Hermes, *coordinator*. The faculty consists of the members of the Department of Geology and the marine geology and geophysics faculty of the Graduate School of Oceanography.

*Landscape Architecture:* Professor Hanson, *coordinator*. Associate Professors Green and Simeoni; Adjunct Assistant Professors Sheridan and Weygand.

*Marine Affairs:* Professor Juda, *chairperson*. Professors Burroughs, Marti, D. Nixon, and West; Associate Professors Gordon and G. Krausse; Assistant Professor Dyer; Professors Emeriti Alexander, Knauss, and Michel.

*Natural Resources Science:* Professor Husband, *chairperson*. Professors August, Gold, Golet, and Wright; Associate Professor Amador; Assistant Professors Compton, McWilliams, Paton and Stolt; Adjunct Professor Perez; Adjunct Associate Professor Groffman; Adjunct Research Professor P. Buckley; Adjunct Associate Research Professor F. Buckley; Adjunct Assistant Research Professors Tefft and Gorres; Adjunct Assistant Research Hydrologist Kellogg; Adjunct Research Scientist Hutchinson.

*Plant Sciences:* Associate Professor Sullivan, *chairperson*. Professors Casagrande, Hull, N. Jackson, LeBrun, and Logan; Associate Professors Alm, Chandlee, Englander, Krul, Mather, Maynard, Ruemmele, and R.J. Shaw; Adjunct Professor Taylorson; Adjunct Associate Professor Ginsberg; Adjunct Assistant Professors Bicki, Bourbonnais, Dellaporta, Gettman, Gordon, E. Roberts, and Weygand; Professor Emeritus Mueller.

## Bachelor of Landscape Architecture Curriculum Requirements

Landscape architecture is a curriculum leading to the Bachelor of Landscape Architecture (B.L.A.) degree. Accredited by the American Society of Landscape Architects, the curriculum is designed to prepare undergraduates for professional careers in the public and private sectors of landscape architecture that involve the design, planning, preservation, and restoration of the landscape by applying both art and science to achieve the best use of our land resources.

Landscape architects engage in the design and planning of parks, recreation areas, new communities and residential developments, urban spaces, pedestrian areas, commercial centers, resort developments, transportation facilities, corporate and institutional centers, industrial parks, and waterfront developments. Their professional skills may also be used to design natural, historic, and coastal landscape preservation projects.

The requirements of this curriculum include preparation in the basic arts and sciences. The major includes 57 credits of program courses; 22–24 credits of supporting requirements; and 13–15 credits of approved supporting electives through which a student may obtain additional preparation in art, community planning, natural resources, or plant sciences. Graduation requirements include a minimum of 130 credits maintaining a quality point average of at least 2.00 and no LAR grades below a grade of C.

Landscape architecture is an oversubscribed program. Accreditation standards regarding staff and facilities limit the present student acceptance into the major to 20 per year and requires a competitive admissions policy. Students will be reviewed twice during the course of their studies: first for admission into the lower-division design sequence and again for acceptance into the upper-division B.L.A. major. A cumulative quality point average requirement is determined each year for both of these reviews. In recent years, the cutoff has ranged from 2.40 to 2.60 for those accepted to either the lower or the upper division.

Admission into the lower-division design sequence courses (LAR 243 and 244) requires departmental approval. Approximately 50 percent of the openings are filled by students entering as incoming freshmen and/or transfer students through the Office of Undergraduate Admissions (subject to their maintaining a minimum 2.00 quality point average with no grades in LAR courses below a C). These students will begin the design sequence in the fall semester of their second year at URI. The remaining openings are filled by matriculated students through an application accompanied by a transcript of grades. Applications and transcripts will be evaluated in February of each year for acceptance into the lower-division courses in the coming fall. In order to encourage minority applicants, one available space will be set aside each year for a minority applicant who meets the minimal program qualifications.

Acceptance into the upper-division (junior-senior) landscape architecture major will be based upon submission and review of a portfolio of lower-division work, academic transcript, and a written essay. A maximum of 20 students per year will be accepted into the upper-division (B.L.A.) curriculum. Eligible applicants for the upper division are students enrolled in LAR 244, repeat applicants, and students who wish to transfer directly into the upper division from other landscape architecture programs. Only students who have completed comparable lower-division courses in programs that have been accredited by the American Society of Landscape Architects will be allowed to compete for these upper-division positions. Such transfer applicants must first be accepted into the University by the Office of Undergraduate Admissions and have their portfolio, transcripts, and essays submitted to the coordinator of the landscape architecture program before February 15 preceding the fall semester in which they wish to enroll. Students will be notified of their acceptance into the upper-division program before preregistration for fall classes.

Interested students should discuss entrance probabilities with the program advisor.

## Bachelor of Science Curriculum Requirements

Most B.S. programs offered in the college require a minimum of 130 credits for graduation, except when specified otherwise under the program description. Required courses come from three categories: General Education requirements (36 credits); program requirements (77–85 credits); and free electives (9–12 credits).

The following outline gives the basic General Education requirements for all students in the B.S. curriculum. Individual programs may require that specific courses be selected.

*English Communication* (6 credits). Three credits in written communication from courses in Group Cw, and three credits in

oral communication from communication studies.

*Mathematics* (3 credits)

*Natural Sciences* (6 credits)

*Social Sciences* (6 credits)

In addition, 15 credits must be chosen from:

*Letters* (3–6 credits)

*Fine Arts and Literature* (3–6 credits)

*Foreign Language and Culture* (3–6 credits)

Total: 36 credits.

**Impacted Status of Programs in Natural Resources Science.** Due to limited staff and facilities, the total number of transfers from University College to the undergraduate majors offered by the Department of Natural Resources Science must be limited to 30–40 students each year. These majors are: environmental science and management, water and soil science, and wildlife biology and management. The competitive admission policy that has been established to deal with student demand consists of required courses, a minimum number of credits, and a weighted quality point average requirement that is determined each year.

Before applying for admission to the College of the Environment and Life Sciences in a natural resources science major, students must complete at least 24 credits of course work, including five of the following courses: NRS 100; BIO 112; BIO 113; GEL 103; CHM 103, 105 or CHM 101, 102 or CHM 124, 126; and MTH 131 or PHY 109, 110. The weighted quality point average emphasizes the grades received in the required basic science courses. It is likely that the cutoff for the weighted quality point average will be in the range of about 2.60 to 3.00.

Applications for admission to one of the majors in natural resources science for the coming academic year must be received by the last day of January. Applications are evaluated only once each year, in early February. Applicants who are accepted will be notified by the last day of February. Admission will be limited to those students with the highest weighted quality point averages. Although those be-

low the cutoff may reapply the following year, they are strongly advised to choose a major outside natural resources science and to select new courses appropriate to that major for the fall. Students who have not satisfied entrance requirements may petition the NRS Curriculum Committee for a waiver of those requirements. Petition forms are available in the main office of the Department of Natural Resources Science.

Transfer students from other institutions must meet the same requirements, as stated above, and will be considered for admission to programs in natural resources science with other students from University College during the February evaluation period.

To ensure that natural resources science majors have access to required courses, a strict registration policy will be followed. Highest priority for NRS courses will be given to natural resources science majors. Students in other majors will be accommodated on a space-available basis.

## Bachelor of Arts Curriculum Requirements

Students who pursue the B.A. in marine affairs must fulfill the Basic Liberal Studies requirements of the College of Arts and Sciences (see page 46). Also see the listing under marine affairs in this section.

## Animal Science and Technology

This major, offered by the Department of Fisheries, Animal and Veterinary Science, is designed for students interested in applied animal science careers. Options are available to students interested in veterinary medicine, animal sciences, and laboratory animal science. Those students who intend to use their study in animal science as credentials for secondary-school teaching should also enroll in this major.

The major requires a minimum of seven credits in introductory animal science and genetics; three credits in biology; eight credits in inorganic chemistry; and three credits in mathematics. Also required are nine to 12 credits in basic science, 24 credits of concentration courses, and 26–29

credits of supporting electives approved for the major.

**Animal Science Option.** This option includes animal nutrition, physiology, behavior, and disease. Students will normally emphasize one or more of these areas. A strong preparatory background in the basic sciences is needed. Students in this option seek employment in technical areas and/or continue their studies in specialized graduate programs.

In addition to the requirements of the major, students choosing this option must complete the following basic science requirements: four to eight credits in organic chemistry, three credits in introductory calculus, and four credits in microbiology. A course in animal anatomy and physiology is required in the concentration. The remaining credit requirements will be selected from the concentration courses and supporting electives approved for this option.

**Laboratory Animal Option.** Research techniques and procedures for animal care are emphasized along with a strong background in the sciences. Students with this training and animal experience would be employed in research and teaching facilities as animal technicians, animal technologists, supervisors of animal technicians, and assistant research project leaders.

In addition to the requirements of the major, students must complete the following basic science requirements: four to eight credits in organic chemistry, three credits in introductory calculus, four credits in microbiology, and three credits in statistical methods. Six credits in animal management, three credits in animal anatomy and physiology, and three credits of general nutrition are required in the concentration. The remaining credits will be selected from the concentration courses and supporting electives approved for this option.

**Preveterinary Option.** This option prepares students for admission to veterinary schools offering the D.V.M. degree and requires a demonstrated capability in the

basic sciences. Because admission requirements among schools are not totally uniform and are subject to change, students should determine specific requirements of the schools in which they are interested. Those who are not accepted for veterinary training will be well prepared to pursue graduate programs in animal physiology and health.

In addition to the requirements of the major, students must complete the following basic science requirements: eight-credit, two-semester sequence in organic chemistry, three credits in biochemistry, four credits in microbiology, eight credits in general physics, three credits in introductory calculus, and three credits in intermediate calculus or statistical methods in research. Three credits in animal anatomy and physiology are required in the concentration. The remaining credits will be selected from the concentration courses and supporting electives approved for this option.

## Aquaculture and Fishery Technology

This major, offered by the Department of Fisheries, Animal and Veterinary Science, prepares students for professional or technical careers in aquaculture or fisheries-oriented occupations. It is sufficiently broad to allow for specialization in either fisheries or aquaculture science and technology. Students who demonstrate superior ability in the basic sciences and wish to continue their professional training can select a course curriculum that will both prepare them for graduate school and provide a broad overview in fisheries and aquaculture science and technology.

The major requires a minimum of nine credits in introductory professional courses including natural resource conservation, fisheries or aquaculture, and resource economics; six to eight credits in animal and plant biology; four credits in general chemistry; four additional credits in general or organic chemistry; and nine to 12 additional credits in basic science selected from an approved course list in the Depart-

ments of Biological Sciences, Chemistry, Computer Science and Statistics, Mathematics, and Physics. In addition, the major requires 24 credits in concentration courses at the 300 level or above, and 18 credits of the concentration courses must be selected from courses offered by the Departments of Biological Sciences (zoology); Fisheries, Animal and Veterinary Science; Food Science and Nutrition; Marine Affairs; Environmental and Natural Resource Economics; and by the Graduate School of Oceanography. Finally, the program requires 30–36 credits of supporting electives selected from an approved list of courses in the Departments of Biological Sciences (botany and zoology); Fisheries, Animal and Veterinary Science; Food Science and Nutrition; Marine Affairs; Environmental and Natural Resource Economics; Natural Resources Science; and by the Graduate School of Oceanography.

## Clinical Laboratory Science

This major, offered by the Department of Biochemistry, Microbiology, and Molecular Genetics, is concerned with the diagnosis, treatment, and prevention of disease using biological, chemical, and physical methods in the clinical laboratory. The department also offers the Master of Science (M.S.) degree.

During the first three years, the emphasis is on General Education requirements and on the basic courses in biology, chemistry, mathematics, and physics needed for background in the applied sciences. The courses of the senior year are taught off campus by the staff members of affiliated hospital schools of medical technology. These schools are accredited by the National Accreditation Agency in Clinical Laboratory Science. The senior year is a 12-month program of study and starts in late July, soon after the completion of the third year of the curriculum. It is taken at one of the following hospitals, which are about 30 miles from the main campus of the University: Rhode Island Hospital and Miriam Hospital in Providence; Our Lady of Fatima Hospital in North Providence. The clinical

program includes lecture and laboratory instruction in clinical chemistry, clinical microbiology, hematology, immunology, and immunohematology, and prepares the student for the national certification examinations.

Applicants to this curriculum should have completed 60 credits by June of the sophomore year and should have taken most of the courses listed below during the first two years. Students are selected by the University Committee on Clinical Laboratory Science and by program officials of the hospital schools. Since the number of students admitted to this professional curriculum is limited, interested students should consult early in their college career with the coordinator so that they will be familiar with the requirements and application procedures. Flexibility in the curriculum permits the student who is not accepted to fulfill requirements for the Bachelor of Science degree in another concentration such as microbiology or certain related health sciences.

Students with a degree in health or a science discipline may also apply to the clinical internship as a fifth year of study.

A total of 130 credits is required for graduation.

### *Freshman Year*

*First semester: 14–15 credits*

CHM 101, 102 or 103, 105 (4); BIO 112 or 113 (4); MTH 111 or 131 (3) or 141 (4); and one General Education requirement (3).

*Second semester: 16 credits*

CHM 112, 114 (4); BIO 112 or 113 (4); CSC 101 or 201 (4); MTC 102 (1); and one General Education requirement (3).

### *Sophomore Year*

*First semester: 17 credits*

CHM 227 (3); PHY 111, 185 (4); MIC 211 (4); and General Education requirements (6).

*Second semester: 17 credits*

BIO 242 (3); CHM 226, 228 (5); General Education requirements (6); and free elective (3).

*Junior Year**First semester: 18 credits*

MIC 333 (3); MTC 483 (3); EDC 102 or 312 (3); and General Education requirements (9).

*Second semester: 15 credits*

MIC 432 (3); BCH 311 (3); STA 307 or 308 (3); MGT 300 or 301 (3); and electives (3).

*Senior Year**First semester: 17 credits*

MTC 405 (2), 407 (2), 409 (4), 411 (4), 413 (2), and 415 (3).

*Second semester: 15 credits*

MTC 406 (2), 410 (4), 412 (4), 414 (2), and 416 (3).

## Dietetics

The major in dietetics, offered by the Department of Food Science and Nutrition, is approved by the American Dietetic Association (ADA) and is required of students planning to become Registered Dietitians. This program is designed to provide the student with an academic background in clinical, community, and administrative dietetics. Students are encouraged to use supporting elective and free elective courses to study disciplines related to the field.

The major requires a minimum of seven credits in professional introductory courses in food science and nutrition; a minimum of 22 credits in basic science courses including introductory chemistry, organic chemistry, biochemistry, human anatomy, human physiology, and microbiology; a minimum of 34 credits in required concentration courses that cover the areas of advanced nutrition, nutrition and disease, nutrition education, nutrition in the life cycle, and food service management; and a minimum of 18 credits in supporting electives selected from an approved list of courses. Students are encouraged to see an academic advisor as soon as possible to discuss specific degree requirements.

After completing the Bachelor of Science requirements, the student can qualify

for the professional title of Registered Dietitian, R.D., by completing experience requirements and passing a national examination. The experience requirements can be met by completing one of the following programs: an ADA-accredited dietetic internship program available to students on a competitive basis in major health care facilities nationwide; or an ADA-approved PreProfessional Practice Program (AP4) available to students on a competitive basis in health care facilities and colleges and universities nationwide. The Department of Food Science and Nutrition has an ADA-approved AP4 program to which graduates of the dietetics program can apply.

Experience programs may be combined with graduate programs in universities leading to an advanced degree. Students completing academic and experience requirements become eligible to take the national registration examination administered through the Commission of Dietetic Registration of the ADA.

A minimum of 123 credits is required for graduation.

## Environmental Economics and Management

This major prepares students for professional careers in the public and private sector which address environmental and natural resource management, business, or public policy. This interdisciplinary major is offered jointly by the Department of Environmental and Natural Resource Economics and the Department of Natural Resources Science. Students develop a foundation in both natural and social sciences to understand the interactions between human society and our natural or environmental resources. Environmental economics and management majors seek careers which address the interface between the economic system and the ecological or environmental systems. For example, economic incentives and values can drive individual decisions to use forest, land, water, or air resources, which can in

turn cause ecosystem management problems. Public officials, nonprofit organizations, and private businesses need professionals to integrate the ecological and natural science with the economic science aspects of their organizations. Such professionals play an important role in coordinating an interdisciplinary team to address such complex problems. Graduates gain an understanding of both natural sciences and the economy.

The degree requires a minimum of 120 credit hours, including a minimum of 24 credit hours in the concentration credits for this interdisciplinary major. The program is designed as a blend of the existing majors of environmental science and management and resource economics and commerce. In addition to satisfying the General Education requirements, students need nine credits in introductory professional courses, including natural resource conservation, introductory resource economics, and introductory soils. As part of the basic science requirements, majors must complete eight credits in biological sciences (four credits in general botany, four credits in general zoology); three credits in introductory ecology; four credits in introductory physics; four credits in physical geology; four credits each in organic and inorganic chemistry, three credits in introductory calculus; and three credits in introductory statistics. Within the 24-credit concentration, students are required to take two courses in forestry and wildlife and two courses in water and soil for a minimum of 12 credits in these natural sciences. A minimum of 12 concentration credits are required in environmental and resource economics, including economics for environmental resource management and policy and economics of land and water resources, as well as two other courses selected according to the student's particular interests. The major also requires a minimum of nine credits in communication skills beyond the General Education requirements. Finally, students may choose a minimum of 12 credits in supporting electives and six credits in free electives.

## Environmental Plant Biology

Environmental plant biology is a joint major offered by the College of the Environment and Life Sciences and the College of Arts and Sciences. The major involves the study of plants from the molecular basis (or underlying gene action) to complex community dynamics. The role of plants throughout the world and their impact on the environment are emphasized. Genetics and molecular biology are studied as a means to improve plants for human use and environmental enhancement. Both harmful and beneficial associations among and between plants and other organisms are featured. A fundamental goal of the study of plants is to achieve stability in landscapes managed for environmental or agricultural purposes. Students with this major can pursue careers in plant biotechnology, plant production and culture, landscape management, and plant protection.

The major requires 130 credits: 36 General Education requirement credits, 82–84 program requirement credits, and 9–12 free elective credits. With significant help from an advisor, students formulate a program of study designed to meet their own educational and professional goals.

## Environmental Science and Management

The major in environmental science and management, offered by the Department of Natural Resources Science, prepares undergraduate students for professional careers in the public and private sectors of natural resources management. Flexible course requirements allow students to develop individual areas of concentration and prepare for a variety of positions in environmental management after graduation. This major is also suitable for students who wish to become certified as teachers of environmental science and natural resources at the secondary level. In addition, the program provides a solid

background for graduate study in several more specialized environmental science disciplines. Environmental science and management majors may meet the educational requirements for state and federal employment as biologists, natural resource specialists, environmental scientists, and other classifications.

The major requires 12 credits of introductory professional courses, which include natural resource conservation, resource economics, introductory soil science, and environmental data analysis. As part of the basic science requirements, environmental science and management majors must complete six to eight credits in biological sciences (three to four credits in general botany, three to four credits in general zoology); three credits in introductory ecology; eight credits in introductory physics; four credits in physical geology; three to four credits in introductory biochemistry, introductory microbiology, or geomorphology; eight credits in introductory chemistry; four credits in organic chemistry, three credits in introductory calculus; and three credits in introductory statistics. Required concentration courses (26 credits) must be taken at the 300 level or above; at least 18 credits must be selected from courses offered by the Department of Natural Resources Science. (Please note that internships, seminars, and special projects may not be counted toward the concentration.)

In addition, one course must be selected from each of the following groups: biological or ecological science; water and soil science; methods in environmental science; natural resources management; and economics, planning, policy, and law. These and the remaining concentration credits should be selected from courses offered by the Department of Natural Resources Science or from an approved list of courses. Supporting electives (20–23 credits) must be selected from an approved list of courses, mostly at the 300 and 400 levels.

## Food Science and Nutrition

The major prepares students for professional or technical careers in food science and nutritional science. The program offers several academic possibilities, and students should choose the direction that challenges and excites their interests. Students are urged to engage in individually designed special projects and internships to gain experience and expertise in the field.

Food science is the application of science and technology to the processing, preservation, and distribution of food. It is the key to converting raw food materials into a wide variety of preserved and processed foods. It deals with the processing of existing food supplies to ensure their quality and safety, developing new food products and preserving food to feed a rapidly increasing world population, and improving the nutritional level of diets throughout the world. It is possible to complete minimum educational standards for food science as officially recognized by the national Institute of Food Technologists. Students choosing this direction are encouraged to focus on career opportunities such as quality assurance, research and development, fermentation technology, and seafood technology.

Nutritional science is the study of the action and interaction of nutrients and other substances in food in relation to health and disease. The body's requirements for nutrients are also studied, along with the social, economic, cultural, and psychological implications of food and eating. Students choosing this direction should consider focusing on nutrition and exercise or on research, or use it as preparation for medical school.

The major requires a minimum of six credits in general nutrition and introductory food science; six to seven credits in animal biology and physiology; eight credits in general chemistry; seven credits in organic chemistry and biochemistry; and four credits in microbiology. The concentration courses include applied food science, food sanitation, food biochemistry,



advanced human nutrition, and 12 additional credits based on the student's interest. Also required are statistics, technical writing, and computer applications in food science and nutrition. An additional 17–18 credits are selected from an approved list of courses, mostly at the 300 and 400 levels.

A minimum of 123 credits is required for graduation.

## Geology

The major in geology, offered by the Department of Geology, is designed as a foundation for careers in the earth sciences. The federal government identifies GEL 210, 240, 320, 321, 370, 450, and supporting sciences as a minimum background for geologists. Students in the curriculum may elect one of the following options: general geology, environmental geology, geophysics, hydrogeology, petrology, or sedimentary geology. These options offer preparation for further work in areas such as environmental geology, mineral and energy resources, hydrology, sedimentology, coastal geology, paleontology, paleoecology, igneous and metamorphic petrology, geochemistry, structural geology, and tectonics.

Students interested in teaching earth science should contact the Department of Geology for details about a cooperative program with the Department of Education.

All B.S. majors are required to complete the following geology courses: 103 (4), 203 (3), 320 (4), 321 (4), 370 (4), 450 (4), 488 (4), and an approved summer field camp (GEL 480) for a minimum of four credits. The field camp is normally undertaken following the junior year.

Students must also complete the following supporting course work: MTH 131 (3) or 141 (4); MTH 132 (3) or 142 (4); BIO 112 (4); BIO 113 (4); CHM 101, 102 (4), and 112, 114 (4); CSC 201 (4) or STA 308 (3); PHY 111, 185 (4) or 213, 285 (4); and PHY 112, 186 (4) or 214, 286 (4).

(Note: Students electing the petrology, hydrogeology, or geophysics options may,

with the chairperson's approval, take GEL 240 or an additional semester of mathematics, chemistry, or physics in lieu of a second semester of biological sciences.) Completion of these courses fulfills the Natural Sciences and Mathematics requirements of the General Education program.

A total of 126 credits is required for graduation.

**General Geology Option.** Emphasizes a broad approach to earth science and incorporates introductory courses in each of the major earth science disciplines. This option includes all of the geology and supporting science courses recognized by the federal government as a minimum background for geologists. Students selecting this option are required to complete the following geology courses: GEL 210 (4), 240 (4), 421 (3), and 465 (3).

**Environmental Geology Option.** Emphasizes the study of geology as it pertains to the environment, including the recognition and reduction of effects of geologic hazards (coastal erosion, volcanic eruptions, earthquakes). Students selecting this option are required to complete the following geology courses: GEL 100 (3), 210 (4), and 301 (3). Students must also take two of the following: GEL 277 (3), 468 (4), 483 (4), 485 (3), 515 (3), 550 (3), 577 (3); NRS 410 (3), 423 (4), 424 (4), 461 (4); and CPL 434 (3).

**Geophysics Option.** Emphasizes applied geophysics, particularly the use of near-surface geophysical methods such as geoelectrics, gravity, and seismic refraction. Students selecting this option are required to complete the following geology courses: GEL 465 (3) and 485 (3). Students must also take two of the following: GEL 421 (3), 468 (4), 483 (4), 565 (3), and 570 (3).

**Hydrogeology Option.** Emphasizes the study of groundwater and its interaction with earth materials. This option includes all of the hydrology and supporting science courses recognized by the federal government as a minimum background for hydrologists. Students selecting this option

are required to complete the following geology courses: GEL 210 (4), 468 (4), and 483 (4). Students must also take two of the following: GEL 421 (3), 485 (3), 515 (3), 550 (3), 568 (3), 583 (3); NRS 412 (3), 461 (4) or CVE 475 (3); NRS 514 (3); and CPL 434 (3).

**Petrology Option.** Emphasizes the study of igneous and metamorphic processes through geochemistry, petrography, and structural analysis, leading to interpretations of rock petrogenesis and earth history. Students selecting this option are required to complete the following geology courses: GEL 421 (3), 530 or 531 (3). Students must also take two of the following: GEL 401 (3), 465 (3), 468 (4), 530 or 531 (3), 554 (3), 565 (3), 570 (3), 580 (3), and CHM 431 (3).

**Sedimentary Geology Option.** Emphasizes the study and interpretation of depositional environments, both in the present and in the geologic record, including the study of sedimentary processes, paleontology, the reconstruction of paleoenvironments, and stratigraphy. Students selecting this option are required to complete the following geology courses: GEL 210 (4), 240 (4), and 468 (4). Students must also take two of the following: GEL 277 (3), 421 (3), 465 (3), 515 (3), 550 (3), 554 (3); NRS 423 (4) and 424 (4).

## Geology and Geological Oceanography

This major, offered by the Department of Geology and the Graduate School of Oceanography, includes a comprehensive background in geology and a solid introduction to geological oceanography. The curriculum includes the full set of chemistry, physics, biology, and mathematics courses required for a B.S. in geology. Students in the program will be advised jointly by geology and oceanography faculty members.

A senior research project will be taken in the Graduate School of Oceanography as OCG 493 or 494, under the direction of a GSO faculty member. Three core courses

in oceanography—OCG 401, 540, and one additional OCG course at the 400 level or above selected by the student in conjunction with the advisor—will provide the student with a good overview of his or her intended field, and also relieve the student of two required courses if he or she continues on to study oceanography at the graduate level at the University of Rhode Island. In addition to this, the student may find opportunities for summer employment or participation in oceanographic research cruises after his or her junior year.

Students completing this program of study will be well prepared to pursue careers in either conventional geology or geological oceanography. Technical positions in private or government oceanographic laboratories are available for geological oceanographers with bachelor's degrees. Students who pursue graduate studies can expect to find a high demand for geological oceanographers with advanced degrees. Students entering the URI Graduate School of Oceanography from this program will have a significant head start compared with those entering from most other undergraduate institutions.

The following core courses are required: GEL 103 (4), 210 (4), 240 (4), 320 (4), 321 (4), 370 (4), 421 (3), 450 (4), 465 (3), 480 (4), 488 (4); OCG 401 (3), 540 (3); OCG 493 or 494 (3); and one additional OCG course at the 400 level or above. Students must also complete the following supporting course work: MTH 131 (3) or 141 (4) and 132 (3) or 142 (4); CSC 201 (4) or STA 308 (3); BIO 112 (4); BIO 113 (4); CHM 101, 102 (4) and 112, 114 (4); PHY 111, 185 (4) or 213, 285 (4); PHY 112, 186 (4) or 214, 286 (4).

A total of 126 credits is required for graduation.

## Marine Affairs

This major, offered by the Department of Marine Affairs, is an interdisciplinary social science field of study which focuses on coastal and ocean management, policy, and law and examines the marine and coastal environment, their resources, and uses from a variety of perspectives. It en-

compasses the areas of coastal and fisheries management, ports and maritime transportation, and international and national ocean policy, law, and institutions.

A marine affairs major establishes a background for careers in the public or private sectors in a wide variety of marine-related fields. Typical areas of employment include positions in government concerned with coastal zone, environmental, or fishery management, and marine transportation. In the private sectors, students have secured positions in environmental consulting firms, marine insurance, public interest nongovernmental organizations, marinas, ports, and companies involved in shipping. The marine affairs major serves well as an educational background for continued study in law, especially environmental, fishery, coastal zone, admiralty, and ocean law. Students have also entered graduate and professional programs in environmental management, public administration, community planning, marine affairs, and related fields.

The Department of Marine Affairs offers a Bachelor of Arts (B.A.) and a Bachelor of Science (B.S.) degree. The department also offers a Master of Arts (M.A.), a Master of Marine Affairs (M.M.A.), and a Ph.D. in marine affairs.

### BACHELOR OF ARTS

Students who obtain the B.A. in marine affairs must fulfill the Basic Liberal Studies requirements of the College of Arts and Sciences (page 46).

Students selecting this field are required to complete at least 30 credits (maximum 45 credits) in marine affairs as follows.

All of the following courses (12 credits): MAF 100, 120, 220, and 410. Five of the following courses (15 credits): MAF 312, 315, 320, 330, 413, 434, 456, 461, 465, 471, 472, 484, and 499. One additional MAF course (three credits) must be taken to complete the required 30 credits in marine affairs.

In addition to the above marine affairs requirements, students must take STA 308 and OCG 123 or 401 (if OCG 123 is taken,

it may also be used toward fulfilling the Basic Liberal Studies Natural Sciences requirement).

A total of 120 credits is required for graduation. At least 42 of these credits must be in courses numbered 300 or above.

### BACHELOR OF SCIENCE

Students selecting this field are required to complete at least 30 hours in marine affairs with the following required MAF courses: MAF 100, 120, 220, 410, 482; and five of the following courses: MAF 312, 315, 320, 330, 413, 434, 456, 461, 465, 471, 472, 484, and 499.

In addition to the above marine affairs requirements, students must take BIO 113 (4); OCG 123 or 401 (3–4); MTH 131 and 132 (6); CSC 200 or 201 (4); and WRT 333 (3).

Students must also select a total of five courses from the following, of which three must be at the 300 level or above: ASP 281, 381, 483; BIO 141, 262, 355, 455/457; CHM 103, 112, 124, 226, 227; CSC 205, 212, 301, 320, 331, 406, 412, 436; FST 315, 321, 415; GEL 100, 103, 210, 240, 370, 450, 483; NRS 406, 410, 423, 424, 461; OCE 101, 215, 307, 310, 311, 416; PHY 111/185, 112/186, 130, 213/285, 214/286, 306; REN 105, 336, 341, 410, 432, 435, 440, 456, 460; STA 412, 413, 415, 416.

A total of 126 credits is required for graduation.

## Marine Resource Development

The program in marine resource development, offered by the Department of Fisheries, Animal and Veterinary Science, is designed to prepare students for a professional career in marine science and technology. The curriculum provides thorough training in the basic sciences and an interdisciplinary approach to marine resource development at the advanced level. Those who complete the program of study can pursue careers in technical or administrative positions in estuarine, coastal, or marine science.

The program requires 36 credits of general education courses; 21–23 credits of basic science courses, excluding three credits of mathematics and six credits of General Education requirements in the natural sciences; nine credits of introductory professional courses; 30 credits of courses in the concentration; 26–28 credits of supporting electives; and six credits of free electives.

## Microbiology

This major, offered by the Department of Biochemistry, Microbiology, and Molecular Genetics, meets the guidelines of the American Society for Microbiology. It will prepare the student for working in a wide variety of scientific areas including molecular genetics, biotechnology, and the pharmaceutical industry, as well as many other aspects of the biological sciences. A strong background in chemistry is achieved, giving an excellent preparation for graduate school and the professional schools. Student who develop a strong interest in the clinical aspect of microbiology can easily move to the Clinical Laboratory Sciences program. This department also offers Master of Science (M.S.) degrees in biochemistry and microbiology, and a Doctor of Philosophy (Ph.D.) in biological sciences.

A minimum of 30 credits in microbiology is required, including MIC 333, 413, 414, 415, 416, and 495, and one course selected from MIC 412, 422, 432, or 576. The student majoring in microbiology may include any course in microbiology; BIO 327, 331, 341, 432, 437, 465, and 534. A student who plans to attend graduate school is advised to take MTH 131 and 132 or 141 and 142, and BCH 435. In addition, the student must take BIO 112, 113, and 352; CHM 101, 102, or 103, 105; 112, 114, 212, 226, 227, and 228; BCH 311; PHY 213, 214, 285, and 286 or 111, 112, 185, and 186; and MTH 131 or 141 and one semester from the following: MTH 111, 132, 142; CSC 201 or STA 308.

Note: CHM 229, 230, which are offered in summer only, may be substituted for CHM 226.

A total of 130 credits is required for graduation.

## Resource Economics and Commerce

This major, offered by the Department of Environmental and Natural Resource Economics, provides students with a broad education focused on resource economics, economics, and natural resources sciences. In the private sector, careers can focus on the production, marketing, and distribution of natural resource commodities such as fisheries and agricultural products, timber, and petroleum, or on recreation and tourism. The major can also prepare the student for working with the conservation and management of natural resources at the state and national levels, for advanced professional programs in community or urban planning or law, or for graduate study in resource and agricultural economics.

REN 105 and NRS 100 are prerequisites for this major, which requires a total of 125 credits. Ten credits in basic sciences are required, including four credits in general chemistry and six credits in general biology. Fifteen credits are required in supporting sciences including three credits in computer science and six credits in mathematics, physics, genetics, plant physiology, population biology, introductory ecology, microbiology, general and organic chemistry, or physical geology. The remaining six credits in supporting sciences can be selected from courses in applied biology, oceanography, mathematics, chemistry, computer science, or statistics. Introductory calculus is strongly suggested. Twenty-four credits in concentration courses are required at the 300 level or above, including 15 credits in resource economics and three credits in microeconomic theory.

Thirty-one credits are required in supporting electives, which must include six credits in communication skills. The student normally selects six credits in communication in addition to the General Education requirements. The remaining credits in concentration courses and supporting

electives should be selected in consultation with a faculty advisor.

Students have considerable flexibility in choosing courses in the College of the Environment and Life Sciences and other colleges at the University. All students are required to take sufficient course work in the physical and biological sciences to gain familiarity with the resource area in which they are interested.

Students interested in water resources, for example, would select appropriate courses from natural resources science and chemistry. Students interested in fisheries marketing and trade should select course work in business, fisheries science and technology, and food science and nutrition. Students intending to pursue graduate studies in resource economics or economics should select course work in economic theory, mathematics, and statistics.

## Urban Horticulture and Turfgrass Management

The major in urban horticulture and turfgrass management, offered by the Department of Plant Sciences, is intended to educate students in the sciences, both natural and social, in preparation for professional careers in the many fields of environmental horticulture. Graduates of this program may pursue careers as landscape contractors; golf course superintendents; directors of park systems and arboreta; proprietors of garden centers and floral shops; plant propagators; nurserymen; vegetable and fruit growers; technical representatives for seed, equipment, and chemical companies; managers of lawn service firms; and horticultural therapists, to name some of the opportunities available. Others may enter graduate school and pursue careers in research and education in both public and private institutions. This program has as its unifying theme the culture and use of plants that enhance the human environment.

Depending on the area of specialization, graduates can meet the standards of several certification organizations. Graduates specializing in turfgrass management

qualify for certification as turfgrass managers or turfgrass specialists with the American Registry of Certified Professionals in Agronomy, Crops, and Soils, Ltd. (ARPACS), of the American Society of Agronomy. These same graduates also meet the requirements for registration with the Golf Course Superintendents Association of America. Graduates specializing in horticulture therapy qualify for registration with the American Horticultural Therapy Association.

The major requires 24–25 credits of preprofessional courses, including six in General Education; 21–24 credits in concentration courses; 39–43 credits in supporting electives selected from approved course lists in the student's area of interest with permission of the advisor; and 12 credits of free electives. Most supporting electives are at the 300 or 400 level, but certain lower-level courses may be acceptable if approved by an advisor. Included among these electives are business and management courses in the Department of Environmental and Natural Resource Economics, as well as advanced offerings in plant science, botany, and soil science.

## Water and Soil Science

The major in water and soil science, offered by the Department of Natural Resources Science, is designed to meet the growing demand for training in the science and management of land and water resources. Course tracks in soil science and water resources provide in-depth training in specific, career-related disciplines. With proper course selection, students are eligible for professional certification by the American Society of Agronomy and the Soil Science Society of America. The water and soil science major also provides a strong background for work in state and federal regulatory agencies or for consulting firms that address land use or environmental contamination issues. Training in water and soil science also provides excellent preparation for graduate study.

This major requires 12 credits of professional courses, which include natural resource conservation, resource econom-

ics, introductory soil science, and environmental data analysis. As part of the basic science requirements, water and soil science students must complete six to eight credits in biological sciences (three to four credits in general botany, three to four credits in general zoology); three credits in introductory ecology; eight credits in introductory physics, four credits in physical geology, three to four credits in introductory biochemistry, introductory microbiology, or geomorphology; eight credits in introductory chemistry; four credits in organic chemistry; three credits in introductory calculus; and three credits in introductory statistics. Required concentration courses (29–33) must include at least 12–13 credits selected from methods of soils and water analysis, a soil morphology practicum, soil-water chemistry, soil conservation and land use, plant nutrition and soil fertility, soil-water relations, microbial ecology of soils and sediments, soil morphology and mapping, and soil genesis and classification; 17–20 credits selected from concepts in GIS, fundamentals of GIS, wetland ecology, wetlands and land use, soil and water conservation technology, hydrology and water management, advanced GIS, water quality sampling and analysis, aquatic entomology, introduction to sedimentation and stratigraphy, general oceanography, and limnology. Supporting electives (13–17 credits) must be selected from approved lists or from remaining concentration electives.

## Wildlife Biology and Management

The major in wildlife biology and management, offered through the Department of Natural Resources Science, prepares students for professional careers in the public and private sectors of wildlife biology. In addition, the major provides a solid background for graduate study. Wildlife biologists are professionals concerned with the scientific management of the earth's wildlife species and their habitats. Wildlife biologists work in the areas of preservation, conservation, and management of wildlife species. Graduates can become

Certified Wildlife Biologists (CWBs) who are recognized by the Wildlife Society, an international professional organization. In addition, wildlife majors meet the educational requirements for state and federal employment in the wildlife profession.

The major requires 12 credits of professional courses, which include natural resource conservation, resource economics, introductory soil science, and environmental data analysis. As part of the basic science requirements, wildlife majors must complete six to eight credits in biological sciences (three to four credits in general botany, three to four credits in general zoology); three credits in introductory ecology; eight credits in introductory physics; four credits in physical geology; four credits in introductory chemistry; four credits in organic chemistry; three credits in introductory calculus; and three credits in introductory statistics. Required concentration courses (22–23 credits) include three credits in the principles of wildlife management; four credits in field botany and taxonomy; three credits in wetland wildlife or nongame and endangered species management; six credits in field ornithology, the biology of mammals, vertebrate biology, or animal behavior; three to four credits in the introduction to forest science, wetland wildlife management, wetland ecology, living aquatic resources, or fishery science; and three credits in either wildlife biometrics or introduction to computing. Supporting electives (31–32 credits) must be selected from approved lists and include the following upper-division course work: three credits in botany; six credits in zoology; six credits in resource policy or administration, environmental law, or land use planning; and six credits in communications. An additional 10–11 credits of supporting electives must be selected from concentration electives, or from other 300- or 400-level natural resources science courses.

## COLLEGE OF HUMAN SCIENCE AND SERVICES

Barbara Brittingham, *Dean*  
 Leo E. O'Donnell, *Associate Dean*  
 Milton Butts Jr., *Assistant Dean*

The College of Human Science and Services is a people-oriented college designed to focus on the human and material resources needed to help individuals and groups solve human problems encountered in contemporary society. Programs in the college prepare students for a variety of professions in three basic areas: teacher education, health-related fields, and fields that have evolved from the University's historic land-grant mission in home economics. These programs include both formal and informal experiences with people in a wide variety of public service settings which enable students to develop the competencies needed in the emerging field of human services. The teacher education programs offered through the College of Human Science and Services are outlined in the following departmental descriptions. For more information on teacher education programs, see "Undergraduate Program Requirements," pages 36–37.

The degrees offered by the college include: a Bachelor of Science degree with majors in communicative disorders; consumer affairs; dental hygiene; human development and family studies; human science and services; physical education; secondary education; textile marketing; textiles, fashion merchandising, and design; and a Bachelor of Arts degree in elementary education. Admission to the Bachelor of Science program in home economics is currently suspended.

**Center for Human Services.** The Center for Human Services, the research, service, and outreach branch of the college, promotes activities in human service areas across all departments of the college. The Center conducts research in education and educational testing, lifelong learning, human transition, child development,

communicative disorders, special populations, gerontology, and exercise physiology. Faculty conducting research and outreach activities also teach within the various departments of the college. The Center provides an environment in which faculty and students can bring together interdisciplinary programs and courses in human science and services. The Center maintains administrative responsibility for the bachelor's degree in human science and services.

The college sponsors a number of organizations and activities that provide special opportunities for students:

*Cardiopulmonary Laboratory:* a laboratory equipped with the latest means of measuring physical activity and its stresses and effects. It sponsors programs for adult fitness and conducts research programs related to fitness, sport, and nutrition.

*Child Development Center:* a modern facility that provides day care and preschool programs; it offers opportunities for undergraduate students to observe young children and to learn to work with them.

*Historic Textile and Costume Collection:* a teaching and research collection of over 16,000 artifacts with an emphasis on historic New England clothing and textiles. Objects range from archaeological textiles to twentieth-century designer garments.

*Microcomputer Laboratory:* a laboratory that contains a variety of up-to-date microcomputers with software designed for use in elementary and secondary classrooms.

*Physical Therapy Clinic:* a clinic that offers physical therapy services to the community and provides a setting for clinical education and research for students in the physical therapy program.

*Speech and Hearing Clinic:* a clinic that provides speech and audiology testing and therapy services to persons throughout the community, as well as to URI faculty, staff, students, and their families. It also provides observational, clinical, and research support for the Department of Communicative Disorders.

**Minors: Interdisciplinary Nondegree Programs.** Students can declare a minor, which will appear on their transcripts as a category separate from their major. Credits may be drawn from any cohesive combination of courses. A minor may be defined as: 1) the completion of 18 or more credits in any of the minors that have been proposed by one or more departments and approved by the Curriculum Affairs Committee, Faculty Senate, and President; 2) the completion of 18 or more credits within a curriculum other than the student's major; or 3) the completion of 18 or more credits of related studies offered by more than one department and approved by a member of the faculty competent in the area and the dean of the college. At least 12 of the 18 credits must be at the 200 level or above. Elective courses and courses in General Education may be used for the minor. No course may be used to apply to both the major and a minor field of study. A minimum average of 2.00 must be earned in the courses in the minor. Courses in the minor may not be taken under the pass-fail option. It is the responsibility of the student to declare and obtain approval for a minor no later than the end of the add period at the start of the senior year. The college participates in the following minors: consumer affairs; gerontology; leadership studies; and special populations (see pages 33–35).

### Faculty

*Communicative Disorders:* Associate Professor J. Singer, *chairperson*. Professors Culatta and Grubman-Black; Associate Professors Marshall and Preece; Assistant Professors Karow and Kovarsky; Adjunct Assistant Professor R. Singer; Clinical Coordinator Connors.

*Dental Hygiene:* Associate Professor B. Brown, *director*. Assistant Professor Saunders.

*Education:* Professor R. Felner, *chairperson*. Professors Boulmetis, Brittingham, Byrd, Croasdale, Long, McKinney, Purnell, and G. Willis; Associate Professors A. Allen,

Barton, R. Sullivan, Trostle, and Young; Assistant Professor Hicks; Adjunct Assistant Professor Tierney; Research Assistant Professors Brand, and Gu.

*Human Development and Family Studies:* Associate Professor Schaffran, *chairperson*. Professors J.G. Anderson, Caruso, P. Clark, S. Cohen, Horm-Wingerd, P. Maynard, and Rae; Associate Professors Adams, Kalymun, Richmond, K. Schroeder, and Xiao; Assistant Professors Blood, Douglas, and Noring; Adjunct Professor Guthrie; Adjunct Associate Professor Knott.

*Physical Education and Exercise Science:* Associate Professor O'Leary and Associate Professor Seleen, *co-chairpersons*. Professors G. Cohen, Manfredi, Nedwidek, and Rowinski; Associate Professors Agostinucci, Blanpied, Lamont, O'Donnell, Polidoro, and Roush; Assistant Professors J.S. Norris and Riebe; Clinical Coordinators Congdon, Katzanek, and McLinden; Clinical Assistant Professor Ernst.

*Textiles, Fashion Merchandising, and Design:* Professor Welters, *chairperson*. Professor Bide; Associate Professors Harps-Logan, Helms, and Ordonez; Assistant Professor Moreno; Adjunct Professor Emery; Curator Kaye.

*Interdisciplinary Programs:* Consumer Affairs—Assistant Professor Noring, *program head*; Gerontology—Professor Clark, *acting director*; Human Science and Services—Professor McKinney, *program head*; Leadership Studies—Associate Professor Richmond, *acting program head*; Special Populations—Associate Professor O'Donnell, *acting program head*.

## Curriculum Requirements

**General Education Requirements.** All students pursuing a bachelor's degree in the College of Human Science and Services are required to develop a 39-credit program in General Education within the framework listed below. For a complete description of the General Education requirements, see "Undergraduate Program Requirements," pages 31–32.

Individual programs may require specific courses for their area.

*English Communication* (6 credits): a minimum of three credits in written communication from courses in Group Cw; a minimum of three credits in oral communication from COM 101, 103.

*Fine Arts and Literature* (6 credits)

*Foreign Language and Culture* (6 credits)

*Letters* (6 credits)

*Mathematics* (3 credits)

*Natural Sciences* (6 credits)

*Social Sciences* (6 credits): a minimum of three credits from anthropology, psychology, or sociology courses approved for General Education.

Total: 39 credits.

Students in the program in elementary education must follow the Basic Liberal Studies requirements of the College of Arts and Sciences.

**Field Work.** Many of the academic programs in the College of Human Science and Services require a supervised field work experience as part of the degree requirements. This experience is designed to provide students with the opportunity to apply classroom knowledge in a career-related setting. Placements are made in a wide variety of agencies such as public schools, health care facilities, day care centers, and other human service settings. Satisfactory completion of a required field experience depends on achievement of basic competencies established by the academic department in cooperation with the agency. The University supervisor is responsible for determining whether or not the student has attained the required competencies and, in some cases, may extend the time required for the experience until the student's performance is satisfactory. If in the opinion of the University supervisor the performance of the student is unsatisfactory, and particularly if client/patient safety is at risk, the student may be removed from the field experience prior to the end of the semester or term.

**Graduation.** It is the responsibility of the student to file an Intent to Graduate form and a curriculum work sheet approved by the advisor in the Dean's Office. The deadline is September 15 for May graduation, April 5 for August graduation, and May 5 for December graduation.

**Course Load.** Approval of the advisor and the Dean is needed for a schedule of more than 19 credits per semester.

**Repeating Courses for Credit.** Unless otherwise stated in the course description, a course cannot be repeated for credit. Credit can be counted only once toward the total credits required for graduation. Repeating courses in which a grade of C or better was earned requires approval of the student's academic dean; students may need to take such courses on a pass-fail basis.

**Transfer Students.** Transfer students should be advised that admission to some programs in the College of Human Science and Services requires meeting certain prerequisites or separate admission criteria. Teacher education programs in the Department of Education, Department of Human Development and Family Studies, and the Department of Physical Education and Exercise Science have specific admission criteria and generally require that a matriculated student complete at least one semester of work at the University of Rhode Island before applying for admission. Transfer students may be admitted to the University, but are not admitted directly into these programs.

The Plan for Early Contingent Admission to the Master of Science Degree Program in Physical Therapy requires careful and timely course planning typically beginning with the freshman year at the University. It is unlikely that transfer students would have the appropriate sequence of courses, including the prerequisites, that would allow them to take advantage of these options.

Students interested in any of the above programs should refer to the specific program descriptions on the following pages

and consult the department for additional information.

## Communicative Disorders

This curriculum leads to a Bachelor of Science (B.S.) degree in communicative disorders. In addition to General Education requirements and appropriate free electives, a major of 40 semester hours in communicative disorders includes 31 semester hours of required courses and nine semester hours of professional electives.

The required courses are CMD 260, 261, 372, 373, 374, 375, 376, 454, 465, and 493. The remaining nine credits (three courses) must be selected from the four areas listed below with a limit of one course in a given area:

**Area A** (0–3 credits). *Normal Human Development and Adjustment*: HDF 200, 201, 450; PSY 232, 235.

**Area B** (0–3 credits). *Special Populations*: CMD 475 (2 credits); HDF 220; PSY 254, 442.

**Area C** (0–3 credits). *Supportive Disciplines*: COM 220; EDC 312, 424; HSS 320; LIN 201; PSY 300, 384, 386; STA 220.

**Area D** (0–3 credits). *Honors Work, Individual Research, or Special Problems within the department*: CMD 391, 392, 491, 492.

With careful early planning, students can use free electives to achieve a double major or to explore special-interest areas in depth. Students should anticipate the necessity for graduate study in speech-language pathology or audiology. The typical minimum entry requirement for graduate study is a quality point average of 3.00.

A total of 120 credits is required for graduation.

**Accelerated Bachelor's-Master's Degree Program in Speech-Language Pathology or Audiology.** URI sixth-semester students pursuing a Bachelor of Science (B.S.) degree in communicative disorders with 25 credits of electives remaining may apply for acceptance into an accelerated master's

degree program in either speech-language pathology or audiology. Students accepted into this program follow a specified sequence of graduate-level course work and clinical practicum during their senior year, and complete the master's degree in one additional year of full-time graduate study. A cumulative quality point average of 3.00 overall and 3.20 in the major is required, with MAT or GRE scores in at least the 50th percentile. Three letters of recommendation (two from URI communicative disorders faculty) are also needed.

This accelerated program is not available to non-URI undergraduates or to part-time graduate students.

Students in this program are required to take a minimum of 25 credits in specified course work and practicums (16 credits at the 500 level) in the senior year, and 30 credits at the 500 level in the fifth year. Requirements for the M.S. degree in speech-language pathology or audiology are outlined in the section "Graduate Programs."

## Consumer Affairs

This curriculum leads to the Bachelor of Science (B.S.) degree in consumer affairs. The interdisciplinary program provides students with course work and experience that will prepare them for entry-level positions in the areas of housing management, personal financial planning, and consumer relations and public policy. Course work in consumer affairs is combined with selected courses in business, economics, political science, psychology, and related areas. Field experience obtained from internships is an important component of the program.

Students who wish to be accepted into the degree program in consumer affairs must have completed and earned at least a combined 2.00 quality point average in the following courses: CNS 220; ECN 201, 202; and MTH 107, 108, 111, or 131.

The following courses are required of all students: one WRT course; COM 101; MTH 107, 108, 111, or 131; PSY 113; SOC 100 or 102; ECN 201, 202; PSC 113; PHL 217, MKT 321, MGT 380, or PSC 368; PSC

288; CNS 422, MKT 415, or STA 412; STA 308 or 409; CSC 101 and PHL 101. Some of these courses may be used to help fulfill the General Education requirements.

The following consumer affairs courses are required: CNS 210, 220, 320, 340, 420, as well as BSL 333, ECN 302 or 337, and MKT 311; and a field experience (minimum of three credits of CNS 477 or 478, or UYA 301 or 302).

Students are required to take an additional 18 credits from one of the three following professional concentrations.

*Consumer Relations and Public Policy*: three required courses are BUS 450, CNS 350 and 457. Students may select the other three courses from COM 210; ECN 337, 403; FSN 150, 207; JOR 110, 200, 340; MKT 405; PSC 304, 368; REN 341; STA 412; and TMD 103.

*Housing Management*: CNS 440 is required. Students must select five courses from the following: CNS 342; CPL 410, 540; ECN 402; FIN 341; HDF 220 or HSS 222; HDF 440.

*Personal Financial Planning*: required courses are ACC 300X or 201; CNS 321, 415; FIN 301; HDF 450 or an equivalent skills course. The remaining course can be selected from INS 301, 425; FIN 322, 341.

Students take 12 credits of free electives. A total of 120 credits is required for graduation.

## Dental Hygiene

The Department of Dental Hygiene offers a Bachelor of Science (B.S.) degree in dental hygiene. This is a bachelor's degree completion program (2+2) designed for dental hygienists who have earned a certificate or an Associate in Science degree in dental hygiene from another institution who are interested in earning a Bachelor of Science degree within the dental hygiene discipline.

The main objective of this program is to provide educational experiences that will enhance the hygienist's professional development as well as expand career

options. Graduates of this program are prepared to assume positions of responsibility and leadership in a variety of health care, community, and educational settings. Graduates are also prepared to continue their education at the graduate and/or professional school level.

Candidates for the Bachelor of Science degree are required to take the following: CHM 101, 102 or 103, 105, and 124, 126; DHY 100, 350, 462, 464; EDC 312; FSN 207; PSY 232; and an 18-credit specialization or minor selected in consultation with their advisor. Students must also complete the University's General Education requirements. A total of 125 credits is required. The University requires that a student earn at least half of the credits required for a degree program at a baccalaureate granting institution. Therefore a maximum of 62 credits from a two-year or community college may be used for degree program credit.

Students may pursue the Bachelor of Science degree on either a full-time or part-time basis. In addition to University requirements for the degree completion program, students must have passed the National Dental Hygiene Examination.

**Joint Dental Hygiene Program with CCRI.** Students applying to this program will be admitted concurrently to both URI and the Community College of Rhode Island (CCRI). Admission to this program is competitive and will consist of the same review process as any applicant to URI and CCRI.

The Bachelor of Science degree in dental hygiene consists of a 1+2+1 course of study. The first year of study takes place at URI where prerequisite courses for admission to the dental hygiene program at CCRI and general education courses are taken. A place is reserved at CCRI for each JDHP student for the following two years. To qualify for the reserved place, the student must meet the admission requirements for the clinical program at CCRI.

Should the student fail to meet these requirements, the student will not continue to the clinical program. Subse-

quently, when the student meets the requirements, admission to the clinical program will be on a *space available basis*.

At the completion of the clinical program at CCRI, the student earns an Associate in Science degree in dental hygiene. The student returns to URI for the senior year to complete requirements for the Bachelor of Science degree. This may be done on a full- or part-time basis.

JDHP student are URI students throughout the four years of college. The student is considered an *Off-Campus Study* student during the two years spent at CCRI. Financial aid, student fees, and/or residence hall and dining contracts are the same as for any URI student, resident or commuter. URI tuition will be assessed throughout the four years, but students will receive a partial tuition scholarship equal to the URI/CCRI tuition differential.

Requirements for entry to the dental hygiene program at CCRI are as follows: BIO 121 Human Anatomy (minimum grade of C); DHY 100 Introduction to Dental Hygiene (minimum grade of C); CPR Healthcare Provider Certificate from the American Heart Association; Hepatitis B vaccination; a cumulative grade point average of 2.00 or better.

## Education

The curriculum in secondary education leads to the Bachelor of Science (B.S.) degree, the curriculum in elementary education to the Bachelor of Arts (B.A.) degree. Students wishing to enroll in the early childhood education program must major in human development and family studies and seek admission to the teacher education component of this program, as outlined below. The Master of Arts (M.A.) degree programs in education are described in the section "Graduate Programs."

The curriculums offer a balanced program of academic preparation and professional training. The required professional courses contribute directly to understanding the teacher's role in society and to the development of teaching skills.

Successful completion of the early childhood education program leads to an initial teaching certificate for the primary grades (N-2), while completion of the elementary education program leads to an initial teaching certificate for grades 1-6. The secondary education program leads to an initial teaching certificate for a specific subject area in grades 7-12.

**Admission Requirements.** Students interested in undergraduate teacher education programs are required to apply for admission to the Office of Teacher Education. Applications for admission to teacher education programs are normally submitted during the sophomore year. Applications will be reviewed by a departmental screening committee based on the following criteria: 1) recommendations from faculty and others who have knowledge of the candidate's experience or interest in working in education; 2) a writing sample expressing career goals, experience in working with children, and expectations as a teacher; 3) scores on a standardized test(s) of basic skills; 4) the student's academic record, including a cumulative quality point average of 2.50 or better and grades in the academic major or specialization averaging 2.50 or better.

Students interested in the early childhood, elementary, and secondary education programs are required to submit a portfolio and sit for an interview as part of the admission process. Students should consult with their education advisor at University College for details.

Due to limited staff and facilities, admission to the programs in early childhood education and elementary education is limited. Some applicants meeting the minimum requirements may not be admitted due to limited space. Students should check with the department or their University College advisor as early as possible for additional information.

Students denied admission can petition the department for a review of the decision. In such cases, the departmental screening committee meets to consider the appeal. Only exceptional circumstances



will lead the appeal committee to override the academic record criteria (2.50 cumulative quality point average and 2.50 in the academic major or specialization).

Applicants who fail to gain admission should seek counsel from an appropriate advisor. Students can reapply for admission but should understand that this may delay their anticipated graduation date.

For courses required for early childhood education, see "Human Development and Family Studies" in this section. For more information on teacher education programs, see "Undergraduate Program Requirements," pages 36–37. For graduate teacher education programs, see the "Graduate Programs" section.

Students who are admitted to the program in elementary education will be required to complete a Bachelor of Arts degree. Students must select a major in the College of Arts and Sciences in addition to the major in elementary education and must fulfill the Basic Liberal Studies requirements of the College of Arts and Sciences. See program requirements in the College of Arts and Sciences section.

The professional sequence courses required for elementary education are: EDC 250, 312, 102 or 360, 424, 452, 453, 454, 455, 456, 457, 458, 459 and EDC 425 or HDF 302. These courses are taken prior to student teaching. EDC 484, 485, and 460 make up the student teaching experience. The following are also required and can be taken as part of the Basic Liberal Studies requirements: COM 101, HIS 142, PSY 113, 232, WRT 101, and a one-credit health education course or equivalent. Students should contact the Department of Education for more details.

The professional sequence courses required for secondary education are: EDC 250, 312, 102 or 360, 371, 430, 431, and 448. These courses are taken prior to student teaching. EDC 484 and 485 make up the student teaching semester. PSY 113 and HDF 310 are also required.

Secondary education students follow the specialization course requirements for the area in which certification is sought. Secondary certification programs are of-

fered in biology, chemistry, English, general science, history, mathematics, modern language, physics, and social studies.

Students must maintain minimum quality point averages of 2.50 overall and 2.50 in the major or specialization, and attain a grade of at least C in EDC 430 and 448 (secondary); EDC 424, 452, 455, 456, 457, and 458 (elementary); HDF 303, EDC 424, 426, and 429 (early childhood) to be eligible for student teaching. Failure to maintain these averages will result in "program probation," a one-semester period during which students have the opportunity to earn acceptable grades but may not student teach. Failure to return grade averages to acceptable standing after one semester leads to dismissal from the program.

The major in elementary education requires 124 credits; secondary education requires 120 credits.

## Human Development and Family Studies

The curriculum in human development and family studies leads to a Bachelor of Science (B.S.) degree. The Master of Science (M.S.) degree, also offered by the department, is described in the section "Graduate Programs." The undergraduate curriculum provides a general background for work with children, families, and adults. Most professions in human development and family studies require academic work beyond the bachelor's degree for continuing professional work and advancement. Individuals with a baccalaureate degree are employed, however, as professionals in nursery schools, day care centers, institutions and hospitals, and in recreational, child guidance, casework, and other community agencies. Students seeking admission to the bachelor's degree program in human development and family studies must complete the following courses with an overall quality point average of 2.00 or better prior to acceptance for admission: HDF 200 or 201, PSY 113, any 100- or 200-level sociology course, and three General Education credits in mathematics.

Students are required to complete the following core curriculum: 1) 12 credits of core courses including HDF 200, 201, 202, and 230; and 2) six to 15 credits of experiential learning chosen from the following options—HDF 380, 381; HDF 497; HDF courses that include one credit allocated to practicums, such as 203, 221, and 406; EDC 484, 485 (early childhood education students only); and University Year for Action.

Additionally, students are required to complete a 15-credit concentration in one of the following four areas. Each area consists of nine credits of required courses and six credits to be chosen from a list of restricted electives.

*Child and Adolescent Development:* required are HDF 203, 310, 400, with restricted electives to be selected from HDF 302 or EDC 425, HDF 357, 406, 432, 434, 455.

*Adult Development and Aging:* required are HDF 220, 221, 420, with restricted electives to be selected from HDF 421, 431, 437, 440, CNS 342.

*Family Studies:* required are HDF 430, 433, 434, with restricted electives to be selected from HDF 421, 431, 432, 437, CNS 210, 320, 340.

*General Studies in Human Development and Family:* required are HDF 420, 430, 203 or 310 or 406, with restricted electives to be selected from HDF 150, 357, 400, 431, 432, 433, 434.

To enhance their concentration, students must also complete 15 credits of professional electives. Professional electives must be approved in consultation with an advisor, and nine of the 15 credits must be at the 300 level or above. Field experience does not meet this requirement.

The program requirements also include 24–33 credits of free electives.

*Early Childhood Education.* Some of the courses in this curriculum, plus certain others in education, meet the requirements for the initial Early Childhood Education Certificate in Rhode Island. Students who wish to meet the requirements for the initial Early Childhood Education Certificate

in Rhode Island must apply to Early Childhood Education through the Office of Teacher Education. See "Undergraduate Program Requirements," pages 36–37, for admission requirements, certification in other states, and other information regarding teacher education. Students applying to the early childhood education program are required to submit a portfolio and sit for an interview and should consult with their advisor in University College for details.

If admitted to Early Childhood Education, students must complete the child and adolescent development concentration. The following requirements must also be completed as part of the state-approved teacher education program: HDF 301, 303, 357, and 302 or EDC 425; FSN 207; EDC 102, 250, 312, 350, 424, 426, 429, 484, 485. A portion of these requirements fulfills the professional electives; EDC 484 and 485 meet the requirement for experiential learning.

Students in early childhood education must maintain a quality point average of 2.50 overall and 2.50 in the major, and attain a grade of at least C in HDF 303, EDC 424, 426, and 429 to be eligible for student teaching. Failure to maintain these averages will result in "program probation," a one-semester period during which students have the opportunity to earn acceptable grades but may not student teach. Failure to return grade averages to acceptable standing after one semester will lead to dismissal from the program.

A total of 120 credits is required for graduation.

## Human Science and Services

This curriculum leads to the Bachelor of Science (B.S.) degree in human science and services. The program is interdisciplinary and allows students to build academic programs consistent with their personal and career goals.

The program provides students the opportunity to develop individual learning plans, to learn in a broader variety of settings, and to document and assess their

own learning and development under the guidance of a faculty committee. We anticipate that this major will appeal to a small number of students (up to 15 per year) who want to choose their own learning goals, believe that these goals can be reached by a broad variety of means, desire to work closely with a small group of faculty members, and seek to strengthen their skills at reflection and self-assessment.

The program is designed primarily for students who are interested in the broad field of human science and services along with a combination of supporting or applied areas. Career opportunities are varied and include entry-level positions in fields such as health, recreation, instruction and training, family services, and consumer services. Many professional areas in human services require graduate study for significant career advancement; this program is also designed to serve as preparation for a variety of graduate programs. Close contact with an academic advisor is strongly recommended for students in this program.

Required course work includes: PHL 217, PSY 113 or SOC 102 and ECN 100 or PSC 113 (PHL 217 may be taken as part of the General Education requirements for Letters; the other courses may be taken as part of the General Education requirements for Social Sciences). A course in ethics is strongly recommended. In addition, students complete a core in human science and services: HDF 200, 201; HSS 120, 140, 141, 320, 350, and 480. Each student will work with a small committee of faculty members to develop a plan. Some of the credits in the major will be from conventional University courses, but some will not. A minimum of 24 and a maximum of 33 credits must be earned from sources that are NOT conventional three-credit seat-based courses. These could be internships or other experiences designed by the student and approved by the committee. To provide students a means for earning such credits, the following courses have been developed: HSS 170, 270, and 470. The program requirements also include electives (15 credits).

A total of 120 credits is required for graduation.

## Physical Education

This curriculum leads to a Bachelor of Science (B.S.) degree with a major in physical education. The Master of Science (M.S.) program in physical education is described in the section "Graduate Programs."

The major, which has four options, is designed for students who plan to pursue a career within the broad field of health and physical education. Students can prepare for certification as public school teachers (physical education K–12) with additional study opportunities in elementary and secondary physical education, athletic coaching, athletic training, and endorsement in corrective and adapted physical education. For those who may be interested in non-teaching careers within the health fitness industry such as fitness instructor, strength training, cardiac rehabilitation, and nutrition counseling, the curriculum offers the Fitness/Wellness, Athletic Training, and General options.

**Teacher Certification Option.** This option is designed for students seeking teacher certification in physical education at the elementary and secondary school levels. The curriculum allows a broad exploration of subject area, but is flexible enough to provide additional areas of study in teaching, coaching, athletic training, and endorsement in corrective and adapted physical education. Completion of the NCATE-approved certification program fulfills the requirement for teacher certification in the state of Rhode Island and in 34 additional states.

Students interested in undergraduate teacher education programs are required to apply for admission to the Office of Teacher Education. Applications for admission to teacher education programs are normally submitted during the sophomore year. Applications will be reviewed by a departmental screening committee based on the following criteria: 1) recommendations from faculty and others who have

knowledge of the candidate's experience or interest in working in education; 2) a writing sample expressing career goals, experience in working with children, and expectations as a teacher; 3) scores on a standardized test(s) of basic skills; 4) the student's academic record, including a cumulative quality point average of 2.50 or better and grades in the academic major or specialization averaging 2.50 or better.

Students denied admission can petition the department for a review of the decision. In such cases, the departmental screening committee meets to consider the appeal. Only exceptional circumstances will lead the appeal committee to override the academic record criteria (2.50 cumulative quality point average and 2.50 in the academic major or specialization).

Applicants who fail to gain admission should seek counsel from an appropriate advisor. Students may reapply for admission to a teacher education program but should understand that this may delay their anticipated graduation date.

The following courses are required for the Teacher Certification Option: URI 101 for 1 credit, 39 General Education credits including COM 101 or 103, WRT 101, BIO 104B or 113, CHM/PHY, PSY 113 and PSY 232; other requirements include BIO 121, 242, and 343, EDC 312, 485, and 486/487, HLT 123 and 172, PEX 250, 270, 295, 310, 314, 315, 324, 369, 370, 380, 382, and 410; eight credits of practicum activity including PEX 120, 222, 251, 321, swimming, 1-1/2 credits of PEX 115 and 1-1/2 credits of PEX 215; plus eight credits of professional electives and nine credits of free electives for a total of 128 credits.

All students must have a quality point average of 2.50 plus a 2.70 in all physical education and health course work prior to student teaching.

All students in teacher education must complete a one-day camping experience at the W. Alton Jones campus.

**Fitness/Wellness, Athletic Training, and General Options.** These options are designed for students interested in non-teaching careers within the health fitness

industry. The following courses are required for all of these options: URI 101 for one credit, 39 credits of General Education including COM 101 or 103, WRT 101, BIO 104B or 113, CHM 103 or PHY, PSY 113 and 232; other requirements include BIO 121, 242 and 343, EDC 312, HLT 123 and 172, PEX 217, 243, 280, 369, 370, 484, and 486; five credits of practicum activity including PEX 105 L, 120, swimming, one credit of PEX 115 and one credit of PEX 215; plus 24 credits of specialization and 14 credits of free electives for a total of 128 credits.

Students selecting the Fitness/Wellness Option are required to take, as part of their 24-credit specialization: FSN 207, PEX 275, 325, and 425 plus 12 credits in consultation with the advisor. This option will prepare students for American College of Sports Medicine-Health Fitness Instructor certification.

Students selecting the Athletic Training Option are required to take, as part of their 24-credit specialization: FSN 207, PEX 343, 344, 345, 443 plus nine credits in consultation with the advisor. In addition, students must complete 1,500 hours of work in athletic training to qualify for certification testing by the National Athletic Association.

All students in these three options must have a 2.50 overall quality point average of 2.70 QPA in PEX/HLT course work to be placed in an internship setting (PEX 484) or student teaching.

Students who do not follow one of the above tracks, or who do not meet the QPA requirement for student teaching or internship placement, may take a General PEX Option in consultation with their advisor.

**Plan for Early Contingent Admission to the Master of Science (M.S.) Degree Program in Physical Therapy.** The department participates in the early contingent admission plan for the M.S. in physical therapy. This program is described in "Undergraduate Program Requirements," page 36.

A total of 128 credits is required for graduation.

## Textile Marketing

This interdepartmental curriculum leads to a Bachelor of Science (B.S.) degree with a major in textile marketing. It combines the professional requirements of a major in textiles with the requirements of the College of Business Administration and is designed to prepare students for wholesale and retail marketing positions in the textile industry. Before admission into the degree-granting colleges, students must complete CHM 103, 105, 124, and 126 and the General Education Mathematics requirement.

Textile marketing managers are responsible for planning and directing the flow of textile products from the manufacturer to the consumer. The major, which provides a strong background in both textiles and marketing, is designed to give students the opportunity to explore the areas of styling and design, manufacturing, market research, consumer behavior, advertising, promotion, fashion, and sales. Students with Spanish language skills have an opportunity to specialize in a Latin American option. With the passage of the North Atlantic Free Trade Agreement, more international opportunities exist to buy and sell to Latin America.

Due to limited staff and facilities, transfers from University College to the undergraduate degree program in textile marketing must be limited to no more than 10 a year. Those admitted stand in the highest 10 when cumulative quality point averages are computed at the end of the third semester. Although cumulative averages are not the sole criterion for admission, students with overall quality point averages of less than 2.50 are advised that there is little chance for admission to this program.

Students selecting this curriculum must take the following courses: TMD 103, 224, 303, 313, 240, or 340 or 406 or 440, 403, 433, and three credits of a TMD elective; CHM 105, 126; MTH 131; STA 308, 412; CSC 201; ACC 201 and 202; MGT 300 or 301; BSL 333; MKT 301, 311, 415, and nine credits of MKT electives.

Students must also take the following courses to complete the General Education requirements: MTH 111; CHM 103, 124; and ECN 201, 202.

A total of 120 credits is required for graduation.

## Textiles, Fashion Merchandising, and Design

This curriculum leads to a Bachelor of Science (B.S.) degree. The Master of Science (M.S.) program is described in the section "Graduate Programs."

The major is open to both men and women with ability and professional interest in the artistic and technical aspects of the subject. Specialized programs of study prepare students for positions in the merchandising of apparel and interior furnishings, textile and apparel manufacturing, consumer services, or museum work. Qualified students can prepare for graduate studies.

The following core courses are required: TMD 103; 224; 232; 216 and 336, or 222 and 327; 303;<sup>1</sup> 313; 240, 340, 406, or 440; 433;<sup>2</sup> CNS 220;<sup>2</sup> ECN 201 and 202; CHM 103, 105, 124, and 126. Twelve credits of TMD electives (six credits must be upper-level courses and no more than three credits from TMD 361, 362, or 461, 462) and 18 credits of professional electives (nine credits from any one area) are required. Students should select TMD electives and professional electives in accordance with the specializations outlined below.

low. Students must have completed the General Education Mathematics requirement before admission into the College of Human Science and Services.

**Apparel Studies.** Students choosing this area of emphasis should select 12 credits of electives from TMD 222, 325, 327, 335, and an additional 18 credits of professional electives<sup>3</sup> from art, management, marketing, or theatre.

**Fashion Merchandising.** Students choosing this area of emphasis should select 12 credits of electives from TMD 222, 232, 327, 332, 422, 432, and an additional 18 credits of professional electives<sup>3</sup> from accounting, business law, management, management science, marketing, and/or art.

**Interior Furnishings and Design.** Students choosing this area of emphasis should select 12 credits of electives from TMD 216, 316, 336, 406, 416, 496, and an additional 18 credits of professional electives<sup>3</sup> from art and/or business.

**General TMD Program.** Students may structure their own programs by concentrating course work in areas such as consumer studies, museum work, journalism, or gerontology. By the end of the sophomore year, students should file a program of study with their advisor. Selection of the 12 required TMD elective credits and the 18 professional elective credits<sup>3</sup> should strengthen career goals and interests.

**Textile Science.** Students selecting this area of concentration should take TMD 403 and 413 as well as additional chemistry, chemical engineering, and/or statistics courses. An internship in textile manufacturing is recommended. By the end of the sophomore year, students should file a program of study with their advisor. The 18 credits of professional electives<sup>3</sup> should be selected from: MTH 111, 131; PHY 111 and 112 or 213 and 214; STA 308 or 412 or CSC 201; CHM 112, 114, 212, 226, 227, or 228.

Students in this option are encouraged to broaden and deepen knowledge of textile science by enrolling for one or two semesters at another university through an exchange program. Through a special arrangement, URI students may study for a semester or year at the Textile Sciences Department at the University of Massachusetts at Dartmouth which has extensive textile manufacturing equipment and analytical instrumentation. Possible course work includes fiber science, yarn spinning, warp and weft knitting, jacquard or dobby weaving, composites, nonwovens, and manufacturing facilities design.

A total of 125 credits is required for graduation.

<sup>1</sup> Organic chemistry is a prerequisite for TMD 303.

<sup>2</sup> Economics is a prerequisite for TMD 433 and CNS 220.

<sup>3</sup> Professional electives are courses related to the student's career goals and are subject to approval by an advisor.

## COLLEGE OF NURSING

Dayle H. Joseph, *Interim Dean*  
Ruth C. Waldman, *Assistant Dean*

The College of Nursing offers a curriculum leading to the Bachelor of Science (B.S.) degree. The college also offers the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.) degrees.

### Faculty

Professors Hirsch, S. Kim, McGrath, J. Miller, Schmieding, and Schwartz-Barcott; Associate Professors Burbank, Dufault, Feather, Fortin, Joseph, Padula, and Yeaw; Assistant Professors Godfrey-Brown, Hames, Leffers, Viau, and Waldman; Adjunct Assistant Professor Walsh; Clinical Assistant Professors Coppa, Evans, Haggerty, Martins, and M. Palm.

The baccalaureate program is designed to prepare students with academic and personal potential to become professional nurses. It aims to develop mature, well-informed graduates who will meet the challenges of health care delivery and continued learning.

Nursing is a creative activity that provides human services for the promotion of health, prevention of illness, and care of the ill. It is interdependent with all other disciplines concerned with health. Nursing knowledge is viewed as a unique synthesis drawn from the humanities and the natural, biomedical, and social sciences. Students use a systems perspective as a conceptual base to nursing. This conceptual approach to nursing incorporates the whole person and his or her environment with the nursing process. Recent revisions in the nursing curriculum were made to enhance students' ability to function professionally in community and home care settings, in keeping with the changes in the health care system.

Clinical practicums include experience in numerous community agencies, schools, nursing homes, clinics, physicians' offices, and hospitals throughout Rhode Island.

There are three routes to admission to the College of Nursing baccalaureate program.

1) *Students with no previous college study* begin their preparation in University College with a major in nursing. After completion of 37–50 credits (which must include required foundation courses) with a minimum 2.20 overall quality point average and a 2.20 quality point average in the foundation courses, they may apply for transfer to the College of Nursing. Priority is given to students with strong academic records and positive recommendations from faculty in introductory nursing courses.

2) *Students with college study in another major* or some nursing study in another baccalaureate program and a minimum of 45 completed credits, if accepted by the University, may be admitted directly into the College of Nursing. Students who transfer from another college or university are admitted into clinical nursing courses on a space-available basis. To enroll in clinical nursing courses, transfer students must meet the requirement of a minimum 2.20 quality point average overall and in the foundation courses. Grades from courses taken at the other institution are not included in the student's quality point average.

Because the number of students accepted into clinical courses is limited, transfer students are advised to contact the Assistant Dean before applying for admission to be sure of placement in a specific course.

3) *Registered nurse students* who have completed diploma or associate degree programs are not required to submit scholastic aptitude scores when seeking admission. As adult students who have developed competence in basic subject areas, they may demonstrate their mastery by completing the College Level Examination Program (CLEP) sponsored by the College Entrance Examination Board. Advanced credit allowances are based on a review of the candidate's test scores and preparatory experience.

R.N. students are required to take 18 credits of nursing courses as follows: NUR 246, 273, 346, 443, 444, 446 (or 503). They are also required to meet the remaining program specifications. R.N. students must have an active Rhode Island nursing license and malpractice insurance.

A total of 120 credits is required for R.N.s to earn the B.S. degree. The college has recently begun an R.N. to M.S. program. Information can be obtained from the Assistant Dean.

The usual time for completion of all requirements for students with no previous college or nursing study is eight semesters and one summer session. All students in the College of Nursing meet all the General Education requirements of the University, as listed in "Undergraduate Program Requirements," pages 31–32. Entry into clinical courses is competitive and based on grade point average and the number of semesters students have been enrolled in nursing. Because of space limitations, students may have to wait one or more semesters before being accepted into NUR 203.

A minimum grade of C must be achieved in all required nursing courses and in each foundation course. Students will not be allowed to repeat a required nursing course more than once. The faculty reserves the right to require withdrawal from the college of a student who gives evidence academically and/or personally of inability to carry out professional responsibility in nursing. The student is limited to 18 credits per semester except by permission of the Dean for special program adjustments or when participating in the Honors Program.

General expenses are approximately the same as for other University students. Special items include uniforms, nursing equipment, transportation, and one summer session. The use of an automobile or funds to meet public transportation costs is required for the clinical experiences. Students must maintain car insurance as required by state law.

The program is approved by the National League for Nursing and the Rhode Island Board of Nurse Registration

and Nursing Education. The graduate is eligible for examination for professional licensure as a registered nurse (R.N.).

The law requires criminal background checks for persons providing care in community agencies.

## Curriculum Requirements

**Foundation Courses.** The following are required before transfer from University College: CHM 103 (3), 124 (3); NUR 103 (3); PSY 113 (3); BIO 121 (4), 242 (3), 244 (1); one writing (Cw) course (3).

The following are prerequisites for some nursing courses, and therefore are recommended during the first three semesters: FSN 207 (3); MIC 201 (4); PSY 232 (3); SOC 100 (3); STA 220 (3).

An example of the curriculum plan follows. (Individual programs may vary.)

### Freshman Year

#### First semester: 14 credits

- 4 BIO 121 Human Anatomy
- 3 SOC 100 General Sociology
- 3 CHM 103 Introductory Chemistry Lecture
- 1 URI 101 Freshman Seminar
- 3 General Education requirement (Cw)

#### Second semester: 16 credits

- 3 BIO 242 Human Physiology
- 1 BIO 244 Human Physiology Laboratory
- 3 CHM 124 Introduction to Organic Chemistry
- 3 PSY 113 General Psychology
- 3 NUR 103 Professional Practice in Health and Illness
- 3 General Education requirement (C)

### Summer Session

3–6 General Education or free elective requirements (to reduce junior year requirements)

### Sophomore Year

#### First semester: 16 credits

- 4 MIC 201 Introductory Medical Microbiology
- 3 STA 220 Statistics in Modern Society
- 3 PSY 232 Developmental Psychology

- 3 NUR 203 Comprehensive Health Assessment
- 3 FSN 207 General Nutrition

#### Second semester: 15 credits

- 3 NUR 213 Pathophysiology
- 3 NUR 223 Health Promotion: Nursing Strategies and Interventions
- 3 NUR 224 Practicum in Health Promotion Nursing
- 3 NUR 273 Critical Thinking and Research in Nursing
- 3 General Education requirement

### Junior Year

#### First semester: 17 credits

- 6 NUR 323 Health Restoration: Nursing Strategies and Interventions
- 6 NUR 324 Practicum in Health Restoration Nursing
- 2 BMS 225 Pharmacology and Therapeutics I
- 3 Free elective

#### Second semester: 17 credits

- 3 NUR 333 Psychiatric-Mental Health Nursing
- 3 NUR 334 Practicum in Psychiatric-Mental Health Nursing
- 3 NUR 343 Nursing in Childbearing and Reproductive Health
- 3 NUR 344 Practicum in Childbearing and Reproductive Health Nursing
- 2 BMS 226 Pharmacology and Therapeutics II
- 3 Free elective

### Senior Year

#### First semester: 12–15 credits

- 3 NUR 423 Chronic Health Alterations: Strategies and Interventions
- 3 NUR 424 Practicum in Nursing of Older Adults with Health Alterations
- 3 NUR 434 Practicum in Nursing of Children with Health Alterations
- 3–6 General Education requirements

#### Second semester: 12–15 credits

- 3 NUR 443 Nursing of Vulnerable Populations in the Home and Community
- 3 NUR 444 Practicum in Nursing of Vulnerable Populations

- 3 NUR 454 Theories, Issues, and Practice in Professional Nursing
- 3–6 General Education requirement

## Required Courses for the Nursing Major.

The following 60 credits are required: NUR 103, 203, 213, 223, 224, 273, 323 (6 credits), 324 (6 credits), 333, 334, 343, 344, 423, 424, 434, 443, 444, and 454.

## General Education Requirements and Electives.

The General Education requirements must be completed with the exception that one of the following divisions may be reduced by three credits: Fine Arts and Literature (A), Letters (L), or Foreign Language and Culture (F).

Six credits of free electives are required.

A total of 125 credits is required for graduation.

**Minor in Thanatology.** The College of Nursing offers an interdisciplinary minor in thanatology to provide a basic understanding of loss, death, and grief.

Core courses are from thanatology; communications or counseling; and ethics, philosophy, or religion. While 12 of the 18 credits must be from the core areas, efforts have been made to keep the requirements as flexible as possible.

Students are required to take two courses in thanatology (6 credits); one course in communications or counseling (3 credits); and one course in ethics, philosophy, or religion (3 credits). The remaining courses (6 credits) may be selected from these and other related areas. Courses may be selected from the following list or from some temporary courses. Contact Professor Jean Miller for more information.

*Thanatology:* HDF 421; NUR 360; PSC 440.

*Communications or Counseling:* COM 103, 337; HDF 450.

*Ethics, Philosophy, or Religion:* PHL 314; RLS 111, 125, 126, 131.

*Other Related Courses:* CSV 302; HDF 221; NUR 103; Independent Study (check with faculty advisor).

## COLLEGE OF PHARMACY

Louis A. Luzzi, *Dean*

Joan M. Lausier, *Associate Dean*

The College of Pharmacy's five-year curriculum leading to the Bachelor of Science (B.S.) degree in pharmacy and its track in the six-year Doctor of Pharmacy degree are currently being phased out. Beginning in the fall of 1998, entering freshmen will be admitted only to the new six-year entry-level Doctor of Pharmacy (Pharm.D.) degree (see page 106). The college also awards two graduate degrees: the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.) in pharmaceutical sciences, both offered by all departments except Pharmacy Practice.

### Pharmacy

The five-year and six-year curriculums are patterned on presently accepted programs of study recommended by the American Association of Colleges of Pharmacy, the American Council on Pharmaceutical Education, and other interested organizations. The Doctor of Pharmacy and baccalaureate in pharmacy are accredited by the American Council on Pharmaceutical Education, 311 West Superior Street, Chicago, Illinois, 60610.

The program in pharmacy provides preparation for community and institutional pharmacy practice. In addition, students have opportunities through the selection of professional electives to commence a specialization in one of several areas of pharmacy, including hospital, clinical, manufacturing, medical supply servicing, drug analysis, administration, and research.

Of the prepharmacy students requesting transfer from University College to the College of Pharmacy at the end of three semesters, priority will be given to those applicants having a 2.50 quality point average or better in required preprofessional courses (CHM 101, 102, 112, 114, and 227; BIO 113, 121, 242, and 244; MTH 131; and MIC 201) with no

grade less than C- in any of these courses, and an overall quality point average of 2.00. Applicants with an average between 2.00 and 2.50 in these courses will be considered for admission on a competitive basis along with other URI undergraduate students and with transfer students from other institutions. Successful candidates must raise their quality point average to 2.50 in prerequisite courses before beginning the third year of study. Applicants with a quality point average of less than 2.00 for the designated prepharmacy courses will not be considered for admission to the College of Pharmacy. At the end of four semesters, the foregoing courses plus CHM 226, 228; STA 307; and BCH 311 (or equivalent courses where permitted) will be included in the calculation of the preprofessional quality point average.

Unless otherwise indicated, courses offered by the college are restricted to pharmacy majors.

Students must earn a minimum quality point average of 2.00 overall and 2.20 in all professional courses in order to qualify for graduation in the B.S. and Pharm.D. programs. A student will be allowed to repeat up to 10 credits of pharmacy courses in which he or she received a C or less in order to achieve the 2.20 QPA graduation requirement.

**The student whose cumulative QPA in professional courses falls below a 2.00 at the end of any semester will be dismissed from the program. Students will not be allowed to proceed into PHP 484, 485, 490, and 590 without at least a 2.00 QPA in required professional pharmacy courses.**

Professional and/or legal exigencies arise from time to time which may necessitate changes in a pharmacy course, progression, and/or graduation requirements. Students should review their status with academic advisors on a timely basis and refer to current publications for updated information.

Students in certain other New England states may enroll in pharmacy under the

New England Regional Student Program. (See "Undergraduate Admission and Registration," page 29.)

Transfer into the College of Pharmacy from another institution or from other programs at the University is highly competitive. Preference is given to students who have already completed the science courses equivalent to those required in the prepharmacy curriculum, as previously described. Students may transfer credits for courses in which they have earned a C or better. Questions concerning the transferability of specific courses and of the evaluation process should be directed to the Associate Dean of Pharmacy.

### Faculty

*Applied Pharmaceutical Sciences:* Professor Needham, *chairperson*. Professors N. Campbell, Kislalioglu, Lausier, Luzzi, C. Rhodes, Rosenbaum, and Zia; Associate Professors Willey Lessne; Assistant Professor Andrade; Adjunct Professors Breuer, Carlin, Crouthamel, Doster, Ette, Gerraughty, Gosslin, Hoffmann, Lukas, Malick, Marshall, Monkhouse, Ryan, Sado, and Woodruff; Adjunct Associate Professors Birmingham, Horhota, Mojaverian, Pittz, Shah, and Szymanski; Adjunct Assistant Professors Beatrice, Benoit, Corvese, Gann, Grant, Himmel, Holm, Marcoux, Molzon, Romeo, Rudnic, and Stetsko; Adjunct Instructors Menard and Ortiz; Associate Research Professor Larrat.

*Biomedical Sciences:* Professor Shaikh, *chairperson*. Professors Panzica, Rodgers, Shimizu, and Swonger; Associate Professors Babson, Cho, and Chichester; Assistant Professors L. Martin and Yan; Adjunct Associate Professors Barrach, Boekelheide, Capasso, Levinsky, Munns, and Nagata; Adjunct Assistant Professors Fisher, Hilliard, and Omar; Professors Emeriti Bond, C. Smith, Worthen, and Youngken.

*Pharmacy Practice:* Professor Hume, *chairperson*. Professors Barbour and Owens; Associate Professors Dufresne and Geletko; Assistant Professors Glen and Rana; Clinical Assistant Professors Luisi and McKindley.

## Bachelor of Science Curriculum Requirements

The five-year accredited program for the Bachelor of Science (B.S.) provides time for the General Education requirements as described in "Undergraduate Program Requirements," pages 31–32. The major portion of the professional program begins in the third year, when basic pharmaceutical and clinical disciplines are introduced.

Each year, the curriculum is supplemented by field trips to selected pharmaceutical industries. Students also make use of selected hospital and community pharmacies in Rhode Island and New England for specialty externships and clerkships.

A total of 170 credits is required for graduation.<sup>1</sup>

### First Year

#### First semester: 15 credits

- 3 CHM 101 General Chemistry Lecture I
- 1 CHM 102 Laboratory for Chemistry 101
- 3 A University-approved English communication course except BGS 100<sup>2</sup>
- 4 BIO 113 General Zoology
- 3 Elective
- 1 URI 101

#### Second semester: 17 credits

- 3 CHM 112 General Chemistry Lecture II
- 1 CHM 114 Laboratory for Chemistry 112
- 3 MTH 131 Applied Calculus I
- 3 A University-approved English communication course except BGS 100<sup>2</sup>
- 4 BIO 121 Human Anatomy
- 3 Elective

### Second Year

#### First semester: 17 credits

- 3 CHM 227 Organic Chemistry Lecture I
- 3 ECN 201 Principles of Economics: Microeconomics
- 4 MIC 201 Introductory Medical Microbiology
- 3 BIO 242 Introductory Human Physiology
- 1 BIO 244 Introductory Human Physiology Laboratory
- 3 Elective

#### Second semester: 17 credits

- 3 BCH 311 Introductory Biochemistry
- 3 CHM 228 Organic Chemistry Lecture II
- 2 CHM 226 Organic Chemistry Laboratory
- 3 STA 307 Introductory Biostatistics
- 6 Electives

### Third Year

#### First semester: 17 credits

- 3 BMS 327 Introduction to Human Pathophysiology
- 2 BMS 343 Principles of Medicinal Chemistry
- 2 APS 327 Biopharmaceutics
- 3 APS 349 Pharmacy Administration Principles
- 3 APS 350 Pharmaceutical Technology and Section A
- 3 APS 340 Physical Pharmacy
- 1 APS 360 Pharmaceutical Technology Laboratory or Section B
- 4 BMS 342 Pharmaceutical Analysis

#### Second semester: 19 credits

- 3 BMS 445 Natural Products and Biotechnical Drugs
- 3 BMS 454 General and Clinical Pharmacology and Toxicology I
- 3 APS 328 Pharmacokinetics
- 3 APS 351 Pharmaceutical Law and Ethics and Section A
- 4 BMS 342 Pharmaceutical Analysis
- 3 Elective or Section B
- 3 APS 340 Physical Pharmacy
- 1 APS 360 Pharmaceutical Technology Laboratory
- 3 Elective

### Fourth Year

#### First semester: 19 credits

- 3 BMS 443 Organic Medicinal Chemistry
- 3 FSN 444 Nutrition and Disease
- 3 BMS 446 Immunologic Drugs, Antibiotics, and Anticancer Drugs

- 3 BMS 455 General and Clinical Pharmacology and Toxicology II
- 4 PHP 455 Pharmacotherapeutics I
- 3 APS 459 Public Health

#### Second semester: 19 credits

- 3 BMS 444 Organic Medicinal Chemistry
- 3 BMS 456 General and Clinical Pharmacology and Toxicology III
- 1 BMS 451 General Pharmacology Laboratory
- 2 APS 448 Third-Party Prescription Programs
- 4 PHP 456 Pharmacotherapeutics II and Section A
- 6 Electives or Section B
- 1 APS 461 Health-Related Supplies
- 3 APS 462 Nonprescription Drugs
- 2 PHP 471 Contemporary Pharmacy Practice Laboratory

### Fifth Year

#### First semester: 15 credits

- Section A
- 1 APS 461 Health-Related Supplies
- 3 APS 462 Nonprescription Drugs
- 2 PHP 471 Contemporary Pharmacy Practice Laboratory
- 9 Electives or Section B
- 5 PHP 484 Institutional Pharmacy Externship
- 5 PHP 485 Community Pharmacy Externship
- 5 PHP 490 Clinical Pharmacy Clerkship

#### Second semester: 15 credits

- Section A
- 5 PHP 484 Institutional Pharmacy Externship
- 5 PHP 485 Community Pharmacy Externship
- 5 PHP 490 Clinical Pharmacy Clerkship or Section B
- 15 Electives



## Track-in Doctor of Pharmacy Curriculum Requirements

This clinically oriented curriculum becomes a separate track from the B.S. program in the fifth year. Students in the B.S. program may apply for admission to the Doctor of Pharmacy (Pharm.D.) program no sooner than the fall of the fourth year. Only students in good academic standing (QPA>2.50) who have met all of the prerequisites may apply. In addition to the application form, students must submit a letter of purpose as well as letters of recommendation from individuals who have known the applicant in a professional capacity. Students admitted to the Pharm.D. program will complete the fourth-year curriculum of the B.S. program in Section B. The students will spend the fifth year in advanced clinical course work. The summer after the fifth year is spent fulfilling externship requirements for licensure, and the sixth year is spent in clerkship rotations. Graduates of the Pharm.D. program are eligible to sit for the national licensing examination.

A total of 209 credits is required for graduation.

### Fifth Year

*First semester: 16 credits*

- 3 PHP 511 Advanced Pharmacotherapeutics I
- 3 APS 535 Pharmacokinetics
- 2 PHP 542 Drug-Induced Diseases
- 4 PHP 561 Advanced Human Pathophysiology I
- 1 PHP 581 Seminar
- 3 Elective

*Second semester: 18 credits*

- 3 PHP 411 Biostatistics II
- 3 PHP 512 Advanced Pharmacotherapeutics II
- 1 PHP 544 Physical Assessment
- 4 PHP 562 Advanced Human Pathophysiology II
- 1 PHP 582 Seminar
- 6 Electives

*Summer Session: 5 credits*

*One of the rotations below:*

- 5 PHP 484 Institutional Pharmacy Externship
- 5 PHP 485 Community Pharmacy Externship
- 5 PHP 590 Advanced Clinical Pharmacy Clerkship

### Sixth Year

*First semester: 15 credits*

- 5 PHP 484 Institutional Pharmacy Externship **or** 5 PHP 485 Community Pharmacy Externship **and**
- 2 x 5 PHP 590 Advanced Clinical Pharmacy Clerkship

*Second semester: 15 credits*

- 3 x 5 PHP 590 Advanced Clinical Pharmacy Clerkship

For students in the Pharm.D. program who already have a B.S. in pharmacy:

### Fifth Year

*First semester: 13 credits*

- 3 PHP 511 Advanced Pharmacotherapeutics I
- 3 APS 535 Pharmacokinetics
- 2 PHP 542 Drug-Induced Diseases
- 4 PHP 561 Advanced Human Pathophysiology I
- 1 PHP 581 Seminar

*Second semester: 12 credits<sup>3</sup>*

- 3 PHP 411 Biostatistics II<sup>4</sup>
- 3 PHP 512 Advanced Pharmacotherapeutics II
- 1 PHP 544 Physical Assessment
- 4 PHP 562 Advanced Human Pathophysiology II
- 1 PHP 582 Seminar

*Summer Session: 5 credits*

- 5 PHP 590 Advanced Clinical Pharmacy Clerkship

### Sixth Year

*First semester: 15 credits*

- 3 x 5 PHP 590 Advanced Clinical Pharmacy Clerkship

*Second semester: 15 credits*

- 3 x 5 PHP 590 Advanced Clinical Pharmacy Clerkship

## Six-year Entry Level Pharm.D. Curriculum Requirements

Beginning in the fall of 1998, entering freshmen will be admitted only to this six-year entry-level Doctor of Pharmacy degree program.

A total of 188 credits is required for graduation.

### First Year

*First semester: 15 credits*

- 3 CHM 101 General Chemistry Lecture I
- 1 CHM 102 Laboratory for Chemistry 101
- 3 A University-approved English communication course except BGS 100<sup>2</sup>
- 4 BIO 113 General Zoology
- 3 Elective
- 1 URI 101

*Second semester: 17 credits*

- 3 CHM 112 General Chemistry Lecture II
- 1 CHM 114 Laboratory for Chemistry 112
- 3 MTH 131 Applied Calculus I
- 3 A University-approved English communication course except BGS 100<sup>2</sup>
- 4 BIO 121 Human Anatomy
- 3 Elective

### Second Year

*First semester: 17 credits*

- 3 CHM 227 Organic Chemistry Lecture I
- 3 ECN 201 Principles of Economics: Microeconomics
- 4 MIC 201 Introductory Medical Microbiology
- 3 BIO 242 Introductory Human Physiology
- 1 BIO 244 Introductory Human Physiology Laboratory
- 3 Elective

*Second semester: 17 credits*

- 3 BCH 311 Introductory Biochemistry
- 3 CHM 228 Organic Chemistry Lecture II
- 2 CHM 226 Organic Chemistry Laboratory
- 3 STA 307 Introductory Biostatistics
- 6 Electives

*Third Year**First semester: 16 credits*

- 2 PHP/BMS 311 Foundations of Human Disease I
- 2 BMS 321 Principles of Pharmacology and Autonomic Pharmacology
- 2 BMS 313 Introduction to Medicinal Chemistry and Drug Metabolism
- 3 APS 314 Physical Pharmacy and Pharmaceutical Calculations
- 2 APS 315 Biopharmaceutics
- 3 APS 316 Pharmacy Law and Ethics
- 1 APS 318 Pharmacy Technology Laboratory
- 1 PHC 317 Interactive Learning Session I<sup>5</sup>

*Second semester: 16 credits*

- 2 PHP/BMS 312 Foundations of Human Disease II
- 2 BMS 322 Pharmacology and Medicinal Chemistry of Drugs Acting on the Central Nervous System
- 2 PHP 324 Pharmacotherapy of CNS and Musculo-Skeletal Disorders—Therapeutics I
- 3 APS 324 Pharmaceutical Technology
- 2 BMS 325 Principles of Drug Analysis
- 1 BMS 326 Pharmacology and Medicinal Chemistry Laboratory I
- 1 PHC 327 Interactive Learning Session II<sup>5</sup>
- 3 Elective

*Fourth Year**First semester: 14 credits*

- 2 PHP/BMS 409 Foundations of Human Disease III
- 2 BMS 421 Pharmacology and Medicinal Chemistry of Anti-Infective and Respiratory Agents
- 2 PHP 413 Pharmacotherapy of Infectious Diseases—Therapeutics II
- 3 APS 403 Pharmacokinetics I
- 3 APS/PHP/STA 411 Biostatistics II
- 1 BMS 416 Pharmacology and Medicinal Chemistry Laboratory II
- 1 PHC 417 Interactive Learning Session III<sup>5</sup>

*Second semester: 14 credits*

- 3 PHP/BMS 410 Foundations of Human Disease IV
- 2 BMS 422 Endocrine, Gastrointestinal, and Biotechnologic Drugs
- 2 PHP 414 Pharmacotherapy of Endocrine and GI Disorders—Therapeutics III
- 3 APS/PHP 404 Pharmacokinetics II
- 3 Professional Tracking
- 1 PHC 427 Interactive Learning Session IV<sup>5</sup>

*Fifth Year**First semester: 17 credits*

- 2 BMS 521 Cancer Chemotherapy and Toxicology
- 2 PHP 513 Pharmacotherapy of Oncology and Toxicology—Therapeutics IV
- 2 APS 503 Health Systems I
- 3 BMS/PHP 518 Self Care I
- 6 Professional Tracking
- 1 PHP/APS 515 Pharmacy Practice Laboratory I
- 1 PHC 517 Interactive Learning Session V<sup>5</sup>

*Second semester: 17 credits*

- 2 PHP/BMS 510 Foundations of Human Disease V
- 2 BMS 522 Pharmacology and Medicinal Chemistry of Cardiovascular and Renal Drugs
- 2 PHP 514 Pharmacotherapy of Renal and Cardiovascular Disorders—Therapeutics V
- 3 APS 504 Health Systems II
- 3 FSN 444 Nutrition and Disease
- 1 PHP/APS 516 Pharmacy Practice Laboratory II
- 3 Professional Tracking
- 1 PHC 527 Interactive Learning Session VI<sup>5</sup>

*Sixth Year**First semester: 14 credits**Second semester: 14 credits*

Students must complete PHP 591, 592, and 593 (Clinical Clerkships, 7 credits each) plus PHC 594 (Tracking Practicum, 7 credits) during the sixth year in any sequence to complete the curriculum.

<sup>1</sup> Proficiency in the American Red Cross Standard First Aid and Community CPR is expected of each student prior to graduation.

<sup>2</sup> CMS 101 (six credits) may be substituted for the writing requirement.

<sup>3</sup> Students who have taken any of the required didactic courses listed in the first year for a grade will receive credit for that course toward their Pharm.D. degree (this is to accommodate those students who have taken course work prior to applying and being accepted as a Pharm.D. student).

<sup>4</sup> Students may substitute APS 540 Principles, Methods, and Applications of Epidemiology for PHP 411.

<sup>5</sup> Interactive Learning courses will be shared by PHP, BMS, and APS under the code of PHC.

# GRADUATE ADMISSION AND REGISTRATION

**P**ersons holding the baccalaureate degree and wishing to take graduate-level courses at the University may do so through admission to the Graduate School.

## Admission

Students may be admitted to the Graduate School as degree candidates or they may pursue postbaccalaureate work in nonmatriculating status (see page 111). Admission to the Graduate School is based on academic qualifications and potential without regard to race, sex, religion, age, color, creed, national origin, disability, or sexual orientation, and without discrimination against disabled and Vietnam era veterans.

*A package of self-managed application materials* can be obtained from the Graduate Admissions Office, University of Rhode Island, 208 Quinn Hall, 55 Lower College Road, Kingston, RI 02881-1966. A ZIP code should be included in the applicant's return address. Inquiries concerning particular degree programs or courses of instruction should be addressed to the appropriate department chairperson or to the graduate program director, as listed in the "Graduate Programs" section of this catalog.

The completed application package must be sent directly to the department or program to which admission is sought. Final decision on admission rests with the Graduate School, which, after considering the recommendation of the department concerned, will notify the applicant of the decision.

Where admission to a doctoral program is possible for those holding the bachelor's degree and meeting other requirements, the Graduate School reserves the right to offer admission only to the master's program while postponing a decision on admission to the doctoral program until at least a substantial portion of the master's work has been completed.

Applications must be accompanied by a nonrefundable application fee: \$30 for in-state and \$45 for out-of-state residents (for residency requirements, see "Fees, Expenses, and Financial Aid," page 17). Simultaneous application to more than one department requires duplicate applications and credentials and separate application fees.

The completed application package and all supporting documents must be received by April 15 for summer admission, July 15 for fall admission, and November 15 for spring admission. The application package must be received by February 1 for consideration for financial aid for the following year. As indicated in the "Graduate Programs" section in this catalog, certain programs admit students only for the fall semester or have earlier deadlines. There is no assurance that applications completed after specified deadlines will be processed in time for enrollment in the desired semester. Admission is valid only for the term offered and must be reconsidered if a postponement is subsequently requested.

**International Applicants.** Applicants from foreign countries must complete the Test of English as a Foreign Language (TOEFL) with a minimum score of 550 unless a higher minimum is listed under the admission requirements for the specific program. Self-administered international application forms can be obtained from the Graduate Admissions Office. The completed application package must be returned directly to the department or program to which admission is sought. Applications not received by February 1 for fall admission and July 15 for spring admission will be considered for the next admission period. Inquir-



ies from international students concerning nonimmigrant visas, transfers, funding, etc., should be sent to the Office of International Students and Scholars. Inquiries concerning housing should be sent to the Department of Housing and Residential Life (for apartments on campus) or to Off-Campus Housing (for rooms, apartments, and houses in the nearby community).

**Transfer Credit.** Transfer credit can be requested for graduate work taken at other accredited institutions of higher learning. Under usual circumstances, such credits may not exceed 20 percent of the total credits required in the program. Doctoral candidates holding a master's degree in the same or a closely related area can request up to 30 credits from their master's degree. The transfer work must have been taken at the graduate level (equivalent to the 500 level or higher in the University of Rhode Island course numbering system) and a passing grade earned at that institution. It must have been completed not more than five years prior to the date of admission into a master's program (ten years for the doctoral program) and must have a clear and unquestioned relevance to the student's program of study. The

request for transfer credit should be accompanied by a proposed program of study and must have the approval of the student's major professor and the Graduate School. If transfer credit is desired for work taken elsewhere after a graduate student is enrolled at the University, *prior approval* must be obtained from the Graduate School.

**Degree Candidates.** Applicants must forward the completed self-managed application package, containing *all* of the requested materials, directly to the department to which admission is being sought. Where required, test scores in the appropriate nationally administered tests should be sent directly to the department by the testing service. Tests required for specific programs can be found in the section "Graduate Programs." Scores (GRE, MAT, or GMAT) earned more than five years prior to the term of application will not be accepted. If test results exceed the five-year limit, applicants must retake the examination.

To be accepted as graduate degree candidates, applicants must have maintained an average of approximately B (3.00 on a 4.00 scale) or better in their undergraduate work. For programs that require standardized tests, students must also have satisfactory scores on the appropriate nationally administered test. Applicants with undergraduate averages below the B level may possibly be admitted with submission of other evidence of academic potential; i.e., satisfactory performance in postbaccalaureate work, professional experience as evidenced by publications or letters of recommendation, and/or high scores in the standardized tests referred to above. All students are expected to maintain a cumulative average of B (3.00) or better. Students who do not maintain a cumulative B average will have their status reviewed and may be placed on provisional status or be dismissed. A student placed on provisional status must achieve a cumulative B average within one semester (or nine credits, if part-time) or be subject to dismissal.

**Advanced Standing.** Advanced standing refers to credits taken at the University of Rhode Island by a nonmatriculating student, by a matriculating student while on nondegree status, or by a student in one degree program before acceptance to any other degree program. Credits earned at the University of Rhode Island by a nonmatriculating student may be applied as advanced standing toward degree requirements only upon the recommendation of the student's major professor and the graduate program director and with the approval of the Graduate School. For the credits to be applied to advanced standing, they must have been earned within a five-year period before the student matriculated into the degree program. For a master's degree program, advanced standing and transfer credit may not total more than 40 percent of the credits required for the degree. For Ph.D. candidates admitted without a master's degree, advanced standing may not total more than 20 percent of the credits required for the degree. In special cases, Ph.D. candidates admitted with a master's degree in the same or a closely related area may request up to nine credits of advanced standing. The request should be accompanied by a proposed program of study and satisfy the time constraints listed for transfer credit.

In certain cases, applicants who have been denied admission may be advised to take several courses in nonmatriculating status (see following paragraphs) to provide a basis for later reconsideration of their applications. In such cases, these courses are usually regarded as if they were entrance deficiencies and are not accepted for advanced standing in minimum-credit programs of study.

**Nonmatriculating Status.** Individuals holding a bachelor's degree who are not candidates for an advanced degree may take courses during the academic year or in the summer in nonmatriculating status. Normally, to take courses for personal satisfaction or professional advancement, postbaccalaureate students enroll in the Alan Shawn Feinstein College of Continuing Education. Any nonmatriculated stu-

dent wishing to take courses on the Kingston Campus must file an application with the Office of the Registrar. If nonmatriculated students later wish to be admitted to a degree program, they must complete the regular admission procedure.

Nonmatriculated students do not have the privileges regularly enjoyed by degree candidates. For example, on the Kingston Campus they may not register until one week before classes begin and must make payment before accessing the telephone registration system. Their enrollment is subject to the accommodation of degree candidates wishing to take these courses. In addition, there is a limit to the number of courses taken in this status that may be used as advanced standing to satisfy degree requirements. Nonmatriculated students are not eligible for financial aid.

## Registration

The responsibility for being properly registered rests with the student. Students must complete their registration within the time period announced by the University in the *Schedule of Courses*. The chairperson of the student's major department will assign an advisor to assist the new graduate student in planning a program. All students must register for courses through the Office of the Registrar in order to be properly enrolled.

**Early Registration.** Matriculated (official degree-seeking) students who meet the eligibility requirements as defined in the *Schedule of Courses* generally register in April and October for the following semester. The *Schedule of Courses* is available at the Office of the Registrar and on the World Wide Web.

**Summer Session.** Although some graduate-level courses are offered during the summer sessions, the University does not guarantee that any particular course will be offered. The availability of individual faculty members to supervise research or to participate in comprehensive examinations and in examinations in defense of theses or dissertations during the summer sessions varies from year to year. During

## 1998–99 Calendar for Candidates for Graduate Degrees

### Fall Semester 1998

#### September 9, Wednesday

Classes begin, Kingston campus

#### October 2, Friday

Final date for nominations for December graduation

#### November 16, Monday

Deadline for applications for Spring 1999, except for programs with earlier deadlines.

#### December 14, Monday

Classes end.

Programs of study due for students admitted for Fall 1998.

Final date for December candidates to submit completed defense copies of master's and doctoral theses in a form acceptable for examination purposes along with the request for oral defense of thesis. NO EXTENSIONS OF TIME WILL BE GRANTED. *Theses must be submitted at least 20 calendar days prior to the date requested for oral defense. Selection of date should allow sufficient time for necessary revisions and retyping before submission in final form. See January 12 deadline and note at the end of the calendar on the next page regarding scheduling examinations during the winter intercession.*

### Spring Semester 1999

#### January 12, Tuesday

Final date for December degree candidates to submit, in final form, master's and doctoral theses which have been successfully defended. NO EXTENSIONS OF TIME WILL BE GRANTED.

Final date for change of grades, changes to programs of study, results of comprehensive exams for December degree candidates to be received in the Graduate School office for certification for December graduation.

#### January 19, Tuesday

Classes begin, Kingston campus.

#### January 29, Friday

Final date for admissions applications from individuals seeking financial aid for 1999. Applications for financial aid received subsequent to this date cannot be assured of full consideration.

#### February 1, Monday

Final date for nominations for May graduation

#### February 19, Friday

Final date for nominations from departments for fellowships and scholarships

#### April 12, Monday

Final date for May degree candidates to submit completed defense copies of master's and doctoral theses in a form acceptable for examina-

tion purposes, along with the request for oral defense of thesis. NO EXTENSIONS OF TIME WILL BE GRANTED. *Theses must be submitted at least 20 calendar days prior to the date requested for oral defense. Selection of date should allow sufficient time for necessary revisions and retyping before submission in final form. See the May 10 deadline.*

#### April 15, Thursday

Application deadline for summer 1999 admissions, except for programs with earlier deadlines

#### May 4, Tuesday

Classes end

Programs of study due for students admitted in January 1999.

#### May 10, Monday

Final date for May degree candidates to submit, in final form, master's and doctoral theses which have been successfully defended. NO EXTENSIONS OF TIME WILL BE GRANTED.

Final date for change of grades, changes to programs of study, results of comprehensive exams for May degree candidates to be received in the Graduate School office for certification for May graduation.

#### May 22, Saturday

Commencement

**Note:** Please also refer to the 1998–99 University Calendar on page 3.

the summer sessions, special arrangements must be made with both the Graduate School and the department for scheduling comprehensive examinations and thesis or dissertation defenses. Students must be registered to be eligible to schedule these exams. Graduate students must make prior individual arrangements for taking directed studies or special problems courses.

### Time Limit and Continuous Registration.

Graduate students are expected to complete their course work and research within the five-year time limit prescribed for the master's degree and the seven-year time limit for the doctorate.

The time limit for a degree program may be extended by applying to the Graduate School for legitimate reasons such as military service or serious illness.

This request requires the endorsement of the student's graduate program director or department chairperson.

Graduate students must remain continuously enrolled—except for summer sessions, which are optional—until they have completed all requirements and have received their degree. Students who wish to maintain graduate status but do not require use of any University resources, are not registered for course work or research, and are not on a leave of absence approved by the department and the Graduate School must pay the continuous registration fee each semester until the degree has been awarded.

Students who are on a leave of absence or are on continuous registration do not have the privileges of consulting regularly

with faculty on research or thesis preparation, nor of using laboratory, computer, or other educational facilities at the University. Students on continuous registration are not eligible for continuation of educational loan deferments based on student status.

A student who does not register for a semester, or obtain approval for a leave of absence, will be considered as having voluntarily withdrawn from the University. Students who are later permitted to re-enroll must pay the continuous registration fee for each semester in which they did not maintain graduate status.

**Full-Time and Part-Time Students.** Minimum full-time registration is nine credit hours during a regular semester and six credit hours during a summer session.

## 1999 Summer Session for Candidates for Graduate Degrees

**NOTE:** All courses taken by graduate students during summer sessions are subject to the same regulations regarding inclusion in programs of study and calculation of overall academic average, etc., as courses taken during the regular academic year. Students wishing to take directed studies or special problems courses during summer sessions must obtain individual approval for these courses from the Summer Session Office unless the specific offering is listed in the Summer Session Bulletin for that year. Students wishing to enroll for thesis or dissertation research during summer sessions must first determine that their major professors and/or members of their thesis or dissertation committees will be available and are willing to provide the necessary supervision. See also the important note at the end of this calendar regarding scheduling of examinations, including defense of theses, during summer session. See the Summer Session Bulletin available at the Summer Session Office.

### SESSION I: MAY 24–JUNE 26

**May 24, Monday**  
Classes begin

**June 7, Monday**  
Final date for nominations for August graduation

**Week of June 21**  
Classes end. Exams

### SESSION II: JUNE 28–JULY 31

**June 28, Monday**  
Classes begin

**July 9, Friday**  
Final date for all August degree candidates to submit completed defense copies of master's and doctoral theses in a form acceptable for examination purposes, along with the request for oral defense of the thesis. **NO EXTENSIONS OF TIME WILL BE GRANTED.** *Theses must be submitted at least 20 calendar days prior to the date requested for the oral defense. Selection of date should allow sufficient time for necessary revisions and retyping before submission in final form. See August 6 deadline.*

### July 15, Thursday

Deadline for Fall 1999 applications, except for programs with earlier deadlines

### Week of July 26

Classes end. Exams

### August 6, Friday

Final date for all August degree candidates to submit, in final form, master's and doctoral theses which have been successfully defended. **NO EXTENSIONS OF TIME WILL BE GRANTED.**

Final date for change of grades, changes to programs of study, results of comprehensive exams for August degree candidates to be received in the Graduate School office for certification for August graduation.

**IMPORTANT NOTE:** Requests for scheduling examinations must be submitted to the Graduate School Office at least 20 calendar days prior to the date(s) requested. Theses and dissertations must be distributed to members of the examining committee at least 15 days prior to the date of the defense. Oral and written examinations, including qualifying and comprehensive examinations and defense of theses, will be

scheduled only at the convenience of the faculty members involved and depending on the availability of the candidate's program committee and additional qualified examiners. Such examinations will not be scheduled during periods when the University is in recess. Students wishing to take any examinations should first check as to the availability and convenience of the faculty members. Each faculty member must initial the request for scheduling the examination to indicate willingness to serve. The faculty should be consulted well in advance for examinations being scheduled during the winter intercession and summer sessions. If they are not registered for course work or research during the summer sessions, students should register for one credit of research to defend theses and for continuous registration to take the other examinations. Please note that persons on continuous registration do not have the privilege of consulting regularly with professors on research or thesis preparation, nor of using the University's laboratory, computer, or other educational facilities (except for the libraries).

Maximum registration of 15 credit hours during a regular semester and eight credits during each summer term may not be exceeded without prior written permission of the Graduate School, based on extraordinary circumstances. (Students on graduate teaching and research assistantships are limited to a maximum of 12 credits.) Credits in excess of 15 will be billed at the per-credit rate. Full-time registration is required of all international students and of all students holding fellowships, assistantships, full scholarships, and traineeships administered by the University.

**Credits Earned Off Campus.** Students who wish to register for credits to be counted toward a degree, and who will be earning these credits through off-campus activities such as research or independent

study at a national laboratory, are required to obtain prior approval from the Graduate School and to have these activities listed as part of their programs of study.

**Intellectual Opportunity Plan (Pass-Fail Option).** To allow graduate students to venture into new areas of knowledge without fear that their scholastic average will suffer, the Graduate Council has approved the Intellectual Opportunity Plan. (Please note that courses below the 400 level are automatically excluded from the scholastic average.) To be eligible for this option, the student's major professor or advisor must certify that the course or courses are outside the student's major field of study, are not entrance deficiencies, and are not specific requirements of, but are relevant to, the student's program. A maximum of four

credits may be taken by the master's degree candidate and a maximum of eight credits, including any taken as a master's candidate, by the doctoral candidate. Deadlines appropriate for participation in this plan are published in the *Schedule of Courses*.

**Late Registration, Schedule of Courses, Payment of Fees, Drop and Add, Auditing, Veterans Administration Educational Benefits, Transcripts, Change of Address, Required Identification.** See "Undergraduate Admission and Registration," pages 29–30.

# GRADUATE PROGRAM REQUIREMENTS



**E**ach advanced degree awarded by the University requires as a minimum the successful completion of a specified number of approved credits of graduate study at the University and the passing of prescribed examinations. Credit hours for a master's or doctoral degree may include formal course work, independent study, research, preparation of a thesis or dissertation, and such other scholarly activities as are approved by the candidate's program committee and the Graduate School.

*It is the student's responsibility to know the calendar, regulations, and pertinent procedures of the Graduate School and to meet its standards and requirements.* These are set forth in this catalog, the *Graduate Student Manual*, the *Statement on Thesis Preparation*, and other publications, all of which are available to graduate students at the Graduate School Office. These documents are also available in some department offices. The student manual is available at the library and, for a fee, at commercial centers in Kingston.

These documents govern both master's and doctoral degree programs. The student manual gives detailed information on responsibilities of major professors and program committees, examination procedures, preparation of theses and dissertations, academic standards, and the Graduate Student Academic Appeals System.

The requirements immediately following are *general requirements* for all graduate students. *Specific requirements* for individual programs are itemized in the section "Graduate Programs."

## Program of Study

The purpose of the program of study is to ensure that students, at an early stage in their graduate study, organize coherent, individualized plans for their course work and research activities. It is expected that the successful completion of students' programs of study along with collateral readings, research, etc., will enable them to demonstrate that they have achieved the high level of competence required of graduate students in their respective fields.

All degree candidates are required to prepare a program of study with the guidance of their major professors (for master's degree programs) or of their program committees (for doctoral programs) in accordance with the guidelines in the *Graduate Student Manual*. After the program has been approved by the major professor for master's degree candidates or by the program committee for doctoral candidates, the program of study is submitted for approval to the Graduate School.

## Course Numbering System

All regular graduate courses are numbered at the 500 and 600 levels. All 900-level courses are special graduate courses for which no graduate program credit is given. Courses numbered at the 400 level are for advanced undergraduates, but may, with approval and to a limited extent, be accepted toward meeting degree requirements at the master's level. For doctoral candidates who have completed the master's degree in the same field or one closely related, all program work must be at the 500 or 600 level.

## Scholastic Standing

Graduate work is evaluated by letter grades. All grades earned will remain on the student's record, and unless the courses were approved for no program credit prior to registration, all unaccept-



able grades will be included in calculating the student's scholastic average.

A grade of C+ (2.33) or lower in courses numbered at the 400 level is considered a failing grade. In such cases of failure the course must either be repeated, if it is a required course, or else replaced by another course approved by the candidate's program committee and the Graduate School. When students receive more than one grade of C+ (2.33) or lower in courses at the 400 level, their graduate status is subject to review by the Graduate School.

Grades of C- or lower are failing grades in courses at the 500 and 600 levels and require immediate review of the student's status. Students failing these courses must repeat them, if they are required courses, or else they must replace them with courses approved by the candidate's program committee and the Graduate School.

The grades S (satisfactory) and U (unsatisfactory) are used for courses of study involving research undertaken for the thesis or dissertation and for certain courses and seminars so designated. The letter I (incomplete) is used for excused unfinished work. Incomplete grades assigned to graduate students should be removed within one calendar year. If the grade of I (incomplete) is not removed within three calendar years, it will remain on the transcript but may not be used for program credit. Grades of S, U, I, and all grades in courses below the 400 level are not included in the academic average.

To qualify for continuation of degree candidate status and for graduation, a cumulative average of B (3.00 on a 4.00 scale) in all work is required, except for courses meeting entrance deficiencies or approved for no program credit prior to registration in the course. At any time when the academic record indicates unsatisfactory performance, the student's status is subject to review. A student who fails to maintain a satisfactory quality point average or to make acceptable progress toward the degree may be dismissed as a graduate student.

## Degree Requirements

**Master's Degree.** There are no major or minor area requirements for the master's degree. However, no degree can be awarded for the accumulation of credits without a planned and approved program of study. Courses for the degree are expected to be concentrated in the candidate's field of interest and related areas to produce a well-developed and coherent program.

The requirements listed here must be met within five years after the date the candidate is first enrolled as a graduate student at the University. With the submission of a written request for an extension and a schedule for completion, endorsed by the major professor and the graduate program director, a specific, time-limited extension may be approved by the Graduate School. The master's degree may be earned through full- or part-time study, or a combination of the two.

Some departments offer both a thesis and a nonthesis option, while others offer only one plan. Please refer to the "Graduate Programs" section for specific information on each program. General requirements for these options are as follows.

**Thesis Option.** The minimum requirements for a master's degree are: 1) the successful completion of 30 credits, including six to nine thesis research credits; 2) at the discretion of the department, the passing of written comprehensive examinations toward the end of the course work; 3) the submission of an acceptable thesis and the passing of an oral examination in defense of the thesis. Four copies of the thesis prepared in accordance with Graduate School requirements must be submitted to the Graduate School Office. A statement on the preparation of theses is available from that office.

**Nonthesis Option.** Depending on departmental requirements, some master's degrees may be earned without a thesis. The minimum requirements for a nonthesis master's degree program are: 1) the successful completion of a minimum of 30

credits; 2) completion of practicums, internships, or other experiences useful to the student's future professional career; 3) registration in one course that requires a substantial paper involving significant independent study; 4) the passing of a written comprehensive examination toward the end of the course work. Some departments may also require a final oral examination.

**Research Competency.** Although not normally required for the master's degree, a student's major professor or thesis committee may require proficiency in a foreign language, statistics, or computer science where appropriate for the subject chosen.

**Professional Degrees.** Students should refer to the specific program requirements for professional degrees and consult with the appropriate dean or director.

**Doctor of Philosophy Degree.** The Doctor of Philosophy degree must be completed within seven years of the date when the student first enrolled as a candidate.

The requirements for the doctoral degree are: 1) the completion of a minimum of 72 credits of graduate study beyond the baccalaureate degree, of which a minimum of 42 credits must be taken at the University of Rhode Island; 2) the passing of a qualifying examination; 3) if required by the department, proficiency in one or more foreign languages and/or in an approved research tool; 4) the passing of a comprehensive examination; 5) the completion of a satisfactory dissertation; 6) the passing of a final oral examination in defense of the dissertation; and 7) fulfillment of the residence requirement by taking a minimum of six credits per semester (specific graduate programs may require more) for at least two consecutive semesters after satisfying qualifying examination requirements. Residence is interpreted as attendance on campus or in the Alan Shawn Feinstein College of Continuing Education during a regularly scheduled semester. Full-time registration for both terms of a summer session counts as one semester of residence.



The department in which the student studies for the doctoral degree may or may not require a master's degree preliminary to, or as part of, the regular course of study.

*Qualifying Examination.* This examination is intended to assess a student's potential to perform satisfactorily at the doctoral level. A student without a master's degree who is accepted as a doctoral candidate is expected to take a qualifying examination, usually after 24–30 credits have been completed. A student who holds a master's degree in the same or a closely related field is normally not required to take the examination. If an examination is required, it will be stipulated at the time of admission.

*Research Competency.* Each department, in cooperation with the Graduate School, is authorized to formulate and to amend its own requirements and methods of testing for competency in research tools such as foreign language(s), computer science, or statistics. The department may, in turn, delegate this responsibility to the program committee for each individual doctoral candidate.

*Comprehensive Examination.* Each doctoral candidate will take comprehensive examinations at or near but not later than 12 months after completion of the formal courses stipulated in the program of study. The examination is designed to assess the student's intellectual capacity and adequacy of training for scholarly research.

The comprehensive examination consists of two parts: written and oral. The student, with the approval of his or her program committee, applies to the Graduate School to take the examination. The oral examination committee includes the student's committee and two additional members of the graduate faculty appointed by the Graduate School. One of the additional members represents a field of study allied to that of the student's major. The candidate's major professor arranges for and chairs the examination. Unanimous approval by the examining

committee is required for the passing of the comprehensive examination.

A candidate whose performance fails to receive unanimous approval may, with the committee's recommendation and the approval of the Graduate School, be permitted one re-examination in the part or parts failed, to be taken no sooner than 10 weeks and no later than one year after the initial examinations.

*Final Oral Examination.* This examination is a defense of the dissertation and is open to all members of the faculty and, generally, to all students. The examination, usually a maximum of two hours, is conducted by an examining committee made up of the candidate's program committee and two additional graduate faculty members appointed by the Graduate School. One of the appointed members will be designated by the Dean to chair the examination.

Unanimous approval of the examining committee is required for passing. If the candidate does not perform satisfactorily, the committee may recommend to the Graduate School that the candidate take one re-examination under stated conditions.

## Theses and Dissertations

For the oral defense, a sufficient number of completed copies of the thesis or dissertation, acceptable in form and substance to each member of the examining committee and the Graduate School, is required. At least 20 calendar days prior to the proposed defense, the copies must be submitted to the Graduate School for scheduling of the examination.

Following a successful defense, and after all changes and corrections have been made, four copies prepared in accordance with requirements of the Graduate School and the library must be submitted to the Graduate School Office. Doctoral candidates must submit an additional abstract, not exceeding 350 words.

Students are advised to consult the *Statement on Thesis Preparation* and

*Instructions for Thesis Defense*, both available in the Graduate School Office, and the most recent edition of Kate L. Turabian's *A Manual for Writers of Term Papers, Theses, and Dissertations*, published by the University of Chicago Press.

# GRADUATE PROGRAMS

**G**raduate students who are interested in the career opportunities related to particular programs of study are encouraged to discuss their interests with the appropriate department chairperson or with the director of graduate studies, as listed in this catalog, with the Dean of the Graduate School, or with the staff of Career Services. Students who are uncertain about their career choices are invited to use the services offered by the Counseling Center.

This section must be read in conjunction with the preceding "Graduate Admission and Registration" and "Graduate Program Requirements." The specific admission and program requirements listed in this section are included within the general requirements set forth in the preceding sections, and do not reduce those general requirements. For example, in nonthesis master's degree programs, all students must take at least one course that requires a substantial paper involving significant independent study. All Ph.D. candidates who do not hold an earned master's degree in a closely related field are required to take the Ph.D. qualifying examination even if it is not listed in the individual program requirements.

The admission requirement of standardized test scores (GRE, GMAT, MAT) is specific to the particular program. For programs that require a standardized test, applications will not be reviewed until the scores have been received. In all other cases, scores may be submitted if applicants believe the test results will enhance their application. However, the test results should be submitted as early as possible. If an application package is received before the test results, the admission decision may be made without the scores.

Please note that the specific program requirements given on the following pages are minimum requirements. For example, additional course credits may be required for individual candidates whose academic

background is considered to be insufficient. All courses, undergraduate and graduate, are described in the section "Courses of Instruction."

Successful completion of any course of study at the University does not guarantee that the student will find either a specific kind or level of employment.

*The availability of programs of study and areas of specialization listed in this section, and their administrative location, requirements, and titles, are subject to change without notice.*

## Accounting

M.S.  
401-874-2073

## Graduate Faculty

*Chairperson:* Professor Henry R. Schwarzbach, D.B.A., 1976, University of Colorado; C.P.A.  
*Director of Graduate Studies:* Associate Professor Mark Higgins, Ph.D., 1989, University of Tennessee; C.P.A.  
Professor Charles Hickox, L.L.M., 1994, Boston University  
Professor Spencer J. Martin, Ph.D., 1970, University of Illinois; C.P.A.  
Professor Joseph P. Matoney, Jr., Ph.D., 1973, Pennsylvania State University; C.P.A.  
Professor Richard Vangermeersch, Ph.D., 1970, University of Florida; C.P.A., C.M.A.  
Associate Professor Judy K. Beckman, Ph.D., 1991, Texas Tech University; C.P.A.  
Associate Professor Edmund J. Boyle, Ph.D., 1990, Pennsylvania State University; C.P.A.



GRADUATE

Associate Professor Marshall A. Geiger, Ph.D., 1988, Pennsylvania State University; C.P.A.  
Associate Professor Alejandro Hazera, D.B.A., 1989, University of Kentucky; C.P.A.

## Master of Science

The Master of Science in accounting program is appropriate for students with a variety of educational backgrounds and professional interests. The program has an objective of providing an accounting and business foundation for the student with an undergraduate degree in an area other than accounting. These students graduate with a strong theoretical understanding of accounting along with the necessary technical background. They are equipped to perform exceedingly well in entry-level positions in accounting. An objective for students with undergraduate degrees in accounting is to provide a fifth year of conceptual, theoretical, and technical education in accounting, finance, management science, and other areas where the student and program director feel the student can gain the most toward achieving his or her educational objectives.

Applicants with a bachelor's degree in accounting from an accredited institution can complete the program of study in one year. Applicants with no prior education in business will need to spend two years in full-time study or longer if studying part-time. The course of study is divided into two parts. Part one is a common body of knowledge in business and accounting that is required for all students without a bachelor's degree in business. The student's undergraduate record is evaluated, and common body of knowledge courses are waived when a student has undergraduate equivalents. The second phase of the program allows the students to build on their accounting foundation and develop a high level of theoretical knowledge and a sound understanding of accounting principles and techniques. During the second part of the program the student selects an area in which to specialize. Two areas are available: 1) financial reporting and auditing, and 2) taxation.

**Admission requirements:** undergraduate quality point average of approximately B or above and a score at the 50th percentile or above on the GMAT examination are expected. The GMAT score and the undergraduate quality point average are not the sole criteria for admission. However, those with undergraduate quality point averages of less than B or with lower than 50th percentile scores on the GMAT have a reduced probability of admission. Applicants for whom English is not the native language will be expected to demonstrate proficiency in written and oral communications (TOEFL score of 575 or above), or they may be required to correct deficiencies by taking selected courses for no program credit.

**Program requirements:** from 30 to 69 credits, depending on undergraduate program. A written comprehensive examination and a course requiring a major paper involving independent study are required in the nonthesis option.

All 600-level courses offered by the departments in the College of Business Administration are open to matriculated graduate students only.

## Animal and Veterinary Science

See Fisheries, Animal and Veterinary Science.

## Applied Mathematical Sciences

(Interdepartmental)

Ph.D.  
401-874-5592

This interdepartmental program is sponsored by the Departments of Computer Science and Statistics, Industrial and Manufacturing Engineering, Management Science and Information Systems, and Mathematics. It is administered by a coordinating committee selected from the graduate faculty.

**Coordinating Committee:** Nancy Eaton (chairperson), David L. Freeman, Leonard M. Kahn, Seetharama Narasimhan, Bala Ravikumar

### Graduate Faculty

Professor Rodney D. Driver, Ph.D., 1960, University of Minnesota  
Professor Norman J. Finizio, Ph.D., 1972, Courant Institute of Mathematical Sciences, New York University  
Professor Edward A. Grove, Ph.D., 1969, Brown University  
Professor R. Choudary Hanumara, Ph.D., 1968, Florida State University  
Professor Jeffrey E. Jarrett, Ph.D., 1967, New York University  
Professor Barbara Kaskosz, Ph.D., 1977, Polish Academy of Sciences  
Professor Russell C. Koza, Ph.D., 1968, Rensselaer Polytechnic Institute  
Professor Gerasimos Ladas, Ph.D., 1968, New York University  
Professor Edmund A. Lamagna, Ph.D., 1975, Brown University  
Professor James T. Lewis, Ph.D., 1969, Brown University  
Professor Dennis W. McLeavey, D.B.A., 1972, Indiana University; C.P.I.M. (Fellow); C.F.A.  
Professor Richard Mojena, Ph.D., 1971, University of Cincinnati  
Professor Seetharama Narasimhan, Ph.D., 1973, Ohio State University  
Professor Lewis J. Pakula, Ph.D., 1972, Massachusetts Institute of Technology

Professor S. Ghon Rhee, Ph.D., 1978, Ohio State University

Professor E. Ramnath Suryanarayan, Ph.D., 1961, University of Michigan

Professor Donald W. Tufts, Sc.D., 1960, Massachusetts Institute of Technology

Professor Ghasi Ram Verma, Ph.D., 1957, Rajasthan University

Associate Professor Gerard M. Baudet, Ph.D., 1978, Carnegie Mellon University

Associate Professor Nancy Eaton, Ph.D., 1992, Emory University

Associate Professor Victor Fay Wolfe, Ph.D., 1991, University of Pennsylvania

Associate Professor Colleen Kelly, Ph.D., 1991, University of California, San Diego

Associate Professor James G. Kowalski, Ph.D., 1975, University of Notre Dame

Associate Professor Orlando Merino, Ph.D., 1988, University of California, San Diego

Associate Professor Joan Peckham, Ph.D., 1990, University of Connecticut

Associate Professor Bala Ravikumar, Ph.D., 1987, University of Minnesota

Associate Professor David M. Shao, Ph.D., 1970, State University of New York, Buffalo

Associate Professor Manbir Sodhi, Ph.D., 1991, University of Arizona

Assistant Professor Betty (Biyue) Liu, Ph.D., 1993, University of Maryland

Professor Emeritus Edward J. Carney, Ph.D., 1967, Iowa State University

Professor Emeritus Emilio O. Roxin, Ph.D., 1959, University of Buenos Aires

### Specializations

Applied mathematics, applied probability, computer science, and operations research.

### Doctor of Philosophy

**Admission requirements:** GRE with advanced test in undergraduate field; bachelor's degree in computer science, engineering, mathematics, management science, physical sciences, statistics, or equivalent. With permission, GMAT may be substituted for GRE by applicants with business background. Applicants with entrance deficiencies may be accepted subject to taking certain undergraduate courses in addition to the graduate program requirements. Although a person with a bachelor's degree may be admitted,

this program is designed principally for people who have a master's degree.

*Program requirements:* dissertation; 54 credits beyond the bachelor's degree including MTH 435, 436; two courses selected from MTH 462, 513, 515, 535, 545, 561, and 641; and three core courses in each of two of the following areas: applied mathematics, basic analysis, numerical analysis, computer science, operations research, statistics, and applied probability. (A maximum of 30 credits may be granted for a master's degree in a closely related area. In this case, 400-level courses cannot be counted for program credit.) Comprehensive examination in core areas and reading proficiency in one foreign language. The oral comprehensive examination should include a faculty member from the Mathematics Department. The Ph.D. qualifying examination is required of students admitted without the master's degree. All Ph.D. candidates must register full-time for two consecutive semesters prior to the Ph.D. comprehensive examination.

Also see Mathematics, in this section.

## Applied Pharmaceutical Sciences

M.S., Ph.D. (Pharmaceutical Sciences)  
401-874-2754

### Graduate Faculty

*Chairperson:* Professor Thomas E. Needham, Ph.D., 1970, University of Rhode Island  
Professor Norman A. Campbell, Ph.D., 1972, University of Wisconsin  
Professor Serpil Kislalioglu, Ph.D., 1973, University of London  
Professor Joan M. Lausier, Ph.D., 1971, University of Rhode Island  
Professor Louis A. Luzzi, Ph.D., 1966, University of Rhode Island  
Professor Christopher T. Rhodes, Ph.D., 1964, Chelsea College, University of London  
Professor Sara Rosenbaum, Ph.D., 1980, University of Liverpool  
Professor Hossein Zia, Ph.D., 1969, University of Georgia  
Associate Professor Cynthia Willey Lessne, Ph.D., 1985, University of North Carolina, Chapel Hill

Assistant Professor Susan Andrade, D.Sc., 1994, Harvard School of Public Health  
Associate Research Professor Paul E. Larrat, Ph.D., 1992, Brown University

### Specializations

Applied pharmaceutical sciences with emphasis on physical pharmacy, biopharmaceutics, pharmacokinetics, formulation and manufacturing of conventional and novel drug delivery systems, and cosmetic products, drug standards, regulatory affairs, pharmacoepidemiology and pharmacoeconomics.

### Master of Science

*Admission requirements:* For the pharmaceuticals and cosmetic science and technology tracks: GRE, bachelor's degree in pharmacy or equivalent, and CSC 200 or equivalent.

*Program requirements:* For the pharmaceuticals track: thesis; STA 409, 411, or equivalent; CHM 431 or CHM 432 or BCH 435; APS 693, 694; nine credits of 500- or 600-level pharmaceuticals courses. For the cosmetic science and technology track: thesis; STA 409, 411, or equivalent; CHM 431 or CHM 432 or BCH 435 or CHE 542; APS 530, 531, 532, 693, 694; and 10 credits of electives with one course selected from 500- or 600-level pharmaceuticals courses.

### Doctor of Philosophy (Pharmaceutical Sciences)

*Admission requirements:* same as for master's degree. Written and oral qualifying examinations are required of all candidates.

*Program requirements:* for pharmaceutical formulations and regulatory affairs, dissertation; M.S. core requirements plus APS 693, 694, IME 533; and written and oral comprehensive examinations. In addition, for the pharmaceutical formulation track: CHE 530; six credits from CHM 512, MIC 533 and 552, FSN 447, APS 680, and CHM 511; and 10 additional credits of 500- or 600-level pharmaceuticals courses. For the regulatory affairs track: STA 409, STA (PHP) 411, APS 621, 670, 660, 680, 540, STA 535, and either APS 622 or 631. Additional

credits from the following to make a total of 48 course credits: APS 535, 550, 622, 623, 631, 633, 640X, 651, 652, PEX 564, MIC 533, MIC 552, MGT 630, MKT 601, CHM 512, PHP 540. Twenty-four doctoral dissertation credits are required.

For the pharmacoepidemiology and pharmacoeconomics track: 27 credits of core courses (APS 540, 550X, 640X, 651, 652, 680, 693, 694, STA 412, PSY 533 or STA 541); nine credits of concentration courses; 12 credits of electives; 24 credits of APS 699, qualifying examination, oral and written comprehensive examinations, and dissertation. Suggested concentrations include the improvement in quality of pharmaceutical delivery, pharmacoepidemiology, epidemiology, statistical analysis, nursing research, medical effectiveness, and health care administration. Tutorials may be arranged in areas of special interest to the student; students are expected to attend and participate in the departmental seminar (APS 693, 694) during their entire tenure in the Ph.D. program, for a maximum of three credits assigned to the core credit requirement.

## Aquaculture

See Fisheries, Animal and Veterinary Science.

## Audiology

M.S.

See Speech-Language Pathology and Audiology.

## Biochemistry

M.S.

401-874-2201

### Graduate Faculty

*Chairperson and Director of Graduate Studies:*  
Professor Jay F. Sperry, Ph.D., 1974, University of Kansas  
Professor Terence M. Bradley, Ph.D., 1983, University of Idaho  
Professor Paul S. Cohen, Ph.D., 1964, Boston University

Professor Marian R. Goldsmith, Ph.D., 1970,  
University of Pennsylvania  
Professor Linda A. Hufnagel, Ph.D., 1967,  
University of Pennsylvania  
Professor David C. Laux, Ph.D., 1971, University  
of Arizona  
Professor David R. Nelson, Ph.D., 1979,  
University of California, Los Angeles  
Professor Richard W. Traxler, Ph.D., 1958,  
University of Texas  
Professor George C. Tremblay, Ph.D., 1965, St.  
Louis University  
Associate Professor Joel M. Chandlee, Ph.D.,  
1984, North Carolina State University  
Associate Professor Anthony S. Fischl, Ph.D.,  
1986, Rutgers—The State University  
Associate Professor William R. Krul, Ph.D., 1967,  
Purdue University  
Associate Professor John P. Mottinger, Ph.D.,  
1968, Indiana University  
Associate Professor Joanna H. Norris, Ph.D.,  
1982, Michigan State University  
Adjunct Professor Albert Kausch, Ph.D., 1983,  
Iowa State University  
Adjunct Assistant Professor Shashikant R. Mehta,  
Ph.D., 1984, University of Texas, Houston  
Professor Emeritus Victor J. Cabelli, Ph.D., 1951,  
University of California, Los Angeles  
Professor Emeritus Karl A. Hartman, Jr., Ph.D.,  
1962, Massachusetts Institute of Technology  
Professor Emeritus Norris P. Wood, Ph.D., 1955,  
University of Pennsylvania

### Master of Science

*Admission requirements:* GRE and a bachelor's degree in some field of science or engineering including two semesters each in organic chemistry with laboratory, biological sciences, and calculus, and one semester in physics. Students may be accepted with deficiencies, which must be made up without program credit.

*Program requirements for all M.S. candidates:* BCH 435, 521, 581, 582, one credit of 695 or 696, and three credits in an additional 500-level course exclusive of special topics or research. All full-time students are expected to be continuously registered for BCH 695, 696 (Seminar), but no more than one credit can be used for program credit. Thesis option: a minimum of 24 credits (exclusive of thesis credits) including the above requirements and a thesis. Nonthesis option: a minimum of 36

credits including the above requirements, BCH 651 or 652, and the written master's examination.

### Biological Sciences

M.S., Ph.D. (Biological Sciences)  
401-874-2372

#### Graduate Faculty

*Chairperson:* Professor Robert C. Bullock, Ph.D., 1972, Harvard University  
*Director of Graduate Studies:* Associate Professor Saran Twombly, Ph.D., 1983, Yale University  
Professor Harold D. Bibb, Ph.D., 1969, University of Iowa  
Professor J. Stanley Cobb, Ph.D., 1969, University of Rhode Island  
Professor Robert F. Costantino, Ph.D., 1967, Purdue University  
Professor Marian R. Goldsmith, Ph.D., 1970, University of Pennsylvania  
Professor Marilyn Harlin, Ph.D., 1971, University of Washington  
Professor Frank H. Heppner, Ph.D., 1967, University of California, Davis  
Professor Robert B. Hill, Ph.D., 1957, Harvard University  
Professor Gabriele Kass-Simon, D.Phil., 1967, University of Zurich  
Professor Keith T. Killingbeck, Ph.D., 1976, University of North Dakota  
Professor Richard E. Koske, Ph.D., 1971, University of British Columbia  
Associate Professor Joanna F. Norris, Ph.D., 1982, Michigan State University  
Associate Professor Alison W. Roberts, Ph.D., 1990, Texas Tech University  
Assistant Professor Emily C. Bell, Ph.D., 1992, Stanford University  
Adjunct Professor James Blake, Ph.D., 1969, University of Maine  
Adjunct Professor Paul S. Chomet, Ph.D., 1988, State University of New York, Stony Brook  
Adjunct Professor Alan W. Harvey, Ph.D., 1988, University of Arizona  
Adjunct Professor Donald C. Miller, Ph.D., 1965, Duke University  
Adjunct Professor Kenneth Sebens, Ph.D., 1977, University of Washington  
Adjunct Professor Peter Smith, Ph.D., 1979, Aberdeen University  
Adjunct Professor Ruth D. Turner, Ph.D., 1954, Radcliffe College, Harvard University

Adjunct Associate Professor Susan L. Hammen-Winn, Ph.D., 1989, University of Rhode Island  
Adjunct Associate Professor Glen D. Thursby, Ph.D., 1983, University of Rhode Island  
Adjunct Assistant Professor Jane N. Gemma, Ph.D., 1987, University of Rhode Island  
Adjunct Assistant Professor Clifford H. Katz, Ph.D., 1982, University of Connecticut  
Adjunct Assistant Professor Eric M. Roberts, Ph.D., 1991, University of Texas, Austin  
Professor Emeritus Roger D. Goos, Ph.D., 1958, University of Iowa  
Professor Emeritus Kerwin E. Hyland, Ph.D., 1953, Duke University  
Professor Emeritus C. Robert Shoop, Ph.D., 1963, Tulane University  
Associate Professor Emeritus William F. Krueger, Ph.D., 1967, Boston University

### Specializations

*Molecular, cell and developmental biology:* role of endogenous and environmental signals in the regulation of gene expansion and differentiation, construction of molecular linkage maps, genetic analysis of quantitative traits, plant-microbe interactions, signal transduction in plants.

*Physiology:* comparative physiology and neurobiology of marine invertebrates; physiology of nutrient resorption in plants; plant stress physiology; physiology of mycorrhizal fungi.

*Ecology, systematics and behavior:* population and community ecology, biomechanics of aquatic and terrestrial plants and animals, recruitment and fisheries biology of decapod crustaceans, invertebrate behavior and neuroethology, ecology and physiology of nutrient resorption, systematics of marine invertebrates, especially Mollusca.

### Master of Science

*Admission requirements:* GRE and bachelor's degree with major in the sciences. Candidates lacking undergraduate courses in organic chemistry, physics, mathematics through introductory calculus, and fundamental courses in biological sciences may be required to make up deficiencies without graduate credit. Applicants are normally admitted for the fall

semester only. The completed application package must be received by April 15. For consideration for financial aid, the application package should be received by February 1.

*Program requirements:* thesis or nonthesis options.

The thesis option requires a minimum of 30 credits, six to nine of which may be earned through thesis research (BIO 599). BIO 581, 582 must be taken each year; thesis defense also required.

The nonthesis option is designed for students in the health sciences planning to enter a professional school upon completion of the M.S. degree. A minimum of 30 credits of course work, a written comprehensive examination, and a substantial project (including a written paper) are required. Twelve credits in biology are chosen from the following: BIO 437, 442, 444, 453, 541, 545, 546, 549, 550, 572, 573, 668, or other approved upper-level courses, three credits in advanced biochemistry (BCH 435, 481, or 581) or physical chemistry (CHM 431), three credits in statistics, at or above the 400 level. Seven elective credits may be chosen from recommended upper-level biology courses including MIC 431, 414, 415, 416, 503, 505, 521, 533, and AVS 472. A maximum of three credits is to be chosen from the following courses or their equivalent: BIO 691, 692 (Biological Problems), BIO 581, 582 must be taken each year.

### Doctor of Philosophy (Biological Sciences)

*Admission requirements:* same as for master's degree; master's degree not required. Applicants are expected, but not required, to have a reading knowledge of two languages in addition to their native language. Applicants are normally admitted for the fall semester only. The completed application package must be received by April 15. For consideration for financial aid, the application package should be received by February 1.

*Program requirements:* comprehensive examination and dissertation defense; qualifying examination required for all

candidates except those having an M.S. degree; a minimum of 72 credits, 18–28 of which can be earned through dissertation research (BIO 699). Thirty transfer credits will be accepted for students who have received a M.S. degree. Registration in BIO 581, 582 required each year.

### Biomedical Sciences

See Medicinal Chemistry.

See Pharmacognosy.

See Pharmacology and Toxicology.

### Business Administration

M.B.A., Ph.D.

401-874-5000

#### Graduate Faculty

*Director of Graduate Programs:* Professor Richard W. Scholl, Ph.D., 1979, University of California, Irvine

*Director of Ph.D. Program:* Professor Shaw K. Chen, Ph.D., 1988, University of Michigan

#### Accounting

*Chairperson:* Professor Henry R. Schwarzbach, D.B.A., 1976, University of Colorado; C.P.A. Professor Spencer J. Martin, Ph.D., 1970, University of Illinois; C.P.A.

Professor Joseph P. Matoney, Jr., Ph.D., 1973, Pennsylvania State University; C.P.A. (Rhode Island)

Professor Richard Vangermeersch, Ph.D., 1970, University of Florida; C.P.A. (Rhode Island) Associate Professor Judy K. Beckman, Ph.D., 1991, Texas Tech University; C.P.A.

Associate Professor Edmund J. Boyle, Ph.D., 1990, Pennsylvania State University; C.P.A.

Associate Professor Marshall A. Geiger, Ph.D., 1988, Pennsylvania State University; C.P.A.

Associate Professor Alejandro Hazera, D.B.A., 1989, University of Kentucky; C.P.A.

Associate Professor Mark Higgins, Ph.D., 1989, University of Tennessee; C.P.A.

#### Business Law

Professor Charles Hickox, L.L.M., 1994, Boston University

Professor Andrew Laviano, J.D., 1965, New York University School of Law

Associate Professor John Dunn, J.D., 1977, Boston College Law School

#### Finance and Insurance

*Chairperson:* Associate Professor Gordon H. Dash, Jr., D.B.A., 1978, University of Colorado

Professor Rosita P. Chang, Ph.D., 1982, University of Pittsburgh

Professor Gene C. Lai, Ph.D., 1987, University of Texas, Austin

Professor Dennis W. McLeavey, D.B.A., 1972, Indiana University; C.F.A.

Professor S. Ghon Rhee, Ph.D., 1978, Ohio State University

Associate Professor Yul Lee, Ph.D., 1986, University of Texas, Austin

Associate Professor Blair M. Lord, Ph.D., 1975, University of California, Davis

Associate Professor Henry R. Oppenheimer, Ph.D., 1979, Purdue University

#### Management

*Chairperson:* Associate Professor Sanjiv Dugal, Ph.D., 1991, University of Massachusetts

Professor Robert A. Comerford, Ph.D., 1976, University of Massachusetts

Professor George deLodzia, Ph.D., 1969, Syracuse University

Professor Craig E. Overton, Ph.D., 1971, University of Massachusetts

Professor Charles T. Schmidt, Jr., Ph.D., 1968, Michigan State University

Professor Richard W. Scholl, Ph.D., 1979, University of California, Irvine

Professor Clay V. Sink, Ph.D., 1968, Ohio State University; C.A.M.

Associate Professor Laura L. Beauvais, Ph.D., 1987, University of Tennessee

Associate Professor Elizabeth A. Cooper, Ph.D., 1985, University of Akron

Assistant Professor Linda M. Randall, Ph.D., 1993, University of Massachusetts

#### Management Science and Information Systems

*Chairperson:* Professor Maling Ebrahimpour, Ph.D., 1986, University of Nebraska

Professor Charles P. Armstrong, Ph.D., 1973, University of Arizona

Professor Frank S. Budnick, D.B.A., 1973, University of Maryland

Professor Shaw K. Chen, Ph.D., 1988, University of Michigan

Professor Alan B. Humphrey, Ph.D., 1965, North Carolina State University

Professor Jeffrey E. Jarrett, Ph.D., 1967, New York University

Professor Chai Kim, Ph.D., 1973, University of Pittsburgh

Professor Russell C. Koza, Ph.D., 1968, Rensselaer Polytechnic Institute

Professor Paul M. Mangiameli, Ph.D., 1979,  
Ohio State University  
Professor Richard Mojena, Ph.D., 1971,  
University of Cincinnati  
Professor Seetharama Narasimhan, Ph.D., 1973,  
Ohio State University  
Professor Stuart Westin, Ph.D., 1983, University  
of Massachusetts  
Associate Professor Roy Ageloff, Ph.D., 1975,  
University of Massachusetts

#### Marketing

*Chairperson:* Professor Albert J. Della Bitta,  
Ph.D., 1971, University of Massachusetts  
Professor Nikhilesh Dholakia, Ph.D., 1975,  
Northwestern University  
Professor Ruby Roy Dholakia, Ph.D., 1976,  
Northwestern University  
Professor Eugene M. Johnson, D.B.A., 1969,  
Washington University  
Professor M. Ven Venkatesan, Ph.D., 1965,  
University of Minnesota  
Associate Professor Bari Harlam, Ph.D., 1991,  
University of Pennsylvania  
Associate Professor Jonathan Schroeder, Ph.D.,  
1990, University of California, Berkeley  
Associate Professor Carol F. Surprenant, Ph.D.,  
1981, University of Wisconsin  
Assistant Professor Deborah Rosen, Ph.D., 1992,  
University of Tennessee

#### Specializations

*For the M.B.A.:* finance, general management, international management, management science, and marketing.

*For the Ph.D.:* finance and insurance, management, management science, and marketing.

#### Master of Business Administration

The Master of Business Administration (M.B.A.) program prepares students for leadership positions in business, government, and nonprofit organizations. The faculty seeks to develop a global perspective while stressing the ethical and environmental responsibilities inherent in all management activities. The program is offered on the Kingston Campus for full-time students, and in the evening through the Alan Shawn Feinstein College of Continuing Education in Providence for part-time students. Full-time candidates may begin the program in the fall semester only. Part-

time candidates may begin the program in the fall or spring semester.

In addition, an M.B.A. for Executives may be completed in 22 months, beginning in August, by participating in a program that meets on Fridays and Saturdays at the W. Alton Jones Campus. A group of 20–25 experienced managers (7–10 years of management experience) follows a curriculum that emphasizes computer applications, human relations, organizational behavior, financial analysis, and other areas useful to the effective manager. Applicants should specify the M.B.A. program (full-time, part-time, executive) they wish to enroll in on the application.

*Admission requirements:* Graduate Management Admissions Test (GMAT), a statement of purpose, a resumé, two letters of recommendation, and transcripts of all previous undergraduate or postbaccalaureate work are required. Work experience is valued. Applicants for whom English is not the native language are required to score 575 or above on the TOEFL. The GMAT score and undergraduate quality point average are not the sole criteria for admission. However, those with undergraduate quality point averages of less than B or those with less than 50th percentile scores on the GMAT have a low probability of admission. Applications from well-qualified individuals who can contribute to the cultural and ethnic diversity of the College of Business Administration and of the University are welcome.

*Program requirements:* nonthesis program requires a minimum of 36 credits and a maximum of 54 credits. Of these, 11 credits are designated entry-level courses: ECN 590, BAC 500, 520, and 530. BAC 500, 520, and 530 may be waived upon successful completion of proficiency examinations administered by the Department of Management Science and Information Systems. These courses may also be waived with permission of the chairperson and program director based on recent successful completion of equivalent college-level courses at an AACSB (the International Association for Management Education) accredited institution. ECN 590

may also be waived based on recent completion of college-level courses in micro- and macroeconomics with grades of B or better.

The 43-credit standard program is composed of 31 credits of required courses: ACC 610; BSL 600; FIN 601, 660; MGT 630, 681; MSI 600, 620, 640; MKT 601; plus 12 credits of electives. Of the required courses, the following may be waived (with the recommendation of the appropriate chairperson and the M.B.A. program director, and the approval of the Dean of the Graduate School) based on significant prior college-level study in the appropriate field (usually multiple courses in the field from an AACSB (the International Association for Management Education) accredited program): ACC 610; BSL 600; MGT 630; and MKT 601. Of the 12 elective credits, no more than nine may be required in a single field of specialization. Students who do not wish to specialize may choose their electives with the prior approval of the M.B.A. program director and the Dean of the Graduate School.

For the specializations listed here, the courses indicated are either required or recommended, *in addition to the required M.B.A. courses*. Other electives may be used to complement the required courses, but such choices are subject to approval by the M.B.A. program director.

Students are encouraged to participate in internships, which include both practical and academic components. Arrangements must be made through an academic advisor and must include registration in the appropriate course; e.g., MGT 693, 694 Internship in Management. Placements may be arranged through various external organizations.

*Finance* (Coordinator: Professor Gene C. Lai). Students choose electives that emphasize corporate finance, investment management, international finance, speculative markets, or financial institutions. Requirements: FIN 641 and two electives chosen from FIN courses and ECN 538.

*General management* (Coordinator: Professor Clay V. Sink). Students go beyond the core management courses and study

areas such as organizational behavior, theory, and development; human relations; labor relations; entrepreneurship; strategic management; and business law. Requirements: three electives selected from MGT or BSL courses, LRS 541, 542 or 543 (not both), and LRS 545.

*International management* (Coordinator: Lisa Hadzkyriakides). Students study the problems and processes of managing organizations in an interdependent, global environment. Requirements: three electives selected from ECN 538; FIN 652; LRS/PSC 521; MGT 655, 656, and 657; and MKT 651. Students are encouraged to take supplemental interdisciplinary courses in the historical, cultural, social, political, economic, or linguistic differences in management. Those with appropriate levels of second-language proficiency are encouraged to take a business language course.

*Management science and information systems* (Coordinator: Professor Maling Ebrahimpour). Students select courses that examine information as an economic resource that can be managed, as can the more traditional resources such as labor, land, and capital. The department encompasses all aspects of managing information as a vital resource. This includes the technologies, mechanisms, methodologies, concepts, and issues involved in the effective acquisition, manipulation, analysis, evaluation, and presentation of information. Requirements: three MSI electives.

*Marketing* (Coordinator: Professor Albert Della Bitta). Students study essential elements of marketing beyond the fundamentals covered in the core marketing course. Electives are chosen from course offerings.

All 600-level courses offered by departments in the College of Business Administration are open to matriculated graduate students only.

### Doctor of Philosophy

The Doctor of Philosophy program is small and highly selective. Admission is competitive and based on academic merit, research capabilities, and the match of research interests between the applicant

and faculty in the indicated area of specialization.

*Admission requirements:* GMAT or GRE, and a master's degree. Applicants with diverse academic backgrounds are encouraged to apply.

Applicants are admitted for the fall semester only. Due to the selectivity of the programs, new admissions to the doctoral program must be limited to a small number each year. Since applicants are evaluated for each of the four specialization areas independently, all applicants must specify a single area of specialization on the application form. Completed application package must be received by March 1; applications received after that date are reviewed on a space-available basis until the programs are full, and are not guaranteed a full review.

Applicants for whom English is not the native language will be expected to score 575 or above on the TOEFL. The GMAT and GRE scores and master's quality point average are not the sole criteria for admission. However, those with master's quality point averages of less than 3.20 on a 4.00 point scale or those who score lower than the 60th percentile on the GMAT or GRE have a low probability of admission. The average master's quality point average for current doctoral candidates is 3.60, and their GMAT scores average in the top 20th percentile.

*Program requirements:* during the qualifying phase of the program, entering doctoral students must take four written qualifying examinations. These written examinations are scheduled in accounting, financial economics, behavioral science, and decision science. One or more of these examinations may be waived for a student on the basis of course work taken in the last five years.

The advanced study phase includes a minimum of 32 credit hours of advanced course work in the area of specialization, in supporting and connected areas, and in research methodology and techniques. Course work during this phase may include seminars, directed studies, research projects, and field work deemed appropriate

for the student's area of specialization. All Ph.D. candidates must include BUS 601 and 602 in their programs of study. Each student is required to write at least three major papers of publishable quality. This phase culminates in a written comprehensive examination covering the student's area of specialization as well as research methods and statistics.

After passing the comprehensive examination, doctoral candidates enter the dissertation research phase and engage in significant research under the supervision of their major professor and the doctoral committee. Doctoral dissertation research is expected to make a major contribution to the state of knowledge in the candidate's field. The dissertation defense is a final oral examination administered according to procedures established by the Graduate School.

The Department of Management Science and Information Systems is also a sponsor of the Ph.D. program in applied mathematical sciences.

### General Information

In addition to the University's Office of Information Services (see page 7), business students have access to four other computer facilities: the Dennis W. Callaghan Microcomputer Laboratory, the Computer-Integrated Manufacturing Laboratory, the college's general computer facility, and a smaller computer laboratory at the Alan Shawn Feinstein College of Continuing Education. These facilities are available to both daytime and evening students six days a week.

## Chemical Engineering

M.S., Ph.D.  
401-874-2655

### Graduate Faculty

*Director of Graduate Studies:* Professor Stanley M. Barnett, Ph.D., 1963, University of Pennsylvania  
Professor Arijit Bose, Ph.D., 1981, University of Rochester



Professor Richard Brown, Ph.D., 1977,  
University of Cambridge  
Professor Otto Gregory, Ph.D., 1982, Brown  
University  
Professor Harold N. Knickle, Ph.D., 1969,  
Rensselaer Polytechnic Institute  
Chester H. Kirk Professor Angelo Lucia, Ph.D.,  
1981, University of Connecticut  
Professor Thomas J. Rockett, Ph.D., 1963, Ohio  
State University  
Professor Vincent C. Rose, Ph.D., 1964,  
University of Missouri; P.E.  
Associate Professor Donald J. Gray, Ph.D., 1980,  
University of Rhode Island  
Associate Professor Mercedes Rivero-Hudec,  
Ph.D., 1986, University of Pennsylvania  
Adjunct Assistant Professor Everett Crisman,  
Ph.D., 1984, Brown University

### Specializations

*Biochemical engineering:* reactors, purification methods, degradation, and chemical production.

*Environmental engineering:* separation methods, heavy metal removal, solvent recovery, hazardous waste minimization, and desalination.

*Food engineering:* membrane processes.

*Materials engineering:* corrosion and erosion, electronic materials processing, ceramic processing, polymer films, conducting polymers and thin film materials and sensors.

*Transport phenomena:* interfacial and colloidal phenomena, filtration, flow through porous media, multiphase fluid mechanics, phase equilibria, and diffusion through polymers.

*Energy engineering:* analysis of energy systems, multiphase flow and water conservation.

*Unit operations:* mixing, vacuum processes, chromatography, electrodialysis, ultrafiltration and microfiltration.

*Process simulations:* design and optimization of multiphase separation systems.

### Master of Science

*Admission requirements:* bachelor's degree in chemical engineering; candidates from other engineering fields or from mathematics, biology, chemistry, or physics may be accepted into the program with possible addition of prerequisite courses.

*Program requirements:* 30 credits including CHE 513, 541. Thesis option; six–nine credits of CHE 599; 21–24 credits of course work. Nonthesis option for part-time students, with permission of the chairperson; master's examination and comprehensive report with oral examination. Attendance in CHE 501 or 502 is required every semester for all on-campus students.

### Doctor of Philosophy

*Admission requirements:* M.S. degree in engineering (may be waived for University of Rhode Island graduate students who pass the qualifying examination with superior performance).

*Program requirements:* candidate's program will be determined in consultation with his or her committee and will be based on his or her background and career goals. A comprehensive examination is required to complete the program. In addition to an acceptable dissertation, a candidate must submit a manuscript, based on his or her research, suitable for publication in a technical journal. CHE 501, 502 is also required.

## Chemistry

M.S., Ph.D.  
401-874-2318

### Graduate Faculty

*Chairperson:* Professor Wilfred H. Nelson, Ph.D., 1962, University of Minnesota  
Professor Christopher W. Brown, Ph.D., 1967, University of Minnesota  
Professor Phyllis R. Brown, Ph.D., 1968, Brown University  
Professor Joel A. Dain, Ph.D., 1957, Cornell University  
Professor William B. Euler, Ph.D., 1979, Florida State University  
Professor James L. Fasching, Ph.D., 1970, Massachusetts Institute of Technology  
Professor Harold W. Fisher, Ph.D., 1959, University of Colorado  
Professor David L. Freeman, Ph.D., 1972, Harvard University  
Professor Louis J. Kirschenbaum, Ph.D., 1968, Brandeis University

Professor Raymond P. Panzica, Ph.D., 1972, University of Utah  
Professor William M. Rosen, Ph.D., 1967, University of California, Riverside  
Professor Yuzuru Shimizu, Ph.D., 1962, Hokkaido University  
Professor Daniel D. Traficante, Ph.D., 1962, Massachusetts Institute of Technology  
Professor Bruno M. Vittimberga, Ph.D., 1957, University of Illinois  
Professor Sze Cheng Yang, Ph.D., 1973, Columbia University  
Associate Professor Cynthia G. Zoski, Ph.D., 1985, Trent University  
Adjunct Associate Research Professor Jimmie Carol Oxley, Ph.D., 1983, University of British Columbia  
Adjunct Associate Research Professor James Smith, Ph.D., 1980, University of British Columbia  
Professor Emeritus Paul I. Abell, Ph.D., 1951, University of Wisconsin

### Specializations

*Analytical chemistry:* electrochemistry, vibrational spectroscopy, separations science, laser spectroscopy, bioanalyses.

*Biological chemistry:* neurochemistry, oxidative stress, macromolecular recognition.

*Inorganic chemistry:* metal oxidation state, solution kinetics, low-dimensional conductors, coordination complexes, light scattering, polymeric materials.

*Organic chemistry:* reaction mechanisms, synthesis, electron transfer, structural analysis, marine natural products, heterocycles, polymerization.

*Physical chemistry:* theoretical chemistry, molecular spectroscopy, polymer arrays, statistical mechanics, smart materials.

### Master of Science

*Admission requirements:* GRE only for graduates of non-U.S. universities, with advanced test strongly recommended. Preference is given to candidates with undergraduate majors in chemistry or chemical engineering with mathematics through calculus.

*Program requirements:* placement examination to determine specific program requirements and successful completion of master's qualifying examinations. For the-

sis option (31 credits), 12 credits of graduate core courses in at least three of the four areas of chemistry; one additional graduate-level course in chemistry; CHM 642 or 643; and thesis. For nonthesis option (30 credits), 18 credits of graduate core courses; six additional credits of graduate course work; CHM 642 (1 credit); CHM 551, 552 (minimum 5 credits); and a written comprehensive examination.

The nonthesis option is also offered on-site at Pfizer, Inc. (Groton, CT): (30 credits), 18 credits of graduate core courses; six additional credits of graduate course work; CHM 642 (1 credit, taken in Kingston), CHM 551 (minimum 5 credits); and a written take-home comprehensive exam.

### Doctor of Philosophy

*Admission requirements:* same as for master's degree.

*Program requirements:* successful completion of qualifying examination; 15 credits of graduate core courses; one additional graduate-level course in chemistry; and CHM 642–644 (3 credits). Comprehensive examination and dissertation.

## Civil and Environmental Engineering

M.S., Ph.D.  
401-874-2692

### Graduate Faculty

*Chairperson:* Professor Raymond M. Wright, Distinguished Professor, Ph.D., 1981, Pennsylvania State University; P.E.

*Director of Graduate Studies:* Professor K. Wayne Lee, Ph.D., 1982, University of Texas, Austin; P.E.

Professor William D. Kovacs, Ph.D., 1968, University of California, Berkeley; P.E.

Professor Calvin P.C. Poon, Ph.D., 1964, University of Illinois; P.E.

Professor Armand J. Silva, Ph.D., 1965, University of Connecticut; P.E.

Professor George Tsiatas, Ph.D., 1984, Case Western Reserve University

Professor Daniel W. Urish, Ph.D., 1978, University of Rhode Island; P.E.

Associate Professor Dimitrios Karamanlidis, D.Eng., 1979, Technical University of Berlin  
Associate Professor Alan S. Marcus, Ph.D., 1969, University of Massachusetts

Associate Professor Leon T. Thiem, Ph.D., 1982, University of Missouri; P.E.

Associate Professor George E. Veyera, Ph.D., 1985, Colorado State University

Adjunct Professor Milton E. Harr, Ph.D., 1958, Purdue University

Adjunct Professor Norbert A. Jaworski, Ph.D., 1968, University of Michigan, Ann Arbor; P.E.

Adjunct Professor Robert B. Shaw, M.S., 1966, Purdue University; P.E.

Adjunct Professor Thomas E. Wright, M.S.E., 1975, West Virginia University; P.E.

Adjunct Associate Professor Michael C. Apostol, Ph.D., 1974, State University of New York, Buffalo

Adjunct Assistant Professor Diane L. Badorek, Ph.D., 1982, University of Missouri; P.E.

### Specializations

*Environmental engineering:* water supply and treatment facilities, municipal and industrial waste treatment, flocculation and coagulation of wastes, solid waste and hazardous waste management, modeling of environmental systems, groundwater pollution, groundwater exploration, coastal groundwater, nonpoint source pollution, stormwater management, river and estuary hydrology, hydraulics and water quality.

*Geotechnical engineering:* geoacoustic modeling and properties of marine sediments, sediment sampling, in-situ testing, deep-sea sedimentary processes, sediment transport, creep processes, environmental geotechnology, dredge material disposal, experimental geomechanics, soil-structure interaction, constitutive modeling of geological materials, particulate mechanics, applications of nonlinear finite element and discrete element methods to geomechanics problems, earthquake engineering, wave propagation in granular media, dynamic soil properties, liquefaction, geosynthetics.

*Structural engineering:* matrix and finite element analysis, computer and numerical methods, deterministic and stochastic structural dynamics, earthquakes, vibration control of buildings, system identification,

structural reliability, hysteretic structures, fatigue, design of steel and concrete structures, marine structures, structural stability, thin-walled structures, coastal structures, deterministic and stochastic structural dynamics, structural reliability, vibration control, earthquakes, soil-structure interaction, condition assessment and rehabilitation of bridges.

*Transportation engineering:* properties of pavement materials, pavement theory and design, pavement management system, highway location, and geometric design. For master's level only: traffic operation and control, transportation cost, transportation supply and demand analysis, and transportation system analysis.

### Master of Science

*Admission requirements:* bachelor's degree in civil or environmental engineering. Candidates in other engineering fields or in mathematics, biology, chemistry, or physics may be accepted with the possibility of additional undergraduate prerequisite courses being required.

*Program requirements:* thesis or nonthesis option. Thirty credits plus CVE 601, 602 except for part-time students. For the thesis option, the thesis counts as six to nine of the required credits. The nonthesis option requires a comprehensive technical report and a written comprehensive examination.

### Doctor of Philosophy

*Admission requirements:* master's degree in civil or environmental engineering or in a related field.

*Program requirements:* a minimum of 42 credits plus CVE 601 and 602 beyond the M.S. degree. Students take between 18 and 24 dissertation credits, including the two-course minor outside of the candidate's area of specialization, where required by the candidate's committee; a comprehensive examination; and a dissertation. Although there is no formal departmental language requirement, the candidate's committee may require proficiency with a research tool or in a foreign language.

## Clinical Laboratory Science

M.S.  
401-874-2315

### Graduate Faculty

*Chairperson:* Professor Jay F. Sperry, Ph.D., 1974, University of Kansas  
*Director of Graduate Studies:* Adjunct Associate Professor Gregory E. Paquette, Ph.D., 1992, University of Rhode Island  
 Professor John Boulmetis, Ph.D., 1982, Ohio State University  
 Professor Norman A. Campbell, Ph.D., 1972, University of Wisconsin  
 Professor Marian R. Goldsmith, Ph.D., 1970, University of Pennsylvania  
 Professor David C. Laux, Ph.D., 1971, University of Arizona  
 Professor George C. Tremblay, Ph.D., 1965, St. Louis University  
 Associate Professor Joanna Hanks Norris, Ph.D., 1982, Michigan State University  
 Associate Professor Mercedes A. Rivero-Hudec, Ph.D., 1986, University of Pennsylvania  
 Adjunct Professor Martha Hutchinson, Ph.D., 1974, Case Western University  
 Adjunct Professor David Mello, M.S., 1978, University of Massachusetts, Dartmouth  
 Adjunct Professor Michael Sheff, Ph.D., 1957, Sheffield University  
 Adjunct Professor Ronald Yankee, M.D., 1960, Yale Medical School  
 Adjunct Associate Professor Barbara E. Barker, Ph.D., 1965, University of Rhode Island  
 Adjunct Associate Professor Jacob A. Canick, Ph.D., 1972, University of Rhode Island  
 Adjunct Associate Professor Steven Opal, M.D., 1976, Albany Medical College  
 Adjunct Associate Professor Umadevi Tantravahi, Ph.D., 1980, Columbia University  
 Adjunct Assistant Professor Wayne J. Aucoin, M.S., 1983, Salve Regina University  
 Adjunct Assistant Professor Edward Balkovic, Ph.D., 1984, Baylor College of Medicine  
 Adjunct Assistant Professor Julia E. Blazek-D'Arezzo, Ph.D., 1982, University of Rhode Island  
 Adjunct Assistant Professor Judith S. Heelan, Ph.D., 1982, University of Rhode Island  
 Adjunct Assistant Professor Margaret Kenney, M.S., 1983, Southeastern Massachusetts University  
 Adjunct Assistant Professor Leonard LaFazia, M.S., 1984, Salve Regina University  
 Adjunct Assistant Professor Kenneth Mayer, M.D., 1977, Northeastern University

Adjunct Assistant Professor Frank Meglio, M.S., 1980, Northeastern University  
 Adjunct Assistant Professor William P. Metheny, Ph.D., 1985, Michigan State University

### Specializations

Major specializations in biotechnology, clinical chemistry, cytopathology, clinical microbiology, hematology, immunohematology; minor specializations in adult education and management.

### Master of Science

*Admission requirements:* GRE recommended; bachelor's degree in clinical laboratory sciences, life sciences, physical sciences, or health sciences (for cytopathology, must include 20 semester hours of biological sciences, including anatomy and physiology, and eight semester hours of chemistry); certification, or certification eligibility, by a nationally recognized certifying agency, or a minimum of one year's postbaccalaureate laboratory experience. One course in statistics is required. Applicants with deficiencies in background courses may be required to complete appropriate course work without graduate credit.

*Program requirements:* BCH 551, EDC 505, 582, 583 or 584 (or MIC 534 or MTC 591 for cytopathology; MIC 534 for biotechnology), MTC 510, 512, 513, and nine to 24 credits in the area of specialization (BIO 437, CHE 574, MTC/APS 571 and MTC 594 for biotechnology; ASP 534, MTC 502 and 543 for clinical chemistry; ASP 534, MTC 501 and 541 for clinical microbiology; ASP 534, MTC 520 and 530 for hematology and immunohematology; MTC 561 through 566 for cytopathology). The remainder of courses are to be selected from education, management, or other specializations for a total of 33 credits (39 credits for cytopathology). Comprehensive written examination. Major research paper. The following courses are recommended for a minor specialization in health care management: APS 651, 652, and 680. The following courses are recommended for a minor specialization in adult education: four

courses selected from EDC 505, 529, 582, 583, and 584.

## Communication Studies

M.A. (pending approval by the Board of Governors)  
401-874-2552

### Graduate Faculty

*Chairperson:* Professor Steven C. Wood, Ph.D., 1984, University of Maryland  
 Professor Judith L. Anderson, Ph.D., 1970, Indiana University  
 Professor and Interim Director of the College of Arts and Sciences, Winifred E. Brownell, Ph.D., 1973, State University of New York, Buffalo  
 Professor L. Patrick Devlin, Ph.D., 1968, Wayne State University  
 Professor Agnes G. Doody, Ph.D., 1961, Pennsylvania State University  
 Professor Sandra M. Ketrow, Ph.D., 1982, Indiana University  
 Professor Norbert Mundorf, Ph.D., 1987, Indiana University  
 Associate Professor Guo-Ming Chen, Ph.D., 1987, Kent State University  
 Associate Professor Antone J. Silvia, M.A., 1976, University of Birmingham, England  
 Assistant Professor Madeline (Lynne) Derbyshire, Ph.D., 1997, University of Maryland  
 Assistant Professor Geoffrey B. Leatham, Ph.D., 1994, University of Iowa  
 Assistant Professor Kevin R. McClure, Ph.D., 1992, Pennsylvania State University  
 Assistant Professor Vanessa Wynder Quainoo, Ph.D., 1993, University of Massachusetts, Amherst

### Specializations

Specializations are offered in applied communication, interpersonal communication, media studies, organizational communication, political communication, and public discourse. In consultation with advisors, students prepare for careers in public and private industry, government, or academic areas. Students are encouraged to develop their course plans to foster their evolving career needs. Thus, one might advance specific interests and competencies in areas such as communication technology, conflict management, political media,

organizational communication consulting, or public relations. Individual specialties can be developed within each of the specialization areas.

Courses are generally offered in late afternoon or evening in Providence and Kingston for the convenience of employed persons. Both full- and part-time programs of study are available.

### Master of Arts

*Admission requirements:* generally, GRE and bachelor's degree with undergraduate credit in communication studies. Students from other academic backgrounds are encouraged to apply and may be admitted with the permission of the Director of Graduate Studies and the department chairperson, but some basic courses may have to be taken for no program credit.

*Program requirements:* an approved program will include a minimum of 30 credits for either the thesis or nonthesis option. COM 501 and COM 502 are required for all students. For the thesis option, a thesis based on independent research and its oral defense, and 24 course credits. For the nonthesis option (admission with approval of the Director of Graduate Studies), one course including a substantial paper requiring significant independent research, and a written comprehensive examination. Up to 12 credits of free electives, including independent study in COM 591 and/or COM 592, are permitted in the program subject to approval by the Director of Graduate Studies in communication. No more than six of those elective credits may be in independent studies.

### Community Planning and Area Development

M.C.P.  
401-874-2248/2249

#### Graduate Faculty

*Chairperson:* Associate Professor Farhad Atash, Ph.D., 1986, Rutgers—The State University  
Professor Marcia Marker Feld, Ph.D., 1973, Harvard University

Associate Professor Marshall M. Feldman, Ph.D., 1981, University of California  
Associate Professor Howard H. Foster, Jr., Ph.D., 1970, Cornell University  
Associate Professor Marjorie E. Jensen, M.S., 1978, University of Rhode Island  
Adjunct Professor Cynthia M. Hamilton, Ph.D., 1980, Boston University  
Adjunct Professor Carol J. Thomas, M.S., 1948, University of Connecticut  
Adjunct Associate Professor David H. Abedon, M.A., 1972, University of Rhode Island  
Adjunct Associate Professor Thomas E. Deller, M.C.P., 1979, University of Rhode Island  
Adjunct Associate Professor Kevin M. Flynn, M.C.P., 1980, University of Rhode Island  
Adjunct Associate Professor Kenneth Payne, M.C.P., 1973, University of Rhode Island  
Adjunct Associate Professor Peter D. Ruggiero, M.C.P., 1981, University of Rhode Island  
Adjunct Associate Professor Samuel J. Shamoan, M.C.P., 1970, University of Rhode Island  
Adjunct Associate Professor Robert Shaw, M.S.C.E., 1966, Purdue University  
Adjunct Associate Professor, David R. Westcott, M.C.P., 1979, University of Rhode Island  
Adjunct Assistant Professor Elizabeth Burke Bryant, J.D., 1985, George Washington University  
Adjunct Assistant Professor Mark Motte, Ph.D., 1995, Rutgers—The State University  
Adjunct Assistant Professor Mary Parella, M.C.P., 1989, University of Rhode Island  
Adjunct Assistant Professor Daniel J. Schatz, J.D., 1978, University of Maine  
Adjunct Assistant Professor Mark Tigan, M.P.A., 1972, San Jose University  
Adjunct Assistant Professor David S. Winsor, M.C.P., 1980, University of Rhode Island  
Professor Emeritus Glenn R. Kumekawa, M.A., 1956, Brown University

### Specializations

The curriculum educates and trains planners for professional positions in community planning and development agencies in both the public and the private sectors. A core of study in theory and substantive methods relating to urban or urbanizing communities is required. In addition, four specializations are offered: *environmental and land use planning*, *urban design and physical planning*, *housing and community development*, and *social policy planning*.

The specialization in *environmental and land use planning* focuses both on planning of the built environment and on concern for the impact of development on the natural environment. The specialization in *urban design and physical planning* emphasizes the significant role urban (community) design plays in the overall planning process and the relation of that design to other functional areas in comprehensive planning; i.e., land use, transportation, and economic development. The specialization in *housing and community development* integrates economic, social, and political theories of development with methods and policies to improve living conditions in communities through housing and economic development. The *social policy planning* specialization emphasizes the elements of social structure and social characteristics that form the imperatives for policy in city planning.

### Master of Community Planning

*Admission requirements:* GRE; the undergraduate background areas preferred are the social sciences, architecture, landscape architecture, natural resources, engineering, and geography. Undergraduate courses in computer science and microeconomics are recommended but not required for admission to the program. The degree is accredited by the Planning Accreditation Board and is offered through the New England Regional Program.

*Program requirements:* the 50-credit program consists of 32 credits of required core courses, six credits of CPL 589 or 599, and 12 credits of courses in the specialization area. Students must select a specialization area by the end of their first semester of study, and must complete a four-course sequence in the area of specialization and a comprehensive examination covering the core and the area of specialization. CPL 510, 512, 522, 523, 526, and 631 are required. CPL 501, 511, and 525 will also be required unless proficiency has been demonstrated by previous course work. A summer internship or equivalent experience is required. The following courses are required in the specialization areas. *Envi-*

*ronmental and land use planning:* CPL 545 and three courses from CPL 537, 538, 539, 549, REN 534, MAF 521, and NRS 410.

*Urban design and physical planning:* CPL 530 and three courses from CPL 516, 536, 538, 545, 546, 555, and CVE 442 and 446. *Housing and community development:* CPL 624 and three courses from CPL 540, 541, 542, 555, and 625. *Social policy planning:* CPL 624 and three courses from CPL 543, 625, LRS 546, and ECN 404. Other acceptable courses may be substituted for the electives where appropriate. Students normally take 13–15 credits per semester to complete degree requirements in two years.

### **Dual-Degree Program: Master of Community Planning (URI) and Juris Doctorate (Roger Williams University of Law)**

A cooperative dual-degree program offered at the University of Rhode Island and Roger Williams School of Law permits joint enrollment leading to an M.C.P. and J.D. The integrated program of the two degrees allows a student to complete both programs in four years instead of the five required if both degrees were pursued separately.

*Admission requirements:* GRE and other requirements listed for URI Graduate School and requirements listed for RWU School of Law. Applicant must apply and be accepted to both programs and must indicate the M.C.P./J.D. as the field of specialization.

*Program requirements:* each student must complete the core requirements of each program. RWU School of Law will accept 15 M.C.P. credits as transfers toward the total of 90 required credit hours in law. URI's Department of Community Planning and Area Development will accept 10 law credits as transfers toward the total of 50 credits. A total of 115 credits is required to complete the dual-degree program. Each student must file separate programs of study and pass the exit requirements of each degree.

## **Computer Science**

M.S.  
401-874-2701

### **Graduate Faculty**

*Chairperson:* Professor Edmund A. Lamagna, Ph.D., 1975, Brown University  
*Director of Graduate Studies:* Associate Professor Bala Ravikumar, Ph.D., 1987, University of Minnesota  
Professor Frank M. Carrano, Ph.D., 1969, Syracuse University  
Associate Professor Gerard M. Baudet, Ph.D., 1978, Carnegie Mellon University  
Associate Professor Victor Fay Wolfe, Ph.D., 1991, University of Pennsylvania  
Associate Professor James G. Kowalski, Ph.D., 1975, University of Notre Dame  
Associate Professor Joan Peckham, Ph.D., 1990, University of Connecticut  
Adjunct Associate Professor Charles M. Strauss, Ph.D., 1969, Brown University  
Adjunct Associate Professor Naitee Ting, Ph.D., 1987, Colorado State University  
Adjunct Assistant Professor Lisa C. DiPippo, Ph.D., 1995, University of Rhode Island  
Adjunct Assistant Professor Robert A. Ravenscroft Jr., Ph.D., 1991, Brown University  
Adjunct Assistant Professor Robert V. Rubin, Ph.D., 1988, Brown University

### **Specializations**

Analysis of algorithms, artificial intelligence, computer architecture, programming languages, theory of computation, databases, operating systems, distributed computing, real time systems, expert systems, graphical user interfaces, software engineering, symbolic and algebraic computation, VLSI systems, numerical analysis, statistical computation, simulation, computer-aided education.

### **Master of Science**

*Admission requirements:* bachelor's degree in computer science or a closely related field. Applicants with a bachelor's degree in an unrelated field will be considered provided they have completed course work covering the material in CSC 211,

212, 301, 305, 340 and MTH 141, 142, 215, 243. Students may be admitted who have completed only a part of the above course work but they may be required to take additional course work beyond that required in the normal program of studies.

The GRE General test is required. A subject test in computer science or a related field is not required but may be considered by the admissions committee.

The M.S. curriculum in computer science has three tracks: thesis, nonthesis, and applied nonthesis. For the purpose of describing degree requirements, computer science courses are organized into the following groups:

*Algorithms:* CSC 440, 541, 542

*Programming Languages:* CSC 402, 501, 502

*Computer Architecture:* CSC 411, 415, 511

*Computer Systems:* CSC 412, 512, 519

*Theory of Computation:* CSC 445, 544

*Software Design:* CSC 505, 509

*Applications:* CSC 406, 436, 481, 536, 550, 581.

A program of study can include at most three courses at the 400-level. Students who have undergraduate credits for a particular 400-level course (or equivalent) cannot repeat the course for graduate credit.

*Program requirements for thesis option:*

1) at least one course from each of the following course groups: algorithms, programming languages, computer architecture, computer systems, and theory of computation; 2) at least three additional courses chosen with the approval of the major professor; 3) eight credits of thesis.

*Program requirements for nonthesis option:*

1) at least one course from each of the following course groups: algorithms, programming languages, computer architecture, computer systems, theory of computation, and software design; 2) at least two courses from the applications group; 3) at least two more courses chosen with the approval of the advisor; 4) at least one of the ten courses listed above should include writing a substantial paper based

on significant independent research;  
5) passing a written comprehensive examination.

*Program requirements for applied nonthesis option*— 1) at least one course from each of the following course groups: algorithms, programming languages, computer architecture, computer systems, and software design; 2) at least two courses from the applications group; 3) at least one course should include writing a substantial paper based on significant independent research; 4) an approved concentration in another discipline. It consists of a minimum of four graduate courses in the area of concentration; 5) passing a written comprehensive examination; 6) the minimum number of credits required for this degree program option is 40.

*Approved concentrations for the applied nonthesis option:*

*Computers and Business Management:* Students in this track will take ACC 610 610 (4); FIN 601 (4); MGT 630 (4); MGT 681 (3); and two of the following courses—MSI 600 (2), 620 (2), 640 (2), and 684 (3).

*Computers and Operations Research:* Students in this track will take IME 432 (3), 540 (3), 555 (3), and 565 (3).

*Computers and Statistics:* Students in this track will take MTH 451 (3), 452 (3); and three of the following: STA 502 (3), 513 (3), 535 (3), 541 (3), 584 (3) or MTH 551 (3).

The department encourages other application areas in the physical, biological, mathematical, and social sciences. Students in the applied track will have an advisor in computer science and an advisor in their application area. Together, these advisors will approve the student's program of study.

### Doctor of Philosophy

See Applied Mathematical Sciences.

## Economics

See Resource Economics.

## Education

M.A. 401-874-2564

Ph.D. 401-874-2244

### Graduate Faculty for the M.S.

*Chairperson:* Professor Robert Felner, Ph.D., 1977, University of Rochester

*Co-Director of Graduate Studies:* Professor John Boulmetis, Ph.D., 1982, Ohio State University

*Co-Director of Graduate Studies:* Professor Theodore Kellogg, Ph.D., 1971, Florida State University

Professor Barbara Brittingham, Ph.D., 1973, Iowa State University

Professor David M. Byrd, Ph.D., 1980, Syracuse University

Professor William Croasdale, Ed.D., 1966, Teachers College, Columbia University

Professor Theodore Kellogg, Ph.D., 1971, Florida State University

Professor John V. Long, Jr., Ph.D., 1971, Syracuse University

Professor William L. McKinney, Ph.D., 1973, University of Chicago

Professor Richard F. Purnell, Ph.D., 1966, University of Texas

Professor George H. Willis, Ph.D., 1971, Johns Hopkins University

Associate Professor James F. Barton, Ph.D., 1990, Stanford University

Associate Professor Richard E. Sullivan, Ph.D., 1971, University of Texas, Austin

Associate Professor Susan L. Trostle, Ed.D., 1984, Pennsylvania State University

Associate Professor Betty Young, Ph.D., 1988, University of California, Los Angeles

Assistant Professor Sandy J. Hicks, Ph.D., 1993, University of Arizona

Assistant Professor Alora Valdez, Ph.D., 1992, University of Arizona

Professor Emeritus Marguerite Bumpus, Ed.D., 1969, University of Massachusetts

Professor Emeritus Robert W. MacMillan, Ph.D., 1966, University of Texas, Austin

Professor Emeritus Francis X. Russo, Ph.D., 1964, Boston University

Associate Professor Emeritus Richard G. Nelson, Ph.D., 1972, University of Wisconsin

### Graduate Faculty for the Ph.D.

*Director of Graduate Studies:* Professor William L. McKinney, Ph.D., 1973, University of Chicago

Professor David M. Byrd, Ph.D., 1980, Syracuse University

Professor Barbara Culatta, Ph.D., 1975, University of Pittsburgh

Professor Marcia Marker Feld, Ph.D., 1973, Harvard University

Professor Diane Horm-Wingerd, Ph.D., 1985, Virginia Polytechnic Institute and State University

Professor Theodore M. Kellogg, Ph.D., 1971, Florida State University

Professor John V. Long, Jr., Ph.D., 1971, Syracuse University

Professor Richard F. Purnell, Ph.D., 1966, University of Texas

Professor George H. Willis, Ph.D., 1971, Johns Hopkins University

Associate Professor James F. Barton, Ph.D., 1990, Stanford University

Associate Professor Susan L. Trostle, Ed.D., 1984, Pennsylvania State University

Associate Professor W. Grant Willis, Ph.D., 1984, University of Georgia

Associate Professor Betty Young, Ph.D., 1988, University of California, Los Angeles

### Specializations

Students seeking the Master of Arts degree must declare an area of specialization. A specialization may be one predefined by the department or designed in accordance with the student's background and interest. Defined specializations include:

*Adult education:* administration, adult literacy, Education, Training, and Management (ETMS), gerontology, training and development, and vocational education.

*Elementary education:* advanced study for elementary teachers; an option for students seeking initial certification in elementary teaching is also available.

*Reading education:* reading teacher certification, literacy education, and reading supervision.

*Secondary education:* advanced study for secondary teachers of English; history, languages, mathematics, science, and social studies; an option for students seeking initial certification in these areas is also available.

## Master of Arts

*Admission requirements:* MAT or GRE and a faculty interview are required. Individuals seeking to undertake the initial certification options in elementary and secondary education are expected to have a substantial academic background in the field of interest. In addition, these students should contact the department regarding the required admissions portfolio and interview process. For foreign students, a TOEFL score of 600 is required.

*Program requirements:* Individuals may choose the thesis or nonthesis option. Required are 30 credits including a required core of six credits (a foundation and a research methodology course); two electives (six credits), and an academic specialization (18–24 credits). The nonthesis option requires a written comprehensive examination and at least one designated course with a substantial paper involving significant independent research.

*Teacher certification option:* students who wish to pursue the initial teacher certification option of the elementary or secondary specializations take 19–34 additional credits. Students may obtain certification prior to completing the requirements for the M.A. See Teacher Certification in this section.

## Doctor of Philosophy (Joint with Rhode Island College)

Rhode Island College and the University of Rhode Island offer a Ph.D. in education which prepares scholar practitioners for new professional roles as educational leaders, mentors, and scholars. The program is grounded in the knowledge bases of school teaching and learning. The program's four objectives provide a framework for the preparation of scholar practitioners to: 1) develop and employ collegial relationships through professional collaboration; 2) acquire and apply the skills and processes of scholarly inquiry; 3) demonstrate expertise in an area of specialization that advances the mission of the American school; and 4) implement professional

practices that promote progress in school settings.

Designed for professionals involved in prekindergarten to twelfth-grade education, the doctoral program admits 12 to 15 students per year. This cohort-based research program is for students who previously earned a master's degree from a regionally accredited institution. A major segment of each student cohort will be made up of teachers and administrators from Rhode Island committed to developing advanced teaching, leadership, and research skills.

*Admission requirements:* GRE General Test, official transcripts, curriculum vitae, and letters of recommendation are required. Finalists in the application process must participate in a personal interview. Applicants are admitted for the fall semester only. The completed application package must be received by February 2. The program is offered jointly by the two institutions with single admissions and administrative processes. Prospective applicants should address inquiries concerning the program to one of the co-directors at either Rhode Island College or the University. Formal application materials can be obtained from the URI Graduate School Office or from Rhode Island College.

*Program requirements:* the program requires a minimum of 56 credits beyond the master's degree. Three year-long core seminars emphasize a clinically based case study approach (EDP 610, 611; 620, 621; 630, 631, for a total of 18 credits). Field-based research experiences are associated with each core seminar (EDP 612, 613; 622, 623; 632, 633, for a total of eight credits). Students gain research expertise to help their development as school leaders through course work (EDP 615, 625, for a total of six credits) and the field experiences. Scholarly expertise in a professional area is acquired through specialization courses (12 credits). All students must complete a doctoral dissertation (12 credits) by the fourth year. The dissertation includes three years of course work, with full-time residency required in the second year. To progress through this program,

each student must: 1) receive positive recommendations from core seminar professors; 2) pass a qualifying examination upon completion of the first core seminar (EDP 610, 611) and the course in research methodology (EDP 615); 3) pass a comprehensive examination after completion of all core seminars, specialization course work, and research experiences; and 4) complete a successful dissertation and defense.

## Electrical Engineering

M.S., Ph.D.  
401-874-2506

### Graduate Faculty

*Chairperson:* Professor William Ohley, Ph.D., 1976, State University of New York, Stony Brook  
*Director of Graduate Studies:* Professor Shashanka S. Mitra, Ph.D., 1957, University of Michigan  
 Professor G. Faye Boudreaux-Bartels, Ph.D., 1983, Rice University  
 Professor James C. Daly, Ph.D., 1967, Rensselaer Polytechnic Institute  
 Professor Godi Fischer, Ph.D., 1985, Swiss Federal Institute of Technology in the Institute of Telecommunications  
 Professor Leland B. Jackson, Sc.D., 1970, Stevens Institute of Technology  
 Professor Steven M. Kay, Ph.D., 1980, Georgia Institute of Technology  
 Professor Ramdas Kumaresan, Ph.D., 1982, University of Rhode Island  
 Professor Allen G. Lindgren, Ph.D., 1963, University of Connecticut  
 Professor Shmuel Mardix, Ph.D., 1969, University of Jerusalem  
 Professor Angaraih G. Sadasiv, Ph.D., 1963, Purdue University  
 Professor Harish R.B. Sunak, Ph.D., 1974, University of Southampton  
 Professor Donald W. Tufts, Sc.D., 1960, Massachusetts Institute of Technology  
 Professor Richard J. Vaccaro, Ph.D., 1983, Princeton University  
 Professor Qing Yang, Ph.D., 1988, University of Southwestern Louisiana  
 Associate Professor Jien-Chung Lo, Ph.D., 1989, University of Southwestern Louisiana  
 Associate Professor Ying Sun, Ph.D., 1985, Worcester Polytechnic Institute

Associate Professor Peter F. Swaszek, Ph.D., 1982, Princeton University  
 Associate Professor August Uht, Ph.D., 1985, Carnegie Mellon University  
 Adjunct Professor Pranab K. Banerjee, Ph.D., 1971, University of Rhode Island  
 Adjunct Assistant Professor David O. Williams, M.D., 1969, Hahnemann Medical College  
 Professor Emeritus Gabriel Lengyel, Ph.D., 1964, University of Toronto  
 Professor Emeritus Charles Polk, Ph.D., 1956, University of Pennsylvania  
 Professor Emeritus John E. Spence, Ph.D., 1962, University of Wisconsin

## Specializations

*Acoustics and underwater acoustics:* communication, detection, classification, and matched-field localization for underwater acoustic channels, speech processing.

*Biomedical engineering:* physiologic systems modeling and control; medical instrumentation employing digital computer techniques, pattern recognition and image processing in medicine (texture analysis, image classification, and segmentation); biological effects of electric and magnetic fields at the cellular level.

*Computer engineering and VLSI:* micro-programming systems, multiprocessing, high-speed signal processing; processor realization using VLSI; MOS layout and microchip design; data structures and computer architectures, fault-tolerant computing.

*Communication theory:* statistical and computer communications; vector quantization; noise modeling and detection; data compression and coding; local area networks, reliable and secure communication.

*Digital signal processing:* detection and parameter estimation; prediction and filtering; spectrum analysis; array processing; digital filter synthesis; adaptive filtering, algorithm design.

*Electrical and optical properties of materials:* optical properties of nonmetallic solids, laser-matter interaction, photocathodes; crystallographic techniques for submicron X-ray lithography; radiation damage in nonmetallic solids; semiconductor physics.

*Electromagnetic fields and optical communication:* numerical and approximate methods for calculation of electromagnetic fields in inhomogeneous and anisotropic structures (related to biological effects of electromagnetic fields); evaluation of mode characteristics in optical and infrared fiber waveguides; fiber optic sensors; fiber optical amplifiers; electro-optic modulators; radiation effects.

*Systems theory:* control and estimation theory, intelligent systems; multivariable systems; nonlinear systems, modeling of deterministic and stochastic systems; model order reduction; optimal smoothing, filtering and prediction; pattern recognition, classification, computer vision; computerized imaging systems and image analysis.

## Master of Science

*Admission requirements:* GRE and B.S. degree in electrical, computer, or biomedical engineering, physics, mathematics, or computer science. Preparation in related fields such as mechanical engineering or in the life sciences may be acceptable.

*Program requirements:* thesis or non-thesis option: minimum of 30 credits in science and engineering with a minimum of 16 credits in graduate-level electrical engineering courses. Two credits of the departmental seminar (ELE 601 and/or 602) are required of all students. Individual programs are designed in accordance with the students' backgrounds and interests, but require departmental and Graduate School approval. For the thesis option the thesis counts as six to nine credits. For the nonthesis option a written master's examination and one course involving significant independent research and a substantial paper are required.

## Doctor of Philosophy

*Admission requirements:* GRE and M.S. degree or equivalent in electrical, computer, or biomedical engineering, physics, mathematics, or computer science, or a related field. Exceptional candidates may be admitted directly from the B.S. degree.

*Program requirements:* a minimum of 72 credits beyond the B.S. degree. The M.S. degree may count up to 30 of these credits; the remaining credits are split between course work and dissertation research. Students with an M.S. in an appropriate field complete between 18–24 dissertation credits; students without the M.S. may take between 18 and 30 (in either case additional dissertation credits may be taken for no program credit). A qualifying examination is required (but may be waived for outstanding students with an M.S.). A comprehensive examination is required after all formal course work is completed. Two credits of the departmental seminar (ELE 601 and/or 602) are required of all students.

## English

M.A., Ph.D.  
 401-874-5931

## Graduate Faculty

*Chairperson:* Professor Dorothy F. Donnelly, Ph.D., 1979, Brandeis University

*Director of Graduate Studies:* Associate Professor Dana R. Shugar, Ph.D., 1991, University of Iowa

Professor Paul G. Arakelian, Ph.D., 1975, Indiana University

Professor Walter L. Barker, Ph.D., 1966, University of Connecticut

Professor Sally F. Burke, Ph.D., 1978, University of Connecticut

Professor Josie P. Campbell, Ph.D., 1972, Pennsylvania State University

Professor Lois A. Cuddy, Ph.D., 1975, Brown University

Professor Wilfred P. Dvorak, Ph.D., 1972, Indiana University

Professor Don R. Kunz, Ph.D., 1968, University of Washington

Professor John R. Leo, Ph.D., 1972, Northwestern University

Professor Richard T. Neuse, Ph.D., 1959, Yale University

Professor F.E. Okeke-Ezigbo, Ph.D., 1979, State University of New York, Buffalo

Professor Daniel D. Pearlman, Ph.D., 1968, Columbia University

Professor Robert A. Schwegler, Ph.D., 1978, University of Chicago



Professor Linda Shamoon, M.A., 1967, Tufts University  
Professor Karen F. Stein, Ph.D., 1982, University of Connecticut  
Associate Professor Walter Cane, Ph.D., 1966, Vanderbilt University  
Associate Professor Mary Cappello, Ph.D., 1988, State University of New York, Buffalo  
Associate Professor Gitahi Gititi, Ph.D., 1990, University of Minnesota  
Associate Professor Celest A. Martin, Ph.D., 1979, University of Southern California  
Associate Professor RB Reaves Jr., Ph.D., 1971, University of Wisconsin  
Associate Professor Nedra Reynolds, Ph.D., 1991, Miami University, Ohio  
Associate Professor Sue Fisher Vaughn, M.A., 1966, Miami University, Ohio  
Associate Professor Jean Walton, Ph.D., 1988, State University of New York, Buffalo  
Assistant Professor Stephen Barber, Ph.D., 1995, York University, Toronto  
Assistant Professor Nancy Cook, Ph.D., 1991, State University of New York, Buffalo  
Assistant Professor William L. Mensel, Jr., Ph.D., 1974, University of Washington  
Assistant Professor Arthur Riss, Ph.D., 1994, University of California, Berkeley  
Professor Emeritus Allan H. MacLaine, Ph.D., 1951, Brown University  
Professor Emeritus Ralph M. Tutt, Ph.D., 1964, Duke University  
Associate Professor Emerita Mathilda M. Hills, Ph.D., 1970, Duke University

### Specializations

*For the M.A. and for the Ph.D.:* historical periods, genres, and major authors in British and American literature; critical theory; rhetoric and composition studies; cultural studies/media/film theory.

### Master of Arts

*Admission requirements:* a B.A. in English or the equivalent, with a quality point average of B (3.00 on a 4.00 scale) or better in all English courses. Completed application packages are to be sent directly to the Director of Graduate Studies, English Department, Independence Hall, University of Rhode Island, and must be received by February 1. Applications received after February 1 will be reviewed on a space-available basis until the program is filled. Applicants will be accepted for September

admission only. GREs (both general and subject) are requested but not required. Nonnative speakers of English must have a minimum score of 630 on the TOEFL in order to be considered for admission.

*Program requirements:* there are three options for fulfilling requirements—24 credits plus thesis (six credits); OR 30 credits including a course requiring a substantial paper involving significant independent study plus a comprehensive examination based on a departmental reading list; OR 30 credits (including ENG 595) plus a portfolio and a related oral examination. The specialization in rhetoric and composition studies requires ENG/WRT 512, 520, and 645.

### Doctor of Philosophy

The Doctor of Philosophy program is small and selective. Admission is competitive and based mainly on academic merit, demonstrated capability to do research, and the match of research interests between the applicant and faculty in indicated or developing areas of specialization.

*Admission requirements:* M.A. in English or equivalent. Although grades are not the only criterion, applicants having less than a 3.50 quality point average (on a 4.00 scale) have a low probability for admission. Completed application packages should be sent to the Director of Graduate Studies, English Department, Independence Hall, University of Rhode Island, and must be received by February 1. Applications received by February 1 will be given a full review; applications received after that deadline but before July 15 will be reviewed on a space-available basis until the program is filled. Applicants will be accepted for September admission only. GREs (both general and subject) are requested but not required; a writing sample of 15 pages maximum is required. Nonnative speakers of English must have a minimum score of 630 on the TOEFL in order to be considered for admission.

*Program requirements:* 24 credits plus 18 credits of dissertation research. Three written comprehensive examinations in three nonoverlapping areas, one of which

must be critical methodology, and an oral examination. A dissertation and an oral defense. For specialization in rhetoric and composition studies, ENG/WRT 512, 520, and 645 are required. A limited number of 500- and 600-level courses in other departments and programs may be used for program credit if approved as part of the student's program of study before the courses are taken. (In some cases, a research tool may be required by a student's doctoral committee in consultation with the Director of Graduate Studies.)

### Financial Aid

All requests for tuition waivers, assistantships, and fellowships should be sent to the Director of Graduate Studies. In addition to teaching assistantships, there are diversity assistantships and an editorial graduate assistantship for the journal *ATQ: A Journal of 19th Century American Literature and Culture*. Complete applications for assistantships must accompany the application packet. Priority will be given to Ph.D. applications received by February 1; thereafter, assistantships will be awarded on a space-available basis.

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### Entomology

See Environmental Sciences.

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### Environmental and Natural Resource Economics

See Resource Economics.

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### Environmental Sciences

M.S., Ph.D. (pending approval by the Board of Governors)

### Graduate Faculty

#### Entomology

*Chairperson:* Associate Professor W. Michael Sullivan, Ph.D., 1981, University of Nebraska  
*Director of Graduate Studies:* Associate Professor Joel M. Chandlee, Ph.D., 1984, North Carolina State University

Professor Richard A. Casagrande, Ph.D., 1975, Michigan State University  
 Professor Roger A. LeBrun, Ph.D., 1977, Cornell University  
 Professor Patrick A. Logan, Ph.D., 1978, Michigan State University  
 Associate Professor Steven R. Alm, Ph.D., 1985, Ohio State University  
 Associate Professor Thomas N. Mather, Ph.D., 1983, University of Wisconsin  
 Adjunct Associate Professor Howard S. Ginsberg, Ph.D., 1979, Cornell University  
 Adjunct Assistant Professor Alan D. Gettman, Ph.D., 1989, University of Florida, Gainesville

### Fisheries, Animal, and Veterinary Science

*Chairperson:* Professor Richard C. Rhodes, Ph.D., 1980, Texas A&M University  
*Director of Graduate Studies:* Associate Professor Michael A. Rice, Ph.D., 1987, University of California, Irvine  
 Professor Terence M. Bradley, Ph.D., 1983, University of Idaho  
 Professor Joseph T. DeAlteris, Ph.D., 1986, College of William and Mary  
 Professor Murn M. Nippo, Ph.D., 1976, University of Rhode Island  
 Professor Richard E. Wolke, Ph.D., 1968, University of Connecticut  
 Associate Professor David Bengtson, Ph.D., 1982, University of Rhode Island  
 Associate Professor Anthony T. Mallilo, Ph.D., 1982, Pennsylvania State University  
 Associate Professor Conrad W. Recksiek, Ph.D., 1972, University of Maine  
 Assistant Professor Marta Gomez-Chiarri, Ph.D., 1992, University of Madrid  
 Assistant Professor Ulysses G. Whitworth, D.V.M., 1976, Tuskegee Institute  
 Adjunct Associate Professor Joel Bodammer, Ph.D., 1974, University of Wisconsin  
 Adjunct Associate Professor Michael W. Fleming, Ph.D., 1980, Ohio State University  
 Adjunct Associate Professor Jan Pechenik, Ph.D., 1978, University of Rhode Island  
 Adjunct Assistant Professor David Berlinsky, Ph.D., 1989, University of Rhode Island  
 Professor Emeritus Pei Wen Chang, Ph.D., 1965, Yale University

### Geology

*Chairperson:* Professor O. Don Hermes, Ph.D., 1967, University of North Carolina  
*Director of Graduate Studies:* Associate Professor Daniel P. Murray, Ph.D., 1976, Brown University  
 Professor Jon C. Boothroyd, Ph.D., 1974, University of South Carolina

Professor and State Geologist J. Allan Cain, Ph.D., 1962, Northwestern University  
 Professor David E. Fastovsky, Ph.D., 1986, University of Wisconsin  
 Associate Professor Reinhard K. Frohlich, Ph.D., 1966, University of Clausthal-Zellerfeld  
 Associate Professor Anne I. Veeger, Ph.D., 1991, University of Arizona  
 Adjunct Associate Professor Rachel J. Burks, Ph.D., 1985, University of Texas, Austin  
 Adjunct Associate Professor Daniel L. Civco, Ph.D., 1987, University of Connecticut  
 Adjunct Associate Professor Karen M. Fischer, Ph.D., 1988, Massachusetts Institute of Technology

### Natural Resources Science

*Chairperson:* Professor Thomas P. Husband, Ph.D., 1977, Michigan State University  
*Director of Graduate Studies:* Professor Francis C. Golet, Ph.D., 1973, University of Massachusetts  
 Professor Peter V. August, Ph.D., 1981, Boston University  
 Professor Arthur J. Gold, Ph.D., 1983, Michigan State University  
 Professor William R. Wright, Ph.D., 1972, University of Maryland  
 Associate Professor José A. Amador, Ph.D., 1990, Cornell University  
 Assistant Professor Jana E. Compton, Ph.D., 1994, University of Washington  
 Assistant Professor Scott R. McWilliams, Ph.D., 1993, University of California, Davis  
 Assistant Professor Peter W.C. Paton, Ph.D., 1994, Utah State University  
 Assistant Professor Mark H. Stolt, Ph.D., 1990, Virginia Polytechnic Institute and State University  
 Adjunct Professor Kenneth Perez, Ph.D., 1971, State University of North Carolina, Raleigh  
 Adjunct Associate Professor Peter M. Groffman, Ph.D., 1984, University of Georgia  
 Adjunct Assistant Professor Josef H. Gorres, Ph.D., 1983, University of Manchester  
 Research Professor P.A. Buckley, Ph.D., 1966, Cornell University

### Plant Sciences

*Chairperson:* Associate Professor W. Michael Sullivan, Ph.D., 1981, University of Nebraska  
*Director of Graduate Studies:* Associate Professor Joel M. Chandlee, Ph.D., 1984, North Carolina State University  
 Professor Richard J. Hull, Ph.D., 1964, University of California, Davis  
 Professor Noel Jackson, Ph.D., 1960, University of Durham, England

Associate Professor Larry Englander, Ph.D., 1973, Oregon State University  
 Associate Professor William R. Krul, Ph.D., 1967, Purdue University  
 Associate Professor Brian K. Maynard, Ph.D., 1990, Cornell University  
 Associate Professor Bridget A. Ruemmele, Ph.D., 1989, University of Minnesota  
 Associate Professor Richard J. Shaw, Ph.D., 1966, University of Missouri  
 Associate Professor Angelo Simeoni Jr., M.L.A., 1979, Cornell University  
 Adjunct Professor Raymond B. Taylorson, Ph.D., 1960, University of Wisconsin  
 Adjunct Assistant Professor Stephen L. Dellaporta, Ph.D., 1981, Worcester Polytechnic Institute  
 Adjunct Assistant Professor Eric M. Roberts, Ph.D., 1991, University of Texas, Austin  
 Professor Emeritus Carl H. Beckman, Ph.D., 1953, University of Wisconsin  
 Professor Emeritus Walter C. Mueller, Ph.D., 1961, Cornell University  
 Associate Professor Emeritus Dale T. Duff, Ph.D., 1967, Michigan State University

### Specializations

*Entomology:* insect ecology, pest management, aquatic entomology, plant-insect interactions, biological control, and biology and ecology of disease-transmitting arthropods.

401-874-2791, [www.uri.edu/cels/pls\\_home/](http://www.uri.edu/cels/pls_home/)

*Fisheries, Animal, and Veterinary Science:* aquacultural production of finfish and shellfish, production of terrestrial livestock, physiological and endocrinological aspects of stress in animals, genetics of cultured and wild populations of fish and shellfish, fish population dynamics, physiological ecology of economically important fish and invertebrates, the pathology of aquatic animals, and the effects of environmental pollution on marine organisms.  
 401-874-2477, [www.uri.edu/cels/favs\\_home/](http://www.uri.edu/cels/favs_home/)

*Geology:* sedimentology, stratigraphy-paleontology, coastal geomorphology, geoarchaeology, glacial geology, hydrogeology, applied geophysics, remote sensing, petrology, and structure and tectonics.  
 401-874-2265, [www.uri.edu/cels/gel/](http://www.uri.edu/cels/gel/)

*Natural Resources Science:* ecosystem ecology, biogeochemistry, soil genesis and classification, soil ecology and microbiology, biodegradation and bioremediation, hydrology and watershed science, wetland science and management, restoration ecology, landscape ecology, GIS and spatial analysis, wildlife and conservation biology, and avian ecology.

401-874-2495, [www.edc.uri.edu/nrs/](http://www.edc.uri.edu/nrs/)

*Plant Sciences:* plant ecology and physiology, plant molecular biology and genetics, plant pathology, environmental horticulture, environmental plant biology, sustainable agriculture, and golf and sports turf management.

401-874-2791, [www.uri.edu/cels/pls\\_home/](http://www.uri.edu/cels/pls_home/)

**Master of Science** (*All departments or programs above except for Fisheries, Animal, and Veterinary Science. See separate listing for Fisheries, Animal, and Veterinary Science on this page.*)

*Admission requirements:* GRE and bachelor's degree in a biological, a physical science, or engineering. Applicants with course deficiencies may be required to take appropriate undergraduate courses for no program credit, and to demonstrate, by their performance in such course work or through a qualifying exam, basic knowledge of the subject matter in the area(s) of deficiency.

*Program requirements:* for the thesis option, six credits of thesis and a minimum of 24 credits of course work, including graduate seminar. An oral preliminary examination may be required for certain fields of study. For the nonthesis option, a minimum of 36 credits of course work, including graduate seminar and at least 14 credits of course work from the home department, three credits of nonthesis Master's Research (EVS 598), three credits of statistics, and a written comprehensive examination. An oral preliminary examination and advanced seminars may be required in certain fields of study.

**Doctor of Philosophy** (*All departments or programs above*)

*Admission requirements:* GRE and bachelor's degree in a biological, physical science, natural resources science, or engineering; specific undergraduate majors or course work may be required for certain fields of study. Master's degree with thesis in biological science, physical science, or natural resources science is highly recommended.

*Program requirements:* a minimum of 72 credits of advanced course work beyond the bachelor's degree (a master's degree may count for up to 30 credits), 18 of which are dissertation credits and at least two of which are graduate seminar credits; comprehensive examination; and dissertation. A qualifying examination will be required for students who are admitted without a master's degree and may be required for students whose prior degrees are outside of the proposed Ph.D. field of study.

## Experimental Statistics

See Statistics.

## Fisheries, Animal and Veterinary Science

M.S.

401-874-2477

See Environmental Sciences for the Ph.D.

## Graduate Faculty

*Chairperson:* Professor Richard C. Rhodes, Ph.D., 1980, Texas A&M University

*Director of Graduate Studies:* Associate Professor Michael A. Rice, Ph.D., 1987, University of California, Irvine

Professor Terence M. Bradley, Ph.D., 1983, University of Idaho

Professor Joseph T. DeAlteris, Ph.D., 1986, College of William and Mary

Professor Murn M. Nippo, Ph.D., 1976, University of Rhode Island

Professor Richard E. Wolke, Ph.D., 1968, University of Connecticut

Associate Professor David Bengtson, Ph.D., 1982, University of Rhode Island

Associate Professor Anthony T. Mallilo, Ph.D.,

1982, Pennsylvania State University

Associate Professor Conrad W. Recksiek, Ph.D., 1972, University of Maine

Assistant Professor Marta Gomez-Chiarri, Ph.D., 1992, University of Madrid

Assistant Professor Ulysses G. Whitworth, D.V.M., 1976, Tuskegee Institute

Adjunct Associate Professor Joel Bodammer, Ph.D., 1974, University of Wisconsin

Adjunct Associate Professor Michael W. Fleming, Ph.D., 1980, Ohio State University

Adjunct Associate Professor Jan Pechenik, Ph.D., 1978, University of Rhode Island

Adjunct Assistant Professor David Berlinsky, Ph.D., 1989, University of Rhode Island

Professor Emeritus Pei Wen Chang, Ph.D., 1965, Yale University

## Specializations

*For the M.S.:* in the specialization *animal science*, regional, national, and global problems are studied in the areas of animal behavior, endocrinology, nutrition, physiology, and reproductive biology. Both domestic livestock and laboratory animals are used in a research context. In the specialization *animal health and disease*, animal health problems of regional, national, and global significance are studied. Bacterial and viral diseases are characterized, and the contributions of stress and pathologic conditions to disease are considered.

The specialization *aquaculture* includes the study of aquaculture of salmonids and shellfish and the genetics, nutrition, and physiology of fishes. The specialization in *fisheries* includes the study of fisheries science and technology. *Aquatic pathology* deals with the pathology of aquatic animals and the effects of environmental pollution on aquatic organisms.

## Master of Science

*Admission requirements:* GRE and an undergraduate major in the biological sciences with a concentration in animal science, fisheries technology, marine biology, microbiology, preveterinary medicine, or zoology, or postgraduate professional degrees (M.D., D.V.M., V.M.D.); one year of organic chemistry and physics. Courses

in statistics, histology, and physiology are strongly recommended.

*Program requirements:* for *animal science*, thesis and 24 credits of course work to include two credits of ASP 501 and/or 502; AVS 412, 472; STA 532. Thesis topic and additional course work will be selected by the student after consultation with, and approval of, the major professor. For *animal health and disease*, thesis and 24 credits of course work to include two semesters of graduate seminar, ASP 501 and/or 502; ASP 401, 534; STA 532. Thesis topic and additional course work will be selected by the student after consultation with, and approval of, the major professor.

For *fisheries*, thesis and 24 credits of course work to include two semesters of graduate seminar, ASP 501 and/or 502; two courses in statistics (at least one at the 500 level); FST 415, 421. A total of 14 credits of ASP or FST course work must be included in the program of study. Thesis topic and additional course work will be selected by the student after consultation with, and approval of, the major professor. For *aquaculture*, thesis and 24 credits of course work to include two semesters of graduate seminar, ASP 501 and/or 502; ASP 400, 483, 486, 581; BCH 581; STA 409. Thesis topic and additional course work will be selected by the student after consultation with, and approval of, the major professor. For *aquatic pathology*, thesis and 24 credits of course work to include two semesters of graduate seminar, ASP 501 and/or 502; ASP 400, 486, 534, 536, 555, 556. Thesis topic and additional course work will be selected by the student after consultation with, and approval of, the major professor.

## Food Science and Nutrition

M.S., Ph.D. (Biological Sciences)  
401-874-2253, 2467

### Graduate Faculty

*Chairperson:* Professor Marjorie J. Caldwell,  
Ph.D., 1972, Cornell University

*Director of Graduate Studies:* Professor Spiros M. Constantinides, Ph.D., 1966, Michigan State University

Professor Chong Min Lee, Ph.D., 1974,  
University of Rhode Island  
Professor Arthur G. Rand Jr., Ph.D., 1964,  
University of Wisconsin  
Professor Richard W. Traxler, Ph.D., 1958,  
University of Texas  
Associate Professor Catherine English, Ph.D.,  
1993, University of Connecticut  
Associate Professor Anthony S. Fischl, Ph.D.,  
1986, Rutgers—The State University  
Associate Professor Leonard Gerber, Ph.D.,  
1979, University of Illinois  
Associate Professor Geoffrey W. Greene, Ph.D.,  
1984, Pennsylvania State University  
Assistant Professor Nancy Fey-Yensan, Ph.D.,  
1995, University of Connecticut  
Adjunct Professor Edward S. Josephson, Ph.D.,  
1940, Massachusetts Institute of Technology  
Adjunct Associate Professor Linda Sebelia, M.S.,  
1974, Ohio State University

## Food Science

### Specializations

*Food biotechnology:* food and lipid biochemistry, yeast technology, food safety biodegradation, and physical properties of biopolymeric food composites.

*Seafood science:* seafood flavor, fish mince-surimi technology, quality assessment, novel approaches to preservation, and utilization of by-products.

### Master of Science

*Admission requirements:* GRE and bachelor's degree in food science or related field of science. Candidates lacking adequate courses in biological sciences, general chemistry, organic chemistry, biochemistry, physics, statistics, and calculus may be required to make up deficiencies without graduate credit. Applications must be received by April 15 for fall admission and by March 15 if financial aid is required.

*Program requirements:* thesis; two credits of FSN 511; a minimum of three credits in biochemistry, chemistry, or microbiology; FSN 421, 431, 432, and 502. If the student has taken courses as an undergraduate, alternate courses can be taken. All resident students are required to be continuously registered in FSN 511 or 512,

but no more than two credits of FSN 511 can be used for program credit.

## Doctor of Philosophy (Biological Sciences)

*Admission requirements:* GRE and master's degree in food science or related physical or biological science. Applications must be received by April 15 for fall admission and by March 15 if financial aid is required.

*Program requirements:* dissertation; same as master's degree plus BCH 581 and either BCH 542 or 584; a total of three credits in FSN 511, and a research problem (FSN 691, 692) under the supervision of an advisor other than the major professor. All resident students are expected to be continuously registered in FSN 511 or 512, but no more than three credits of FSN 511 can be used for program credit.

## Nutrition

### Specializations

Nutritional status and food behavior of high risk population groups; dietary behavior change to reduce chronic disease risk; nutrition issues related to aging and weight management; diet and exercise; diet and cancer.

### Master of Science

*Admission requirements:* GRE and bachelor's degree in nutrition or dietetics including a course in statistics. Students from other academic areas are encouraged to apply but must have physiology, biochemistry, nutrition, and statistics prior to admission. Applications must be received by April 15 for fall admission and by March 15 if financial aid is required.

*Program requirements:* thesis; two credits of FSN 511; a minimum of three credits in biochemistry, chemistry, microbiology, or physiology; FSN 505, 551, and 552. All resident students are required to be continuously registered in FSN 511 or 512, but no more than two credits of FSN 511 can be used for program credit.

## Doctor of Philosophy (Biological Sciences)

*Admission requirements:* GRE and master's degree in nutrition. Students from other academic areas are encouraged to apply, but must meet entrance requirements for the M.S. program. Applications must be received by April 15 for fall admission and by March 15 if financial aid is required.

*Program requirements:* dissertation, a 500- or 600-level course in statistics/experimental design; a total of three credits in FSN 511, and a research problem (FSN 691/692) under the supervision of an advisor other than the major professor. Students who have not taken the courses required for the M.S. must do so as part of the Ph.D. program. All resident students are expected to be continuously registered in FSN 511 or 512, but no more than three credits of FSN 511 can be used for program credit.

## Dietetic Internship Certificate Program

*Admission requirements:* cumulative undergraduate quality point average of 3.00 or better; an earned bachelor's degree with completion of the American Dietetic Association (ADA) Didactic Program in Dietetics (DPD) requirements; and the ADA Verification Statement or ADA Declaration of Intent Form from their DPD director. Completion of the Graduate School and Internship application forms are required. Criteria used for admission include a balance of: a) academic achievement; b) relevant work experience; c) statement of purpose; and d) professional recommendations. Admission is competitive and selection is determined by the national computer matching process. Admission is for the fall term only. Enrollment is expected to be limited to eight students. Program information and application deadlines can be obtained by contacting the department.

*Program requirements:* the Dietetic Internship Certificate Program is an ADA-accredited internship program and is administered under the department's

nondegree status. The program consists of nine courses including more than 1,200 hours of supervised practice experience in health care facilities. Students satisfactorily completing the program will receive a certificate qualifying them to take the Dietetic Registration Examination.

## Geology

See Environmental Sciences.

## History

M.A.  
401-874-2528

## Graduate Faculty

*Chairperson:* Associate Professor Michael W. Honhart, Ph.D., 1972, Duke University  
*Director of Graduate Studies:* Professor Sharon Hartman Strom, Ph.D., 1969, Cornell University  
 Professor Josiah M. Briggs, Ph.D., 1962, Columbia University  
 Professor Joel A. Cohen, Ph.D., 1967, University of Connecticut  
 Professor James F. Findlay, Jr., Ph.D., 1961, Northwestern University  
 Professor Maurice N. Klein, Ph.D., 1965, Emory University  
 Professor Gary Thurston, Ph.D., 1973, Columbia University  
 Assistant Professor Roderick Mather, D.Phil., 1996, New College, Oxford  
 Professor Robert G. Weisbord, Ph.D., 1966, New York University Graduate School  
 Assistant Professor Rosa Maria Pegueros, Ph.D., 1998, University of California, Los Angeles  
 Assistant Professor Joelle Rollo-Koster, Ph.D., 1992, State University of New York, Binghamton  
 Assistant Professor Marie J. Schwartz, Ph.D., 1994, University of Maryland  
 Adjunct Associate Professor Albert T. Klyberg, Ph.D., 1967, University of Michigan  
 Adjunct Research Professor Chong Sun Kim, Ph.D., 1965, University of Washington  
 Professor Emeritus Robert M. Gutchen, Ph.D., 1966, Columbia University  
 Assistant Professor Emeritus Gino Silvestri, Ph.D., 1969, Syracuse University

## Specializations

United States and Europe, with an emphasis on social, cultural, and political history. Students may complement their work in these fields with courses in Latin American or Asian history or with courses taken outside the department, particularly in political science, education, English, and languages.

Students may also take up to six credits from the graduate offerings at Rhode Island College; the available courses will be posted in the department each semester. These courses must be approved for program credit prior to registration and must be included in the six-credit maximum for transfer credit and the 12-credit maximum for advanced standing. The master's program in history includes both class work and individual instruction in the form of 500-level seminars; small 400-level courses that include undergraduates; tutorials; and directed study courses, as well as master's thesis research for those who choose the thesis option. All graduate work stresses independent research and is designed to promote critical reading and writing. The diversified program—with its requirement for work in more than one field of history and the opportunity it offers of work in another discipline—should be of service both to students who wish to continue their graduate education at the doctoral level and to those who are interested in secondary teaching. Students are required to develop a systematic program of studies with the Director of Graduate Studies during their first semester as a master's degree candidate.

For tutorials (HIS 502, 503, 536, 537, 588, and 589), students participate in 300-level courses and complete additional projects assigned by the instructors. Tutorial arrangements are made with the instructor at the beginning of the semester. To be eligible, a graduate student must not have taken the 300-level course or one closely resembling it as an undergraduate.

## Master of Arts

*Admission requirements:* GRE and bachelor's degree. While 24 credits of history are usually required, majors in related fields may be admitted with the permission of the Director of Graduate Studies and the department chairperson.

*Program requirements:* there are thesis and nonthesis options. In both options the student must declare a primary concentration in European or United States history, and a secondary concentration in another area of history or in a related field outside the department. An approved program will require 30 credits, including at least six credits from HIS 401, 441, or 481 and at least six credits from HIS 506, 507, and 508. The nonthesis option will require completion of a research paper in HIS 495, or in exceptional circumstances, in another graduate-level course with the permission of the instructor and the Graduate Director or department chair. Admission to the thesis option will be granted after evaluation, by the Director of Graduate Studies and two faculty members who serve on the thesis committee, of the student's first year of graduate work.

In the nonthesis option, the student may earn no more than 12 credits in tutorials (502, 503, 536, 537, 588, and 589) and directed studies (591). Nine credits will normally be taken in the secondary concentration. A four-hour written comprehensive examination in the student's primary and secondary concentrations and a follow-up oral examination are required. The examining committee will normally consist of two faculty members from the student's primary concentration and one from the secondary concentration. In the thesis option, the student may earn a maximum of nine credits of HIS 599, a maximum of three credits of Directed Study (HIS 591), and a maximum of nine credits of tutorials (HIS 502, 503, 536, 537, 588, 589). Work in the secondary concentration may be limited to six credits.

## M.A. in History and M.L.I.S. Cooperative Program

By proper selection of course work, a student may simultaneously earn the degrees of Master of Arts in history and Master of Library and Information Studies.

*Admission requirements:* GRE (subject test desirable) and other requirements listed for history and library science. Applicant must apply and be accepted in both programs. The application for each program must indicate history/library and information studies as the field of specialization.

*Program requirements:* students must submit individual programs of study for the 42-credit M.L.I.S. program and the 30-credit program for the M.A. in history. The integrated pursuit of the two degrees makes it possible for six credits of appropriately selected course work from one program to serve as electives in the other, and for six credits of course work to be applied in the opposite direction. Thus, when planned and taken jointly, the two programs can be completed with a total of 60 credits rather than 72 credits.

## Human Development and Family Studies

M.S.  
401-874-2150

### Graduate Faculty

*Chairperson:* Associate Professor Jerome A. Schaffran, Ph.D., 1971, University of Iowa  
*Director of Graduate Studies:* Associate Professor Jerome Adams, Ph.D., 1989, Purdue University

#### *Human Development and Family Studies*

*Coordinator:* Associate Professor Karen A. Schroeder, Ph.D., 1977, University of Connecticut  
Professor Joan Gray Anderson, Ph.D., 1984, University of California, Davis  
Professor Phillip G. Clark, Sc.D., 1979, Harvard University  
Professor Stewart Cohen, Ph.D., 1967, Purdue University  
Professor Diane Horm-Wingerd, Ph.D., 1985, Virginia Polytechnic Institute and State University

Professor Gwenneth Rae, Ed.D., 1972, University of California, Los Angeles  
Associate Professor Mary Kalymun, Ph.D., 1982, University of Pennsylvania  
Associate Professor Jingjian Xiao, Ph.D., 1991, Oregon State University  
Associate Professor Emerita Helen F. Greene, Ph.D., 1954, Florida State University

#### *Marriage and Family Therapy*

*Director:* Professor Peter E. Maynard, Ph.D., 1969, State University of New York, Buffalo  
Professor Gwenneth Rae, Ed.D., 1972, University of California, Los Angeles  
Associate Professor Jerome Adams, Ph.D., 1989, Purdue University  
Associate Professor Karen A. Schroeder, Ph.D., 1977, University of Connecticut

#### *College Student Personnel*

*Coordinator:* Associate Professor Jerome A. Schaffran, Ph.D., 1971, University of Iowa  
Associate Professor Jayne Richmond, Ph.D., 1982, University of Florida  
Assistant Professor Katherine B. Douglas, Ph.D., 1997, Indiana University

## Specializations

Human development and family studies; marriage and family therapy; college student personnel.

## Human Development and Family Studies

*Admission requirements:* GRE or MAT, PSY 300 or STA 308 or equivalent, and 18 undergraduate credits distributed among at least three of the following areas: human development and family studies, psychology, sociology, biology, and education. Subspecializations are available in human development, early childhood education, family studies, and gerontology.

*Program requirements:* nine credits of core courses—HDF 500, 530, and 570; six credits of thesis or action research; nine credits of free electives (one course must be taken outside the department); and a comprehensive examination. An additional 12 credits must be taken from one of the following subspecialization areas: early childhood education—HDF 400, 406, 434, 455, 501, 502, and 503; human development—HDF 400, 406, 434, 502, and 503; adult development/gerontology—HDF 420, 421, 431, 433, 440, 505, 520, 527, 535, and 559; family studies—HDF 430,

431, 433, 434, 505, 535, and 559. A total of 36 credits is required.

*State provisional certification:* persons wishing to meet state provisional certification requirements (Nursery to Grade 2) must apply for admission to teacher certification (nondegree status). Official transcripts of all previous course work plus two letters of recommendation are required. As a prerequisite to enrolling in courses that meet certification requirements, accepted applicants must complete or have completed the equivalent of an undergraduate degree in human development and family studies.

### Marriage and Family Therapy

*Admission requirements:* GRE or MAT; at least 12 credits of relevant preparation courses, including family relations, developmental theory, abnormal psychology, and introduction to counseling or equivalent courses. Two letters of recommendation should be from supervisors in a related field attesting to observed experience, emotional stability, and maturity. After initial screening, qualified applicants will be required to come to campus for a personal interview. The goal of the personal interview is to determine whether the applicant possesses the full range of academic qualifications, experiential background, clinical competency, and readiness to undertake the rigors of an academically and emotionally demanding clinical preparation program. Several of the program's faculty members will conduct the interviews. Selection for admission to this program is competitive and enrollment is limited. Diversity among the students in the program is a major program goal. The program adheres to the standards established by the American Association for Marriage and Family Therapy (AAMFT). Completed application package must be received by March 1.

*Program requirements:* a minimum of 45 credits of approved graduate courses, including a 30-hour core and 15 credits of practice and internship depending on previous training and background, a comprehensive examination, and a research

project. Normal program requirements are usually met with 54 to 60 credits. This program involves intense clinical practice and a year-long internship at cooperating agencies or the department's Family Therapy Clinic.

### College Student Personnel

*Admission requirements:* GRE or MAT and interview; preference given to applicants with experience in student affairs.

*Program requirements:* 27 credits in core HDF courses (HDF 450, 551, 554, 560, 562, 567, 568, 570, 590), six credits in adult development or social science electives, plus one of the following—  
a) nonthesis option with internship (HDF 580, 581, 583, 584) and a comprehensive examination, for a total of 45 credits;  
b) nonthesis option with action research project (HDF 595, six credits), one additional elective, and a comprehensive examination, for a total of 42 credits; or  
c) thesis option (HDF 599, six credits) and one additional elective, for a total of 42 credits.

### Industrial and Manufacturing Engineering

See Manufacturing and Industrial Engineering.

### Labor and Industrial Relations

M.S.  
401-874-2239

### Graduate Faculty

*Director, Labor Research Center:* Professor Charles T. Schmidt, Jr., Ph.D., 1968, Michigan State University (Professor of Industrial Relations)  
Professor Judith Anderson, Ph.D., 1970, Indiana University  
Professor Charles P. Armstrong, Ph.D., 1973, University of Arizona  
Professor Harold Barnett, Ph.D., 1973, Massachusetts Institute of Technology  
Professor Winifred E. Brownell, Ph.D., 1973, State University of New York, Buffalo

Professor John P. Burkett, Ph.D., 1981, University of California, Berkeley  
Professor Jerry Cohen, Ph.D., 1973, University of Illinois  
Professor William Croasdale, Ed.D., 1966, Teachers College, Columbia University  
Professor Albert J. Della Bitta, Ph.D., 1971, University of Massachusetts  
Professor James F. Findlay, Jr., Ph.D., 1961, Northwestern University  
Professor Timothy M. Hennessey, Ph.D., 1968, University of North Carolina  
Professor Jeffrey E. Jarrett, Ph.D., 1967, New York University  
Professor Sandra Ketrow, Ph.D., 1982, Indiana University  
Professor Leonard P. Lardaro, Ph.D., 1979, Indiana University  
Professor Andrew Laviano, J.D., 1965, New York University School of Law  
Professor Richard McIntyre, Ph.D., 1989, University of Massachusetts  
Professor Arthur C. Mead, Ph.D., 1978, Boston College  
Professor Craig E. Overton, Ph.D., 1971, University of Massachusetts  
Professor John J. Poggie, Jr., Ph.D., 1968, University of Minnesota  
Professor Yngve Ramstad, Ph.D., 1981, University of California, Berkeley  
Professor Lawrence Rothstein, Ph.D., 1976, University of Massachusetts  
Professor Richard W. Scholl, Ph.D., 1979, University of California, Irvine  
Professor James L. Starkey, Ph.D., 1971, Boston College  
Professor Sharon Hartman Strom, Ph.D., 1969, Cornell University  
Professor Robert Weisbord, Ph.D., 1966, New York University Graduate School  
Associate Professor Laura Beauvais, Ph.D., 1987, University of Tennessee, Knoxville  
Associate Professor Elizabeth Cooper, Ph.D., 1985, University of Akron  
Associate Professor Diane Disney, Ph.D., 1988, Brandeis University  
Associate Professor Carole Miller, Ph.D., 1988, Syracuse University  
Associate Professor D. Scott Molloy, Ph.D., 1991, Providence College  
Assistant Professor Matthew M. Bodah, Ph.D., 1996, Michigan State University  
Assistant Professor Charles Latos, Ph.D., 1977, Brown University  
Assistant Professor Gail A. Shea, Ph.D., 1975, Brown University  
Adjunct Professor J. Michael Keating, J.D., 1973, Georgetown University Law School

Adjunct Professor Suzanne Taylor, Ph.D., 1970, University of Connecticut  
 Professor Emeritus Carl Gersuny, Ph.D., 1968, Western Reserve University  
 Professor Emeritus Elton Rayack, Ph.D., 1957, University of Chicago

The program is designed for union, government, neutral, or human resource management, labor, and industrial relations professionals, or for those students who aspire to such positions. Students in other graduate programs may find it rewarding and professionally desirable to enroll in one or more of the labor relations and labor studies courses. All courses are offered in the very late afternoon or in the evening in Providence and Kingston so that they are convenient for those currently employed. Full-time and part-time programs are available.

### Specializations

The following areas of specialization are listed along with available courses. Substitutions may be made with permission of the director of the Labor Research Center and approval of the Graduate School.

*Labor relations:* three courses from LRS 520, 533, 545, 581, 590, 591; MGT 640; and LRS 543 or 579.

*Human resource administration:* three courses from MGT 640; PSC 503 or MGT 641; LRS 533, 545, 581, 590, 591 and LRS 543 or 579; PSY 434; EDC 529 or 583.

*Labor and worker studies:* three courses from LRS 520, 545, 581, 590, 591; ENG 445; HIS 591; PSC 486; and PSY 480.

*Worker/labor or management education and training:* three courses from LRS/EDC 579; LRS 581; LRS 590, 591; EDC 505, 539, 581, 582, 583, 584.

*International development:* three courses including REN 595 and two related electives.

*Alternative dispute and conflict resolution processes:* three courses including LRS 545, 546, 581, 590, 591, and PSC 420 or 432.

*Nondesignated specialization:* three courses in an area that satisfies the student's individual professional goals—e.g., computer science or statistics; economics or social policy; law and legal pro-

cesses; or workplace issues such as alcohol and drug abuse, sexual or age discrimination, or racism.

### Master of Science

*Admission requirements:* GRE or MAT or GMAT. Undergraduate majors in any field will be considered for admission. Those with majors in social science, history, management, and labor studies are especially encouraged to apply, as are those with engineering, nursing, education, urban affairs, black studies, and women's studies backgrounds. Professional experience in labor and industrial relations will carry additional weight in admission decisions.

*Program requirements:* minimum of 36 credits including 27–28 credits in core courses and nine credits of specialization plus requirements of three credits each in statistics and computer science, which may be met by prior course work or examination, and a written master's examination. The required core courses (27–28 credits) are: LRS/HIS 544; LRS/PSC 521; SOC/LRS 432 or MGT 630; LRS/ECN 526 and 534; LRS 531, 541, 542, and 580.

### Languages

The University offers the Master of Arts degree in Spanish. See separate listing under Spanish.

### Library and Information Studies

M.L.I.S.  
 401-874-2947

### Graduate Faculty

*Director, Graduate School of Library and Information Studies:* Associate Professor W. Michael Havener, Ph.D., 1988, University of North Carolina, Chapel Hill

*Assistant to the Director for Regional Studies:* Associate Professor C. Herbert Carson, Ph.D., 1988, Syracuse University  
 Professor Jonathan S. Tryon, Certificate in Advanced Librarianship, 1974, Columbia University; J.D., 1981, Suffolk University

Associate Professor E. Gale Eaton, Ph.D., 1990, University of North Carolina, Chapel Hill  
 Associate Professor Donna Gilton, Ph.D., 1988, University of Pittsburgh  
 Associate Professor Cheryl McCarthy, D.A., 1990, Simmons College  
 Assistant Professor Yan Ma, Ph.D., 1993, University of Wisconsin, Madison

### Specializations

The overall goal of the school is to educate librarians who will not only function effectively, but also demonstrate the capacity to affect the course of librarianship. The Graduate School of Library and Information Studies prepares students for professional service in libraries and information agencies by offering an ALA-accredited program leading to the Master of Library and Information Studies (M.L.I.S.) degree. It also provides an opportunity for students to pursue simultaneously master's degrees in library and information studies and in history or public administration. The school library media specialization is accredited by NASDTEC and NCATE.

Through consultation with advisors, students prepare for careers in academic, school, public, or special libraries. They also may plan for specialization in areas such as children's service, reference and bibliography, cataloging, special collections, media programs, information science, automation, administration, young adult services, and library history.

### Master of Library and Information Studies

*Admission requirements:* bachelor's degree (B average) and GRE or MAT at the 50th percentile or above. GRE or MAT waived for applicants with a master's degree. The completed application package should be received by November 15 for spring admission, April 15 for summer admission, and July 15 for fall admission.

*Program requirements:* 42 credits of which 15 credits in the following are required: LSC 504, 505, 508, and two from LSC 502, 503, and 507; 27 credits of electives of which up to six may be taken in



courses outside library science when relevant to the student's specialization; one course with major paper requiring significant independent research; and a written comprehensive examination. Up to 27 hours may be taken at the regional centers at the University of Massachusetts in Amherst or Boston and at the University of New Hampshire at Durham. No more than six credits or two courses may be taken in nonmatriculating status for transfer into the degree program. Students in the School Library Media track must meet particular state requirements.

Requirements for the M.L.I.S. must be completed within a period of four calendar years. A one-year extension, to five calendar years, may be granted for good cause by the G.S.L.I.S. faculty with notice to the Dean of the Graduate School in response to a student's petition. Further extensions, to a maximum of seven calendar years, are possible under Graduate School policy, but are generally undesirable because of the rapid change in library and information services. If such extensions are granted, courses completed more than five calendar years prior to graduation will no longer be valid, and must be replaced by new courses or reinstated by examination to ensure that the graduate's knowledge of the field is current.

### **M.A. in History and M.L.I.S. Cooperative Program**

By proper selection of course work, a student may simultaneously earn the degrees of Master of Arts in history and Master of Library and Information Studies.

*Admission requirements:* GRE (subject test desirable) and other requirements listed for history and library science. Applicant must apply and be accepted in both programs. The application to each program must indicate history/library and information studies as the field of specialization.

*Program requirements:* students must submit individual programs of study for the 42-credit M.L.I.S. program and the

30-credit program for the M.A. in history. The integrated pursuit of the two degrees makes it possible for six credits of appropriately selected course work from one program to serve as electives in the other, and for six credits of course work to be applied in the opposite direction. Thus, when planned and taken jointly, the two programs can be completed with a total of 60 credits rather than 72 credits.

### **M.P.A. and M.L.I.S. Cooperative Program**

A second cooperative program permits joint enrollment in the Master of Library and Information Studies and Master of Public Administration programs. The integrated pursuit of the two degrees makes it possible for nine credits of appropriately selected course work from one program to serve as electives in the other, and for six credits to be applied in the opposite direction. Thus, when planned and taken jointly, the two programs can be completed with a total of 63 credits.

*Admission requirements:* GRE and other requirements listed for M.L.I.S. and M.P.A. Applicant must apply and be accepted in both programs. The application to each program must indicate M.L.I.S./M.P.A. as the field of specialization.

*Program requirements:* each student must complete the required core courses for both programs plus three credits of PSC 590 for the M.P.A. After consultation with, and approval of, both departments, students must file separate programs of study for each degree, indicating the courses to be jointly counted. Each student must pass the separate comprehensive examination for each degree. A student who fails to complete one of the programs may, of course, complete the other in accordance with the separate program of study.

*Other Cooperative Programs:* Under existing University policy, students may be able to establish cooperative programs with other master's degree programs within the University. Interested persons should consult with the director.

## **Manufacturing and Industrial Engineering**

M.S. (Manufacturing Engineering)  
Ph.D. (Industrial and Manufacturing Engineering)  
401-874-2455

### **Graduate Faculty**

*Chairperson:* Professor Winston A. Knight, Ph.D., 1967, Birmingham University  
*Director of Graduate Studies:* Associate Professor Manbir Sodhi, Ph.D., 1991, University of Arizona  
Professor Peter Dewhurst, Ph.D., 1973, University of Manchester  
Associate Professor David M. Shao, Ph.D., 1970, State University of New York, Buffalo  
Assistant Professor Jyh-Hone Wang, Ph.D., 1988, University of Iowa  
Adjunct Professor Charles C. Reynolds, Ph.D., 1963, Massachusetts Institute of Technology  
Professor Emeritus Geoffrey Boothroyd, Ph.D., 1962, D.Sc., 1974, University of London

### **Specializations**

Fundamentals of manufacturing processes and manufacturing automation; computer systems in manufacturing, including applications for inspection, rapid prototyping, and control.

Product design for manufacture and assembly, and design evaluation for reliability, maintenance, and recycling.

Engineering optimization with applications to manufacturing systems.

Facilities planning and analyses of material handling in manufacturing organizations.

Quality and process control of production.

### **Master of Science**

*Admission requirements:* GRE (for graduates of non-U.S. universities only) and B.S. degree in industrial, manufacturing, or mechanical engineering. An applicant with a B.S. degree in another field of engineering, mathematics, physics, chemistry, or computer science will be considered; such applicants will be required to complete some deficiency courses.

*Program requirements:* the thesis option requires 30 credits including thesis (nine credits); IME 549 or special project in design for manufacture (IME 591 or 592); and elective courses covering the areas of fundamentals of manufacturing processes and manufacturing properties of materials, quality engineering, rapid prototyping, control and organization of manufacturing systems, and computer systems in manufacturing engineering and design. The nonthesis option for part-time students with department permission requires 30 credits of course work including IME 549; elective courses covering the areas of fundamentals of manufacturing processes and manufacturing properties of materials, quality engineering, rapid prototyping, control and organization of manufacturing systems and computer systems in manufacturing engineering and design; and a comprehensive examination. IME 240 or equivalent is a prerequisite.

### Doctor of Philosophy

*Admission requirements:* GRE (for graduates of non-U.S. universities only) and B.S. degree in industrial, manufacturing, or mechanical engineering. An applicant with a B.S. degree in another field of engineering or in mathematics, physics, chemistry, or computer science will be considered; such applicants will be required to complete some deficiency courses. Although a person with a bachelor's degree may be admitted, this program is designed principally for people who have a master's degree.

*Program requirements:* qualifying examination may be waived for students with a master's degree. A minimum of 72 credits beyond the B.S. degree, 18 of which are dissertation credits (a master's degree may count for up to 30 credits). Fifty-four credits of course work including IME 542, 544, 549 and 18 credits of required electives with at least two courses selected from each of the following areas of concentration: fundamentals of manufacturing processes and manufacturing properties of materials, control and organization of

manufacturing systems, and computer systems in manufacturing and design. Eighteen credits of IME 699. Reading proficiency in a foreign language may be required by the student's committee. A comprehensive examination must be taken after all formal course work is completed. All Ph.D. candidates must register full-time for two consecutive semesters prior to taking the Ph.D. comprehensive examination. Dissertation research makes use of major modern laboratories in the listed areas of specialization.

### Financial Aid

A number of graduate and research assistantships are available for qualified graduate students.

Also see Applied Mathematical Sciences.

## Marine Affairs

M.A., M.M.A., Ph.D.  
401-874-2596

### Graduate Faculty

*Chairperson:* Professor Lawrence Juda, Ph.D., 1973, Columbia University

*Director of Graduate Studies:* Professor Dennis W. Nixon, J.D., 1975, University of Cincinnati; M.M.A., 1976, University of Rhode Island

Professor Richard H. Burroughs, Ph.D., 1975, Massachusetts Institute of Technology and Woods Hole Oceanographic Institution  
Professor Timothy Hennessey, Ph.D., 1968, University of North Carolina

Professor Bruce E. Marti, Ph.D., 1982, University of Florida

Professor John J. Poggie, Ph.D., 1968, University of Minnesota

Professor Richard B. Pollnac, Ph.D., 1972, University of Missouri

Professor Niels West, Ph.D., 1973, Rutgers—The State University

Associate Professor William R. Gordon, Jr., Ph.D., 1987, Texas A&M University

Associate Professor Gerald H. Krausse, Ph.D., 1975, University of Pittsburgh

Assistant Professor Christopher Dyer, Ph.D., 1990, Arizona State University

Adjunct Professor Claiborne D. Pell, M.A., 1946, Columbia University

Professor Emeritus Lewis M. Alexander, Ph.D., 1949, Clark University

Professor Emeritus John A. Knauss, Ph.D., 1959, University of California

### Specializations

Coastal zone management, marine transportation and port planning, fisheries law and management, international marine policy and law.

### Master of Arts (M.A.)

*Admission requirements:* GRE and bachelor's degree in related science or social science. For international students, minimum TOEFL score of 550. Full-time applicants are admitted for the fall semester only.

*Program requirements:* thesis and MAF 482, 502, 577, 651; MAF 511 or appropriate oceanography substitute; REN 514 or appropriate resource economics substitute; plus a minimum of 21 elective credits for a total of 45 credits.

### Master of Marine Affairs (M.M.A.)

*Admission requirements:* prior graduate degree or five years of equivalent experience in marine areas. For international students, minimum TOEFL score of 550. Full-time applicants are admitted for the fall semester only.

*Program requirements:* nonthesis program; MAF 577, 589, 651; REN 514; MAF 511 or appropriate oceanography substitute; plus 15 elective credits for a total of 30 credits; written comprehensive examination.

### M.M.A./J.D. Joint Program between URI and Roger Williams University Law School

*Admission requirements:* students will have to apply and be accepted into each program under the separate admissions requirements currently in effect at each school.

*Program requirements:* at Roger Williams University, the J.D. program requires 90 credits which can be completed on a full-time basis in three years. The M.M.A. de-

gree at URI requires 30 credits which can be completed on a full-time basis in one year. A student matriculated in the joint program will take some credits in one program which will also help satisfy the overall credit requirements of the other degree program. The effect of these credit transfers would be to reduce the total time needed to complete both degrees from four to three and one-half years. Students in the joint program must complete MAF 511, 577, 589, 651, 652, and REN 514 or their equivalent as part of their 24-credit requirement at URI in addition to six credits at Roger Williams. Roger Williams students must complete the required law school curriculum and will accept nine Marine Affairs credits toward the J.D.

### Doctor of Philosophy (Marine Affairs)

*Admission requirements:* the Ph.D. program is small and selective. Admission is based on academic merit, research capability, availability of faculty, and match of interests between applicant and faculty. Applicants must have completed work for the master's degree in some related area. GRE, letters of recommendation, writing samples including master's thesis or major research paper, statement of purpose, and interview required.

*Program requirements:* students must complete the following required courses or their equivalents (18 credits): MAF 482, 502, 511, 577, 651; REN 514. Beyond the courses indicated above, Ph.D. candidates are required to complete a minimum of 48 additional credits, of which 24 will be awarded for dissertation research. The course credits earned to meet this requirement will be selected by the student from among 500- and 600-level courses with the approval of the student's Ph.D. committee. Students will have to demonstrate proficiency in research tools, foreign language(s), and/or statistics as appropriate for the proposed course of study and dissertation. Required capabilities will be determined by the Ph.D. committee.

Upon completion of course work, students will have to pass written and oral

comprehensive examinations in major and minor fields of marine affairs. Each student is to write and successfully defend a dissertation of high quality.

## Mathematics

M.S., Ph.D.  
401-874-2709

### Graduate Faculty

*Chairperson:* Professor Norman J. Finizio, Ph.D., 1972, Courant Institute of Mathematical Sciences, New York University  
*Director of Graduate Studies:* Professor James T. Lewis, Ph.D., 1969, Brown University  
Professor Raymond A. Beauregard, Ph.D., 1968, University of New Hampshire  
Professor Dean Clark, Ph.D., 1978, Brown University  
Professor Dilip K. Datta, Ph.D., 1963, Delhi University  
Professor Rodney D. Driver, Ph.D., 1960, University of Minnesota  
Professor John B. Fraleigh, M.A., 1956, Princeton University  
Professor Edward A. Grove, Ph.D., 1969, Brown University  
Professor Barbara Kaskosz, Ph.D., 1977, Polish Academy of Sciences  
Professor Gerasimos Ladas, Ph.D., 1968, New York University  
Professor John T. Montgomery, Ph.D., 1971, University of Wisconsin  
Professor Lewis I. Pakula, Ph.D., 1972, Massachusetts Institute of Technology  
Professor E. Ramnath Suryanarayan, Ph.D., 1961, University of Michigan  
Professor Ghasi Ram Verma, Ph.D., 1957, Rajasthan University  
Associate Professor Nancy Eaton, Ph.D., 1992, Emory University  
Associate Professor Orlando Merino, Ph.D., 1988, University of California, San Diego  
Assistant Professor Betty (Biyue) Liu, Ph.D., 1993, University of Maryland  
Adjunct Professor Roy Streit, Ph.D., 1978, University of Rhode Island  
Adjunct Associate Professor David H. Wood, Ph.D., 1972, University of Rhode Island  
Professor Emeritus Emilio O. Roxin, Ph.D., 1959, University of Buenos Aires  
Professor Emeritus Sol Schwartzman, Ph.D., 1953, Yale University

## Specializations

Ordinary, functional, partial differential equations, abstract differential equations, difference equations, functional analysis, approximation theory, probability, fluid mechanics, and control theory.

### Master of Science

*Admission requirements:* bachelor's degree with strong undergraduate background in mathematics. Applicants with deficiencies in mathematics may be accepted subject to taking certain undergraduate courses in addition to the graduate program requirements.

*Program requirements:* 30 credits (or 24 plus thesis), including at least 18 credits in mathematics of which at least 12 must be at the 500 level or above. A course requiring a substantial paper involving significant independent study and a written comprehensive examination are required for the nonthesis option. MTH 435 and 513 must be completed with a grade of A or B. Recommended courses include MTH 515, 525, 535, 536, and 562.

### Doctor of Philosophy

*Admission requirements:* same as for master's program.

*Program requirements:* MTH 513, 515, 525, 535, 536, and 562, plus specialized courses and electives. Reading ability (in candidate's specialty and with a dictionary) in one language chosen from French, German, or Russian. A Ph.D. qualifying examination is required of all students admitted without a master's degree in mathematics.

Also see the listing under Applied Mathematical Sciences.

## General Information

Programs of study can be designed for individuals who are employed on a full-time basis. However, all Ph.D. candidates must register full-time for two consecutive semesters prior to taking the doctoral comprehensive examination.

## Mechanical Engineering and Applied Mechanics

M.S., Ph.D.  
401-874-2524

### Graduate Faculty

*Chairperson:* Professor Martin H. Sadd, Ph.D., 1971, Illinois Institute of Technology  
*Director of Graduate Studies:* Distinguished Engineering Professor Hamouda Ghonem, Ph.D., 1978, McGill University  
 Professor Philip Datseris, Ph.D., 1976, Columbia University  
 Professor Mohammad Faghri, Ph.D., 1973, Oregon State University  
 Professor Thomas J. Kim, Ph.D., 1967, University of Illinois  
 Professor Richard C. Lessmann, Ph.D., 1969, Brown University  
 Professor William J. Palm, Ph.D., 1971, Northwestern University  
 Distinguished Engineering Professor Arun Shukla, Ph.D., 1981, University of Maryland  
 Associate Professor Osama Ibrahim, Ph.D., 1991, University of Wisconsin, Madison  
 Associate Professor Musa Jouaneh, Ph.D., 1989, University of California, Berkeley  
 Associate Professor Zongqin Zhang, Ph.D., 1990, Duke University  
 Assistant Professor Deborah Pence, Ph.D., 1995, Clemson University  
 Adjunct Assistant Professor Wayne Tucker, Ph.D., 1987, University of Rhode Island  
 Professor Emeritus Frank M. White, Ph.D., 1959, Georgia Institute of Technology

### Specializations

*Fluid mechanics:* boundary layers, separated flows, turbulence, particle-flow interactions, flow measurement, computational fluid dynamics, flow in human airways, microbubble generation.

*Robotics and design:* robotics, automation, automated assembly, expert systems, plasma welding and fusion, design optimization, computer-aided design, precision engineering, manufacturing.

*Solid mechanics:* elasticity, plasticity, continuum mechanics, fracture mechanics, photomechanics, impact mechanics, wave propagation and dynamic geomechanics, computational methods, composite and ceramic materials, micromechanics, non-

linear mechanics, waterjet processing, fiber optic sensors.

*Systems and control:* robotics, control systems, microprocessor and digital control, system dynamics, precision engineering, advanced dynamics, vibrations.

*Thermal science:* phase change problems, ice making, microscale convection heat transfer, direct contact heat transfer, direct energy conversion, solar energy, fluidized beds, chaotic heat transfer, new engine designs, thermal pollution, computational heat transfer.

### Master of Science

*Admission requirements:* GRE (required of foreign applicants only), B.S. degree in mechanical engineering, applied mechanics, aerospace engineering, or in a related field such as engineering science, civil engineering, applied mathematics, applied physics. Students admitted to the program will be expected to have the equivalent of MCE 372. Students without this background may be required to make up this deficiency with no program credit.

*Program requirements:* for thesis option, 30 credits exclusive of seminar including six to nine credits of thesis (required of all full-time students) and 24–21 credits of course work; one course outside the area of specialization; and MCE 501, 502, graduate seminar (required of all on-campus students). For nonthesis option for part-time students, permission of chairperson; 30 credits exclusive of seminar, including one course outside specialization; one course requiring a substantial paper involving significant independent study; and a comprehensive examination.

### Doctor of Philosophy

*Admission requirements:* GRE (required of foreign applicants only); master's degree. Exceptional students with a bachelor's degree and superior master's candidates who have passed the Ph.D. qualifying examination also will be considered.

*Program requirements:* Ph.D. qualifying examination; students admitted with only

a bachelor's degree are required to take this examination after one year of full-time study. Completion of a minimum of 24 credits of course work beyond the master's degree, exclusive of seminar (48 credits of course work after bachelor's degree); MCE 501, 502, graduate seminar (required of all on-campus students). Comprehensive examination and dissertation.

### Financial Aid

A number of graduate and research assistantships are available for qualified M.S. and Ph.D. students. Temporary instructorships may be available for highly qualified Ph.D. students.

### General Information

Programs of study can be designed for individuals who are employed on a full-time basis. However, all Ph.D. candidates must register full-time for two consecutive semesters prior to taking the comprehensive examination.

### Medical Technology

See Clinical Laboratory Science.

### Medicinal Chemistry

M.S., Ph.D. (Pharmaceutical Sciences)  
401-874-2776

### Graduate Faculty

*Chairperson:* Professor Zahir A. Shaikh, Ph.D., 1972, Dalhousie University, Canada  
 Professor Raymond P. Panzica, Ph.D., 1972, University of Utah  
 Associate Professor Bongsup P. Cho, Ph.D., 1985, University of Illinois Medical Center

### Specializations

Research activities are focused on the design and synthesis of chemotherapeutic agents and on the mechanism of carcinogenesis. Research projects include the rational development of new compounds by synthetic methods, the chemical modification of clinical agents to facilitate drug

delivery to target sites, and the synthesis of enzyme inhibitors. The research program in chemical carcinogenesis is aimed at understanding the molecular basis of how carcinogen-DNA adducts affect DNA replication, ultimately leading to cancer.

### Master of Science

*Admission requirements:* GRE (for graduates of non-U.S. universities only) and bachelor's degree in pharmacy, chemistry, biochemistry, or allied sciences.

*Program requirements:* ACS placement exam (organic) to determine specific program requirements; one seminar presentation per year; thesis; demonstrated proficiency in physical chemistry or successful completion of BCH 435 with a grade of C or better; 30 credits including six to nine research credits (BMS 599), two credits of BMS 523 or 524, BMS 525, BMS 530 or 535, BCH 581; three or four of the following courses in consultation with major professor: CHM 427, 520, 521, 522, BMS 443, 444, 597, 598, 691, 697, 698.

### Doctor of Philosophy (Pharmaceutical Sciences)

*Admission requirements:* GRE and master's degree in pharmacy, chemistry, biochemistry, or allied sciences, or bachelor's degree in one of these with evidence of superior ability.

*Program requirements:* dissertation; ACS placement examination (organic) to determine specific program requirements; same as master's degree plus the following: both BMS 535 and BMS 530 required; one additional seminar credit; two additional graduate-level courses from BMS or BCH 582; research credits as required; 72 credits total; comprehensive examination, written and oral.

Qualifying examination is required for candidates accepted without the M.S. degree.

## Microbiology

M.S., Ph.D. (Biological Sciences)  
401-874-2205

### Graduate Faculty

*Chairperson and Director of Graduate Studies:*

Professor Jay F. Sperry, Ph.D., 1974,  
University of Kansas

Professor Terence M. Bradley, Ph.D., 1983,  
University of Idaho

Professor Paul S. Cohen, Ph.D., 1964, Boston  
University

Professor Marian R. Goldsmith, Ph.D., 1970,  
University of Pennsylvania

Professor Linda A. Hufnagel, Ph.D., 1967,  
University of Pennsylvania

Professor David C. Laux, Ph.D., 1971, University  
of Arizona

Professor David R. Nelson, Ph.D., 1979,  
University of California, Los Angeles

Professor Richard W. Traxler, Ph.D., 1958,  
University of Texas

Professor George C. Tremblay, Ph.D., 1965,  
St. Louis University

Associate Professor Joel M. Chandless, Ph.D.,  
1984, North Carolina State University

Associate Professor Anthony S. Fischl, Ph.D.,  
1986, Rutgers—The State University

Associate Professor William R. Krul, Ph.D., 1967,  
Purdue University

Associate Professor John P. Mottinger, Ph.D.,  
1968, Indiana University

Associate Professor Joanna Hanks Norris, Ph.D.,  
1982, Michigan State University

Adjunct Professor Albert Kausch, Ph.D., 1983,  
Iowa State University

Adjunct Assistant Professor Shashikant R. Mehta,  
Ph.D., 1984, University of Texas, Houston

Professor Emeritus Victor J. Cabelli, Ph.D., 1951,  
University of California, Los Angeles

Professor Emeritus Karl A. Hartman, Ph.D.,  
1962, Massachusetts Institute of Technology

Professor Emeritus Norris P. Wood, Ph.D., 1955,  
University of Pennsylvania

### Specializations

*Cell biology, cellular development, ultrastructure:* ciliogenesis in protozoa, electron microscopy, ultrastructure of electrically conducting systems, cell culture, cellular immunity.

*Medical microbiology:* pathogenesis, immunology, mycology, virology.

*Microbial ecology, industrial microbiology, pollution:* marine and freshwater microbial ecology, biodeterioration, sanitary bacteriology, coliform ecology.

*Microbial genetics, physiology, molecular microbiology:* genetic and molecular relation of cellular morphogenesis and development, bacterial colonization of the mammalian intestine, messenger RNA metabolism in procaryotes and eucaryotes, virus multiplication, control of transport and metabolism, mechanisms of survival, membrane structure.

### Master of Science

*Admission requirements:* GRE and two semesters each of biological sciences (botany, zoology), general and organic chemistry, mathematics, calculus, and physics; a semester each of microbiology, genetics, quantitative analysis, biochemistry, and statistics. Applicants with deficiencies in these background courses may be required to complete appropriate course work without graduate credit.

*Program requirements:* thesis; BCH 581; MIC 413, 414, 415, 416, 599, 695, and 696; major portion of courses in microbiology, including one in virology, mycology, phycology, cell biology, or protozoology; written comprehensive examination.

### Doctor of Philosophy (Biological Sciences)

*Admission requirements:* same as for master's degree. A course in physical chemistry is also recommended.

*Program requirements:* same as for master's degree plus BCH 582; MIC 533, 552, and dissertation. A course in microbial physiology (MIC 641, BIO 534, OCG 663, or equivalent). Of the credits earned beyond the master's degree, 18 should be in course work. Qualifying examination is required for students admitted without a master's degree. Prior to the last semester, the candidate must pass a written and oral comprehensive examination in the major areas of microbiology. Dissertation.

## Music

M.M.  
401-874-2431

### Graduate Faculty

*Chairperson:* Professor Ronald T. Lee, Ph.D., 1970, University of Michigan  
*Director of Graduate Studies:* Associate Professor Carolyn Livingston, Ph.D., 1986, University of Florida  
 Professor John D. Dempsey, M.M., 1964, Eastman School of Music, University of Rochester  
 Professor Henry C. Fuchs, M.M., 1961, University of Michigan  
 Professor Geoffrey D. Gibbs, D.M.A., 1974, Eastman School of Music, University of Rochester  
 Professor George E. Kent, M.M., 1960, New England Conservatory of Music  
 Professor James Ladewig, Ph.D., 1978, University of California, Berkeley  
 Professor Gene J. Pollart, Ph.D., 1989, Columbia Pacific University  
 Professor W. Donald Rankin, D.M.A., 1970, Boston University  
 Assistant Professor Ann Danis, M.M., 1971, New England Conservatory of Music

### Specializations

*Performance:* 12 credits of performance in MUS 510 (minimum of three in a semester) plus MUS 548, 550, 567, 580, 581, and three credits distributed according to the major performance subject, as follows. For *vocalists*, two credits in MUS 598 and music elective. Vocalists are also tested in foreign language diction and reading. For *pianists*, two credits in MUS 590 or 598 and music elective. For *organists and guitarists*, two credits in MUS 598 and music elective. For *other instrumentalists*, MUS 512 and ensemble elective. All performance candidates must also take a minimum of nine credits of electives from music history and theory/composition (no more than six credits in any one of these two areas), and pass a written comprehensive examination in music history, theory, and the performance major after 15 hours of study have been completed.

*Music education:* MUS 540, 545, 548, 579, 580, 581, and nine credits in one of the following subject areas. For *performance/essay*, six credits of MUS 510 (2 + 2 or 3 + 3 credits), 550, and 570. For *conducting*, MUS 511, 512, and 513. For *composition (classical or studio)*, six credits of MUS 510V (2 + 2 + 2 or 3 + 3), 511 or 512 and 552. Credits recommended for studio composition are MUS 510V in jazz arranging and composition, MUS 579 in the jazz/studio area, (e.g., a professional recording studio), 596, or 598J. For *thesis*, at least six credits in MUS 599 and three elective credits. All music education candidates must also take a minimum of nine credits of electives from music history, theory/composition, and performance (no more than six credits in any one of these three areas, and performance only if it is not already part of the specialization). Students in a thesis program must pass a written qualifying examination before thesis work is begun and defend the thesis in a final oral examination. All other music education candidates must pass a written comprehensive examination in music history, theory, and music education after 15 hours of study have been completed.

The graduate teacher certification program may be taken at the graduate level, along or in conjunction with the Master of Music degree. It presumes that a candidate has completed the equivalent of the URI Bachelor of Music degree program with courses in music theory, form and analysis, music history, performance, and vocal and instrumental ensembles. Requirements include the MUS 169–179 Performance Classes; MUS 311 and 312 Conducting; MUS 416 Form or MUS 417 Instrumentation and Choral Arranging; MUS 238, MUS 339, 340 Methods, PSY 113, EDC 102, 250, and 312; EDC 484 Student Teaching; MUS 480 Graduate Portfolio in Music (includes Student Teaching Seminar), and the piano proficiency examination. Advanced standing by examination in the above areas is possible. Certain 500-level music education courses may be used as substitutes with permission of the department.

Completion of the teacher certification program can require as many as 36 credits (or more, if remedial studies in music are needed) in addition to what is required for the M.M. degree alone.

### Master of Music

*Admission requirements:* undergraduate major, or the equivalent, in music with a quality point average of 2.50 or above. Applicants for performance as a specialization, or for the performance/essay subspecialization under music education, must pass an audition in their major performance subject on tape or, preferably, in person, before acceptance into a program. Applicants for conducting as a specialization must pass an audition in choral or instrumental conducting, on videotape or, preferably, in person. Applicants for composition as a subspecialization must submit a portfolio of scores and/or tapes of original works.

*Program requirements:* post-admission placement examinations in appropriate areas (music history, theory, composition, and/or music education) determine whether background deficiencies must be made up with no program credit. A minimum of 30 credits is required for graduation. One-half of the program credits must be at the 500 level. (Teacher certification requires additional courses in education at the undergraduate level.)

Students may also take up to six credits from the graduate offerings at Rhode Island College. The available courses will be posted in the department each semester. These courses must be approved for program credit prior to registration and must be included in the six-credit maximum for transfer credit and the 12-credit maximum for advanced standing.

### Natural Resources Science

See Environmental Sciences.

## Nursing

M.S., Ph.D.  
401-874-2766

### Graduate Faculty

*Interim Dean:* Associate Professor Dayle Hunt Joseph, R.N., Ed.D., 1982, Boston University  
*Director of Graduate Studies:* Professor Donna Schwartz-Barcott, R.N., Ph.D., 1978, University of North Carolina  
 Professor Janet I. Hirsch, R.N., Ed.D., 1978, Boston University  
 Professor Hesook S. Kim, R.N., Ph.D., 1977, Brown University  
 Professor Margaret McGrath, R.N., D.N.Sc., 1988, Boston University  
 Professor Jean Miller, R.N., Ph.D., 1975, University of Washington  
 Professor Norma Jean Schmieding, R.N., Ed.D., 1983, Boston University  
 Associate Professor Patricia M. Burbank, R.N., D.N.Sc., 1988, Boston University  
 Associate Professor Marlene A. Dufault, Ph.D., 1983, University of Connecticut  
 Associate Professor Jacqueline D. Fortin, R.N., D.N.Sc., 1984, Boston University  
 Associate Professor Cynthia Padula, R.N., Ph.D., 1994, University of Connecticut  
 Associate Professor Evelyn Yeaw, R.N., Ph.D., 1983, Boston College  
 Assistant Professor Rebecca Carley, M.S., 1982, Boston University  
 Assistant Professor Holly Powell Kennedy, R.N., M.S.N., 1978, Medical College of Georgia  
 Assistant Professor Diane Gergevitz, M.S., 1987, University of Rhode Island  
 Clinical Assistant Professor Denise Coppa, M.S., 1979, University of Colorado

### Specializations

*For the M.S.:* education, administration, mental health care, primary health care, advanced clinical practice (with emphasis on critical care, gerontological nursing, or parent-child nursing), and nurse-midwifery.

*Note:* Applications for advanced clinical practice with concentration in critical care and parent-child nursing will not be accepted for the 1998–99 academic year.

*For the Ph.D.:* clinical nursing research in the domains of client, client-nurse interactions, and nursing practice.

### Master of Science

*Admission requirements:* MAT or GRE; a bachelor's degree from an NLN-accredited program with an upper-division major in nursing and an undergraduate course in statistics. For specialization in primary health care, two years of professional nursing practice. Students are required to pass an elementary statistics and an elementary pathophysiology course with a grade of C or better prior to entering the program. There is a challenge exam established for those incoming students who have not taken a pathophysiology course within five years prior to enrolling in the nurse practitioner program. For specialization in midwifery, two years of professional nursing practice, preferably in maternal-infant health nursing, and completion of a course in expanded assessment skills in nursing, equivalent of NUR 503. Students who have not completed upper-division undergraduate nursing course work will be required to make up this deficiency prior to admission. Completed application package with vita must be received by November 15 for spring admission and April 15 for summer and fall admission. Acceptance is based on a full review of the applicant's record and not on any one single component.

*Program requirements:* 41 credits for education, administration, mental health, and clinical practice specializations; 42 credits for primary health care specialization; 46 credits for nurse-midwifery concentration, including 14 credits in core courses (NUR 500, 505, 507, 510, and 520); nine to 32 credits in the area of specialization (NUR 538, 539, 541, 542 for education; NUR 551, 552 for administration; NUR 511, 512, 513, 514, 590 for mental health care; NUR 503, 504, 531, 532, 533, 534, 535, 582, and 590 for primary health care; NUR 521, 522, 569, and 562 or 564 for clinical practice in critical care and parent-child nursing; NUR 555, 556, 557, and 558 for clinical practice in gerontology; and NUR 571, 572, 573, 574, 575, 576, 577, 535, and 582 for nurse-midwifery); 16 credits of restricted electives for administration, 10 credits for all

other areas of specialization, except for primary health care and nurse-midwifery; a major paper involving significant independent study; and a written comprehensive examination.

*R.N. to M.S. program with an intermediate B.S. degree:* This option allows the completion of three to nine credits of 500-level courses in nursing (NUR 510, 503, 560) during the senior year of the baccalaureate degree. This is contingent upon the concentration in nursing and upon meeting other grade and admission requirements. If a matriculated graduate student in the R.N. to M.S. nursing program has taken these courses for undergraduate degree credit, he or she will not be required to retake them or to substitute other courses for them.

### Doctor of Philosophy

*Admission requirements:* GRE (scores at 60th percentile or above are desirable); a bachelor's degree from an NLN-accredited program or its equivalent in nursing and a master's degree in nursing or its equivalent (cumulative averages of 3.00 and 3.30, respectively, are desirable); two scholarly papers (one theoretical and one empirical) or a master's thesis or equivalent; three recommendations for doctoral study including one by a doctorally prepared person; a statement of purpose indicating goals congruent with those of the program and institution; a vita and a course in statistics including inferential statistics. Acceptance is based on a full review of the applicant's record and not on any one single component.

*Program requirements:* a minimum of 61 credits including core courses in nursing (19 credits) and cognates (six credits); electives in nursing (nine credits) and research methods (six credits); free electives (three credits); and the doctoral dissertation (at least 18 credits), plus written and oral comprehensive examinations in nursing theory, research methods, and one substantive area.

## Ocean Engineering

M.S., Ph.D.  
401-874-6139

### Graduate Faculty

*Chairperson:* Professor Malcolm L. Spaulding, Ph.D., 1972, University of Rhode Island  
*Director of Graduate Studies:* Professor Peter R. Stepanishen, Ph.D., 1969, Pennsylvania State University  
 Professor Richard Brown, Ph.D., 1977, University of Cambridge  
 Distinguished Engineering Professor Stephan Grilli, Ph.D., 1985, University of Liege, Belgium  
 Professor Armand J. Silva, Ph.D., 1965, University of Connecticut  
 Professor Robert C. Tyce, Ph.D., 1976, Scripps Institution of Oceanography, University of California  
 Distinguished Engineering Professor Raymond M. Wright, Ph.D., 1981, Pennsylvania State University  
 Associate Professor Sau-Lon James Hu, Ph.D., 1984, Rice University  
 Associate Professor James H. Miller, D.Sc., 1987, Massachusetts Institute of Technology and Woods Hole Oceanographic Institution  
 Adjunct Professor John K. Hall, Ph.D., 1970, Columbia University  
 Adjunct Professor Robert L. Methot, Ph.D., 1972, Kansas State University  
 Adjunct Professor David H. Shonting, Sc.D., 1966, Massachusetts Institute of Technology  
 Adjunct Professor Edmund J. Sullivan, Ph.D., 1970, University of Rhode Island  
 Adjunct Associate Professor James S. Uhlman, Ph.D., 1983, Massachusetts Institute of Technology

### Specializations

Ocean instrumentation and seafloor mapping, underwater acoustics and data analysis, marine hydrodynamics and water-wave mechanics, coastal and nearshore processes, marine geomechanics, and coastal and offshore structures.

### Master of Science

*Admission requirements:* B.S. degree in engineering, physics, applied mathematics or other technical disciplines. Students with a nonengineering background may

be required to take undergraduate courses in thermodynamics, fluid mechanics, strength of materials, electrical circuits, and applied mathematics.

*Program requirements:* the thesis option requires 30 credits with a minimum of 12 credits of course work in ocean engineering and nine credits for thesis research. The nonthesis option requires permission of the chairperson and a total of 30 credits with a minimum of 18 credits of course work in ocean engineering, with one course requiring a substantial paper involving significant independent study and a written comprehensive examination. OCE 605 and 606 are required of all full-time students.

### Doctor of Philosophy

*Admission requirements:* M.S. degree in engineering or equivalent; exceptional students with a Bachelor of Science in engineering will also be considered. All students will be required to complete courses equivalent to those for the M.S. degree in ocean engineering if not included in their master's degree.

*Program requirements:* A total of 42 credits beyond the M.S. degree (or 72 credits beyond the B.S. degree), composed of at least 18 credits of course work and 24 credits of dissertation research. Courses must include one in advanced applied mathematics, one in engineering or oceanography, and a minimum of two in ocean engineering. Qualifying and written and oral comprehensive examinations are required. OCE 605 and 606 are required of all full-time students.

### Financial Aid

Graduate and research assistantships are available for highly qualified students. Some industrial and other fellowships are also available.

### General Information

Programs of study can be designed for individuals who are employed on a full-time basis.

## Oceanography

M.O., M.S., Ph.D.  
401-874-6246

### Graduate Faculty

*Dean:* Professor Margaret Leinen, Ph.D., 1980, University of Rhode Island  
*Associate Dean:* Professor James A. Yoder, Ph.D., 1979, University of Rhode Island  
 Professor Peter Cornillon, Ph.D., 1973, Cornell University  
 Professor Edward G. Durbin, Ph.D., 1976, University of Rhode Island  
 Professor Paul E. Hargraves, Ph.D., 1968, College of William and Mary  
 Professor Dana R. Kester, Ph.D., 1969, Oregon State University  
 Professor Roger L. Larson, Ph.D., 1970, Scripps Institution of Oceanography, University of California  
 Professor John T. Merrill, Ph.D., 1976, University of Colorado  
 Professor Scott W. Nixon, Ph.D., 1969, University of North Carolina  
 Professor Candace A. Oviatt, Ph.D., 1967, University of Rhode Island  
 Professor Michael E.Q. Pilson, Ph.D., 1964, University of California, San Diego  
 Professor James G. Quinn, Ph.D., 1967, University of Connecticut  
 Professor Kenneth A. Rahn, Ph.D., 1971, University of Michigan  
 Professor Hans T. Rossby, Ph.D., 1966, Massachusetts Institute of Technology  
 Professor Jean-Guy Schilling, Ph.D., 1966, Massachusetts Institute of Technology  
 Professor Haraldur Sigurdsson, Ph.D., 1970, Durham University, England  
 Professor Jennifer Specker, Ph.D., 1980, Oregon State University  
 Professor Elijah Swift, Ph.D., 1967, Johns Hopkins University  
 Professor Robert C. Tyce, Ph.D., 1976, Scripps Institution of Oceanography, University of California  
 Professor D. Randolph Watts, Ph.D., 1973, Cornell University  
 Professor Mark Wimbush, Ph.D., 1969, Scripps Institution of Oceanography, University of California  
 Professor Karen Wishner, Ph.D., 1979, Scripps Institution of Oceanography, University of California  
 Associate Professor Steven N. Carey, Ph.D., 1983, University of Rhode Island



Associate Professor Jeremy S. Collie, Ph.D., 1985, Massachusetts Institute of Technology and Woods Hole Oceanographic Institution  
 Associate Professor Steven D'Hondt, Ph.D., 1990, Princeton University  
 Associate Professor Tetsu Hara, Ph.D., 1990, Massachusetts Institute of Technology  
 Associate Professor David L. Hebert, Ph.D., 1991, Dalhousie University, Canada  
 Associate Professor Brian G. Heikes, Ph.D., 1984, University of Michigan  
 Associate Professor Christopher R. Kincaid, Ph.D., 1989, Johns Hopkins University  
 Associate Professor John King, Ph.D., 1983, University of Minnesota  
 Associate Professor S. Bradley Moran, Ph.D., 1991, Dalhousie University, Canada  
 Associate Professor Lewis M. Rothstein, Ph.D., 1983, University of Hawaii  
 Assistant Professor David C. Smith, Ph.D., 1994, Scripps Institution of Oceanography, University of California, San Diego  
 Assistant Professor Yang Shen, Ph.D., 1994, Brown University  
 Research Professor Theodore J. Smayda, Dr.Philos., 1967, University of Oslo, Sweden  
 Professor Emeritus H. Perry Jeffries Ph.D., 1959, Rutgers—The State University  
 Professor Emeritus John A. Knauss, Ph.D., 1959, University of California  
 Professor Emeritus Saul B. Salla, Ph.D., 1952, Cornell University  
 Professor Emeritus John M. Sieburth, Ph.D., 1954, University of Minnesota  
 Associate Professor Emeritus Theodore A. Nopora, Ph.D., 1964, Yale University

### Specializations

Biological, chemical, geological, and physical oceanography.

### Master of Oceanography

*Admission requirements:* GRE (aptitude required) and bachelor's degree in natural sciences or engineering. Most applicants are admitted for the fall semester, but admission for the start of the second semester is possible. Due to the limited number of students that can be accepted as degree candidates, no application will be considered which shows an undergraduate average of less than B unless there is post baccalaureate work indicating outstanding ability. To ensure full consideration for admission, the complete application packet should be received by January 15.

*Program requirements (total of 30 credits):* OCG 695 (two credits); written comprehensive examination; major paper (three credits); OCG 501, 521, 540, 561; six credits in oceanography or other science departments; three credits in policy, management, economics, or a related field; three credits in statistics, data analysis, or scientific writing.

### Master of Science

*Admission requirements:* GRE (aptitude required, advanced in the applicant's undergraduate major recommended) and bachelor's degree in natural sciences or engineering. Most applicants are admitted for the fall semester, but admission for the start of the second semester is possible. Due to the limited number of students that can be accepted as degree candidates, no application will be considered which shows an undergraduate average of less than B unless there is postbaccalaureate work indicating outstanding ability. To ensure full consideration for admission and financial support, the completed application packet should be received by January 15.

*Program requirements:* thesis, OCG 695, and participation in a regular ocean research cruise. For specialization in biological and chemical oceanography, OCG 501, 521, 540, and 561; for specialization in geological oceanography, six credits of 500- and 600-level OCG courses outside the geological oceanography discipline (not including OCG 695); for specialization in physical oceanography, OCG 501, 510, and any two of OCG 605, 610, and 613.

### Doctor of Philosophy

*Admission requirements:* GRE (aptitude required, advanced in the applicant's undergraduate major recommended); bachelor's degree in natural sciences or engineering. Most applicants are admitted for the fall semester, but admission for the start of the second semester is possible. Due to the limited number of students that can be accepted as degree candidates, no application will be considered which shows an undergraduate average of less than B unless there is postbaccalaureate work in-

dicating outstanding ability. To ensure full consideration for admission and financial support, the completed application packet should be received by January 15.

*Program requirements:* comprehensive examination; dissertation; OCG 695; participation in a regular ocean research cruise; six credits of 600-level OCG courses (excluding problems and research courses and OCG 695). For specialization in biological or chemical oceanography, OCG 501, 521, 540, and 561; for specialization in geological oceanography, OCG 540 and any two of OCG 501, 521, and 561; for specialization in physical oceanography, OCG 501, 510, 605, and 613 and any six credits of 500- and 600-level OCG courses outside the physical oceanography discipline. A Ph.D. qualifying examination is required of all doctoral students. This requirement is satisfied by completing, with a grade of B or better, the courses specified for the appropriate discipline.

### Financial Aid

There is a limited number of assistantships for master's and doctoral candidates.

### General Information

It is anticipated that approximately 20 students will be admitted to the program for the 1998–99 academic year.

### Pharmacognosy

M.S., Ph.D. (Pharmaceutical Sciences)  
 401-874-2751

### Graduate Faculty

*Chairperson:* Professor Zahir A. Shaikh, Ph.D., 1972, Dalhousie University, Canada  
 Professor Yuzuru Shimizu, Ph.D., 1963, Hokkaido University  
 Assistant Professor Lenore M. Martin, Ph.D., 1988, University of California, Los Angeles  
 Adjunct Assistant Professor Mostafa M. Omar, Ph.D., 1982, University of Rhode Island

### Specializations

Drug plants, herbal medicine, bio-organic chemistry, combinatorial chemis-

try, solid phase synthesis; and peptide chemistry. Biosynthesis of drug plant constituents, natural product chemistry including the isolation and structural elucidation of materials of potential medicinal interest, screening of natural products for physiologically active agents including materials from both land and marine sources.

### Master of Science

*Admission requirements:* GRE and bachelor's degree in pharmacy, chemistry, or biology.

*Program requirements:* ACS placement examination (organic) to determine specific program requirements; one seminar presentation per year; thesis; 30 credits including six to nine research credits (BMS 599), two credits of BMS 523 or 524, BMS 525, BMS 530 or BMS 535, BMS 551, BCH 581; two or three additional graduate courses or BMS 445 or 446 in consultation with major professor.

### Doctor of Philosophy (Pharmaceutical Sciences)

*Admission requirements:* GRE and master's degree in pharmacy, chemistry, or biology, or bachelor's degree in one of these with evidence of superior ability. Qualifying examination is required for candidates accepted without the master's degree.

*Program requirements:* same as M.S. plus the following: one additional seminar credit; two additional graduate-level BMS courses including BMS 633; research credits as required; 72 credits total; comprehensive examination, written and oral.

### Pharmacology and Toxicology

M.S., Ph.D. (Pharmaceutical Sciences)  
401-874-2362

### Graduate Faculty

*Chairperson:* Professor Zahir A. Shaikh, Ph.D., 1972, Dalhousie University, Canada  
Professor Robert L. Rodgers, Ph.D., 1977, University of Oklahoma  
Professor Alvin K. Swonger, Ph.D., 1971, Dartmouth College

Associate Professor John R. Babson, Ph.D., 1980, Oregon State University  
Associate Professor Clinton O. Chichester III, Ph.D., 1980, University of Rhode Island  
Assistant Professor Bingfang Yan, Ph.D., 1994, University of Kansas  
Adjunct Professor Kim Boekelheide, M.D., Ph.D., 1980, Duke University  
Adjunct Professor Ryoichi Nagata, Ph.D., 1991, Kagoshima University  
Adjunct Associate Professor Hans-Jurgen H. Barrach, Ph.D., 1973, Free University of Berlin  
Adjunct Associate Professor Joseph M. Capasso, Ph.D., 1979, St. John's University  
Adjunct Associate Professor Douglas O. Fisher, Ph.D., 1979, University of Rhode Island  
Adjunct Associate Professor Herbert V. Levinsky, Ph.D., 1969, College of Agriculture, Vienna  
Adjunct Assistant Professor Dennis C. Hilliard, M.S., 1980, University of Rhode Island

### Specializations

Effects of diabetes and hypertension on the heart, and hormonal regulation of cardiac and vascular functions; connective tissue metabolism and its relationship to rheumatoid arthritis; biochemical mechanisms of hepatic and renal toxicity of heavy metals; biochemical mechanisms of drug and chemical toxicity to cardiac and neuronormal cells; molecular biology of drug metabolizing enzymes and signal transduction.

### Master of Science

*Admission requirements:* GRE and bachelor's degree in pharmacy, biological sciences, or chemistry.

*Program requirements:* one seminar presentation per year; thesis; demonstrated proficiency in statistics either by course work or examination; 30 credits including six to nine research credits (BMS 599), two credits of BMS 523 or 524, BMS 525, BMS 530 or BMS 535, BMS 581; three or four courses from the following in consultation with major professor: BMS 446, 454, 455, 456, 544, 546, 572, 641, 642, 644; BCH 582.

### Doctor of Philosophy (Pharmaceutical Sciences)

*Admission requirements:* GRE and bachelor's or master's degree in pharmacy or science.

*Program requirements:* same as M.S. plus the following: both BMS 535 and BMS 530 required; one additional seminar credit; research credits as required; two additional graduate-level courses from BMS or BCH 582; 72 credits total; comprehensive examination, written and oral. Qualifying examination is required of candidates accepted without an M.S. degree.

### Pharmacy Administration

M.S.  
401-874-2789

### Graduate Faculty

*Director of Graduate Studies:* Professor Norman A. Campbell, Ph.D., 1972, University of Wisconsin  
Associate Professor Cynthia Willey Lessne, Ph.D., 1985, University of North Carolina, Chapel Hill  
Assistant Professor Susan Andrade, Sc.D., 1994, Harvard School of Public Health  
Associate Research Professor Paul E. Larrat, Ph.D., 1992, Brown University

### Specializations

Development and utilization of pharmacy resources in health care systems involving the organization, financing, and delivery of health care services and materials and the legal and socioeconomic constraints.

### Master of Science

*Admission requirements:* GRE or MAT and first professional degree in pharmacy.

*Program requirements:* thesis; APS 599, 651, 652, 693, 694, STA 409, or equivalents.

### Financial Aid

Fellowships from the American Foundation for Pharmaceutical Education are available.

## Philosophy

M.A.  
401-874-2418

Admissions to the M.A. program in philosophy have been suspended, and no applications are being accepted. The frequency with which the following 500-level courses are offered depends on the needs of current students. For further information, please contact the department directly.

### Graduate Faculty

*Chairperson:* Professor Galen A. Johnson, Ph.D., 1977, Boston University  
Professor Yong Choon Kim, Ph.D., 1969, Temple University  
Professor Lynn Pasquerella, Ph.D., 1985, Brown University  
Professor John F. Peterson, Jr., Ph.D., 1965, Indiana University  
Professor Stephen D. Schwarz, Ph.D., 1966, Harvard University  
Professor Fritz Wenisch, Ph.D., 1968, University of Salzburg  
Professor Donald J. Zeyl, Ph.D., 1972, Harvard University  
Associate Professor Cheryl A. Foster, Ph.D., 1992, University of Edinburgh  
Associate Professor James G. Kowalski, Ph.D., 1975, University of Notre Dame  
Professor Emeritus William Young, B.Litt., 1958, University of Oxford

### Specializations

Programs of study are offered in the following general areas: logic and philosophy of science, axiology, and history of philosophy.

### Master of Arts

*Admission requirements:* GRE and 18 credits in basic philosophy courses. Students whose undergraduate preparation did not include at least 18 credits in basic philosophy courses will be required to take these in addition to the graduate program requirements.

*Program requirements:* for the thesis option, 24 credits in course work, six credits in master's thesis research. For the non-thesis option, 30 credits in course work,

comprehensive examination. Students in both options will normally include six credits in disciplines other than philosophy. Proficiency in a foreign language will be required if the student's program committee considers it essential for the thesis topic or the substantial paper involving significant independent research to be written by students choosing the nonthesis option.

## Physical Education

M.S.  
401-874-2976

### Graduate Faculty

*Director of Graduate Studies:* Professor Greta L. Cohen, Ed.D., 1981, Boston University  
Professor Thomas Manfredi, Ph.D., 1976, University of Massachusetts  
Professor Raymond A. Nedwidek, Ed.D., 1965, University of Pittsburgh  
Associate Professor Linda S. Lamont, Ph.D., 1983, Kent State University  
Associate Professor Leo E. O'Donnell, Ed.D., 1970, Temple University  
Associate Professor John O'Leary, M.S., 1963, Southern Connecticut State College  
Associate Professor J. Richard Polidoro, D.P.E., 1969, Springfield College  
Associate Professor Diane Seleen, Ed.D., 1981, Boston University  
Assistant Professor Deborah Riebe, Ph.D., 1995, University of Connecticut, Storrs  
Professor Emerita Lorraine E. Bloomquist, Ed.D., 1974, Boston University  
Professor Emeritus Robert J. Sonstroem, Ph.D., 1968, University of Minnesota

### Specializations

Exercise science—experimental track, clinical track; teaching and administration; psychosocial perspectives.

### Master of Science

*Admission requirements:* MAT or GRE with B.S. degree in physical education, health, or physical education and sport science. In exceptional cases, a candidate without a major in physical education or a related area but with a strong emphasis in the health and wellness field is accepted.

*Program requirements:* for thesis option, 30 credits, including core courses PEX 530, and 599. For nonthesis option, 33 credits, including core courses PEX 530, 591, and a written master's comprehensive examination. Required courses for each concentration include the following: *exercise science experimental track:* EXS 531, 559, and 562; *exercise science clinical track:* EXS 559, 565, 581, and PEX 592; *teaching and administration:* PEX 510, 520, and 550; *psychosocial perspectives:* PEX 578 or EXS 581. Additionally, recommended electives are indicated for each program concentration.

## Physical Therapy

M.S.  
401-874-5001

### Graduate Faculty

*Director:* Professor Mark J. Rowinski, Ph.D., 1976, Medical College of Georgia  
Associate Professor James Agostinucci, D.Sci., 1988, Boston University  
Associate Professor Peter R. Blanpied, Ph.D., 1989, University of Iowa  
Associate Professor Susan E. Roush, Ph.D., 1990, University of Washington

The physical therapy program is an entry-level Master of Science program that prepares students for the state professional licensure examination. There is an emphasis on the development of clinical skill and research capability through the three-year graduate study plan.

### Specializations

Research activities are focused on tissue biomechanics, neuromuscular control, muscle performance, and neurological rehabilitation. Clinical therapeutic skill is enhanced by faculty clinical practice and regional internships.

### Master of Science

*Admission requirements:* GRE (aptitude test scores at the 50th percentile or above are desired) and a bachelor's degree with 12 credits of biological sciences (including

a minimum of six credits of human anatomy and human physiology); physical sciences (preferably 16 credits, eight in chemistry and eight in physics); six credits of social sciences (including general and developmental psychology); three credits in mathematics (preferably precalculus); and three credits in communications (preferably writing or speech). Courses in abnormal psychology, computer science, exercise physiology, and statistics through ANOVA are strongly recommended but not required.

A clinical experience with a physical therapist is required. The experience should include observing and aiding a physical therapist in treatment or evaluation procedures. The minimum number of hours recommended for the clinical experience is 30–40 hours of voluntary or paid time. Most successful applicants demonstrate a diversity of clinical experience and a number of hours exceeding the minimum required in a physical therapy setting. The experience may be part of field work study for credit in a health-related discipline. Evidence of such experience should be documented by a recommendation from the physical therapist addressing the nature and duration of the experience, which should be submitted as part of the application process. Special recommendation forms and a form for the listing of completed prerequisites should be obtained by sending a self-addressed, stamped envelope with \$3 postage to the physical therapy program. Baccalaureate requirements must be completed prior to final acceptance into the master's program. The completed application package must be received by the second Friday in January. While applications will be reviewed as early as December 15, applicants will be admitted for the fall semester only.

**Program requirements:** a minimum of 83 credits of specified physical therapy course work, including 15 credits of internship. This program is a three-year plan of required course work, with the first two semesters at the 400 and 500 levels (29 credits), followed by four semesters and a

summer session of graduate-level course work, including an internship at an affiliated institution between the second and third years. As for all internships, the student may have to pay living expenses for summer internships. Internships and clinical course work of the first year also require immunization for the hepatitis B virus and instruction in HIV precautions, as required by OSHA standards. Immunization is at the student's expense. Though essentially a nonthesis program, a substantial paper involving significant independent research is required. A course in statistical methods, which includes ANOVA, correlation, and regression analysis, is required prior to or concurrent with the first semester of the second year of the program. All courses involving clinical skill development require skill competency testing via practical examination. All clinical competencies determined necessary by the faculty of the respective course must be demonstrated as adequately learned by the student in these courses for achievement of an adequate scholastic course grade. (See "Scholastic Standing," page 112.) Master's comprehensive examination is required. Courses required during the first two semesters may be waived, with an equivalent reduction in credits required for the degree, if acceptable grades have been earned in the course(s) prior to final acceptance into graduate status, and if approved by the program faculty.

## Physics

M.S., Ph.D.  
401-874-2633

### Graduate Faculty

**Chairperson:** Professor Surendra S. Malik, Ph.D., 1960, Agra University  
Professor Kenneth L. Hartt, Ph.D., 1963, University of Nebraska  
Professor David R. Heskett, Ph.D., 1985, University of Pennsylvania  
Professor Leonard M. Kahn, Ph.D., 1976, Brown University  
Professor Charles Kaufman, Ph.D., 1963, Pennsylvania State University

Professor Stephen V. Letcher, Ph.D., 1964, Brown University  
Professor Alexander E. Meyerovich, D.Sc., 1985, Institute of Physical Problems, Moscow  
Professor Gerhard Muller, Ph.D., 1980, University of Basel  
Professor M. Peter Nightingale, Ph.D., 1978, University of Amsterdam  
Professor Jan A. Northby, Ph.D., 1966, University of Minnesota  
Professor Anthony C. Nunes, Ph.D., 1969, Massachusetts Institute of Technology  
Professor Albert Steyerl, Ph.D., 1971, Technische Universitat, Munich  
Adjunct Professor Louis Goodman, Ph.D., 1971, Drexel University  
Adjunct Professor Richard A. McCorkle, Ph.D., 1970, North Carolina State University  
Adjunct Associate Professor Elizabeth Bozyan, Ph.D., 1985, University of Texas, Austin  
Adjunct Assistant Professor Michael Briere, Ph.D., 1993, Technical University of Berlin, Germany  
Professor Emeritus J. Scott Desjardins, Ph.D., 1959, Columbia University  
Professor Emeritus Stanley J. Pickart, Ph.D., 1958, University of Maryland

### Specializations

**Acoustics and optics:** underwater acoustics; acoustic imaging; ultrasonics; acousto-optical transducers; fiber optics.

**Astronomy:** astrometry; differential photometry.

**Condensed matter theory:** low-dimensional physics; statistical mechanics; magnetism; surface magnetism; Fermi liquids, spin-polarized helium and hydrogen, nonlocal hydrodynamics; chemisorption; superconductivity; alloys; hydrogen in metals; defects in solids.

**Interdisciplinary physics:** computational physics; biophysics; magnetochemistry; fiber optics; dissipative chaos applied to marine and climate phenomena.

**Liquid state:** liquid crystals; liquid helium; ferrofluids; turbulence; superfluids.

**Low-temperature physics:** ionic mobilities; finite droplet effects; magnetic susceptibility; specific heats; magnetic cooling; quantum solids, liquids, and gases.

**Neutron physics:** ultra-cold neutrons; neutron optics.

*Neutron scattering:* small-angle scattering; solution scattering; surfaces and fine particles; crystal structure; amorphous magnets; high-temperature superconductors; inelastic scattering; phonons and spin waves.

*Nuclear theory:* inverse scattering studies; few-nucleon studies; hypernuclei; weak interactions.

*Surface physics:* electronic and structural properties of surfaces including phase transitions using LEEDS, AUGER, X-rays, and BNL Synchrotron Facility.

### Master of Science

*Admission requirements:* GRE and advanced test recommended; bachelor's degree with major in physics preferred.

*Program requirements:* PHY 510, 520, 525, 530, 560, 570, and 580 are required of all students. For both the thesis and the nonthesis options, the student will complete 30 credits, of which no more than six may be below the 500 level. For the nonthesis option, at least one course will require a substantial paper involving significant independent study, and the student must pass a final written and oral examination.

### Doctor of Philosophy

*Admission requirements:* GRE and advanced test recommended; bachelor's degree with major in physics preferred. Master's degree is not required.

*Program requirements:* PHY 510, 520, 525, 530, 570, 580, 610, 625 (or 626), 630, 660, 670, and 680. There is no formal departmental language requirement, although the candidate's committee may require demonstration of language proficiency. Successful completion of a qualifying examination is required of all students.

### Plant Sciences

See Environmental Sciences.

### Political Science

M.A., M.P.A.  
401-874-2183; 401-277-5200

#### Graduate Faculty

*Chairperson:* Professor Gerry S. Tyler, Ph.D., 1972, Yale University  
Professor Timothy M. Hennessey, Ph.D., 1968, University of North Carolina  
Professor Lawrence Juda, Ph.D., 1973, Columbia University  
Professor Alfred G. Killilea, Ph.D., 1969, University of Chicago  
Professor Edgar C. Leduc, Ph.D., 1963, Indiana University  
Professor Lawrence Rothstein, Ph.D., 1976, University of Massachusetts  
Professor Arthur Stein, Ph.D., 1965, University of Pennsylvania  
Professor Norman L. Zucker, Ph.D., 1960, Rutgers—The State University  
Associate Professor Marc A. Genest, Ph.D., 1992, Georgetown University  
Associate Professor Cynthia M. Hamilton, Ph.D., 1980, Boston University  
Associate Professor Maureen Moakley, Ph.D., 1984, Rutgers—The State University  
Associate Professor Nicolai N. Petro, Ph.D., 1984, University of Virginia  
Adjunct Professor Victor L. Profughi, Ph.D., 1967, University of Pittsburgh  
Adjunct Associate Professor Francis J. Leazes, Jr., Ph.D., 1984, University of Connecticut

#### Specializations

International relations, comparative politics, American politics, public policy, and public administration.

#### Master of Arts

*Admission requirements:* generally, GRE, GMAT, or MAT, and undergraduate credit in basic political science and political theory.

*Program requirements:* a minimum of 30 credits including PSC 553, 580 or 584, and 583 for both thesis and nonthesis options; nonthesis option requires one course including a substantial paper requiring significant independent research and an oral examination in addition to the comprehensive examination.

### Master of Public Administration

The Rhode Island Master of Public Administration Program (RIMPA) leads to the M.P.A. degree conferred by the University of Rhode Island. It is a collaborative undertaking, governed and offered by a committee of university faculty that includes adjunct faculty from Rhode Island College. The RIMPA is offered at URI's Providence campus and provides federal, state, city, and nonprofit officials and agencies easy access to its instructional programs and research expertise. In addition to delivering its degree and certificate programs, internships, and workshops, the RIMPA faculty conducts research into the formation and implementation of public policy and the administration of public and nonprofit agencies. Current research areas include public professional ethics, the training of public managers, water resource management, the governance and financing of nonprofits, state prison administration, the public administration of technology, industrial policy at the state and national levels, and case management in mental health agencies.

*Admission requirements:* generally, based on the applicant's undergraduate academic record; current scores for one of the following exams: GRE, MAT, GMAT. Exam requirement waived for applicants holding an advanced degree from an accredited institution of higher education.

*Program requirements:* nonthesis program; one course including a substantial paper requiring significant independent research; comprehensive examination; internship; minimum total of 36 credits including PSC 501, 502, 503, 505, 506, 524, and 573. Competency in computer science and statistics is required and may be demonstrated by completion of a basic course at the undergraduate level.

Students in the RIMPA program taking elective courses at the participating institutions will be governed by the same regulations effective for courses taken at URI. Under this rule, grades (including failures) for all graduate courses taken at a participating institution will be included in the grade

point average and will become part of the student's record.

### M.P.A. and M.L.I.S. Cooperative Program

A cooperative program permits joint enrollment in the Master of Public Administration and the Master of Library and Information Studies programs. The integrated pursuit of the two degrees makes it possible for nine credits of appropriately selected course work from one program to serve as electives in the other, and for six credits of such course work to be applied in the opposite direction. Thus, when planned and taken jointly, the two programs can be completed with a total of 63 credits.

*Admission requirements:* GRE and other requirements listed for M.P.A. and M.L.I.S. Applicant must apply and be accepted in both programs. Applications to both programs must indicate M.P.A./M.L.I.S. as the field of specialization.

*Program requirements:* Each student must complete the required core courses for both programs plus three credits of PSC 590 for the M.P.A. After consultation with, and approval of, both departments, students must file separate programs of study for each degree, indicating the courses to be jointly counted. Each student must pass the separate comprehensive examination for each degree. A student who fails to complete one of the programs may, of course, complete the other in accordance with the separate program of study.

## Psychology

M.S., Ph.D.  
401-874-2193

### Graduate Faculty

*Chairperson:* Professor Charles E. Collyer, Ph.D., 1976, Princeton University  
Professor Allan Berman, Ph.D., 1968, Louisiana State University  
Professor Henry B. Biller, Ph.D., 1967, Duke University  
Professor Susan A. Brady, Ph.D., 1975, University of Connecticut

Professor Jerry L. Cohen, Ph.D., 1973, University of Illinois  
Professor David Faust, Ph.D., 1979, Ohio University  
Professor Paul R. Florin, Ph.D., 1981, George Peabody College, Vanderbilt University  
Professor Richard J. Gelles, Ph.D., 1973, University of New Hampshire  
Professor Lawrence C. Grebstein, Ph.D., 1964, University of Kentucky  
Professor Ira Gross, Ph.D., 1967, University of Illinois  
Professor Lisa L. Harlow, Ph.D., 1985, University of California, Los Angeles  
Professor Janet M. Kulberg, Ph.D., 1967, George Peabody College, Vanderbilt University  
Professor Patricia J. Morokoff, Ph.D., 1980, State University of New York, Stony Brook  
Professor James O. Prochaska, Ph.D., 1969, Wayne State University  
Professor Kathryn Quina, Ph.D., 1973, University of Georgia  
Professor Albert Silverstein, Ph.D., 1963, University of California, Berkeley  
Professor Nelson F. Smith, Ph.D., 1963, Princeton University  
Professor John F. Stevenson, Ph.D., 1974, University of Michigan  
Professor Dominic Valentino, Ph.D., 1971, University of California, Riverside  
Professor Wayne F. Velicer, Ph.D., 1972, Purdue University  
Professor W. Grant Willis, Ph.D., 1984, University of Georgia  
Associate Professor Paul B. deMesquita, Ph.D., 1987, University of Texas at Austin  
Associate Professor Shanette M. Harris, Ph.D., 1989, Virginia Polytechnic Institute and State University  
Associate Professor Laurie Ruggiero, Ph.D., 1988, Louisiana State University  
Adjunct Professor David Abrams, Ph.D., 1981, Brown University  
Adjunct Professor John J. Colby, Ph.D., 1974, University of Rhode Island  
Adjunct Professor Joseph S. Rossi, Ph.D., 1984, University of Rhode Island  
Adjunct Associate Professor Douglas Bernon, Ph.D., 1987, California School of Professional Psychology  
Adjunct Associate Professor Joseph Fava, Ph.D., 1990, University of Rhode Island  
Adjunct Associate Professor Anne Fowler, Ph.D., 1984, University of Pennsylvania  
Adjunct Associate Professor J. Eugene Knott, Ph.D., 1975, University of Maryland

Adjunct Associate Professor Robert LaForge, Sc.D., 1987, Johns Hopkins University  
Adjunct Associate Professor Debra Lobato, Ph.D., 1981, University of Massachusetts  
Adjunct Associate Professor Elaine C. Meyer, Ph.D., 1990, University of Rhode Island  
Adjunct Associate Professor Roger Mitchell, Ph.D., 1980, University of Maryland  
Adjunct Associate Professor Peter Monti, Ph.D., 1974, University of Rhode Island  
Adjunct Associate Professor Unto Pallonen, Ph.D., 1986, University of Minnesota  
Adjunct Assistant Professor James Arruda, Ph.D., 1994, University of Rhode Island  
Adjunct Assistant Professor Jody Brown, Ph.D., 1990, City University of New York  
Adjunct Assistant Professor Bette LaSere Erickson, Ed.D., 1976, University of Massachusetts  
Adjunct Assistant Professor Sherri Fitts, Ph.D., 1992, University of Rhode Island  
Adjunct Assistant Professor E. Grace Frenzel, Ph.D., 1979, Colorado State University  
Adjunct Assistant Professor Katherine C. Haspel, Ph.D., 1981, University of Rhode Island  
Adjunct Assistant Professor Susan Kirschenbaum, Ph.D., 1985, University of Rhode Island  
Adjunct Assistant Professor Andrea Kotula, Ed.D., 1992, Harvard University Graduate School of Education  
Adjunct Assistant Professor Joseph A. Maxwell, Ph.D., 1986, University of Chicago  
Adjunct Assistant Professor Barry A. Plummer, Ph.D., 1981, University of Rhode Island  
Adjunct Assistant Professor Colleen Redding, Ph.D., 1993, University of Rhode Island  
Adjunct Assistant Professor Robert Samuels, Ph.D., 1987, University of Massachusetts  
Professor Emeritus Albert J. Lott, Ph.D., 1958, University of Colorado  
Professor Emerita Bernice Lott, Ph.D., 1953, University of California, Los Angeles  
Professor Emeritus Peter F. Merenda, Ph.D., 1957, University of Wisconsin  
Professor Emeritus William T. Vosburgh, Ph.D., 1965, Syracuse University  
Professor Emeritus Alan Willoughby, Ph.D., 1959, University of Connecticut

### Specializations

Programs are offered in clinical, experimental, and school psychology. Specializations are offered within each program. The clinical program encourages students to organize their courses so as to foster their developing career needs. Thus, one is en-

couraged to develop specific interests and competencies in areas such as health psychology, substance abuse, child/clinical, community, neuropsychology, applied methodology, gender issues, and family systems. Students in the experimental program tend to concentrate in one of the following five areas: 1) human perception and learning; 2) conditioning and behavior change; 3) psychophysiology; 4) methodology and quantitative psychology; and 5) personality/social/community bases of behavior. Additional individual specialties can be developed within each of the program areas.

### **Master of Science (School Psychology Only)**

*Admission requirements:* GRE, advanced test recommended. Undergraduate major in psychology recommended. Applicants are admitted for the fall semester only. The completed application package must be received by February 15.

*Program requirements:* nonthesis—internship; total of 60 credits with a minimum of 30 for the master's degree plus additional credits for certification as a school psychologist; one course with a major paper involving significant independent research; and a written comprehensive examination.

This program is accredited by NCATE/NASP and NASDTEC, and meets the requirements for certification in Rhode Island.

### **Doctor of Philosophy (Clinical, Experimental, and School Psychology)**

*Admission requirements:* GRE, advanced test recommended; evidence of research competency. Applicants are admitted for the fall semester only. The completed application package must be received by January 20 for clinical, by February 15 for school, and by March 1 for experimental. Prospective applicants are asked to address initial inquiries concerning the desired specialization to the department. The formal application materials can be obtained from

the Graduate School Office, but the completed application package must be sent to the department. Applicants to the clinical and school programs are evaluated on the basis of previous academic achievement, GRE scores, previous life experience, previous applied clinical and research experience, letters of recommendation, personal interview, and projected balance between applicant and program needs.

Due to limited facilities, new admissions to the doctoral programs must be limited to a small number per year. Finalists in the school and clinical specialization must participate in a personal interview to complete the evaluation process. Although test scores and cumulative averages are not the sole criteria for admission to the clinical program, those with overall quality point averages of less than 3.00 (on a 4.00 scale), or whose verbal and quantitative GRE scores do not total above 1200, are advised that there is little chance for admission.

*Program requirements:* completion of a minimum of 90 credits (72 plus 18 for dissertation). Research course requirements: a minimum of two courses in statistics (STA/PSY 532, PSY 533) and a research methods course (PSY 611). The research competency requirement may be met by successfully defending a master's thesis or by successfully completing a research competency project under the direction of the major professor. The research competency project option is limited to those who have nonthesis master's degrees in psychology. Students who successfully complete the thesis option will earn a Master of Arts degree in psychology. A Ph.D. qualifying examination is required of all doctoral students entering without the master's degree. This requirement is met by completing four core courses from STA/PSY 532, PSY 533, 611, and those numbered 601–609, with a grade of B or better. These courses are usually completed prior to earning 24–30 credits. For students in the applied areas (clinical and school), at least one core course must be completed in each of the following content areas of psychology: biological bases of behavior;

cognitive and affective bases; social bases; individual differences; and history and systems of psychology.

The objective of our Ph.D. program is to give our students the knowledge and skills they will need to be effective psychologists in their chosen area. Scientific training and research experience as well as knowledge and technical skills are a part of each student's program, but his or her program is individually designed around his or her needs and goals.

Both the clinical and the school psychology programs are accredited by the American Psychological Association. Both programs subscribe to the scientist-practitioner model, and thus course requirements are consistent with maintaining such accreditation. Practicum and individual research projects can be specifically tailored to help the student prepare for the professional role of his or her choice. These programs also have a strong experiential base, including field activity in each year. Students are expected to be involved in research for a substantial portion of their program.

The department emphasizes a close working relationship between faculty and students. No single theoretical or philosophical model is espoused.

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## **Resource Economics**

M.S., Ph.D.  
401-874-2471

### **Graduate Faculty**

*Chairperson:* Associate Professor Cathy R. Wessells, Ph.D., 1990, University of California, Davis

*Director of Graduate Studies:* Professor Jon G. Sutinen, Ph.D., 1973, University of Washington

Professor James L. Anderson, Ph.D., 1983, University of California, Davis

Professor John M. Gates, Ph.D., 1969, University of California, Berkeley

Professor Thomas A. Grigalunas, Ph.D., 1972, University of Maryland

Professor James J. Opaluch, Ph.D., 1979, University of California, Berkeley

Professor Timothy J. Tyrrell, Ph.D., 1979, Cornell University  
 Associate Professor Stephen K. Swallow, Ph.D., 1988, Duke University  
 Associate Professor Dennis G. Wichelns, Ph.D., 1986, University of California, Davis  
 Adjunct Professor Jason Shogren, Ph.D., 1986, University of Wyoming

### Specializations

*For M.S. and Ph.D.:* environmental economics, renewable and nonrenewable natural resource economics, fisheries management, international fisheries development, international trade, fisheries marketing, coastal zone land use and management, quality of the marine environment, aquaculture economics, offshore oil and gas management, and natural resource pricing policies.

### Master of Science

*Admission requirements:* the GRE is required. A strong undergraduate record in economics or business is highly desirable.

*Program requirements:* for the thesis option, 24 credits including REN 534 and REN 501, in addition to a written comprehensive examination, and at least six M.S. thesis credits. For the nonthesis option, 34 credits including REN 534 and REN 501, in addition to a written comprehensive examination, and at least one REN 598 credit given for a substantial paper requiring significant independent research. REN 501 must be taken each semester by full-time graduate students in residence, but only one credit may count toward the program.

### Doctor of Philosophy

*Admission requirements:* GRE, six credits in statistics, and the following courses or their equivalents—ECN 327, 328, and 375.

*Program requirements:* the Ph.D. qualifying examination is required of students admitted without the master's degree. ECN 527; REN 501, 534, 576, 602, 628, 630, 634, 635, and 676 are required. REN 501 must be taken each semester by full-time graduate students in residence, but only one credit may count toward the program. Additional courses may be elected

from appropriate offerings in economics, resource economics, engineering, geography, oceanography, mathematics, political science, statistics, computer science, and management science. The dissertation will be written on a problem involving marine resources or an associated industry, such as minerals, petroleum, fisheries, water, transportation, recreation, or waste disposal.

### Spanish

M.A.  
 401-874-5911

### Graduate Faculty

*Chairperson:* Professor John M. Grandin, Ph.D., 1970, University of Michigan  
*Director of Graduate Studies:* Associate Professor Clement A. White, Ph.D., 1987, Brown University  
 Professor David M. Gitlitz, Ph.D., 1968, Harvard University  
 Professor Robert C. Manteiga, Ph.D., 1977, University of Virginia  
 Professor Mario F. Trubiano, Ph.D., 1979, University of Massachusetts  
 Associate Professor Thomas D. Morin, Ph.D., 1975, Columbia University

### Specializations

The Master of Arts in Spanish is designed for those who wish to perfect their undergraduate achievement in the general area of Hispanic studies, including language mastery and understanding of literature in the total context of civilization and culture. The literary production of Spain, Spanish America, and the Spanish-speaking peoples of the United States will be studied. Any one of these areas could provide a field for specialization.

### Master of Arts

*Admission requirements:* undergraduate major in Spanish or equivalent, including 12 credits in Spanish or Hispanic-American literature. Qualified students may be admitted with less than 12 credits but must make them up without graduate credit.

*Program requirements:* all work carried out in Spanish. For thesis option, 30 credits

including six thesis research credits. For nonthesis option, 30 credits. All candidates must pass a written comprehensive examination and an oral comprehensive examination. Course work may be completed on campus or through the URI summer study program in Salamanca, Spain, or a combination of both.

### Speech-Language Pathology and Audiology

M.S.  
 401-874-5969

### Graduate Faculty

*Chairperson:* Associate Professor Jay Singer, Ph.D., 1976, Case Western Reserve University  
 Professor Barbara Culatta, Ph.D., 1975, University of Pittsburgh  
 Professor Stephen D. Grubman-Black, Ph.D., 1972, State University of New York, Buffalo  
 Associate Professor Robert C. Marshall, Ph.D., 1969, University of Oklahoma  
 Associate Professor John P. Preece, Ph.D., 1985, University of Iowa  
 Assistant Professor Dana Kovarsky, Ph.D., 1989, University of Texas at Austin

### Specializations

Audiology and speech-language pathology.

### Master of Science

*Admission requirements:* GRE or MAT and 19 undergraduate credits in communicative disorders (always including CMD 372, 373, 374, 375, 376, and 465, or equivalents). Although cumulative average is not the sole criterion for admission to the graduate programs in speech-language pathology and audiology, those applicants with overall quality point averages of less than 3.00 (on a 4.00 scale) may be advised to address background deficits to gain admission to the program. The completed application package must be received by October 15 for spring admission and March 1 for fall admission.

*Program requirements:* M.S. in speech-language pathology with thesis and



*nonthesis options (54 credits).* Required courses consist of the following: CMD 454, 504, 551, 560, 561, 564, 569, 570, 582, 584, 585, and 592. Nonthesis option (54 credits): written comprehensive examination; CMD 504; 40 credits in speech-language pathology and eight credits in audiology. Thesis option (54 credits): thesis; CMD 504; 34 credits in speech-language pathology and eight credits in audiology. *M.S. in audiology with thesis and nonthesis options (54 credits).* Required courses consist of the following: CMD 454, 504, 551, 552, 553, 555, 556, 557, 570, and 572. Nonthesis option (54 credits): written comprehensive examination; CMD 504; 40 credits in audiology and eight credits in speech-language pathology. Thesis option (54 credits): thesis; CMD 504; 34 credits in audiology and eight credits in speech-language pathology.

For either the M.S. program in speech-language pathology or audiology, students must also complete sufficient directed observations and supervised clock hours of practicum to satisfy the requirements of the American Speech-Language Hearing Association. Because program requirements in both speech-language pathology and audiology include clinical responsibilities, the average length of time to complete any of the programs is two academic years and one summer.

### **Accelerated Bachelor's-Master's Degree Program in Speech-Language Pathology or Audiology**

University of Rhode Island senior undergraduate majors in communicative disorders who have met requirements for early acceptance in the graduate program of either speech-language pathology or audiology may follow a special sequence of graduate-level course work and clinical practicum during their senior year. If eligible, following the award of the Bachelor of Science degree in communicative disorders, students may complete a 30-semester-hour master's degree (rather than the usual 54-semester-hour master's degree) in one year of full-time graduate study. This

option, which requires careful sequencing of senior and graduate course work, is not available to students from other undergraduate institutions nor to students who elect part-time graduate study prior to completion of the fifth year.

*Admission requirements:* URI sixth-semester standing in communicative disorders with all major requirements completed and 28 elective credits remaining; a 3.00 cumulative quality point average and 3.20 in the major through the fifth semester; and two letters of recommendation from URI communicative disorders faculty.

*Program requirements:* for students who have taken the specified 25 credits (16 of which must be at the 500 level) of communicative disorders course work in the senior year to complete the bachelor's degree in communicative disorders, 30 credits of course work in the fifth year (postbaccalaureate) at the 500 level. Specific course requirements are as stated in the regular two-year master's program.

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## **Statistics**

M.S.  
401-874-2701

### **Graduate Faculty**

*Chairperson:* Professor Edmund A. Lamagna, Ph.D., 1975, Brown University  
*Section Head:* Professor R. Choudary Hanumara, Ph.D., 1968, Florida State University  
Professor James F. Heltshe, Ph.D., 1973, Kansas State University  
Associate Professor Colleen Kelly, Ph.D., 1991, University of California, San Diego  
Professor Emeritus Edward J. Carney, Ph.D., 1967, Iowa State University

### **Specializations**

Experimental design, sampling, ecological statistics and biostatistics, statistical computation, simulation, multivariate analysis, nonparametric methods, classification and discrimination, analysis of variance, bootstrap and jackknife estimation, sequential methods.

## **Master of Science**

*Admission requirements:* bachelor's degree including the equivalent of MTH 141, 142 Introductory and Intermediate Calculus with Analytic Geometry; MTH 243 Calculus for Functions of Several Variables; MTH 215 Introduction to Linear Algebra; CSC 201 Introduction to Computing; STA 409, 412 Statistical Methods in Research I and II. GRE; advanced test in mathematics or undergraduate field is desirable.

*Thesis option program requirements:* a minimum of 24 credits (exclusive of thesis) including MTH 451, 452, either STA 501 or 502, and at least nine additional credits selected from STA 500, 501, 502, 520, 541, 542, 550, 592, 611.

*Nonthesis option program requirements:* 33 credits distributed as follows—1) MTH 451, 452, and either STA 501 or 502; 2) at least nine credits selected from STA 500, 501, 502, 520, 541, 550, 592, 611; 3) at least six of the remaining credits must be at the 500 level or above (exclusive of STA 591); 4) the above course work must include at least one course that requires a substantial paper involving significant independent study; and 5) written comprehensive examination.

### **Doctor of Philosophy**

See Applied Mathematical Sciences.

### **General Information**

Programs of study can be designed for individuals who are employed on a full-time basis.

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## **Teacher Certification**

401-874-4068

Students who did not obtain Rhode Island Teacher Certification as part of their undergraduate studies may do so by being admitted to a certification program or a master's degree program with a certification option and satisfactorily completing a prescribed set of courses in the appropriate fields. Applicants for elementary or one of the secondary fields described below must

apply as master's degree students. Applicants for early childhood education, music education, or school library media certification may indicate the specific TCP program code on the application forms and submit two official transcripts of all prior academic work, showing receipt of the bachelor's degree, plus a personal statement of objectives and two letters of recommendation.

Applications for the education department programs are reviewed by each individual specialization (see below); admission is competitive. If space becomes available for any particular program, completed applications for that program may be reviewed subsequently.

A test of basic skills is required prior to action on the application. The NTE Communications and General Knowledge tests are required as part of the admissions process for the music education program. For all other teacher education programs, the basic skills requirement consists of a mathematics test administered by the Department of Education each spring. Please contact the appropriate department(s) in the following list for additional information relative to this requirement. An interview is also required of all applicants. Students admitted to the TCP program are governed by the same academic standards as matriculated graduate students.

Further information can be obtained from the Office of Teacher Education at 401-874-5930 or from the following areas of specialization:

*Early Childhood Education (510):* Associate Professor Diane Horm-Wingerd, Chairperson, Department of Human Development and Family Studies, 401-874-2150

*Elementary Education (525):* Assistant Professor Sandy Hicks, Department of Education, 401-874-5976

*Secondary Education (525)*

English: Associate Professor Richard G. Nelson, Department of Education, 401-874-4165  
Mathematics: Professor John V. Long, Jr., Department of Education, 401-874-4149  
Science: Professor William Croasdale, Department of Education, 401-874-4161

Social Studies: Professor David Byrd, Department of Education, 401-874-5484  
Languages: Associate Professor JoAnne Hammadou, Department of Modern and Classical Languages and Literatures, 401-874-4712

*Music Education (070):* Associate Professor Carolyn Livingston, Department of Music, 401-874-2763

*School Library Media (940):* Assistant Professor Cheryl McCarthy, Graduate School of Library and Information Studies, 401-874-2878

## Textiles, Fashion Merchandising, and Design

M.S.  
401-874-4574

### Graduate Faculty

*Chairperson:* Professor Linda M. Welters, Ph.D., 1981, University of Minnesota  
Professor Martin J. Bide, Ph.D., 1979, University of Bradford, England  
Associate Professor Yvette Harps-Logan, Ph.D., 1990, Virginia Polytechnic Institute and State University  
Associate Professor Patricia A. Helms, Ph.D., 1971, Florida State University  
Associate Professor Margaret Ordoñez, Ph.D., 1978, Florida State University  
Assistant Professor Josephine Moreno, Ph.D., 1995, Iowa State University  
Adjunct Professor Joy Emery, M.A., 1966, Ohio State University  
Adjunct Assistant Professor Gail Mohanty, Ph.D., 1984, University of Pennsylvania  
Professor Emerita Misako Higa, Ph.D., 1973, University of Minnesota

The department offers a wide variety of individualized programs in close association with other departments (Art, Chemistry, Education, History, Human Development and Family Studies, Marketing) and with various social science fields.

### Specializations

Textile science, historic textiles and costume, textile conservation, cultural analysis, and fashion merchandising.

### Master of Science

*Admission requirements:* GRE and a bachelor's degree with adequate preparation for the proposed area of study.

*Program requirements:* for thesis option, completion of a minimum of 30 credits, including six credits of thesis research. For nonthesis option, completion of a minimum of 33 credits, half of which must be TMD courses numbered 500 or above, including at least one course that requires a substantial paper involving significant independent study, and written comprehensive examinations. TMD 510 is a requirement for all students. For the textile science specialization, TMD 503 and 510; half of the remaining elective credits must be from TMD courses numbered 500 or above. For the historic textiles and costume specialization, TMD 510, 520, 524, and a supervised internship (TMD 530, two to four credits); half of the remaining elective credits must be from TMD courses numbered 500 or above. A minimum of nine credits is required to achieve a competency level in an allied field such as art history, history, or anthropology; this may result in a program of more than 30 credits. The committee may elect to waive this requirement if the candidate has adequate preparation in the allied field as an undergraduate. Candidates lacking undergraduate courses in textile science and historic costume may be required to make up deficiencies without graduate credit. For the fashion merchandising specialization, TMD 510 and 524; six credits to be selected from TMD 532, 542, and 552; half of the remaining elective credits must be from TMD courses numbered 500 or above. Candidates lacking undergraduate courses in textile science and fashion merchandising may be required to make up deficiencies without graduate credit.

# COURSES OF INSTRUCTION



**U**ndergraduate and graduate courses offered at the University of Rhode Island are listed on the following pages by subject in alphabetical order. If any subject cannot be located readily, refer to the index.

Courses numbered 001–099 are pre-freshman and special undergraduate courses, and do not carry bachelor's degree credit. Those numbered 100–299 are lower-division undergraduate courses, and those numbered 300–399 are upper-division undergraduate courses. The 400-level courses are generally limited to juniors and seniors majoring in that field, but are open to other advanced undergraduates and to graduate students with permission.

The 500-level courses are graduate courses with a bachelor's degree usually a prerequisite, but qualified seniors and honors students are admitted with permission. These courses should make up the majority of course work for students working toward a master's degree. Courses at the 600 level are advanced graduate courses. The 900-level courses are special types of graduate courses for which no degree

credit is given. They include courses offered to remedy deficiencies as well as workshops, institutes, and courses offered one time only by visiting faculty.

Courses with two numbers—e.g., ACC 201, 202—indicate a year's sequence; the first course is either a prerequisite for the second, or at least the two cannot be taken in reverse order without special permission. Parentheses after a course number enclose either the old course number or, in cases of multiple listings, the departments and numbers under which the course is also offered. The roman numeral indicates the semester the course will be offered, with *SS* for Summer Session. The arabic numeral indicates the credit hours, and distribution of class hours each week is in parentheses. *S/U* credit signifies a course in which only satisfactory or unsatisfactory grades are given. The instructor's name follows the course description.

Courses that meet the General Education requirements are designated with a letter in parentheses indicating the appropriate group, as follows:

- (A) Fine Arts and Literature
- (F) Foreign Language and Culture
- (L) Letters
- (C) English Communication (General)
- (Cw) English Communication (Written)
- (M) Mathematics
- (N) Natural Sciences
- (S) Social Sciences

The *Schedule of Courses* is issued by the Office of the Registrar immediately before the early registration period for each semester and again at least two weeks before the first week of classes. It lists the specific courses to be offered that semester with the time of meeting, location, and instructor assigned for the section.

## Accounting (ACC)

*Chairperson:* Professor Schwarzbach

**201, 202 Elementary Accounting I, II** (*I and II, 3 each*) 201: Basic concepts and systems used in financial accounting for business organizations. 202: Basic techniques and systems used by management accountants in budgeting, cost accounting, cost analysis and control. (*Lec. 3*) Staff

**311, 312 Intermediate Accounting I, II** (*I and II, 3 each*) 311: Theoretical aspects of accounting principles, emphasis on current and fixed assets and the corporate structure. 312: Continuation including investments, liabilities, financial statements, application of funds, cash flow, and price-level impacts. (*Lec. 3*) Pre: 202. Staff

**321 Cost Accounting** (*I, 3*) Cost and managerial accounting systems and concepts including cost allocation, actual and standard cost systems, cost and profit planning, and control systems. (*Lec. 3*) Staff

**371, 372 Directed Study in Accounting** (*I and II, 1–3 each*) Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) Pre: permission of instructor. Staff

**415 Accounting Computer Systems (I and II, 3)** Accounting information systems and use of the computer for decision making; emphasis on sources of information and employment of analytical tools in solving accounting problems. (Lec. 3) Pre: 312, 321, or permission of instructor. Staff

**431 Advanced Accounting (II, 3)** Accounting principles and policies for governmental and nonprofit organizations, multinational and multidivisional organizations, partnerships, and other complex organizational structures. (Lec. 3) Pre: 312. Staff

**443 Federal Tax Accounting (II, 3)** Federal laws, regulations, and other authorities affecting taxation of individuals. (Lec. 3) Pre: 202. Staff

**461 Auditing (I, 3)** Auditing standards, procedures, programs, working papers, and internal control. (Lec. 3) Pre: 312. Staff

**493 Internship in Accounting (I and II, 3)** Approved, supervised work experience with participation in accounting and problem solving related to accounting. Fifteen working days (or 120 hours). (Practicum) Pre: junior standing and proposal approved by the Department of Accounting. May be repeated for credit. Not for graduate credit. S/U only. Staff

**535 Advanced Problems in Accounting (II, 3)** General and specialized accounting problems that constitute the subject matter of C.P.A. examinations. (Lec. 3) Pre: 431. Staff

**544 Taxation of Corporations and Shareholders (II, 3)** Examination of the tax laws affecting corporations and shareholders. Includes law governing corporate formation, liquidating and nonliquidating distributions, reorganizations, taxes on corporation accumulations, and planning of transactions for tax compliance and

minimization. (Lec. 3) Pre: 443 or permission of instructor. Matoney

**562 Advanced Auditing (II, 3)** Statements on auditing standards, auditing electronic systems, auditor's reports, statistical sampling in auditing, regulations of SEC, and cases in auditing. (Lec. 3) Pre: 461. Boyle

**610 Financial Accounting (I and II, 4)** Covers basic accounting principles, accounting systems design, and financial statement analysis. Includes principles of responsibility accounting and budgeting. (Lec. 4) Pre: mathematics or statistics, ECN 590, BAC 520 and 530. Staff

**611 Managerial Accounting (I or II, 3)** Determination of accounting information for the purposes of decision making, control, and evaluation with emphasis on decision models using accounting information. (Lec. 3) Pre: 610, BAC 520 and 530. Staff

#### Course Codes

ACC Accounting  
ADE Adult and Extension Education  
AAF African and Afro-American Studies  
AVS Animal and Veterinary Science  
APG Anthropology  
AMS Applied Mathematical Sciences  
APS Applied Pharmaceutical Sciences  
ASP Aquacultural Science and Pathology  
ART Art  
ARH Art History  
AST Astronomy  
BGS Bachelor of General Studies  
BCH Biochemistry  
BIO Biological Sciences  
BMS Biomedical Sciences  
BUS Business  
BAC Business Analysis and Computing  
BSL Business Law  
CHE Chemical Engineering  
CHM Chemistry  
CHN Chinese  
CVE Civil and Environmental Engineering  
CLA Classics  
CMS Communication Skills  
COM Communication Studies  
CMD Communicative Disorders  
CPL Community Planning  
CSV Community Service  
CLS Comparative Literature Studies  
CSC Computer Science  
CNS Consumer Studies  
DHY Dental Hygiene  
ECN Economics  
EDC Education  
EDP Ph.D. in Education  
ELE Electrical Engineering  
EGR Engineering  
ENG English  
ELS English Language Studies  
ENT Entomology

EVS Environmental Sciences  
EXS Exercise Science  
FIN Finance  
FST Fisheries Science and Technology  
FSN Food Science and Nutrition  
FRN French  
GEG Geography  
GEL Geology  
GER German  
GRK Greek  
HLT Health  
HSA Health Services Administration  
HBW Hebrew  
HIS History  
HEC Home Economics  
HED Home Economics Education  
HPR Honors Program  
HDF Human Development and Family Studies  
HSS Human Science and Services  
IME Industrial and Manufacturing Engineering  
INS Insurance  
IRE Irish  
ITL Italian  
JPN Japanese  
JOR Journalism  
LRS Labor and Industrial Relations  
LAR Landscape Architecture  
LAN Languages  
LAT Latin  
LAS Latin American Studies  
LET Letters  
LSC Library and Information Studies  
LIN Linguistics  
MGT Management  
MSI Management Science and Information Systems  
MAF Marine Affairs  
MRD Marine Resource Development  
MKT Marketing  
MTH Mathematics

MCE Mechanical Engineering and Applied Mechanics  
MTC Medical Technology  
MIC Microbiology  
MSC Military Science  
MUS Music  
NRS Natural Resources Science  
NES New England Studies  
NUR Nursing  
OCE Ocean Engineering  
OCG Oceanography  
PHC Pharmacy  
PHP Pharmacy Practice  
PHL Philosophy  
PEX Physical Education and Exercise Science  
PHT Physical Therapy  
PHY Physics  
PLS Plant Sciences  
PSC Political Science  
POR Portuguese  
PLA Prior Learning Assessment  
PSY Psychology  
MPH Public Health  
PRS Public Relations  
RLS Religious Studies  
RDV Resource Development  
RDE Resource Development Education  
REN Resource Economics  
RUS Russian  
SOC Sociology  
SPA Spanish  
STA Statistics  
TMD Textiles, Fashion Merchandising, and Design  
THE Theatre  
URI University of Rhode Island Freshman Seminar  
UYA University Year for Action Internship Program  
WMS Women's Studies  
WRT Writing

**618 Current Accounting Theory (I, 3)** Critical examination of accounting theory and practice to develop research techniques with emphasis on financial accounting. (Lec. 3) Pre: 311 and 312. Staff

**619 Current Accounting Theory (II, 3)** Critical examination of accounting theory and practice with respect to cost and managerial accounting. (Lec. 3) Pre: 321. Staff

**631 International Accounting (II, 3)** Covers interpretation of international financial statements, focusing on foreign currency exchange, comparative accounting principles and disclosures, and audit reports. Uses actual financial statements in case analyses. (Lec. 3) Pre: 610 or permission of instructor. Staff

**641 Federal Taxation Seminar (II, 3)** Examination and discussion of the laws and rationale affecting the federal taxation of individuals as well as an introduction to research in taxation. (Lec. 3) Pre: 311 and graduate standing in accounting. Staff

**643 Federal Taxes and Business Decisions (II, 3)** The course focuses on tax law and its effect on business decisions. Cases are employed and primary emphasis is on income tax planning, although estate and gift taxes are explored. (Lec. 3) Pre: 610. Staff

**644 Partnership, Estate, and Gift Taxation (II, 3)** Examination of the tax laws affecting partnerships, estates, and gifts. Includes income and wealth taxation with an emphasis on tax avoidance through effective planning. (Lec. 3) Pre: 641. Matoney

**645 Advanced Topics in Federal Taxation (II, 3)** Examination of tax laws governing sales and exchanges, accounting methods, accounting changes, deferred compensation, tax shelters, and recent developments in the tax laws. (Lec. 3) Pre: 443 or 641. Matoney

**646 Seminar in Tax Research, Policy, and Planning (I, 3)** Examination of the methodology of tax research, the principles and procedures involved in tax planning, and the procedures involved in dealing with the IRS. (Sem. 3) Pre: 641 or equivalent. Matoney

**661 Seminar in Auditing (I, 3)** Readings and discussions on auditing standards, procedures, programs, working papers, internal control, and current auditing topics. (Sem. 3) Pre: 311 and graduate standing in accounting. Staff

**681 Accounting Policy (II, 3)** Development of accounting policy with respect to managerial planning and control. Emphasis on analytical

evaluation of cases with major research project. (Lec. 3) Pre: 618, graduate standing, and completion of all foundation courses. Staff

**691, 692 Directed Study in Accounting (I and II, 1–3 each)** Advanced work under the supervision of a staff member and arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of instructor. Staff

**693 Internship in Accounting (I and II, 3)** Participation in management and/or problem solving under the supervision and guidance of a sponsoring agency with evaluation by the College of Business Administration. (Practicum) Pre: proposal acceptance by the College of Business Administration, no previous internship credit, graduate standing. S/U credit. Staff

## Adult and Extension Education (ADE)

Program Director: Professor McCreight

**491, 492 Special Problems in Adult Education (I and II, 1–3 each)** Specialized problems in adult and extension education. Seminars or supervised individual projects. (Independent Study) Pre: permission of instructor. Staff

## African and Afro-American Studies (AAF)

Director: Associate Professor Hamilton

**150 Introduction to Afro-American History**  
See History 150.

**201 Introduction to the Black Experience (I, 3)** Interdisciplinary exploration of some of the pivotal themes and issues in the study of peoples of African descent. (Lec. 3) Staff

**202 Introduction to Afro-American Culture (II, 3)** Interdisciplinary survey of the social origins of Afro-American culture. (Lec. 3) Gititi

**247 Introduction to Pan-African Literature**  
See English 247.

**248 Afro-American Literature from 1900 to Present**  
See English 248.

**250 (or APG 250) Africinity (I and II, 3)** Multidisciplinary survey that seeks to analyze the factors of unity and diversity of African culture through the examination of language, art, music, belief systems, world views, and social organizations within various African civilizations. (Seminar) Pollnac and Staff (F)

**300 Special Topics in African and Afro-American Studies (I or II, 3)** Selected contemporary topics, problems, issues, and individuals from the field of African and Afro-American studies. The topical format allows in-depth analysis of some significant aspect of the African and Afro-American experience. (Lec. 3) Pre: 201 or 202 or permission of instructor. May be repeated with different topic. Fall 1998: *African American Artist in Context: A Cultural and Historical Survey I*, Dilworth. Fall 1998: *Conditions for Community Service: An Ethical/Theological Approach*, Thompson. Fall 1998: *Black Women: Service, Community and Self*, Hamilton. Spring 1999: *African American Artist in Context: A Cultural and Historical Survey II*, Hamilton

**359 History of Slavery in America**  
See History 359.

**360 (or ENG 360) Africana Folk Life (I, 3)** Examination of the process of creativity, context, and form in the oral literary tradition of peoples of African descent throughout the world. (Lec. 3) In alternate years. Next offered fall 1999. Staff

**362 Afro-American Poetry and Drama**  
See English 362.

**363 Afro-American Fiction**  
See English 363.

**364 The African Novel**  
See English 364.

**388 History of Sub-Saharan Africa**  
See History 388.

**390 Directed Study or Research (I and II, 3)** Directed study arranged to meet the needs of individual students who desire independent work and to promote collective research efforts in African and Afro-American Studies. (Independent Study) Pre: permission of director. Staff

**410 (or PSC 410) Issues in African Development (I or II, 3)** A seminar focusing on the dynamics of African development, including political and social change, economic development, education, urbanization, rural development, environmental management, labor and business, industrialization, and technology transfer. (Seminar) Pre: APG 313 or PSC 201 or HIS 388 or permission of instructor. Staff

**466 Urban Problems**  
See Political Science 466.

**474 Topics in Pan-African Literature**  
See English 474.

**498 Senior Seminar in African and Afro-American Studies (II, 3)** Study of a particular issue of the experience of Blacks in the diaspora from an interdisciplinary perspective. Subject or theme will change yearly. *Pre:* 150, 201, 202, senior standing, or permission of instructor. Not for graduate credit. Hamilton

## Animal and Veterinary Science (AVS)

*Chairperson:* Professor Rhodes (Fisheries, Animal and Veterinary Science)

**101 Introduction to Animal Science (I, 3)** Animal industry's role in world and national economy; inheritance, growth, physiology, nutrition, and diseases of domestic animals and poultry; geographic distribution and marketing of animal products. (*Lec. 3*) Nippo (N)

**102 Introduction to Animal Science Laboratory (I, 1)** Laboratory and demonstrations of principles of the animal industries. (*Lab. 2*) *Pre:* credit or concurrent enrollment in 101. Staff

**104 Animal Management Techniques (II, 2)** Lecture and laboratory in the handling skills needed to maintain animal comfort and productivity. (*Lec. 1, Lab. 2*) *Pre:* 101 and 102. Gross

**110 Freshman Seminar in Animal and Veterinary Science (II, 1)** Overview of the animal and veterinary sciences and the fields they encompass. Student projects, presentations, and field trips. (*Seminar*) *Pre:* 101. Open only to freshmen. Nippo or Mallilo

**201 Companion Animal Management (II, 3)** Nutrition, reproduction, behavior, and management of companion animals. (*Lec. 3*) *Pre:* 101. Nippo

**212 Feeds and Feeding (I, 3)** Principles and practices of feeding farm animals, nutrient requirements, physiology of digestion, identification and comparative value of feeds, computer calculation of rations for livestock. (*Lec. 2, Lab. 2*) Mallilo

**301, 302 Seminar in Animal and Veterinary Science (I and II, 1 each)** Readings, reports, lectures, and discussions on scientific topics in animal and veterinary science. Subject matter adapted to student and faculty interest. (*Seminar*) *Pre:* junior or senior standing. Nippo

**323 Animal Management I (I, 3)** Principles of care and management of domesticated ruminant animals including dairy cattle, beef cattle, sheep, and goats. Emphasis on the production methods of the animal industries. Par-

ticipation in field trips required. (*Lec. 3*) Mallilo, McCreight, and Gross

**324 Animal Management II (II, 3)** Principles of the care and management of domesticated monogastric animals including swine, horses, and poultry. Emphasis will be given to modern production methods. Participation in field trips required. (*Lec. 3*) Rhodes, Gross, and McCreight

**331 Anatomy and Physiology (I, 3)** Fundamentals of anatomy and physiology of domesticated animals. (*Lec. 3*) *Pre:* BIO 113 and junior standing. Rhodes

**332 Animal Diseases (II, 3)** Specific diseases of avian and mammalian species; etiology, symptoms, and control. (*Lec. 3*) *Pre:* 331. Whitworth

**333 Anatomy and Physiology Laboratory (I, 1)** The fundamental anatomy of domestic animals is examined. Demonstrations of physiological principles are performed. Laboratory techniques for screening physiological function *in vivo* and *in vitro* are covered. (*Lab. 2*) *Pre:* credit or concurrent enrollment in 331. Rhodes

**343 Behavior of Domestic Animals (II, 3)** Examination of the basis for, and exhibition and control of, behavioral patterns of domestic animals. (*Lec. 3*) *Pre:* 101. Nippo

**365 Laboratory Animal Technology (I, 3)** Management of laboratory animals with emphasis on animal biology, breeding, care, health, research use, and animal welfare. (*Lec. 2, Lab. 2*) *Pre:* BIO 113. Whitworth

**372 Introductory Endocrinology (I, 3)** Morphology and physiology of endocrine glands. Roles of hormones in regulation of body processes. Discussion of all endocrine organs and relationship of endocrine and nervous systems. Emphasis on domesticated animals and fowl. (*Lec. 3*) *Pre:* BIO 104B or 113. Rhodes

**390 Wildlife and Human Disease** See Entomology 390.

**399 Animal Science Internship (I and II, 1–6)** Options in various professional experience programs involving the animal and veterinary sciences. (*Practicum*) *Pre:* permission of chairperson. May be repeated for a maximum of 6 credits. S/U credit. Staff

**412 Animal Nutrition (I, 3)** Principles of animal nutrition, metabolism of carbohydrates, proteins, and fats; mineral and vitamin requirements; nutritive requirements for maintenance, growth, reproduction, lactation, and work. (*Lec. 3*) *Pre:* 212, organic chemistry, and junior standing. Nippo

**420 Animal Breeding and Genetics (II, 3)** Scientific methods for the genetic improvement of domesticated animals. Genetic variation and expected results of different types of selection and mating systems. (*Lec. 3*) *Pre:* ASP 352 or equivalent. In alternate years. Next offered 1999–00. Gross

**462 Laboratory Animal Techniques (II, 3)** Laboratory animal applications in clinical studies; research in nutrition, endocrinology, and other selected topics. (*Lec. 1, Lab. 4*) *Pre:* 365. Whitworth

**463 Animal Veterinary Technology (II, 3)** Theory and application of animal health practices required of paraprofessionals in a veterinary practice. The role of the veterinary assistant in a modern clinical practice will be emphasized. (*Lec. 2, Lab. 3*) *Pre:* 331. Balmforth

**472 Physiology of Reproduction (II, 3)** Anatomy and physiology of reproduction, with emphasis on domestic animals. Current experimentation in endocrinology of reproduction is surveyed. (*Lec. 2, Lab. 2*) *Pre:* BIO 113. Rhodes

**491, 492 Special Projects (I and II, 1–3 each)** Work that meets the individual needs of students in animal and veterinary science. (*Independent Study*) Staff

**500 Instructional Methods in Life Sciences (II, 2)** Organization and development of instructional material and teaching methods for graduate teaching assistants in the life sciences. Emphasis on practice presentation in classroom/lab setting. (*Lec. 2*) *Pre:* graduate standing or permission of instructor for senior undergraduate. Mallilo

**591, 592 Research Problems (I and II, 3 each)** Research problems to meet individual needs of graduate and honors students in the fields of animal breeding, nutrition, or physiology and food science. (*Independent Study*) *Pre:* permission of chairperson. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

## Anthropology (APG)

*Chairperson:* Professor Carroll (Sociology and Anthropology)

**200 (or LIN 200) Language and Culture (I or II, 3)** Cross-cultural survey of the interaction of culture and language. Introduction to various fields of linguistic research emphasizing descrip-

tive and semantic investigations. Linguistic studies used as illustrative material. (Lec. 3) Pollnac (S)

**201 Human Origins** (I and II, 3) The biocultural evolution of humans; review of the fossil record. (Lec. 3) Loy and LaVelle (N)

**202 The Prehistoric Ages** (I and II, 3) Archaeological perspectives on human biological and cultural development from the Old Stone Age to the Iron Age. Emphasizes prehistoric lifeways, emergence of food production, earliest Old and New World civilizations. (Lec. 3) Turnbaugh (S)

**203 Cultural Anthropology** (I and II, 3) Anthropological approaches to the study of peoples and cultures around the world. (Lec. 3) Staff (S)

**220 Introduction to the Study of Language**  
See Linguistics 220.

**250 Africinity**  
See African and Afro-American Studies 250.

**300 Human Fossil Record** (I, 4) Investigation into the biocultural evolution of hominids over the last 15 million years; course based on evidence from fossil bones, teeth, and paleoecological reconstruction. (Lec. 3, Lab. 2) Pre: 201 or 202 or permission of instructor. LaVelle

**302 Methods of Anthropological Inquiry** (I or II, 3) Logic, techniques, and problems in obtaining true information in anthropological inquiry. Problems from anthropological field work and use of cross-cultural data. (Lec. 3) Pre: 203 or permission of instructor. Poggie

**303 New World Prehistory** (I or II, 3) Reconstruction of American Indian cultural history from earliest times to the period of European discovery and colonization, using archaeological evidence and perspectives. (Lec. 3) Turnbaugh (F)

**309 Anthropology of Religion** (I or II, 3) Religious systems of selected peoples around the world; examination of theories concerning the origins, functions, and natures of these religions. (Lec. 3) Staff

**310 Topics in Anthropology** (I and II, 1–3) Analytical study of selected topics in anthropology. Subjects will vary according to the expertise and availability of instructors. (Lec. 1–3) Pre: one anthropology course or permission of instructor. May be repeated with different topic. Staff

**311 Native North Americans** (I or II, 3) Survey of selected North American Indian groups from before European contact to the present. Modern reservation life; influence of the federal government on Indian life. (Lec. 3) Staff (F)

**313 Peoples of Africa** (I or II, 3) Studies of Africa's peoples and cultures from prehistoric times to the present. (Lec. 3) Pollnac (F)

**315 Cultures and Societies of Latin America** (I or II, 3) Contemporary cultures and societies; emphasis on adjustment of the people to modern social and economic changes. (Lec. 3) Pre: 203 or permission of instructor. Poggie (F)

**317 Archaeological Method and Theory** (I or II, 3) Problems of collection and interpretation of data, emphasizing nature of archaeological investigation, classification, dating, reconstruction of social contexts. Laboratory demonstrations. (Lec. 3) In alternate years. Next offered 1998–99. Turnbaugh

**319 Cultural Behavior and Environment** (I or II, 3) Cultural adaptations made by traditional and industrial societies to natural and human environments using examples from prehistory and ethnography. (Lec. 3) In alternate years. Next offered 1999–00. Turnbaugh (S)

**320 Sociolinguistics**  
See Linguistics 320.

**322 Anthropology of Modernization** (I or II, 3) Patterns and processes of contemporary social and cultural change among traditional people. (Lec. 3) Pre: 203 or permission of instructor. Poggie

**325 The Irish** (I, 3) An examination of the beliefs, customs, and social institutions which comprise Irish life, at home and abroad. (Lec. 3) Staff (F)

**327 History of Physical Anthropology** (I or II, 3) An examination of some classic works in human evolution and physical anthropology. Designed to provide an understanding of the philosophical and historical development of biological anthropology. (Lec. 3) Loy (L)

**350 Human Variation** (I or II, 3) Anthropological investigation into the nature and causes of human biological diversity with emphasis on living populations. Students enrolled in this course will serve as a sample for measuring human variation. (Lec. 3) Pre: any 200-level anthropology course or permission of instructor. LaVelle

**400 Evolution, Culture, and Human Disease** (II, 3) Investigation of the dynamic interrelationships between culture, human disease, and evolution. Encompasses study of living peoples as well as our fossil and prehistoric ancestors, and includes infectious and chronic diseases. (Lec. 3) Pre: introductory physical anthropology, biology, or zoology, or permission of instructor. Staff

**401 History of Anthropological Theory** (I or II, 3) Theory from the sixteenth century to the present; readings from Tylor, Morgan, Boas, Sapir, Kroeber, Benedict, Malinowski, and Radcliffe-Brown. (Seminar) Pre: 203 or permission of instructor. Poggie

**405 (or PSY 405) Psychological Anthropology** (I or II, 3) Study of human behavior in different cultures employing psychological concepts and theories. (Lec. 3) Pre: 203 or permission of instructor. Pollnac

**412 Primate Behavior and Organization** (I or II, 3) Investigation of the naturalistic behavior and organization of nonhuman primates, and the relationship of primate data to anthropology. (Lec. 3) Pre: 201 or permission of instructor. Loy

**413 (or MAF 413) Peoples of the Sea** (I, 3) Examination of human sociocultural adaptation to the seas. (Lec. 3) Pre: 203 or permission of instructor. Pollnac and Poggie

**427 Unity of Anthropology** (II, 3) Survey of recent advances in the subfields of anthropology. Designed to help majors appreciate the unity of anthropology in an age of specialization. (Seminar 3) Pre: junior or senior standing. Loy

**470 Problems in Anthropology** (I and II, 3) Staff-guided study and research, seminar, or individual program. (Independent Study) Pre: permission of chairperson. Staff

## Applied Mathematical Sciences (AMS)

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Applied Pharmaceutical Sciences (APS)

Chairperson: Professor Needham

**314 Physical Pharmacy and Pharmaceutical Calculations** (I, 3) Physicochemical properties of drug molecules and their effect on formulation and manufacturing of various dosage forms. An emphasis on necessary pharmaceutical calculations. (Lec. 3) Pre: third-year standing or permission of instructor. Zia

**315 Biopharmaceutics** (I, 2) Applications of kinetics to dissolution, absorption, and other biopharmaceutical processes. Bioavailability and

generic equivalence. Regulatory aspects of biopharmaceutics including special populations. (Lec. 2) *Pre: third-year standing or permission of instructor.* Rhodes

**316 Pharmacy Law and Ethics (I, 3)** Basic principles of law and ethics as applied to federal, state and local acts, regulation, and practices encountered in professional practice. Specific attention to liabilities of pharmacists in decisions; actions involving sale of medicinals, poisons, narcotics. (Lec. 3) *Pre: third-year standing or permission of instructor.* Campbell

**318 Pharmacy Technology Laboratory (I, 1)** Prescription processing and compounding techniques for pharmaceutical dosage forms. (Lab. 3) *Pre: third-year standing or permission of instructor.* Zia

**324 Pharmaceutical Technology (II, 3)** A review of the methods of manufacture and evaluation of drug delivery systems. (Lec. 3) *Pre: third-year standing or permission of instructor.* Kislioglu

**327 Biopharmaceutics (I, 2)** Physicochemical properties of dosage forms as they control drug release; dissolution kinetics. (Lec. 2) *Pre: third-year standing.* (Last offered fall 1999.) Rhodes

**328 Pharmacokinetics (II, 3)** Application of pharmacokinetic principles to the disposition of drugs in the body. Development of drug dosage regimen in disease states. (Lec. 3) *Pre: 327 or equivalent.* (Last offered spring 2000.) Rosenbaum

**340 Physical Pharmacy (I and II, 3)** Physicochemical properties of pharmaceutical systems. (Lec. 3) *Pre: third-year standing.* (Last offered spring 2000.) Zia

**349 Pharmacy Administration Principles (I, 3)** Practical solutions to problems encountered in selection, location, and management of pharmacies, their personnel, stock, and equipment. (Lec. 3) (Last offered fall 1999.) Staff

**350 Pharmaceutical Technology (I, 3)** Preparation and evaluation of drug delivery systems. (Lec. 3) *Pre: third-year standing.* (Last offered fall 1999.) Kislioglu

**351 Pharmaceutical Law and Ethics (II, 3)** Basic principles of law and ethics as applied to federal, state, and local acts, regulation, and practices encountered in professional practice. Specific attention to liabilities of pharmacists in decisions; actions involving sale of medicinals, poisons, narcotics. (Lec. 2, Rec. 1) (Last offered spring 2000.) Campbell

**352 Personal Cosmetics (II, 3)** Formulation and manufacture of various types of personal cosmetics and toilet preparations. Examples of types studied are prepared in laboratory. (Lec. 2, Lab. 3) *Pre: 350.* Lausier

**360 Pharmaceutical Technology Laboratory (I and II, 1)** Formulation, compounding, and evaluation of drug delivery systems. (Lab. 4) *Pre: third-year standing.* (Last offered spring 2000.) Zia

**403 Pharmacokinetics I (I, 3)** Pharmacokinetics of drug distribution, metabolism, and elimination. Compartmental models, pharmacokinetic modeling, development of dosage regimens. (Lec. 3) *Pre: fourth-year standing or permission of instructor.* Rosenbaum

**404 (or PHP 404) Pharmacokinetics II (II, 3)** Applied pharmacokinetics; therapeutic drug monitoring, individualization of doses. (Lec. 3) *Pre: fourth-year standing or permission of instructor.* Rosenbaum and McKindley

**406 Pharmacy Retailing (II, 3)** Effect of economic trends and marketing changes on the retail distribution of pharmaceuticals and allied products, particularly as they affect the professional practice of pharmacy. (Lec. 3) *Pre: permission of chairperson.* Not for graduate credit. Campbell and Staff

**411 (or PHP 411 or STA 411) Biostatistics II (I, 3)** An overview of statistical methods used in performing research in pharmacotherapeutics and pharmaco-epidemiology. Emphasis on understanding both common study designs and the output from statistical analysis of data obtained from these studies. (Lec. 3) *Pre: fourth-year standing or permission of instructor.* Dufresne, Heltshe, and Staff

**448 Third-Party Prescription Programs (II, 2)** Methods of evaluating third-party prescription programs in relationship to the health care system, including the relationship of public and private for-profit and nonprofit programs. Evaluation of delivery of pharmaceutical services as applied to patient and drug eligibility, reimbursement, and claims processing. (Lec. 2) *Pre: 349 and 351.* Not for graduate credit. (Last offered spring 2001.) Campbell and Staff

**453 Drug Marketing Principles (II, 2)** Modern methods of merchandising, agencies involved in marketing drug products; their functions, particularly as they affect the community pharmacy phase of professional practice. (Lec. 2) *Pre: fifth-year standing, ECN 201, or permission of chairperson.* Not for graduate credit. Campbell and Staff

**459 Public Health (I, 3)** Principles of prevention and control of disease and application of this information to current health problems. (Lec. 3) *Pre: MIC 201 and BMS 446.* Not for graduate credit. (Last offered fall 2000.) Staff

**461 Health-Related Supplies (I or II, 1)** Practical training in fitting health supports and using medical devices. (Lab. 2) *Pre: 340, 350, 360, fourth-year standing.* May be taken concurrently with 462. Not for graduate credit. (Last offered fall 2001.) Staff

**462 Nonprescription Drugs (I or II, 3)** Study and evaluation of nonprescription drugs. (Lec. 3) *Pre: 340, 350, 360, fourth-year standing.* May be taken concurrently with 461. Not for graduate credit. (Last offered fall 2001.) Staff

**480 Prepaid Drug Plans (I, 3)** Institutional relationships involved in the prescribing, dispensing, and prepayment of drugs. Problems of interference with pharmaceutical or medical practice arising from different types of prepayment plans. Actual experience, laws, and court decisions, abuse and controls. (Lec. 3) *Pre: 349 and 453, or equivalent.* Not for graduate credit. Staff

**497, 498 Special Problems (I and II, 1–3 each)** Method of carrying out a specific research project. Literature search, planning, laboratory work, writing an acceptable report. (*Independent Study*) *Pre: permission of chairperson.* Staff

**503 Health Systems I (I, 2)** Introduction to the principles of financial analysis, personal management, pharmaceutical marketing, organizational behavior, inventory control, and health policy. Principles as they relate to health care delivery with an emphasis on planning systems. (Lec. 2) *Pre: fifth-year standing or permission of instructor.* Staff

**504 Health Systems II (II, 3)** Analysis and interpretation of the health care delivery system from the perspectives of organizational structure and program analysis. Emphasis on pharmacoeconomic aspects of quality of life issues, outcome measurements, reimbursement systems, and drug utilization evaluation. (Lec. 3) *Pre: fifth-year standing or permission of instructor.* Staff

**515 (or PHP 515) Pharmacy Practice Laboratory I (I, 1)** Simulated practice sessions designed to develop the delivery of pharmaceutical care, including prescription processing, use of patient profiles, communication with patients and health care professionals, pharmaco-epidemiology, and physical assessment. (Lab. 3) *Pre: fifth-year standing or permission of instructor.* Cyganoski



**516 (or PHP 516) Pharmacy Practice Laboratory II (II, 1)** Simulated practice sessions designed to develop the delivery of pharmaceutical care, including prescription processing, use of patient profiles, communication with patients and health care professionals, pharmaco-epidemiology, and physical assessment. (Lab. 3) *Pre: fifth-year standing or permission of instructor.* Cyganoski

**530 Fundamentals of Cosmetic Science (I, 3)** Study of the fundamentals of the function and behavior of skin, hair, and nails and their reactivity to cosmetic raw materials. Properties of cosmetic ingredients will also be addressed. (Lec. 3) *Pre: permission of instructor.* Kislalioglu and Staff

**531 Basic Research in Cosmetic Science (I, 2)** Laboratory exercises in the form of individual projects designed to provide an understanding of the basic properties and behavior of skin, hair, and nails. Assessment of cosmetic product performance and the basic properties of cosmetic ingredients. (Lab.) *Pre: permission of instructor.* Kislalioglu and Staff

**532 Cosmetic Product Formulation (II, 2)** Provides a basic understanding of cosmetic products, technology, and quality control; improves formulation skills with a particular emphasis on the application of new technological developments in cosmetic preparation. (Lab. 2) *Pre: permission of instructor.* Kislalioglu and Staff

**533 Behavioral Skills in Pharmacy (SS, 3)** Communication skills, behavioral aspects of illness, and the social and ethical considerations of clinical pharmacy. (Lec. 3) *Pre: graduate standing or permission of instructor.* Staff

**535 Pharmacokinetics (II, 3)** The principles and application of clinical pharmacokinetics for advanced pharmacy students. Developing, modifying, and evaluating dosage regimens. (Lec. 3) Rosenbaum

**540 Principles, Methods, and Applications of Epidemiology (I, 3)** An introduction to epidemiology, the study of health and disease in populations. Epidemiologic methods and research design for conducting and interpreting health research. (Lec. 3) *Pre: STA 307 or permission of instructor.* Willey Lessne

**550 Pharmacoepidemiology (II, 3)** The application of epidemiologic principles to the study of drug effects in human populations. (Lec. 3) *Pre: 540 or permission of instructor.* Larrat or Andrade

**570 Case Studies in Pharmacy Law (II, 3)** Case studies and a detailed analysis of the FDC, Con-

trolled Substances Act, and health insurance laws. (Lec. 3) *Pre: 351.* Campbell

**571 Biotechnology Product Evaluation and Development**  
*See Medical Technology 571.*

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

**621 Manufacturing Pharmacy I (I or II, 2)** Theory and practice in the manufacture of pharmaceuticals and the principles of operation of the equipment used for their production. (Lec. 2) *In alternate years.* Rhodes

**622 Manufacturing Pharmacy II (I or II, 3)** Theories applied to the manufacture of pharmaceuticals with an emphasis on formulation considerations and principles of operation of equipment used for their production. (Lec. 3) *Pre: 621. In alternate years.* Needham

**623 Manufacturing Pharmacy Laboratory (I or II, 2)** Practical application of the principles of all aspects of dose-form manufacture, including an emphasis on good manufacturing practices. (Lab.) *Pre: credit or concurrent enrollment in 622.* Needham

**631 Advanced Physical Pharmacy (I or II, 4)** Theory and application of physical chemical principles to problems in pharmaceutical research, with emphasis on methods by which properties of new medicinal agents are determined. (Lec. 4) *Pre: permission of instructor.* Zia and Staff

**633 Advanced Physical Pharmacy Laboratory (II, 1)** Laboratory exercises dealing with the physical-chemical principles used in the evaluation of pharmaceutical substances. (Lab. 4) *Pre: permission of instructor.* Zia and Staff

**640 Epidemiologic Methods for the Health Sciences (II, 2)** A focus on quantitative methods used in epidemiologic and health-related research. Students will learn to analyze and interpret data from large-scale observational studies and will be exposed to problematic situations in research design and data analysis. (Lec. 3) *Pre: 540, STA 412, or permission of instructor.* Willey Lessne

**651, 652 Health Care Systems I, II (I and II, 3 each)** Arrangements for utilizing pharmaceutical resources in public and private systems of health care in the United States and other countries. Variations in quality and distribution of care among socioeconomic groups. (Lec. 3) *Pre: 480*

*and STA 308 or 409, or equivalent. In alternate years.* Campbell and Staff

**660 Industrial Project (Pharmaceutics) (I, II, or SS, 3)** A research project directed by the major professor on a topic in industrial pharmacy. A report must be submitted to the department faculty. The project will normally be conducted off campus. (Lab.) *Pre: graduate standing in pharmaceutics.* Staff

**670 Advanced Pharmacokinetics (I, 2)** Application of classical compartmental and noncompartmental analyses to drug absorption and disposition in linear and nonlinear systems. (Lec. 2) *Pre: 535 or permission of instructor.* Rosenbaum and Staff

**680 The Legal Environment in Health Administration (I, 3)** Application of specialized statutory and regulatory provisions in federal and state law to the delivery of health care. (Lec. 3) *Pre: graduate standing.* Campbell

**693, 694 Seminar (I and II, 1 each)** Seminar discussions including presentation of papers on selected topics in pharmacy. (*Seminar*) *Required of all graduate students, with a maximum of 1 credit allowed per year. May be repeated for a maximum of 2 credits for M.S. candidates. May be repeated for a maximum of 5 credits for Ph.D. candidates.* Needham

**697, 698 Research in Applied Pharmaceutical Sciences (I and II, 1–3 each)** Literature survey, laboratory work, and a detailed research report on one or more assigned topics in pharmacy. (*Independent Study*) Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

## Aquacultural Science and Pathology (ASP)

*Chairperson:* Professor Rhodes (Fisheries, Animal and Veterinary Science)

**281 Introduction to Aquaculture (I, 3)** Aquaculture, its contribution to world food supply, methods of production, environmental and ecological considerations, cultural practices employed for selected species, selective breeding, feeding, disease, processing, and marketing. (Lec. 3) *Pre: BIO 104B or 113.* Rice

**282 Introductory Aquaculture Simulation Laboratory (I, 1)** Modeling aquaculture of various fish species in tank and pond systems using computer simulation software. Exploration of

the effects of stocking density, feeding rate, oxygenation levels, disease, and other factors on the profitability of fish farms. (Lab. 3) *Pre: concurrent enrollment in 281.* Rice

### 352 General Genetics

See Plant Sciences 352.

### 355 Genetics Laboratory

See Plant Sciences 355.

**381 Shellfish Aquaculture (II, 3)** Worldwide culture of marine and freshwater crustaceans and mollusks. Emphasis on life history, biological requirements, cultural practices, and economic importance of major species used for human food. (Lec. 3) *Pre: 281 and one semester of general chemistry.* Rice

**400 Diseases of Cultured Fishes (II, 3)** Nature, causes, diagnosis, and spread of diseases limiting piscine freshwater and marine aquaculture projects. Emphasis on prevention, control, and treatment of more common diseases affecting hatchery management. (Lec. 3) *Pre: 281; BIO 201 or AVS 331.* Staff

**401 Pathobiology (I, 3)** Mechanisms and causes of disease in homeothermic and poikilothermic vertebrates. Cell death, inflammation, infection, metabolic disorders, and neoplasia in relation to fish, reptiles, birds, and mammals. Effects of disease at the cellular, tissue, organ, and organismal levels with a medical orientation. (Lec. 3) *Pre: BIO 201 or AVS 331.* Wolke

**476 The Genetics of Fish (I, 3)** Modes of inheritance found in fish including chromosome number, polyploidy, sex determination, and hybridization. Heritabilities, methods of selection, and mating systems used in the development of fish suited for intensive culture. (Lec. 3) *Pre: 352.* Gomez-Chiarri

**481 Shellfish Aquaculture Laboratory (I, 2)** Detailed study of hatchery, nursery, and grow-out techniques for the production of bivalve mollusks. Culture of phytoplankton, conditioning of broodstock, spawning, larviculture, settlement, metamorphosis, nursery and grow-out methods. (Lab. 6) *Pre: 381 or permission of instructor. Offered fall of odd-numbered years.* Rice

**483 Salmonid Aquaculture (I, 3)** Principles of salmonid aquaculture, including culturing, spawning, incubation, feed formulation and feeding, disease control, genetics, systems management, harvesting, and transport. (Lec. 2, Lab. 2) *Pre: 281 or equivalent.* Bradley

**486 Applied Physiology of Fish (II, 3)** Functions of the organ systems of fish, regulation of

physiological functions and environmental interactions. Emphasis on the teleosts. (Lec. 3) *Pre: BIO 341 or equivalent.* Bradley

### 491, 492 Special Projects (I and II, 1–3 each)

Work that meets the individual needs of students in aquaculture. (*Independent Study*) Staff

**501, 502 Seminar (I and II, 1 each)** Preparation and presentation of scientific papers on selected subjects in animal pathology and virology. (*Seminar*) Bengtson

### 532 Experimental Design

See Statistics 532.

**534 (or MIC 534) Animal Virology (I, 3)** Basic properties, classification, and evolution of animal viruses. Individual agents are studied in detail. (Lec. 3) *Pre: MIC 432, 533, or permission of chairperson.* Staff

**536 (or MIC 536) Virology Laboratory (I, 2)** Methods employed in diagnosis and for the investigation of the biological, physical, and chemical properties of animal viruses. (Lab. 6) *Pre: credit or concurrent enrollment in 534.* Staff

**538 (or MIC 538) Epidemiology of Viral and Rickettsial Diseases (II, 2)** Principles of epidemiology. Interrelationships of host, environment, and agent in viral and rickettsial diseases. (Lec. 2) *Pre: credit or concurrent enrollment in 534. In alternate years. Next offered 1999–00.* Staff

**555, 556 Pathology Rotation (I and II, 3 each)** Applied anatomical and clinical pathology of aquatic animals including necropsy duty and/or clinical hematology, chemistry, microbiology, parasitology. Attendance at weekly histopathology seminar and research/case report required. (Lab. 6) *Pre: one course in histology or BIO 327, MIC 432, or permission of instructor. In alternate years. Next offered 1999–00.* Staff

**581 Current Topics in Molluscan Aquaculture (I, 3)** Review and critical analysis of recent literature within the field of molluscan biology with emphasis on application to mariculture techniques. Student presentation of selected topics and field trips to state-of-the-art mariculture facilities. (Lec. 3) *Pre: graduate standing or senior standing with permission of instructor.* Rice

**584 Advanced Aquaculture Systems (II, 3)** Development of design criteria, operational analysis, and management of selected species in water reuse systems. (Lec. 2, Lab. 2) *In alternate years. Next offered 1999–00.* DeAlteris

**586 Fish Nutrition (I, 3)** Digestion and metabolism of carbohydrate, protein, and lipids by fish. Role of vitamins and minerals in metabolism

and associative nutritional diseases resulting from deficiencies. Inadvertent toxic factors in fish feeds. (Lec. 3) *Pre: AVS 412 and CHM 228 or equivalent. In alternate years. Next offered 1999–00.* Bengtson

**591, 592 Special Projects (I and II, 1–3 each)** Research projects in animal pathology, virology, and aquaculture. (*Independent Study*) *Pre: graduate standing or permission of chairperson.* Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) *S/U credit.*

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) *S/U credit.*

## Art (ART)

*Chairperson:* Professor Holmes

**002 Sophomore Review (I and II, 0)** Presentation by majors of a broad selection of their previous college-level work for review by faculty. (*Studio*) *Pre: 101, 103, 207, and ARH 120.* Staff

**101 Two-Dimensional Studio I (I and II, 3)** Exploration of principles of visual organization relating primarily to formulations on the two-dimensional surface by means of fundamental studies and assignments in studio techniques. (*Studio 6*) Staff (A)

**103 Three-Dimensional Studio I (I and II, 3)** Introduction to problems in three-dimensional organization. Observations from objects with discussion and application to simple mold and casting techniques. Introduction to the use of basic materials, clay, plaster, and wood. (*Studio 6*) Rohm and Calabro (A)

**203 Color (I or II, 3)** Visual perception of color and manipulation of light as they pertain to two- or three-dimensional formulations. (*Studio 6*) *Next offered 1998–99.* Dilworth (A)

**204 Computer Design (I and II, 3)** An introduction to various computer design and imaging programs including paint-type, object-oriented, and page layout software. Readings, discussions, and critiques emphasize conceptual understanding of digital media and their roles in the larger cultural context. (*Studio*) Wills

**207 Drawing I (I and II, 3)** Visual perception and observation, using nature structures, drawing from models, still life, and landscape; exercises in basic drawing techniques and principles. (*Studio 6*) Staff (A)

**208 Drawing II** (*I and II, 3*) Advanced practice in graphic conceptions; exercises in spatial problems, organizing relationships of abstract forms and structures; advanced drawing media. (*Studio 6*) Pre: 207. Staff

**213 Photography I** (*I and II, 3*) Introduction to photography, exploration of related techniques using light-sensitive materials. (*Studio 6*) May be repeated for a maximum of 6 credits. Staff

**215 Video and Filmmaking I** (*I or II, 3*) Introduction to basic filmmaking and video techniques and theories of moving images. Emphasis on film and video as artistic media. Required projects and readings. (*Studio 6*) May be repeated for a maximum of 6 credits with permission of instructor. May be taken once for General Education credit. Next offered 1998–99. Wills (A)

**221 Two-Dimensional Studio II** (*I or II, 3*) Techniques of painting, utilizing as reference the natural and manmade environments. Traditional and contemporary materials. (*Studio 6*) Pre: 101 and 207. Klenk

**231 Printmaking I** (*I and II, 3*) Introduction to intaglio and lithographic processes, with an emphasis on image development and workshop procedures. (*Studio 6*) Pre: 101 or 207 or permission of instructor. Pagh (A)

**233 Relief Printing and Typography I** (*I and II, 3*) Introduction to basic elements of graphic design; letter forms, their relationship to the page and to the image. Various traditional and modern reproduction techniques, workshop practice in typesetting and layout. (*Studio 6*) Pre: 101 or permission of chairperson. Richman (A)

**243 Three-Dimensional Studio II** (*I and II, 3*) Formation of three-dimensional forms employing basic sculptural materials and techniques. Basic media, emphasis on form, material, and structural means in studio practice. (*Studio 6*) Pre: 103 or permission of instructor. Calabro

**300 Art Gallery Internship** (*I and II, 3*) Curatorial responsibilities taught through hands-on experience in exhibition programs including: exhibition research, production of interpretive texts and lectures, art object preparation, registration, and installation. (*Practicum*) Pre: junior standing and permission of instructor and chairperson. S/U only. Tolnick

**301, 302 Projects in Studio I, II** (*I and II, 3 each*) Studio projects under guidance of instructor selected by student. The student may select a different instructor for 301 and 302. (*Independent Study*) Pre: permission of chairperson and in-

structor. A limit of 6 credits for both 301 and 302 may count toward graduation. Staff

**303 Topics in Studio** (*I or II, 3*) Selected topics based on particular materials, techniques, or thematic premises. Topics and semesters to be announced. (*Studio 6*) Pre: art major status, or permission of instructor or chairperson. May be repeated for credit with permission of instructor and chairperson. Staff

**304 Introduction to Computer Art** (*I or II, 3*) Introduction to using the microcomputer to create final works or as an aid in producing works in traditional media. (*Studio 6*) Pre: junior or senior standing in the art studio program. Wills

**305 Photographic Alternatives** (*I or II, 3*) Topics emphasize possibilities in photographic themes and techniques, including alternative processes, collotype, and studio practice. (*Studio 6*) Pre: 213 and permission of instructor. May be repeated with permission of instructor and chairperson. Staff

**307 Art Studio Internship** (*I and II, 3 or 6*) Work in an institution, agency, or organization supervised by an art professional and a studio faculty member. Activities, expectations, performance assessments, hours, and credits determined through prior consultation. (*Practicum*) Limit of 6 credits toward graduation. Pre: junior standing in the B.A. or B.F.A. studio program and permission of chairperson. S/U only. Staff

**309, 310 Drawing III, IV** (*I, 3 each*) 309: Further problems, with emphasis on independent investigation in analysis, planning, and supportive notation. 310: Continuation of 309. (*Studio 6*) Pre: 208 or permission of instructor for 309; 309 for 310. 310 may be repeated for credit with permission of instructor. Klenk

**314 Photography II** (*I and II, 3*) Continuation of 213. (*Studio 6*) Pre: 213. May be repeated for credit with permission of instructor. Staff

**316 Video and Filmmaking II** (*I or II, 3*) Continuation of 215 with added emphasis on sound. Required projects and reading. (*Studio 6*) Pre: 215. May be repeated once for credit with permission of instructor. Staff

**322 Two-Dimensional Studio III** (*I or II, 3*) Continuation of 221. (*Studio 6*) Pre: 221. May be repeated for credit with permission of instructor. Klenk

**332 Printmaking II** (*I and II, 3*) Continuation of 231 with introduction to color lithography. Contemporary viewpoints and their relationship to traditional printmaking, with emphasis on

individual image development. (*Studio 6*) Pre: 231. Pagh

**334 Relief Printing and Typography II** (*I and II, 3*) Continuation of 233. Applications of previous studies to experimental workshop assignments leading to production of book pages, folders, posters, and other visual material incorporating type and print in a contemporary idiom. (*Studio 6*) Pre: 233 or permission of chairperson. May be repeated for credit with permission of instructor. Richman

**337 Printmaking III** (*I and II, 3*) Semi-independent work in printmaking media. Introduction of aluminum plate and photo-lithography. (*Studio 6*) Pre: 332. Pagh

**338 Printmaking IV** (*I and II, 3*) Emphasis on individual development in specific printmaking media. Critical evaluation of visual development. (*Studio 6*) Pre: 337. May be repeated for a maximum of 6 credits with permission of instructor. Pagh

**344 Three-Dimensional Studio III** (*I and II, 3*) Continuation of 243. (*Studio 6*) Pre: 243 or permission of instructor. May be repeated for a maximum of 6 credits with permission of instructor. Rohm and Calabro

**405, 406 Studio Seminar** (*I and II, 3 each*) Intensive self-directed work under guidance of instructors. Periodic critiques and discussions of work of all participants. (*Studio 6*) Pre: 002 and senior standing; 405 for 406. Staff

**501 Graduate Studio Seminar** (*I or II, 3*) Intensive independent studio work under guidance of instructors. Periodic critiques and discussions related to work of all participants in the course. (*Studio 6*) Pre: 48 credits in studio. Staff

## Art History (ARH)

Chairperson: Professor Holmes (Art)

**120 Introduction to Art** (*I and II, 3*) Fundamental principles of the visual arts, evolution of styles and conceptions through the ages in different forms of creative expression. (*Lec. 3*) Holmes (A)

**184 Architecture: An Introduction** (*I and II, 3*) An introduction to the theory and history of architecture, considering aesthetic issues, social function, and the impact of technological change. Material will be presented in slide lectures and field visits to architectural sites. (*Lec. 3*) Onorato

**251 Introduction to History of Art (I and II, 3)** The development of architecture, sculpture, and painting from prehistory through the Middle Ages. (Lec. 3) Hollinshead (A)

**252 Introduction to History of Art (I and II, 3)** The development of architecture, sculpture, and painting from the early Renaissance to the present. (Lec. 3) Roworth (A)

**284 Introductory Topics in Architectural History (I or II, 3)** Consideration of the history of architecture and city planning through surveys of selected periods and themes. (Lec. 3) *May be repeated for a maximum of 6 credits with permission of instructor. May be taken once for General Education credit.* Onorato (A)

**285 Women in Art (I or II, 3)** Survey of images of women throughout the history of art in Europe and America; investigation of the roles of women as patrons and artists in art history. (Lec. 3) Staff (A)

**300 Art History Internship (I and II, 3–6)** Internship in an approved professional organization (such as museum, gallery, preservation society, auction house). Specific details determined in consultation with faculty supervisor and off-campus liaison, and approved by chairperson. (Practicum) *May be taken in one semester or repeated for a maximum of 6 credits. S/U only.* Staff

**354 The Art of Greece and Rome (I, 3)** Developments in architecture, painting, and sculpture in Greece and Rome from 800 B.C. to 400 A.D. Brief analysis of the art of the Aegean from 2500 to 1500 B.C. (Lec. 3) *Pre: 251 or permission of chairperson.* Hollinshead (F)

**356 Medieval Art (II, 3)** Painting, sculpture, architecture, and minor arts of the Middle Ages from 500 to 1400 in Western Europe. (Lec. 3) *Pre: 251 or permission of chairperson.* Hollinshead (F)

**359 Baroque Art (II, 3)** Developments in painting, sculpture, and architecture in Italy and northern Europe from 1600 to 1750. (Lec. 3) *Pre: 251 or 252 or permission of instructor.* Roworth (A) (F)

**363 Modern Art: Nineteenth and Twentieth Centuries (I or II, 3)** A survey of trends in the visual arts over the last two centuries with emphasis on defining a “modern” aesthetic. Painting, sculpture, performance, conceptual, and related arts will be discussed. (Lec. 3) *Pre: 251 or 252 or permission of instructor.* Onorato (F)

**364 American Art (I or II, 3)** Painting, sculpture, and architecture from their origins in the seventeenth century to the present; emphasis on the nineteenth century. (Lec. 3) *Pre: 251 or 252.* Onorato (A)

**365 Renaissance Art (I, 3)** Painting, sculpture, and architecture of Italy and northern Europe from 1400 to 1600. (Lec. 3) *Pre: 251 or 252 or permission of instructor.* Roworth (F)

**371, 372 Projects in Art History I, II (I and II, 3 each)** Directed study in art history under guidance of instructor selected by student. The student may select a different instructor for 371 and 372. (Independent Study) *Pre: permission of chairperson and instructor.* Staff

**374 Topics in Film (I or II, 3)** Explores the social, historical, and aesthetic development of the cinema from 1895 to the present. Lectures (3 hours) and required film screenings. (Lec. 3) *May be repeated for a maximum of 6 credits with permission of instructor. Next offered 1999–00.* Staff (A)

**375 Topics in the History of Photography (I or II, 3)** Explores the social, historical, and aesthetic development of photography from 1826 to the present. (Lec. 3) *May be repeated for a maximum of 6 credits with permission of instructor.* Staff

**461 Topics in Methods, Theory, and Criticism (I or II, 3)** Art history methods or selected topics in the theory and criticism of art. (Lec. 3) *Pre: permission of chairperson. May be repeated for credit with permission of instructor.* Staff

**462 Contemporary Art Seminar: Art Since 1945 (II, 3)** Analysis of contemporary work and its relation to earlier movements. (Seminar) *Pre: 363. May be repeated for a maximum of 6 credits with permission of instructor.* Onorato

**469, 470 Art History: Senior Projects (I and II, 3–6 each)** Intensive, independent work on a project determined by consultation with the student’s project advisor. (469, Independent Study; 470, Tutorial) *Pre: senior standing, art history major, permission of chairperson.* Staff

**480 Advanced Topics in European and American Art (I or II, 3)** Consideration of the history of European and American art through analysis of selected periods or themes. (Seminar) *Pre: permission of instructor. May be repeated for credit with a different topic.* Staff

## Astronomy (AST)

*Chairperson:* Professor Malik (Physics)

**108 Introductory Astronomy (I and II, 3)** Celestial sphere, earth as an astronomical body, sun, motions and characteristics of members of solar system, constellations, constitution of stars and nebulae. Planetarium used freely for lectures and demonstration. (Lec. 3) Staff (N)

**334 Optics**  
See Physics 334.

**483, 484 Laboratory and Research Problems in Physics**  
See Physics 483, 484.

**491, 492 Special Problems**  
See Physics 491, 492.

## Bachelor of General Studies (BGS)

*Coordinator:* Professor Grubman-Black

**100 Pro-Seminar (I or II, 3)** Introduction to critical approaches to learning with emphasis on reading and rhetorical skills appropriate to college students. *Must be taken concurrently with URI 101. S/U credit.* Staff (Cw)

**390 Social Science Seminar (I or II, 6)** Exploration of the social sciences for BGS students who have completed the Pro-Seminar, started their major, and have the consent of their advisor. (Seminar) *Required of BGS students.* Staff (S)

**391 Natural Science Seminar (I or II, 6)** Exploration of the natural sciences for BGS students who have completed the Pro-Seminar, started their major, and have the consent of their advisor. (Seminar) *Required of BGS students.* Staff (N)

**392 Humanities Seminar (I or II, 6)** Exploration of the humanities for BGS students who have completed their Pro-Seminar, started their major, and have the consent of their advisor. (Seminar) *Required of BGS students.* Staff (L)

**397 Human Studies Major Seminar (I or II, 3)** Capstone course of human studies major. Review and assessment of students’ major education through intensive exploration of issues central to human studies. (Seminar) *Pre: completion of 30 credits of major. Required of BGS human studies majors.* Staff

**398 Applied Communication Major Seminar (I and II, 3)** Capstone course of applied communications major. Review and assessment of students’ major education through intensive exploration of issues central to professional com-

munications. (Seminar) Pre: completion of 30 credits of major courses. Required of all applied communication majors. Staff

**399 Supervised Senior Project (I and II, 3)** A project chosen by the student with faculty guidance on a topic relevant to the student's major, resulting in a paper or other demonstration of academic achievement. (Independent Study) Pre: senior standing in BGS program and approval of advisor and BGS coordinator. Required of BGS students. Staff

## Biochemistry (BCH)

Chairperson: Professor Sperry (Biochemistry, Microbiology, and Molecular Genetics)

**282 The Nature of Biochemistry (II, 3)** A few topics will be selected for historical development on the basis of their significance in the emergence of biochemistry as a scientific discipline, their importance in revealing fundamental principles of biochemistry, and their continual prominence in contemporary research. (This is not a survey course in biochemistry.) Pre: CHM 124 or 227. Tremblay

**311 Introductory Biochemistry (I and II, 3)** Chemistry of biological transformations in the cell. Chemistry of carbohydrates, fats, proteins, nucleic acids, enzymes, vitamins, and hormones integrated into a general discussion of the energy-yielding and biosynthetic reactions in the cell. (Lec. 3) Pre: CHM 124 or equivalent. Staff

**312 Introductory Biochemistry Laboratory (II, 2)** Laboratory exercises illustrate chemical and physical properties of biomolecules, separation techniques, enzyme catalysis, symptoms of nutritional deficiency, quantification of metabolic end-products, and drug detoxification. (Lab. 4) Pre: credit or concurrent enrollment in 311. Tremblay

**342 Human Genetics and Human Affairs (II, 3)** Basic principles of genetics including patterns of inheritance, mitosis and meiosis, sex determination and sex linkage. Genetic diseases, their cause and cures. Recombinant DNA and genetic engineering. Human diversity and evolution. (Lec. 3) Mottinger (N)

**352 Genetics**  
See Biological Sciences 352.

**401 (or MIC 401) Quantitative Cell Culture (I, 3)** Methods of mammalian cell culture used for quantitative studies of normal and abnormal cells. Basic techniques for propagation and

manipulation of cells in culture. (Lec. 2, Lab. 3) Pre: MIC 211 or BCH 311. In alternate years. Next offered fall 1999. Staff

**403 (or MIC 403) Introduction to Electron Microscopy (I, 2)** Survey of techniques in electron microscopy. Discussion of advantages and limitations. Thin sectioning, negative staining, shadow-casting, freezing-etching, histochemical procedures, autoradiology, darkroom procedures, scanning electron microscopy, interpretation of electron micrographs. (Lec. 2) Pre: permission of chairperson. Hufnagel

**405 Electron Microscopy Laboratory**  
See Microbiology 405.

**412 Biochemistry Laboratory (II, 3)** Same as 312 plus an individual supervised laboratory project selected in consultation with the student. Projects may include enzyme action, enzyme induction, drug action, use of radioisotopes, and plant metabolism. (Lab. 6) Pre: credit or concurrent enrollment in 311. Tremblay

**421 (or MIC 421) Cell Biology and Cancer (I, 3)** Methods of study of the cancer cell and comparison to normal cell. Emphasis on cell culture experiments. (Lec. 3) Pre: MIC 211 or BCH 311. In alternate years. Next offered fall 1998. Staff

**435 Physical Chemistry for Life Sciences (I, 3)** Gases, solution, thermodynamics, equilibrium, kinetics, quantum theory, and photochemistry. (Lec. 3) Pre: one semester each of organic chemistry, physics, and calculus (two semesters of each recommended). Not open to chemistry majors. Staff

**437 Fundamentals of Molecular Biology**  
See Biological Sciences 437.

**451 Laboratory in Cell Biology**  
See Biological Sciences 451.

**453 Cell Biology**  
See Biological Sciences 453.

**454 Genetics Laboratory**  
See Biological Sciences 454.

**464 Biochemistry of Metabolic Disease (II, 3)** A study of the primary and secondary molecular changes in human metabolic diseases. Topics include aging, alcoholism, arteriosclerosis, diabetes, depression, and genetic diseases. (Lec. 3) Pre: 311 or 481. Staff

**481 Principles of Biochemistry I (I, 4)** Principles of biochemistry including bioenergetics, proteins and enzymology, carbohydrate metabolism, and oxidative phosphorylation. (Lec. 3, Rec. 1) Pre: CHM 228, 229. Not for graduate credit in biochemistry. Tremblay and Staff

**482 Principles of Biochemistry II (II, 4)** Principles of biochemistry including membranes, photosynthesis, lipid and nitrogen metabolism, hormones, and biosynthesis of DNA, RNA, and proteins. (Lec. 3, Rec. 1) Pre: CHM 228, 229 and BCH 481. Not for graduate credit in biochemistry. Tremblay and Chandless

**484 Physical Methods in Biochemistry (II, 3)** Experimental methods including spectroscopy, spectrofluorimetry, optical rotation, chromatography, and electrophoresis are applied to biochemical compounds and reactions. Physical principles and the calculation of important properties are stressed. (Lec. 1, Lab. 4) Pre: 435, 481, and permission of chairperson. Staff

**491, 492 Research in Biochemistry (I and II, 1–6 each)** Special problems. Student outlines the problem, carries on experimental work, presents the conclusions in a report. (Independent Study) Pre: permission of instructor. Not for graduate credit in biochemistry. Staff

**495, 496 Biochemistry Seminar (I and II, 1 each)** Discussion and presentation of research papers on selected subjects in biochemistry. (Lec. 1) Pre: 311, 482, or 582. Staff

**502 Techniques in Microbial and Molecular Genetics**  
See Microbiology 502.

**503 Electron Microscopy**  
See Microbiology 503.

**505 Laboratory in Electron Microscopy**  
See Microbiology 505.

**521 Physical Biochemistry (I, 3)** The use of diffusion, sedimentation, viscosity, electrophoresis, isoelectric focusing, chromatography, and spectroscopy, (including linear and circular dichroism) to determine the size, shape, structure, interactions, and molecular weight of biological macromolecules. (Lec. 3) Pre: 435 or equivalent. In alternate years. Next offered fall 1999. Staff

**522 Plant Molecular Biology**  
See Biological Sciences 522.

**523, 524 Special Topics in Biochemistry (I and II, 1–3 each)** Advanced work arranged to suit the individual needs of the student. Lecture and/or laboratory according to the nature of the problem. (Independent Study) Pre: permission of chairperson. May be repeated for a maximum of 12 credits. S/U credit for 524. Staff

**542 Proteins: Purification and Characterization (II, 3)** Use of techniques for protein purification and activity studies. Laboratories involve

enzymology, chromatography, investigation of soluble and membrane-bound receptors, gel electrophoresis and silver staining, thin-layer electrophoresis and autoradiography. (Lab. 9) Pre: 311 or 581 and permission of instructor. Staff

**551 (or MTC 551) Topics in Biochemistry for the Clinical Scientist (I, II, or SS, 3)** Description of the major components of biochemistry as it relates to the medical sciences. Major concepts include molecular genetics, regulatory biochemistry, and medically related applied biochemistry. (Lec. 3) Offered every third year. Staff

**552 Microbial Genetics**  
See Microbiology 552.

**572 Plant Biochemistry**  
See Plant Sciences 572.

**573 Developmental Genetics**  
See Biological Sciences 573.

**579 Advanced Genetics Seminar**  
See Biological Sciences 579.

**581 General Biochemistry I (I, 3)** First semester of a two-semester course on the principles of biochemistry. Topics include: bioenergetics, protein structure, enzymology, glycolysis, the tricarboxylic acid cycle, and oxidative phosphorylation. (Lec. 3) Pre: CHM 228 and 229. Tremblay

**582 General Biochemistry II (II, 3)** Second semester of a two-semester course on the principles of biochemistry. Topics include: photosynthesis, membranes, hormones, metabolism, the biosynthesis of DNA, RNA, and proteins. (Lec. 3) Pre: 581 or permission of instructor. Tremblay and Chandlee

**583 Metabolism (I, 3)** Intensive study of metabolic pathways of carbohydrates, lipids, and nitrogenous compounds; their interrelationships. Effects of hormonal and nutritional status on activity of these pathways. (Lec. 3) Pre: 581, 582, and/or permission of chairperson. In alternate years. Tremblay

**584 Membrane Biochemistry (I, 3)** Review of model systems for biochemical, physical, and chemical studies of cell membranes. Discussion of current research directed at a molecular understanding of membrane structure and function. (Lec. 3) Pre: credit or concurrent enrollment in 582 or permission of instructor. In alternate years. Next offered 1999–00. Staff

**585 Recent Advances in Receptor Research (I, 1)** Discussion of current research literature about receptors for hormones, pheromones, neurotransmitters, and other biological signals.

Consequences of receptor activation will also be discussed. (Lec. 1) Pre: 311 and permission of instructor. May be repeated. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**622 Advanced Electron Microscopy (II, 2)** The physical functioning of electron microscopes, high-resolution microscopy of macromolecules, newly available EM histochemical procedures, and computer processing of electron images. (Lec. 2) Pre: 403, 405, or permission of chairperson. Hufnagel

**624 Advanced Electron Microscopy Laboratory (II, 2)** Cleaning and aligning the electron microscope, development of independent project using advanced techniques, and formal presentation of results of individual projects to the class. (Lab. 6) Pre: credit or concurrent enrollment in 622 or permission of chairperson. Hufnagel

**642 Biochemical Toxicology**  
See Biomedical Sciences 642.

**651, 652 Research in Biochemistry (I and II, 3 each)** Students are required to outline a research problem, conduct necessary literature survey and experimental work, and present the observations and conclusions in a substantial written report. (Independent Study) Pre: graduate standing. Staff

**695, 696 Graduate Seminar**  
See Microbiology 695, 696.

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Biological Sciences (BIO)

Acting Chairperson: Professor Harlin

**100 Topics in Biology (I and II, 3)** Introduction to major concepts in biology through in-depth study of individual topics. Topics will vary by semester and instructor. Designed for nonmajors. Topics listed in registration catalog. (Lec. 3) May not be repeated. Not open to students with credit in BIO 103 or 104. Staff

**103 Topics in Biology with Recitation (I and II, 3)** Introduction to major concepts in biology through in-depth study of individual topics. Designed for nonmajors. Recitation illustrates or extends lecture. Topics listed in registration

catalog. (Lec. 2, Rec. 1) May not be repeated. Not open to students with credit in 100 or 104. Staff

**104 Topics in Biology with Laboratory (I and II, 3)** Introduction to major concepts in biology through in-depth study of individual topics. Designed for nonmajors. Laboratory illustrates or extends lecture. Topics listed in registration catalog. (Lec. 2, Lab. 2) May not be repeated. Not open to students with credit in 100 or 103. Staff

A Biology of Plants (N)  
B General Animal Biology (N)

**107 Plant Biology Seminar**  
See Plant Sciences 107.

**112 General Botany (I and II, 4)** Structure, physiology, and reproduction of seed plants as a basis for understanding broad principles of biology and relation of plants to human life. Survey of plant kingdom. (Lec. 3, Lab. 2) Not open to students with credit in 104A. Koske or Staff (N)

**113 General Zoology (I and II, 4)** Physiology, development, genetics, ecology, and study of types of animals, with emphasis on evolution. Introduction to further studies in zoology for both potential professional and nonprofessional students. (Lec. 3, Lab. 2) Not open to students with credit in 104B. Heppner or Staff (N)

**121 Human Anatomy (I and II, 4)** Elementary anatomy of the organ systems, studied with the aid of charts, models, and dissection of the cat. (Lec. 2, Lab. 4) Open to B.A. biology, B.S. biological sciences, physical education, dental hygiene, nursing, pharmacy, pre-physical therapy, and dietetics majors only. Staff

**130 Topics in Marine Biology (I and II, 1)** Current and classical issues considered in small classes. Designed for students interested in marine biology. (Seminar) Pre: concurrent or previous enrollment in a biology course. Freshman or sophomore standing only. May not be repeated. Harlin and Cobb

**141 Introduction to the Biology of Marine Animals (I, 3)** Environmental adaptations, physiology, and behavior of marine animals. Description of methods of study of marine animals. (Lec. 2, Rec. 1) Hill or Staff

**201 General Animal Physiology (I, 3)** Basic principles of physiology with emphasis on cellular and membrane mechanisms. Topics include bioenergetics and metabolism, enzymes, respiratory functions of blood cells, osmoregulation, bioelectricity and motility, cellular responses to humoral stimuli. (Lec. 2, Lab. 3) Pre: two semesters of biology and one semester of chemistry recommended. Kass-Simon

**202 Animal Development (II, 3)**

Descriptions and analyses of developmental changes in animals based on experimentally derived principles. (Lec. 2, Lab. 3) *Pre: two semesters of biological sciences.* Bibb

**203 Introduction to Evolutionary Genetics (I, 3)**

The genetic basis of evolutionary change. Topics of the origin, maintenance, and significance of genetic variation. The Darwinian revolution. (Lec. 2, Lab. 3) *Pre: two semesters of biological sciences.* Costantino

**204 Chordate Anatomy (II, 3)** Functional anatomy of chordates, including a consideration of the genesis of principal organ systems. Laboratory consists of detailed, integrated study of selected chordate forms. (Lec. 2, Lab. 3) *Pre: one semester of biological sciences.* Staff

**205 Animal Diversity (I, 3)** Survey of animal groups with emphasis on invertebrate forms, laboratory dissections, observations, and experiments. Occasional field trips. Lectures stress progressive specialization of structures and their functions. (Lec. 2, Lab. 3) Bullock

**206 Population and Community Dynamics (II, 3)** Principles of population and community dynamics from empirical and mathematical perspectives. Topics include population growth, species interactions, optimal foraging strategy, niche theory, natural selection. Laboratory sessions incorporate use of natural selection, use of computers, problem solving, and population growth in *Tribolium* and *Daphnia*, competition and predation. (Lec. 2, Lab. 3) Costantino and Staff

**242 Introductory Human Physiology (I and II, 3)** Functions of the organ systems of the human body and their coordination in the whole human organism. Attention is given to the needs of students preparing for health-related professions. (Lec. 3) *Pre: 104B, 113 or 121.* Specker and Staff

**244 Introductory Human Physiology Laboratory (I and II, 1)** Mechanisms of physiological processes are illustrated by experiments on vertebrate animals. (Lab. 3) *Pre: credit or concurrent enrollment in 242. Not open to students with credit in 442.* Hill

**262 Introductory Ecology (I and II, 3)** Structure and function of ecosystems, limiting factors, population dynamics, population interactions, and community relationships. Selected habitats and general ecological effects of humans. (Lec. 2, Rec. 1) *Pre: 104A, 104B, or 112, 113 or equivalent.* Killingbeck, Twombly, and Staff

**286 Humans, Insects, and Disease (I, 3)** Role of insects, ticks, and mites as vectors and as direct agents of diseases in humans; factors affecting the spread of these diseases and their role in our cultural development. (Lec. 3) *Not for major credit for B.S. in biological sciences.* Staff (N)

**301 Physiological Experiments (II, 3)** Methods of investigating physiological problems in the laboratory. Topics and techniques will be presented briefly, then employed in an individual laboratory project. (Lab. 6) *Pre: any four of 201, 202, 203, 204, 205, 206.* Staff

**311 Plant Anatomy (I, 3)** Structure of vascular plant tissues and organs as it relates to their function. Variations in anatomy, phylogeny of vascular tissue, anatomy of fossils, and the relation of structure to economic value. (Lec. 1, Lab. 4) *Pre: 112 or permission of instructor.* A. Roberts

**321 Plant Diversity (II, 3)** Representative forms of prokaryotes, algae, fungi, bryophytes, and vascular plants with emphasis on evolution, ecology, and life cycle. (Lec. 1, Lab. 4) *Pre: 112 or permission of instructor.* Staff

**323 Field Botany and Taxonomy (I, 4)** Collection, identification, and study of vascular flora of Rhode Island, including use of manuals and herbarium specimens. Field trips throughout Rhode Island. Discussion of principles, methods, and data used in classification. (Lec. 2, Lab. 4) *Pre: 104A or 112.* Killingbeck

**327 Vertebrate Histology (I, 3)** A study of the normal microscopic organization of the cells and tissues that compose the organ systems of vertebrates. An introduction to histochemical and cytochemical methods is included. (Lec. 3) *Pre: one year of biological sciences and one semester of organic chemistry.* Staff

**329 Vertebrate Histology Laboratory (I, 1)** A detailed study in the laboratory of prepared microscope slides of cells and tissues of vertebrates. (Lab. 3) *Pre: credit or concurrent enrollment in 327.* Staff

**331 Parasitology (II, 3)** Structure, life cycles, ecology, and economic relationships of the parasitic protozoa, helminths, and arthropods. Origin and biological significance of parasitism and host-parasite relationships. Encompasses experimental laboratory work on life cycles of selected species and collection and identification of local parasitic forms including those from the marine fauna. (Lec. 2, Lab. 3) *Pre: two semesters of biology.* Staff

**332 (or PLS 332) Plant Pathology (II, 4)** Nature, cause, and control of plant diseases. Use of basic techniques for identification of major types of plant diseases and their causal agents. (Lec. 4) *Pre: 112 or permission of instructor.* Staff

**341 Basic Cellular Physiology (II, 3)** Cellular processes are examined with respect to chemical composition of cells and media, membranes and organelles, exchange of materials and energy with environment, cellular replication, activities such as movement, conduction. (Lec. 2, Lab. 3) *Pre: one semester of chemistry and one semester of biology.* Staff

**343 Physiology of Exercise (I, 3)** Applied human physiology, with applications to work, health, physical education, and athletic sports. Particular attention to adjustments of the circulatory and respiratory systems during physical activity. Application of latest technology in the field of fitness and health. (Lec. 2, Lab. 3) *Pre: 201 or 242.* Manfredi

**345 Marine Environmental Physiology (I, 3)** The physiological basis of adaptation to the marine environment. Physiological methods adapted to marine plants and animals. (Lec. 2, Lab. 3) *Pre: Two semesters of biological sciences.* Hill or Staff

**350 (or GEL 350) Evolution (I, 4)** Introduction to evolution as the unifying thread in the biosphere. Processes and patterns discussed, including microevolution and macroevolution. Social impact of evolution discussed from a biological perspective. *Pre: GEL 102 or one semester of biological sciences, or permission of instructors.* Twombly and Fastovsky

**352 (or BCH 352) Genetics (II, 3)** Fundamental concepts of inheritance and variation in plants, animals, bacteria, and viruses. Methods of recombination, the process of mutation, gene structure, and function. (Lec. 3) *Pre: 112 and 113, or permission of instructor. Not open to students with credit in ASP 352 (or PLS 352).* Mottinger

**355 Marine Invertebrates of Southern New England (SS, 3)** Collection, identification, and preparation of marine invertebrates of southern New England. Emphasis on field work and preparation of specimens for scientific study. (Lab. 6) *Pre: 205 or permission of instructor.* Bullock

**381 Introductory Entomology**  
See Entomology 385.

**382 Introductory Entomology Lab**  
See Entomology 386.

**395 Seminar in Biology (I and II, 1)**

Introduction to sources of biological literature. Presentation of reports of scientific papers by students, with discussion by the class. (*Seminar*) Pre: junior standing and three courses in biology. S/U credit. Staff

**396 Biology and Society (II, 2)** A seminar course dealing with the impact of biological discoveries on societal questions and with the social influences that affect biological discovery. Discussion of original papers, magazines, newspaper articles, and books about various discoveries. (*Seminar*) Pre: three courses in biology (including current enrollment) or permission of instructor. Kass-Simon

**397, 398 Colloquium in Biological Sciences (I and II, 0 each)** Introduction to modern scholarly work in biology. Lectures by visiting and resident scholars, with questions from the audience. Expected of students enrolled in the biology honors program. (*Lec.*) Pre: Open to biological sciences majors only. S/U only. Staff

**418 Marine Botany (I, 3)** Field and laboratory study of ecology and taxonomy of various communities of marine plants, primarily seaweeds and seagrasses. Methods of collecting, fixation, herbarium processing, and identification. Individual projects required. (*Lec. 2, Lab. 3*) Pre: two courses in biological sciences including 112 or equivalent. Harlin

**432 Mycology: Introduction to the Fungi (I, 4)** Structure, development, cytology, distribution, and identification of fungi, with consideration of their importance in industry, medicine, plant disease, and organic decomposition. (*Lec. 2, Lab. 4*) Pre: 104A or 112; 321 recommended. Koske

**437 (or BCH 437) Fundamentals of Molecular Biology (I, 3)** Biochemical basis of heredity as seen through the structure and function of nucleic acids. Includes DNA replication, transcription, translation, gene regulation, and gene organization in prokaryotes and eukaryotes. Current methods emphasized. (*Lec. 3*) Pre: MIC 211, BIO 352, and BCH 311, or permission of instructor. Norris or Goldsmith

**441 Environmental Physiology of Animals (I or II, 3)** The dynamics of the interaction of animal functions with the environment. Emphasis on quantitative study of physiological adaptations to environmental fluctuations. (*Lec. 3*) Pre: 201 or 341. In alternate years. Next offered in 1999–00. Hill

**442 Mammalian Physiology (II, 3)** Intensive study of the physiological mechanisms that regulate the animal body and its organ systems. Emphasis on knowledge obtained from experimental physiology. Class discussion of applied physiology. (*Lec. 2; Rec. 1 or Lab. 3*) Pre: one semester each of anatomy and physiology courses. Recitation section limited to graduate students in the College of Nursing. Hill

**444 Experimental Physiology (II, 1)** Introduction to non-invasive research methods in physiology. Emphasis on experimental design, recording and analyzing data, and use of laboratory notebooks in writing for publication. (*Lab. 3*) Pre: 201 or three semesters of biological sciences. Hill

**445 Endocrinology I (I, 3)** Comparative approach to the endocrine regulation of the organism and to the molecular basis for hormone action. (*Lec. 3*) Pre: BCH 311 or equivalent and BIO 201 or 242 or equivalent. Specker

**446 Introduction to Cellular and Behavioral Neurobiology (II, 3)** Basic principles of excitable cell function. Emphasis will be on cellular and membrane mechanisms as they relate to behavior (*Lec. 3*) Pre: an animal physiology course; one semester of calculus, physics, or biochemistry is strongly recommended or permission of instructor. Next offered spring 2000. Not for graduate credit. Kass-Simon

**447 Plant Physiology (II, 3)** Growth and function of vascular plants from seed germination through flowering. Topics include energy metabolism, transport processes, environmental interactions, stress physiology, and developmental control. (*Lec. 2, Lab. 3*) Pre: 112, CHM 112 or permission of instructor. A. Roberts

**451 (or BCH 451 or MIC 451) Laboratory in Cell Biology (II, 1)** Analysis of subcellular processes, structures, and molecules using techniques including gel electrophoresis, spectrophotometry ultracentrifugation, and protein purification. Topics range from analysis of gene expression to subcellular localization of enzymatic activity. (*Lab. 2*) Pre: concurrent enrollment in 453 (or MIC 453) or permission of instructor. Norris

**453 (or BCH 453 or MIC 453) Cell Biology (II, 3)** Structure, replication, and function of eukaryotic cells at subcellular level. Topics considered include cell membranes, cytoplasmic organelles and nuclei, cell division, cellular differentiation, and methods. Emphasis on recent publications. (*Lec. 3*) Pre: two semesters of biology, BCH 311, junior standing, or permission of instructor. Norris

**454 (or BCH 454) Genetics Laboratory (I, 3)** Principles of classical and molecular genetics using microorganisms as well as higher plants and animals. Experimental techniques include human chromosome preparations, screening for growth requirements in microorganisms, mutagenesis, gel electrophoresis, and nucleic acid hybridization. (*Lab. 6*) Pre: 352. In alternate years. Next offered 1999–00. Mottinger

**455 Marine Ecology (I, 3)** Investigation of the structure and dynamics of various marine ecosystems. Includes mineral cycling, energy flow, community and population organization, and behavioral ecology in selected marine environments. (*Lec. 3*) Pre: 262 or permission of instructor. Bell

**457 Marine Ecology Laboratory (I, 1)** Field and laboratory work on community relationships of dominant organisms in Rhode Island marine environments. (*Lab. 3*) Pre: concurrent enrollment in 455 and permission of instructor. Limited to 15 students. Bell

**458 Limnology (I, 4)** The study of continental waters. Emphasis on ponds and lakes, including uptake kinetics, population biology, and community structure of lacustrine organisms, as well as physical and chemical properties of fresh water. (*Lec. 3, Lab. 3*) Pre: 206 or 262 and one semester of chemistry. Twombly

**460 Advanced Population Biology (II, 3)** An extension of the seminal views of Fisher, Wright, Haldane, Volterra, and Lotka on the biology of populations, especially in the areas of genetics, ecology, and demography. (*Lec. 3*) Pre: MTH 131 and 132 or 141 and 142. Costantino or Staff

**464 Invertebrate Zoology (II, 4)** Study of the origin and evolutionary relationship of the invertebrate animals. Emphasis on marine forms. Laboratory sessions include comparative study of selected examples and field trips to local environments. (*Lec. 2, Lab. 4*) Pre: 104A, 104B or 205 or 112 and 113 or equivalent. Bullock

**465 Biology of Algae (II, 3)** Taxonomy, morphology, and evolution of algae. Use of ultrastructure in modern taxonomy; various systems of classification. Field trips to different communities. Labs on the taxa discussed and techniques for axenic culture. (*Lec. 1, Lab. 3*) Pre: 112, 321 recommended. Harlin

**466 Vertebrate Biology (II, 3)** Life histories, adaptations, ecology, classifications, and distribution of vertebrate animals. Laboratory and extensive field work on local vertebrates. (*Lec. 2, Lab 3*) Pre: 206 or 262 recommended. Staff



**467 Animal Behavior** (II, 3) Ethology and sociobiology of animals. Topics in the control and development of behavior patterns, orientation in time and space, social behavior, and behavioral ecology. (Lec. 3) Pre: two semesters of zoology; 206 or 262 recommended. Cobb

**491, 492 Special Problems** (I and II, 1-3 each) Selected areas pertinent to needs of individuals or small groups. Class, seminar, or tutorial situations. (Independent Study) Open only to undergraduates on arrangement with staff. S/U only. Staff

**501 Systematic Zoology** (I, 3) Species concepts and theories of biological classification. Taxonomic decisions and publication, numerical taxonomy, and review of the rules of zoological nomenclature. (Lec. 3) Pre: 262 and 352, 466 recommended. In alternate years. Next offered 1998. Bullock

**505 Biological Photography** (I, 3) Application of scientific photography to biological subjects, living and prepared. Photomacrography. Principles of photography as applied to the specialized needs of biological research and publication. (Lec. 1, Lab. 5) Pre: permission of instructor. Heppner

**508 Seminar in Biological Literature** (II, 1) Survey of biological literature including traditional methods of bibliographic control, contemporary information retrieval services, and the development of a personalized information system. (Lec. 1) Pre: graduate standing in biological sciences. Kelland

**511 Special Readings in Developmental Plant Anatomy** (I, 3) Intensive tutorial work, research, and reading on ontogeny of plant structures and morphogenetic mechanisms. (Independent Study) Pre: graduate standing and permission of instructor. Concurrent audit of 311 required. Offered on demand. A. Roberts

**515 Light Microscopy Research Methods** (I, 4) Introduction to optical techniques and biological specimen preparation for light microscopy with emphasis on application of these methods in biological research. Topics include: optics, embedding and sectioning, fluorescence and immunocytochemistry, and computer image analysis. (Lec. 1, Lab. 6) Pre: graduate standing or permission of instructor. Offered fall in even-numbered years. A. Roberts

**521 Recent Advances in Cell Biology**  
See Microbiology 521.

**522 (or BCH 522) Plant Molecular Biology** (I, 4) Analysis of gene expression in plants includ-

ing topics such as chloroplast DNA, mitochondrial DNA, transgenic plants, and symbiotic genes. Laboratory includes cloning, restriction mapping, and hybridization. Emphasis on research literature. (Lec. 2, Lab. 4) Pre: 352, BCH 311, or permission of instructor. In alternate years. Norris

**524 Methods in Plant Ecology** (II, 3) Methods in analysis of vegetation and microenvironments. Emphasis on quantitative techniques in analysis of vegetation, soil, and microclimate; techniques in physiological ecology. (Lec. 2, Lab. 3) Pre: 112 and 262 or equivalent; STA 412 recommended. In alternate years. Next offered 1999-00. Killingbeck

**531 Advanced Parasitology Seminar** (II, 2) Advanced topics in the host-parasite relationships of protozoan and metazoan parasites. Reading knowledge of one foreign language assumed. Topics vary from year to year. (Lec. 2) Pre: 331 or equivalent. Staff

**534 Physiology of the Fungi** (II, 3) Life processes of fungi with particular emphasis on chemical composition, organic and mineral nutrition, toxic and stimulating agencies, and metabolism. Also stresses phenomena of variation of growth and sporulation as affected by various environmental factors. (Lec. 2, Lab. 2) Pre: 432 or permission of instructor. In alternate years. Koske

**536 Seminar in Plant Stress Physiology** (II, 1-2) Readings, discussion, and analysis of current literature with emphasis on biochemical and genetic aspects of responses. Students electing two credits will write review papers. (Seminar) Pre: one course in plant physiology and one course in biochemistry. In alternate years. A. Roberts

**541 Comparative Physiology of Marine Animals** (I, 3) Comparison of physiological mechanisms by which animals maintain life with emphasis on marine invertebrates. Responses to external environment mediated by receptors, nervous systems, effectors. Living control systems for muscular activity and circulation. (Lec. 2, Lab. 3) Pre: 201 and 205. In alternate years. Next offered 1998-99. Hill

**545 Endocrinology II** (I, 3) Molecular basis of hormone action and evolution of regulatory systems. (Lec. 3) Pre: graduate standing and one course in physiology and one course in biochemistry at the college level. Next offered 1998-99. Specker

**546 Introduction to Neurobiology** (II, 2) Fundamental processes in neurobiology with emphasis on cellular and membrane mechanisms

of nerve functioning. (Lec. 2) Pre: 201 and MTH 141. In alternate years. Next offered spring 2000. Kass-Simon

**547 Laboratory in Electrophysiological Techniques** (II, 2) Introduction to methods of extracellular and intracellular electrophysiology of excitable tissues. (Lab. 4) Pre: credit or concurrent enrollment in 546. In alternate years. Next offered spring 2000. Kass-Simon

**549, 550 Advanced Topics in Neurobiology** (II, 3 each) Published papers in selected aspects of neurobiology will be discussed. Representative topics include role of  $Ca^{++}$ , c-AMP in the nervous system, gating currents learning at the cellular level, cellular rhythmicity. (Seminar) In alternate years. Next offered 1999. Kass-Simon

**551 Seminar in Aquatic Botany** (II, 1) Readings and discussion on current research involving algae and other aquatic plants. (Seminar) Pre: permission of instructor. May be repeated. Harlin

**554 Cytogenetics** (I, 4) Comparisons of various types of crossing-over, chromosomal aberrations and their effects, mutation, and other cytogenetic phenomena in fungi and higher organisms. Laboratory studies of meiosis in maize, identification of chromosomes, and induced rearrangements. (Lec. 2, Lab. 4) Pre: 352, 453, or permission of instructor. Mottinger

**560 Seminar in Plant Ecology** (II, 2) Recent topics and investigations pertinent to plant ecology. Library research, oral presentation of reports, and group discussions. (Seminar) Pre: 262 or equivalent or permission of instructor. May be repeated. Killingbeck

**561 Behavioral Ecology** (I, 3) The interaction of animal behavior, ecology, and evolution. Topics include predator-prey relationships, resource partitioning, competition, territoriality, and reproductive behavior. Term project required. (Lec. 3) Pre: a course in animal behavior and a course in ecology. In alternate years. Next offered 1999-00. Cobb

**562 Seminar in Behavioral Ecology** (I, 1) Special topics in the relationships between animal behavior and ecology, such as social organization of animals, evolution of behavior, competition, and habitat selection. Discussion and presentation of individual reports. (Seminar) S/U only. Cobb

**563 Ichthyology** (I, 3) Fishes of the world. Their structure, evolution, classification, ecology, and physiology. Emphasis on local marine and freshwater fauna. Several field trips. (Lec. 2, Lab. 3) Pre: 202 or 204 and 466. Staff

**566 Herpetology (II, 3)** Biology of recent orders of amphibians and reptiles; emphasis on adaptations and evolution, world faunal relationships past and present, current systematic problems. Selected herpetological material in laboratory, field trips. (Lec. 2, Lab. 3) Pre: 202 or 204 or permission of instructor. Shoop

**567 Natural Selection (II, 3)** Ideas and controversies concerning the action of natural selection. Maintenance of genetic variability, neutral mutation, levels of selection, recombination and sexual reproduction, and rates of evolution. (Lec. 2, Lab. 3) Pre: 262 and 352 or 206 or permission of instructor. Twombly

**568 Ornithology (II, 2)** Biology of birds with emphasis on the role of birds in biological research. Areas covered include systematics, evolution, physiology, ecology, and behavior. Discussion of current topics in ornithology. (Lec. 2) Pre: 466 or permission of instructor. Heppner

**570 Field Biology of Fishes (II, 3)** Selected field problems in fish biology, including distribution and diversity, habitat segregation, reproduction, and natural movements. Emphasis on freshwater and diadromous populations. (Lec. 3) Pre: 563 or permission of instructor.

Limited to 10 students, with preference given to graduate students and senior biological sciences majors. In alternate years. Next offered 1998–99. Staff

**571 General Acarology (I, 3)** Detailed study of mites and ticks, their structure, life histories, and classification. Free-living forms as well as plant and animal feeders. (Lab. 6) Pre: 331 or 572. In alternate years. Next offered 1998–99. Staff

**572 (or ENT 586) Medical and Veterinary Entomology (I, 3)** Life history, classification, habits, and control of insects and other arthropods affecting human and animal health. Topics will include public health significance, vector-parasite interactions, and survey and research methodologies. (Lec. 1, Lab. 4) Pre: 331 or 381 or equivalent. In alternate years. Next offered 1998–99. Mather or Staff

**573 (or BCH 573) Developmental Genetics (I, 3)** An examination of animal and plant model systems incorporating concepts of cell biology, physiology, molecular biology, and genetics to understand fundamental mechanisms regulating patterns of organismal development. (Lec. 3) Pre: introductory courses in genetics development, biochemistry, or molecular biology preferred. Goldsmith and Chandless

**579 (or BCH 579) Advanced Genetics Seminar (I and II, 1)** Current topics in genetics, including cytological, ecological, molecular, physiological, population, quantitative, and radiation genetics. (Seminar) Pre: 352 and permission of instructor. Goldsmith and Mottinger

**581, 582 Biological Sciences Seminar (I and II, 1 each)** Preparation and presentation of papers on subjects in selected areas relating to biology. Required of graduate students majoring in biological sciences. (Seminar) S/U credit. Staff

**587 Seminar in Neurobiology (I or II, 1)** Current literature in the neurosciences will be surveyed. Topics include molecular and behavioral electrophysiology, ultrastructure of excitable cells, receptor and pharmacological neurobiology of invertebrates and vertebrates. (Seminar) Pre: graduate standing or one advanced neuroscience course. Kass-Simon

**590 Botanical Techniques (I, 1)** Current research techniques in the botanical sciences. Includes short-term participation in several ongoing research programs and an overnight, weekend field trip. (Lab. 3) Pre: graduate standing or permission of instructor. Staff

**591, 592 Biological Problems (I and II, 1–3 each)** Special work arranged to meet the needs of individual students who are prepared for and desire advanced work in biological sciences. (Independent Study) Offered only by arrangement with staff. Staff

**593 Special Topics in Botany (I and II, 1–3)** Covers the following specialized areas of botany: a) recent advances in mycology, b) physiological ecology of marine macroalgae, c) nutrient ecology of plants, and d) ecology of fungi. (Independent Study) Pre: permission of instructor. May be repeated for a maximum of 9 credits. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**641, 642 Seminar in Physiology (I and II, 1–3 each)** Reports and discussions on topics of current research in physiology. Subject matter adapted to meet interests of staff and students. (Seminar) Pre: permission of instructor. Staff

**654 Seminar in Ichthyology (II, 2)** Reading, library research, reports, and class discussion on problems of current research interest in the biology of fishes. (Seminar) Pre: 563 or permission of instructor. In alternate years. Next offered 1999–00. Staff

**661 Phytoplankton Taxonomy**  
See Oceanography 661.

**663 Phytoplankton Physiology**  
See Oceanography 663.

**664 Phytoplankton Ecology**  
See Oceanography 664.

**666 Biology of Metamorphosis (II, 3)** The evolutionary, ecological, and physiological regulation of metamorphosis and related life-history events in diverse taxa. (Seminar) Pre: graduate standing and 541 or 545 or 567 or 573. Specker or Twombly

**667 Advanced Phytoplankton Seminar**  
See Oceanography 667.

**668 Biology of Reproduction in Animals (II, 3)** Evolution of sexual reproduction, neuroendocrine signals, and behavioral controlling mechanisms in diverse phyla. (Lec. 3) Pre: 545, 561, or 567. Twombly, Specker, and Cobb

**675 Advanced Ecology Seminars (I and II, 2 each)** Specialized and advanced areas of ecological research and theory, including biogeography, Pleistocene ecology, population dynamics, energy flow in ecosystems, and radiation ecology. (Seminar) Pre: permission of instructor. Staff

**679 Animal Communication**  
See Oceanography 679.

**691, 692 Biological Problems (I and II, 1–6 each)** Special work to meet the needs of individual students who are prepared to undertake special problems. (Independent Study) Pre: permission of chairperson. Open only to doctoral students. Staff

**695 Graduate Seminar (I and II, 1)** Students to give seminar reports on their thesis research. Attendance and registration required of all graduate students in residence, but only 2 credits may be applied to the program of study. (Seminar) Pre: graduate standing. S/U credit. Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**930 Workshop in Biology Topics for Teachers (I, II, or SS, 0–3)** Especially designed for secondary school science teachers. Basic topics in biology from an advanced or pedagogical perspective. (Workshop) Pre: teacher certification. Staff

## Biomedical Sciences (BMS)

Chairperson: Professor Shaikh

**202 Maintaining Health in the Age of Chemicals (II, 2)** Introduction for the general student to the potential hazards posed by drugs, food additives, and pollutants to the maintenance of health. (Lec. 2) *Not for program credit for nursing or pharmacy majors in the third year or beyond.* Swonger and Staff

**225 Pharmacology and Therapeutics I (I, 2)** Properties, actions, uses, adverse effects, and interactions of drugs used in treatment of disease. (Lec. 2) *Pre: BIO 242; previous or concurrent enrollment in NUR 323. Open to students in the College of Nursing only.* Swonger

**226 Pharmacology and Therapeutics II (II, 2)** Continuation of 225. Properties, actions, uses, adverse effects, and interactions of drugs used in treatment of disease. (Lec. 2) *Pre: BIO 242; previous or concurrent enrollment in NUR 323. Open to students in the College of Nursing only.* Swonger

**311 (or PHP 311) Foundations of Human Disease I: Immunoinflammatory Disease (I, 2)** The pathogenesis, etiology, epidemiology, symptomatology, and diagnosis of immunoinflammatory and musculo-skeletal diseases. The pharmacology and medicinal chemistry of anti-inflammatory medications, immunosuppressives, and anti-rheumatic drugs. (Lec. 2) *Pre: third-year standing or permission of instructor. Next offered fall 2000.* Chichester, Panzica, Martin, Owens

**312 (or PHP 312) Foundations of Human Disease II: Central Nervous System Disease (II, 2)** The etiology, pathogenesis, epidemiology, symptomatology, and diagnosis of diseases of the central nervous system. (Lec. 2) *Next offered spring 2001.* Swonger, Owens

**313 Introduction to Medicinal Chemistry and Drug Metabolism (I,2)** Basic chemical knowledge for understanding drug-receptor interaction, biotransformation of drugs [Phase I (oxidation, reduction, hydrolysis) and Phase II (conjugation, addition) metabolism], and prodrug concept. (Lec. 2) *Pre: third-year standing or permission of instructor. Next offered fall 2000.* Cho, Panzica

**321 Principles of Pharmacology and Autonomic Pharmacology (I,2)** Fundamental principles of drug action with emphasis on drug/receptor interactions. Mechanisms of action and medicinal chemistry of drugs that affect the autonomic nervous system. (Lec. 2) *Pre: third-year*

*standing or permission of instructor. Next offered fall 2000.* Babson, Panzica, and Rodgers

**322 Pharmacology and Medicinal Chemistry of Drugs Acting on the Central Nervous System (II, 2)** Neurologic agents in the brain; antidepressants, antipsychotics, sedative hypnotics, analgesics, anti-seizure medications, anti-dementia therapy, and anti-anxiety medications. (Lec. 2) *Pre: third-year standing or permission of instructor. Next offered spring 2001.* Swonger

**325 Principles of Drug Analysis (II, 2)** Competency in understanding the molecular basis of drug analysis: neutralization, oxidation/reduction, enzymatic reactions, clinically relevant spectroscopic and chromatographic techniques. (Lec. 2) *Pre: third-year standing or permission of instructor. Next offered spring 2001.* Cho

**326 Pharmacology and Medicinal Chemistry Laboratory I (II, 1)** Effects of drugs on physiological functions. Identification and quantification of drugs and their actions. (Lab. 3) *Pre: third-year standing or permission of instructor. Next offered spring 2001.* Chichester, Cho, and Staff

**327 Introduction to Human Pathophysiology (I, 3)** Systems approach to normal and abnormal human physiology, with selected examples of important and well-defined human diseases. Participating faculty include scientists and clinical practitioners. (Lec. 3) *Pre: BCH 311, BIO 242, and MIC 201. Last offered fall 1999.* Rodgers and Staff

**342 Pharmaceutical Analysis (I and II, 4)** Principles and techniques of official and nonpharmaceutical necessities, raw natural products, and radiopharmaceuticals. (Lec. 3, Lab. 3) *Pre: CHM 226, 227, 228 or equivalent. Last offered spring 2000.* Staff

**343 Principles of Medicinal Chemistry (I, 2)** Chemical, physicochemical, and biomolecular principles affecting drug delivery and action including biotransformation, isosteres, and MRI. (Lec. 2) *Pre: CHM 226, 227, 228, BCH 311 or equivalent. Last offered fall 1999.* Staff

**409 (or PHP 409) Foundations of Human Disease III: Infectious and Pulmonary Processes (I, 2)** The etiology, pathogenesis, epidemiology, symptomatology, and diagnosis of infections and pulmonary diseases. (Lec. 2) *Pre: fourth-year standing or permission of instructor. Next offered fall 2001.* Geletko and Shimizu

**410 (or PHP 410) Foundations of Human Disease IV: Endocrinology, Oncology, Medicinal Genetics, GI (II, 3)** The etiology, pathogenesis, symptomatology, and diagnosis of diseases of

endocrine, oncologic, and genetic origin. (Lec. 3) *Pre: fourth-year standing or permission of instructor. Next offered spring 2002.* Yan, Glen

**416 Pharmacology and Medicinal Chemistry Laboratory II (I, 1)** Pharmacologic principles relating to the modification of drug activity and toxicity. Clinical assays relevant to assessing drug effects. (Lab. 3) *Pre: fourth-year standing or permission of instructor. Next offered fall 2001.* Yan, Martin, and Staff

**420 (421) (or PHP 420 (421)) Biotechnology Products in Pharmacy (I, 2)** Clinical, pharmaceutical, and economic impact of biotechnology products in pharmacy, including monoclonal antibodies, interleukins, human growth factors, antigens oligonucleotides, DNase, and interferons. (Lec. 2) McKindley and Chichester

**421 Pharmacology and Medicinal Chemistry of Anti-infective and Respiratory Agents (I, 2)** Chemistry, mechanism of action, sensitivity, resistance and toxicity of anti-infections drugs, and an overview of antibacterial, antifungal, antiviral, antiprotazoal, respiratory drugs, and vaccines in current use. (Lec. 2) *Pre: fourth-year standing or permission of instructor. Next offered fall 2001.* Staff

**422 Endocrine, Gastrointestinal and Biotechnologic Drugs (II, 2)** Mechanisms of action of drugs used to treat endocrine and gastrointestinal disorders. Biological and biotechnologic sources, isolation, design, and medicinal chemistry of biopolymer drugs. (Lec. 2) *Pre: fourth-year standing or permission of instructor. Next offered spring 2002.* Babson and Martin

**436 (or PSY 436) Psychotropic Drugs and Therapy (I and II, 3)** Interaction of drug and nondrug therapy and of physiological and psychological origins of psychopathology. Intended for advanced undergraduate and graduate students interested in clinical psychology. (Lec. 3) *Pre: any one of the following—BIO 104B, 113, 121, PSY 381, or permission of instructor. Not for graduate credit.* Swonger

**443, 444 Organic Medicinal Chemistry (I and II, 3 each)** Selected compounds of medicinal and pharmaceutical importance. Uses, syntheses, incompatibilities, correlation of physical properties, structures, and biological activity. (Lec. 3) *Pre: 342, 343, CHM 228, and/or permission of instructor. 443: Last offered fall 2000; 444: Last offered spring 2001.* Panzica

**445 Natural Products and Biotechnological Drugs (II, 3)** Natural drug products of biological or biotechnological origin. Sources, process of

isolation or production, and general fundamental properties. (Lec. 3) Pre: CHM 228; MIC 201 or equivalent. Shimizu and Martin

**446 Immunologic Drugs, Antibiotics, and Anticancer Drugs (I, 3)** Effects of immunologic drugs, antibiotics, and anticancer drugs in relation to host defense systems. Mechanisms of action, toxic effects, and pertinent clinical aspects will be discussed. (Lec. 3) Pre: 327 and 454 or permission of instructor. Last offered fall 2000. Chichester and Martin

**451 General Pharmacology Laboratory (II, 1)** Effects of drugs on physiological function with reference to responses by tissue systems. Toxic effects, mechanisms of action, and dosage. (Lab. 3) Pre: fourth-year standing or permission of chairperson. Not for graduate credit. Last offered spring 2001. Chichester, Yan, and Staff

**454 General and Clinical Pharmacology and Toxicology I (I and II, 3)** Principles of drug action with emphasis on effects of drugs and other chemicals on physiological function of various organ systems. Mechanisms of action, toxic effects, and pertinent clinical aspects will be discussed. (Lec. 3) Pre: BIO 242, BCH 311, and BMS 327, or permission of instructor. Last offered spring 2000. Babson and Rodgers

**455 General and Clinical Pharmacology and Toxicology II (I and II, 3)** Principles of drug action with emphasis on effects of drugs and other chemicals on physiological function of various organ systems. Mechanisms of action, toxic effects, and pertinent clinical aspects will be discussed. (Lec. 3) Pre: 327 and 454 or permission of instructor. Last offered fall 2000. Shaikh and Staff

**456 General and Clinical Pharmacology and Toxicology III (II, 3)** Principles of drug action with emphasis on effects of drugs and other chemicals on physiological function of various organ systems. Mechanisms of action, toxic effects, and pertinent clinical aspects will be discussed. (Lec. 3) Pre: 327, 454, and 455 or permission of instructor. Last offered spring 2001. Swonger and Staff

**497, 498 Special Problems (I and II, 1–5 each)** Methods of carrying out a specific research project. Literature search, planning, laboratory work, writing an acceptable report. (Independent Study) Pre: permission of chairperson. Not for graduate credit. Staff

**510 (or PHP 510) Foundations of Human Disease V: Renal and Cardiovascular Diseases (II, 2)** The etiology, pathogenesis, epidemiology,

and symptomatology, and diagnosis of renal and cardiovascular diseases. (Lec. 2) Pre: fifth-year standing or permission of instructor. Next offered spring 2003. Barbour and Rodgers

**518 (or PHP 518) Self-Care I (I, 3)** An overview of alternative therapies with an emphasis on self-care and natural medicine alternatives. Basic information as well as case studies. (Lec. 3) Pre: fifth-year standing or permission of instructor. Next offered fall 2002. Staff

**521 Cancer Chemotherapy and Toxicology (I, 2)** Pharmacology and medicinal chemistry of oncology drugs. Principles of toxicology. (Lec. 2) Pre: fifth-year standing or permission of instructor. Next offered fall 2002. Chichester, Panzica, and Shaikh

**522 Pharmacology and Medicinal Chemistry of Cardiovascular and Renal Drugs (II, 2)** Mechanism of action, adverse effects, and therapeutic applications of drugs affecting cardiovascular and renal function. (Lec. 2) Pre: fifth-year standing or permission of instructor. Next offered spring 2003. Rodgers

**523, 524 (521, 522) Seminar (I and II, 1 each)** Seminar presentation of scientific literature on a selected topic in the biomedical sciences or on the status of students' research work. (Seminar) Required of all graduate students in the department, with a maximum of 1 credit allowed per year. May be repeated for a maximum of 1 credit per degree. S/U only. Staff

**525 Experimental Techniques in Biomedical Sciences (I, 4)** Provides experience with a variety of techniques used in biomedical science research, including HPLC, NMR, polarimetry, biotransformations, solid-phase synthesis, cell fractionation, and isolation and purification of proteins. (Lab. 4) Staff

**526 Lipid Chemistry**  
See Food Science and Nutrition 526.

**530 Drug Metabolism (II, 3)** Mechanisms of Phase 1 (oxidation, reduction, hydrolysis) and Phase 2 (conjugations and synthesis) of drug metabolism. (Lec. 3) Pre: BCH 581 or permission of instructor. In alternate years. Next offered spring 1999. Chichester, Cho, Babson, Martin, and Panzica

**533 Medicinal Plants (I, 3)** Problems in drug plant chemotaxonomy with field work in the drug plant gardens. Emphasis is placed on certain alkaloid, glycoside and oil-yielding plants, weedicides and insecticides as related to measures for control. (Lec. 2, Lab. 3) Pre: 446 or equivalent. Staff

**535 Pharmaceutical Biotechnology (II, 3)** Introduction to pharmaceutical biotechnology, including drug design, DNA sequencing, cloning, recombinant proteins, monoclonal antibodies, and drug-screening techniques. (Lec. 3) Pre: BCH 581 or permission of instructor. Next offered spring 2000. Staff

**544 Forensic Toxicology (I, 3)** Theoretical and practical aspects of poisoning including the isolation and identification of toxic materials from pharmaceuticals, body fluids, and tissues. Isolation and identification of physiological fluids from stains, hairs, and tissue with application to forensic medicine. (Lec. 2, Lab. 3) Pre: permission of instructor. Offered every third year. Next offered fall 1999. Staff

**546 Advanced Toxicology (II, 3)** Toxic effects of selected drugs and other xenobiotics on physiological and biochemical processes. (Lec. 3) Pre: permission of instructor. Offered every third year. Next offered spring 2000. Shaikh

**551 Chemistry of Natural Products (I and II, 3)** Introduction to chemistry of certain groups of natural products especially in relation to their chemotaxonomic position in plant classification. Topics limited to secondary metabolites; e.g., terpenoids, phenolic compounds, aromatic compounds, phytosterols, alkaloids. (Lec. 3) Pre: CHM 228 and 230. In alternate years. Next offered 1999–00. Shimizu

**572 Neural Bases of Drug Action (I, 3)** Review of neuroanatomy, neurochemistry, and neurophysiology as they relate to drug action. (Lec. 3) Pre: 446 or equivalent or permission of instructor. Offered every third year. Next offered fall 1998. Swonger

**597, 598 Special Problems (I and II, 1–3 each)** Special graduate student project assignments in the study of natural drug research under the supervision of faculty. (Independent Study) Pre: graduate standing. May be repeated for a maximum of 6 credits. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**633 Biosynthesis (I and II, 3)** Biogenesis of medicinally active principles of biological origin. Emphasis given to organic acids, polysaccharides, glycosides, steroids, and certain nitrogenous compounds. (Lec. 3) In alternate years. Next offered 1999–00. Shimizu

**635, 636 Pharmacognosy Techniques (I and II, 3–4 each)** Physical and chemical factors influ-

encing growth and development of active principles of drug plants. Certain biological analyses of results are performed. (Lec. 1, Lab. 6–9) Staff

**641 Biochemical Pharmacology** (II, 3) Theory and application of pharmacological studies at the cellular and subcellular levels and their significance to drug action in the intact organism. (Lec. 2, Lab. 3) Pre: permission of instructor. Offered every third year. Next offered spring 2000. Chichester

**642 (or BCH 642) Biochemical Toxicology** (II, 3) Biochemical and molecular aspects of chemically induced cell injury and chemical carcinogenesis. (Lec. 3) Pre: permission of instructor. Offered every third year. Next offered spring 1999. Babson

**644 Cardiovascular Pharmacology** (I, 3) Cellular mechanisms of drug action as a basis for understanding therapeutic effects. Emphasis on current developments in antihypertensive, antiarrhythmic, antianginal, and cardiotonic drug research. (Lec. 3) Pre: permission of instructor. Offered every third year. Next offered fall 1999. Rodgers

**691 Selected Topics in Medicinal Science** (I and II, 3) Covers the following special research topics of interest: (a) heterocyclic chemistry; (b) nucleoside antibiotics; (c) prodrugs and isosteres; (d) nucleosides and nucleotides—synthesis and biological function; and (e) nucleic acid targeted drug design. (Lec. 3) Pre: permission of instructor. May be repeated for a maximum of 9 credits. Staff

**697, 698 Research in Biomedical Sciences** (I and II, 1–3 each) Literature survey, laboratory work, and a detailed research report on one or more assigned topics. (Independent Study) Staff

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Business (BUS)

**354 (or COM 354) International Business Communications Exchange** (I, 3) Examination of effective international business communication. Use of worldwide E-mail network to exchange views on business topics with counterparts abroad. (Lec. 3, Lab. 1) Pre: junior or senior standing or permission of instructor. Kim

**493 Internship in Business Administration** (I and II, 3) Approved, supervised work experience with participation in management and problem solving related to the student's major field.

Internships with approximately 120 hours of field experience and 20 hours of class work are provided by the college's internship program. (Practicum) Pre: senior standing, admission into internship program, and permission of instructor. Not for graduate credit. S/U only. Staff

**601 Practicum in Business** (I, 1) Course involves training and experience in teaching undergraduate business courses under the supervision of a full-time faculty member. Participation in the instructional development program is an essential component of the class. (Practicum) Pre: enrollment in Ph.D. program in business administration and permission of Ph.D. program director. Staff

**602 Doctoral Colloquium in Business Administration** (II, 1) Course involves presenting the results of at least one piece of original research to faculty and other Ph.D. candidates. When not presenting, students are expected to play an active role in critiquing the presented research. (Lec. 1) Pre: permission of Ph.D. program director. Staff

**603 Special Problems in Business Research** (I and II, 1–6) Advanced research and writing of theoretical and empirical papers in business administration in the student's area of specialization under the supervision of the faculty advisor. Pre: permission of instructor. S/U only. Staff

**685 Knowledge Systems in Managerial Disciplines** (I or II, 3) Examination of knowledge production and dissemination systems in management disciplines. Discussion of various paradigms and philosophy of science perspectives. Metascientific and research program issues are examined. (Seminar) Pre: Ph.D. candidate. Staff

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) Pre: enrollment in Phase III of the Ph.D. program in business administration. S/U credit.

## Business Analysis and Computing (BAC)

Chairperson: Professor Ebrahimpour (Management Science and Information Systems)

**110 Business Computing Applications** (I and II, 3) Applications and concepts relevant to computers and management information systems, including communication, spreadsheet, word-processing, and Internet software. (Lec. 3) Pre: open only to students with BU code or permission of instructor. Staff

**120 Introduction to Business Analysis and Applications** (I and II, 3) Selected mathematical tools and techniques for analysis of business and economic problems and as aids in decision making. Topics from finite and modern mathematics and applied calculus. (Lec. 3) Pre: open only to students with BU code or permission of instructor. Algebra proficiency test required. Staff (M)

**201, 202 Managerial Statistics I, II** (I and II, 3 each) 201: General statistical methods used in the collection, presentation, analysis, and interpretation of statistical data. Includes frequency distribution, measures of central tendency and dispersion, probability theory, sampling distribution, central limit theorem, law of large numbers, estimation, and tests of hypothesis. Pre: 120 or equivalent. 202: Additional data analysis techniques, including tests of independence and goodness of fit, regression, correlation, analysis of variance, time series, and index numbers. (Lec. 3) Pre: 201. Staff

**500 Computing for Management** (I and II, 2–3) Computer concepts and programming using spreadsheet, database, presentation, communication, and other software packages. Emphasis on PC computing as an administrative and analytic tool for applications in management. (Lec. 2–3) Graduate credit for non-M.B.A. students only if MSI 600 is completed. Staff

**520 Mathematical Methods for Management** (I and II, 3) Fundamental mathematical methods applied to the understanding and solution of managerial problems. Topics include the solution of systems of linear equations, differential calculus, and related areas. (Lec. 3) Graduate credit for students matriculated in the M.B.A. and M.S. in accounting programs only. Staff

**530 Statistical Methods for Management** (I and II, 3) Introductory statistical methods applied to business problems. Topics include descriptive statistics, probability, distributions, inference, regression analysis, chi-square analysis, and introduction to time series. (Lec. 3) Graduate credit for students matriculated in the M.B.A. and M.S. in accounting programs only. Pre: 520 or permission of instructor. Staff

## Business Law (BSL)

Chairperson: Associate Professor Dugal (Management)

**333 Legal and Ethical Environment of Business I** (I and II, 3) An introduction to the origins, framework, and concepts of the legal and ethical environment of business with emphasis on contractual relations. (Lec. 3) Pre: junior

*standing. Open to nonbusiness students with permission of chairperson. Staff*

**334 Legal and Ethical Environment of Business II (I and II, 3)** Operations of the U.S. system of jurisprudence and ethics as it affects the law of contracts, sales, debtor-creditor rights, and business organizations. (Lec. 3) *Pre: 333. Open to nonbusiness students with permission of chairperson. Staff*

**442 Property Interests (II, 3)** Creation and transfer of personal and real property interests: suretyship and guarantee, bailments, real estate law, trusts and estates. (Lec. 3) *Pre: 333 or permission of instructor. Staff*

**450 Consumer Law and Legislation (I, 3)** Introduction to consumer law (state and federal). Coverage includes a study of statutory law, administrative agencies, and court decisions. (Lec. 3) *Pre: 333 or permission of instructor. Laviano*

**460 Law and the Entrepreneur (II, 3)** Study of legal issues of concern to the entrepreneur: business organizations; limited partnership syndications, bankruptcy, SEC regulations, and patent and trademark protection. (Lec. 3) *Pre: 333. Dunn*

**501 Law and Accounting (II, 3)** Introduction to C.P.A. law exam, question and answer techniques, coverage of most accounting-related legal subjects currently included on the C.P.A. exam. (Lec. 3) *Pre: 600 or permission of chairperson. Hickox*

**600 Legal Environment of Business (I and II, 3)** Coverage includes both substantive and procedural rules of law in the civil and administrative law field with emphasis on business, regulation, societal, and ethical issues. (Lec. 3) *Pre: graduate standing. Staff*

**691 Directed Study in Business Law (I and II, 1–3)** Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) *Pre: permission of instructor. Staff*

## Chemical Engineering (CHE)

**212 Chemical Process Calculations (I, 3)** Orientation to chemical engineering, material-balance computations on chemical processes, use of gas laws, vapor pressure, humidity, solubility, and crystallization. (Lec. 3) *Pre: CHM 112 or 192. Barnett*

**272 Introduction to Chemical Engineering Calculations (II, 3)** Introduction to the use of computers and numerical methods, including

numerical solution of differential equations as applied to chemical engineering. (Lec. 2, Lab. 3) *Pre: 212 and MTH 243. Rivero*

**313 Chemical Engineering Thermodynamics I (I, 3)** Applications of the first, second, and third laws of thermodynamics involving thermophysics, thermochemistry, energy balances, combustion, and properties of fluids. (Lec. 2, Lab. 3) *Pre: 212 or CHM 431 and MTH 243. Lucia or Knickle*

**314 Chemical Engineering Thermodynamics II (II, 3)** Continuation of 313 with applications to compression, refrigeration, phase and chemical equilibria. (Lec. 2, Lab. 3) *Pre: 313. Gregory or Lucia*

**322 Chemical Engineering Microlaboratory (II, 2)** Use of microprocessors, A/D and D/A converters, sensors, and control hardware to analyze and control laboratory-scale processes. (Lab. 6) *Pre: credit or concurrent enrollment in 348. Knickle*

**328 Industrial Plants (I, 1)** Field trips to nearby plants demonstrating various phases of chemical engineering. Written reports are required. (Lab. 3) *Pre: 348. Rose*

**332 Physical Metallurgy (I and II, 3)** Fundamentals of physical metallurgy as they apply particularly to the engineering metals and their alloys. Properties, characteristics, and structure of metals, theory of alloys, thermal processing, and studies in corrosion. (Lec. 2, Lab. 3) *Not open to students with credit in 333 or 437. Pre: CHM 101, 103, or 191. Gregory or Brown*

**333 Engineering Materials (I and II, 3)** First course in engineering materials devoted largely, but not exclusively, to physical metallurgy. Includes structure and properties of pure substances and binary systems at equilibrium and, when used intentionally, at nonequilibrium. (Lec. 2, Lab. 3) *Pre: junior standing or permission of instructor. Not open to students with credit in 332 or 437. Brown or Gregory*

**340 Materials Processing and Metrology I** See Industrial and Manufacturing Engineering 340.

**345, 346 Chemical Engineering Laboratory (I and II, 2 each)** Quantitative studies illustrating chemical engineering principles. Emphasis on report writing and the interpretation of experimental data. (Lab. 6) *Pre: 348. Rose*

**347 Transfer Operations I (I, 3)** Dimensional analysis; fluid statics; mass, energy, and momentum balances for fluid systems, boundary layers, turbulence, incompressible flow; flow

through fixed beds of solids and fluidized beds; filtration. (Lec. 3) *Pre: credit or concurrent enrollment in 313 or MCE 341. Gray*

**348 Transfer Operations II (II, 3)** Heat transfer: conduction, convection, radiation. Mass transfer: distillation, liquid extraction, gas absorption; staged and differential contact. (Lec. 2, Lab. 3) *Pre: 347. Bose or Rivero*

**349 Transfer Operations III (I, 2)** Diffusion and mass transfer, humidification and dehumidification, water cooling, absorption and ion exchange, drying, leaching. (Lec. 2) *Pre: 348. Bose or Gray*

**351, 352 Plant Design and Economics (I and II, 3 each)** Elements of plant design integrating the principles learned in previous courses. Emphasis is on optimum economic design and the writing of reports. (Lec. 1, Lab. 6) *Pre: 314 and 348. Gray and Lucia*

**391, 392 Honors Work (I and II, 1–3 each)** Independent study under close faculty supervision. Discussion of advanced topics in chemical engineering in preparation for graduate work. (*Independent Study*) *Pre: junior standing and permission of chairperson. Staff*

**403, 404 Introduction to Ocean Engineering Processes I, II (I and II, 3 each)** Theory and basic principles directly applicable to ocean-related processes. Desalinization, mining, combating oil spills, seawater as a coolant, seawater as a waste diluent, food processing, sulfur and petroleum production, recovery minerals. (Lec. 2, Lab. 4) *Pre: permission of instructor. Barnett and Knickle*

**425 Process Dynamics and Control (II, 3)** Principles involved in automatic control of processing plants. Modeling and responses of dynamic systems, feedback control. (Lec. 3) *Pre: MTH 243 and ELE 220 and credit or concurrent enrollment in 347 or MCE 354. Barnett or Knickle*

**437 Materials Engineering (I and II, 3)** Introduction to engineering aspects of the fundamentals of the solid state. Structural, chemical, and physical properties of engineering materials with emphasis on ceramics, polymers, and composite materials. (Lec. 3) *Pre: CHM 101, 103, or 191, or permission of chairperson. Brown*

**438 Failure Analysis and Prevention (II, 3)** Failure analysis of engineering components. Examples of overload, fatigue, creep, corrosion, and electrical failures in metals, glasses, ceramics, composites, polymers, concrete, and semiconductors. Case studies, microscopic techniques, and prevention are emphasized. (Lec. 3) *Pre: 332, 333, or 437. Brown or Gregory*

**447 (or FSN 447) Food Engineering** (I, 4) Basic principles underlying unit operations of chemical engineering applied to food industries. Topics covered include heat transfer, fluid flow, extraction, and drying. (Lec. 3, Lab. 3) Pre: CHM 124, PHY 112, MTH 132 or 142, and permission of instructor. Not for major credit in chemical engineering. Barnett

**464 Industrial Reaction Kinetics** (I, 3) Modeling of simple chemical-reacting systems; computation of design parameters to satisfy system constraints and typical restraints (e.g., product rate and distribution) and conditions of optimality. (Lec. 3) Pre: 314 and CHM 432. Rivero

**491, 492 Special Problems** (I and II, 1–6 each) Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of chairperson. May be repeated for a maximum of 12 credits. Not for graduate credit in chemical engineering. Staff

**501, 502 Graduate Seminar** (I and II, 1 each) Seminar discussions including the presentation of papers based on research or detailed literature surveys. (Seminar) Required of all graduate students, with a maximum of 1 credit per year allowed. May be repeated for a maximum of 2 credits. S/U credit. Rose

**503 Dynamics of Chemical Engineering Applications** (I or II, 3) Emphasizes analytical and/or numerical techniques commonly used in analysis arising from classical chemical engineering applications; necessary for understanding more complex problems. Rivero-Hudec

**513 Advanced Chemical Engineering Thermodynamics** (I or II, 3) Applications of the first, second, and third laws of thermodynamics and their relation to chemical engineering processes. Emphasis on properties of fluids, chemical and physical equilibria, and refrigeration. (Lec. 3) Pre: 313, 314 or equivalent, graduate standing, or permission of chairperson. In alternate years. Gregory or Lucia

**530 Polymer Chemistry** (I or II, 3) Polymer structure, molecular forces, glass and crystalline transitions, solution properties, polymerization kinetics, molecular weight distribution, fractionation, viscoelastic properties, and transport processes. (Lec. 3) Pre: CHM 228 and CHE 332 or permission of instructor. In alternate years. Barnett and Yang

**531 Polymer Engineering** (I or II, 3) Polymer processing and mechanical properties of plastics, fibers, and elastomers. (Lec. 3) Pre: 348 or

MCE 448 or permission of instructor. In alternate years. Barnett

**532 Ceramic Engineering** (I or II, 3) Properties of ceramic materials as related to starting materials and forming, densification, and finishing processes. Emphasis on resulting phases and microstructure. Application of physical and chemical principles to tailor properties to engineering needs. (Lec. 3) Pre: 437 or equivalent. In alternate years. Brown or Gregory

**533 Engineering Metallurgy** (II, 3) Structures and properties of metals and alloys required to meet typical engineering problems; proper selection of tool materials; properties of stainless steels; materials of special importance in nuclear fields, etc. (Lec. 3) Pre: 333 or permission of instructor. Brown

**534 (or OCE 534) Corrosion and Corrosion Control** (II, 3) Chemical nature of metals, electrochemical nature of corrosion. Types of corrosion, influence of environment, methods of corrosion control. Behavior of engineering materials in corrosion with emphasis on industrial and ocean environments. (Lec. 3) Pre: permission of instructor. Brown

**535 (or OCE 535) Advanced Course in Corrosion** (I, 3) High-temperature corrosion, oxidation by gaseous environments, industrial problems with high-temperature corrosion. Materials selection and techniques to combat high-temperature corrosion. (Lec. 2, Lab. 3) Pre: 534 (or OCE 534) or permission of instructor. Brown or Gregory

**537 (or OCE 537) Advanced Materials Engineering** (I or II, 3) Engineering properties, molecular design, and applications of materials. Synthesis, fabrication, and processing of materials. Effects of environment on materials, materials products, devices, and systems. (Lec. 3) Pre: 437 and PHY 341. Gregory

**539 Electron and Light Microscopy of Solids** (I or II, 3) Theory and physical principles governing the design and use of light and electron optical systems in identification, analysis, and structural characterization of metals, ceramics, polymers, glasses, and composites. Emphasis on polarized light and scanning electron microscopy. (Lec. 3) Pre: 437 or equivalent. In alternate years. Gregory

**540 Phase Equilibria** (II, 3) Interpretation, construction, and thermodynamics of one, two, three to n-component phase diagrams with examples of their use in chemical, ceramic,

metallurgical, and mineral engineering. (Lec. 3) Pre: CHM 431 or equivalent. In alternate years. Staff

**541 Transport Phenomena I** (I or II, 3) Analysis of transport processes in fluids with emphasis on diffusion of matter. (Lec. 3) Pre: 347, 348 or equivalent, graduate standing, or permission of chairperson. In alternate years. Bose

**542 Advances in Interfacial Phenomena** (I or II, 3) Topics will include capillarity, surface tension; surface thermodynamics, electrical aspects of surface chemistry; contact angles and wettability; emulsions and foams; adsorption from solutions; hydrodynamic stability of interfaces. (Lec. 3) Pre: CHM 431, 432 or equivalent, or permission of instructor. In alternate years. Bose

**548 (or FSN 548) Separations for Biotechnology** (I or II, 3) A study of methods of concentration used in the biotechnology industries for production and isolation of products. (Lec. 3) Pre: 348 or 447. In alternate years. Barnett

**560 Chemical and Physical Processes of Integrated Circuit Fabrication** (I or II, 3) Chemical and physical processes used in the fabrication of integrated circuits and devices. Emphasis on crystal growth, oxidation, CVD, plasma processes, photochemical processes, solid-state diffusion, lithography, and their relation to device performance. (Lec. 3) Pre: CHM 431, CHE 349, or equivalent. In alternate years. Gregory

**573 Mechanical Metallurgy** (I or II, 3) Behavior and response of metals to mechanical plastic forming. Property control by analysis and design of industrial metal processing. Principles of annealing, forging, rolling, extruding, rod, wire, and tube drawing. Recent advances and developments. (Lec. 3) Pre: permission of instructor. Brown

**574 Biochemical Engineering I** (I or II, 3) Introduction to biotechnology. Includes properties of biological materials, dynamics, control, and operation of biological systems and processing of biological materials. (Lec. 3) Pre: permission of instructor. In alternate years. Rivero-Hudec

**576 Process Engineering for Pollution Prevention** (I or II, 3) Management of processes and development of techniques for waste minimization in the chemical process, machine tool coating, plating, plastics and other industries. (Lec/Workshop) Pre: permission of instructor. Barnett or Park

**577, 578 Seminar in Sensors and Surface Technology (I and II, 1)** Students, faculty, and invited outside speakers present and discuss selected topics related to research interests of the Sensors and Surface Technology Partnership. (Seminar) Pre: permission of instructor. May be repeated. S/U only. Gregory

**591, 592 Special Problems (I and II, 1–6 each)** Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of chairperson. May be repeated for a maximum of 12 credits. Staff

**599 Master's Thesis Research (I and II, 1–9)** Number of credits is determined each semester in consultation with the major professor. (Independent Study) S/U credit.

**614 Advanced Chemical Engineering Thermodynamics (I or II, 3)** Continuation of 513. (Lec. 3) Pre: 513. In alternate years. Lucia or Gregory

**641 Transport Phenomena II (I or II, 3)** Steady, unsteady, and multidimensional heat conduction; convection. Mass transport at low and high fluxes; diffusion and chemitheaty; approximate methods for heat and mass transfer problems. (Lec. 3) Pre: 541 or permission of instructor. In alternate years. Bose

**643 Fluid Dynamics (I or II, 3)** Advanced problem course dealing with isothermal and nonisothermal flow of compressible and incompressible fluids. (Lec. 3) In alternate years. Knickle

**644 Process Heat Transfer (I or II, 3)** Advanced study of heat transfer by conduction in the steady and unsteady state, radiation, and convection. (Lec. 3) In alternate years. Knickle

**647 Mass Transfer I (I or II, 3)** Advanced course dealing with the application of mass transfer theory in the distillation of binary, multicomponent, and complex mixtures. (Lec. 3) In alternate years. Gray

**648 Mass Transfer II (I or II, 3)** Advanced study of vapor-liquid equilibria and mass-transfer theory applied to gas-liquid systems; humidification and gas absorption, simple and multicomponent systems, with and without chemical reaction. (Lec. 3) In alternate years. Gray

**691, 692 Special Problems (I and II, 1–6 each)** Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of chairperson. May be repeated for a maximum of 12 credits. Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Chemistry (CHM)

Chairperson: Professor W. Nelson

**099 Basic Chemistry Lecture (I, 3)** Part one of a two-semester 101 sequence designed for students who need additional work in problem-solving skills. Successful completion of part one leads to a special section of 101 in the second semester. (Lec. 3) Not for General Education or program credit. S/U credit. Staff

**100 Chemistry of Our Environment (I and II, 3)** Elementary chemistry for nonscience majors, emphasizing chemical aspects of the human environment. Chemistry of the biosphere, pollution, and aspects of industrial chemistry. (Lec. 3) Zoski, P. Brown, or Yang (N)

**101 General Chemistry Lecture I (I and II, 3)** Fundamental concepts and principles in atomic structure, energy relationships, and reaction mechanisms balanced with applied and descriptive materials. (Lec. 3) Not open to students with credit in 103 or 191. Fasching, Smith, P. Brown, Zoski, Kirschenbaum, or Pothier (N)

**102 Laboratory for Chemistry 101 (I and II, 1)** Experimental work illustrating certain concepts and principles of general chemistry. Experiments in solution, reaction rates, enthalpy, molar heat capacity, and electrochemistry. (Lab. 3) Pre: credit or concurrent enrollment in 101. Staff (N)

**103 Introductory Chemistry Lecture (I, 3)** One-semester general chemistry course designed for students whose curriculums require the one-semester organic chemistry course, 124. (Lec. 3) Not open to students with credit in 101 or 191. Fisher (N)

**105 Laboratory for Chemistry 103 (I, 1)** Fits course content of 103. (Lab. 3) Pre: credit or concurrent enrollment in 103. Staff (N)

**112 General Chemistry Lecture II (I or II, 3)** Elementary thermodynamics, chemical equilibrium in aqueous solutions, properties and reactions of inorganic species, practical applications of chemical principles. (Lec. 3) Pre: 101 or permission of instructor. C. Brown, Kirschenbaum, Nelson, Euler, or Zoski (N)

**114 Laboratory for Chemistry 112 (I or II, 1)** Semi-microqualitative analysis and its applications. (Lab. 3) Pre: credit or concurrent enrollment in 112. Staff (N)

**124 Introduction to Organic Chemistry (I and II, 3)** Elementary principles of organic chemistry with emphasis on aliphatic compounds, especially those of physiological significance such as amino acids and proteins, carbohydrates, fats, and waxes. (Lec. 2, Lab. 3) Pre: 101, 102 or 103, 105, and concurrent enrollment in 126 required when curriculum specifies laboratory. Not open to chemistry or chemical engineering majors. Dain (N)

**126 Laboratory for Chemistry 124 (I and II, 1)** Introduction to chemistry procedures, with emphasis on properties of substances of physiological significance. (Lab. 3) Pre: credit or concurrent enrollment in 124. Not open to chemistry or chemical engineering majors. Staff

**191 General Chemistry (I, 5)** Includes descriptive inorganic chemistry, qualitative analysis, and an introduction to quantitative analysis. Recommended for students in the chemistry curriculum who have had a year of high school chemistry. (Lec. 5) Not open to students with credit in 101 or 103. Smith (N)

**192 General Chemistry (II, 5)** Continuation of 191. (Lec. 5) Staff (N)

**212 Quantitative Analysis (I, 4)** Principles of gravimetric and volumetric analysis with detailed attention to solution of stoichiometric problems. Laboratory analysis of representative substances by gravimetric or volumetric procedures. (Lec. 3, Lab. 3) Pre: 112 and 114. Zoski

**226 Organic Chemistry Laboratory (I and II, 2)** Common techniques and typical preparative methods in both aliphatic and aromatic series. (Lab. 6) Pre: concurrent enrollment in 228. Not open to students with credit in 229 or 230. Staff

**227 Organic Chemistry Lecture I (I or II, 3)** General principles and theories with emphasis on classification, nomenclature, methods of preparation, and characteristic reactions of organic compounds in aliphatic series. (Lec. 3) Pre: 112 and 114 or 192. Vittimberga, Rosen, or Lucht

**228 Organic Chemistry Lecture II (I or II, 3)** Continuation of 227 with emphasis on the aromatic series. (Lec. 3) Pre: 227. Vittimberga, Rosen, or Lucht

**229 Organic Chemistry Laboratory I (SS, 1)** Common techniques and typical preparative methods in aliphatic series. (Lab. 3) Pre: credit or concurrent enrollment in 227. Vittimberga

**230 Organic Chemistry Laboratory II (SS, 1)** Continuation of 229 with emphasis on the aromatic series. (Lab. 3) Pre: 229 or equivalent and



credit or concurrent enrollment in 228. Only for students requiring a second credit of organic laboratory. Vittimberga

**291 Organic Chemistry (I, 4)** Development of principles and theory through an examination of structure, nomenclature, and reactions of organic compounds. (Lec. 3, Lab. 3) Pre: 192 or permission of instructor. Not open to students with credit in 227. Staff

**292 Organic Chemistry (II, 4)** Continuation of 291 with extension to several additional families of compounds. (Lec. 3, Lab. 3) Pre: 291. Not open to students with credit in 228. Staff

**335 Physical Chemistry Laboratory (I, 2)** Physical chemical properties of gases, liquids, and solutions; electrochemical cells; phase diagrams of binary and ternary systems; and chemical kinetics. Designed for chemistry majors. (Lab. 4) Pre: 431. May be taken concurrently with 431. Freeman or Yang

**353, 354 Undergraduate Research (I and II, 1–6 each)** Methods of approach to a research problem. Literature, laboratory work, and a report of an original problem or problems. (Independent Study) Pre: permission of instructor. May be repeated for a maximum of 12 credits. Staff

**401 Intermediate Inorganic Chemistry (I, 3)** Principles of inorganic chemistry broadly related to structure and reactivity. Many-electron atoms bonding theories, acid-base concepts, coordination chemistry, reaction mechanisms. (Lec. 3) Pre: 432. Nelson, Euler, or Kirschenbaum

**402 Physical Inorganic Laboratory (II, 2)** Synthesis of inorganic compounds emphasizing inert atmosphere and vacuum line techniques; characterization by spectroscopic and electro-mechanical techniques. (Lab. 6) Pre: 401. Euler

**412 Instrumental Methods of Analysis (II, 3)** Theory and application of optical and electrical instruments to solution of chemical problems: flame photometry, emission spectroscopy, ultraviolet, visible, and infrared spectrophotometry, colorimetry, turbidimetry, nephelometry, fluorometry, potentiometry, voltametric titration methods. (Lec. 3) Pre: 228 and credit or concurrent enrollment in 432. C. Brown

**414 Instrumental Methods of Analysis Laboratory (II, 2)** Applications of instrumental methods to the solution of problems in analytical chemistry. (Lab. 6) Pre: credit or concurrent enrollment in 412. Staff

**425 Qualitative Organic Analysis (I, 2)** Methods of identification of pure organic com-

pounds. Separation of mixtures and identification of components by infrared and nuclear magnetic resonance spectroscopy. (Lab. 6) Pre: 292 or equivalent and credit or concurrent enrollment in 427. Lucht

**427 Intermediate Organic Chemistry (I, 3)** Intermediate organic chemistry with emphasis on organic reaction mechanism, stereochemistry, spectroscopic characterization, and newer synthetic methods. (Lec. 3) Pre: 226, 228, or 292. Lucht

**431 Physical Chemistry I (I, 3)** Gas laws, laws of thermodynamics, chemical equilibrium, phase equilibria, and electrochemistry. (Lec. 3) Pre: 112 or 192; MTH 142; and PHY 111 and 112 or PHY 213, 214, 285, 286. May be taken for graduate credit by graduate students whose undergraduate programs do not require physical chemistry. Freeman or Yang

**432 Physical Chemistry II (II, 3)** Atomic theory, quantum chemistry, bonding, molecular interactions, chemical kinetics, kinetic theory, and spectroscopy. (Lec. 3) Pre: 431. May be taken for graduate credit by graduate students whose undergraduate programs do not require physical chemistry. Freeman or Yang

**436 Laser Spectroscopy Laboratory (II, 2)** Applications to spectroscopy. Includes topics on optics, laser characteristics, and laser spectrometers as well as spectroscopic techniques. Designed for science and engineering majors. (Lab. 4) Pre: 101 and 112 or CHM 191 and 192 and PHY 111 and 112 or permission of instructor. Not for graduate credit for graduate students in chemistry. Staff

**492 Seminar in Chemistry (II, 1)** Preparation and presentation of papers on selected topics in chemistry. Required of seniors in chemistry. (Seminar) Pre: prior or concurrent enrollment in 432. Not for graduate credit. Staff

**501 Advanced Inorganic Chemistry I (II, 3)** Systematic analysis of bonding schemes and structural aspects of molecular systems encountered in inorganic chemistry. Special emphasis on electron density distributions, physical methods of analysis, and practical applications of quantum mechanics. (Lec. 3) Pre: 401. Euler

**502 Advanced Inorganic Chemistry II (II, 3)** Modern inorganic chemistry approached from experimental, theoretical, and descriptive points of view. Includes electronic structure and bonding in coordination chemistry, topology, thermodynamics of complex formation, mechanisms, lanthanides, and actinides. (Lec. 3) Pre: 401 or equivalent. Kirschenbaum

**504 Physical Methods of Inorganic Chemistry (II, 3)** Theory and application of numerous experimental techniques used for the elucidation of molecular and electronic structure of inorganic molecules. Primary emphasis is on nuclear magnetic resonance, optical, infrared, Raman, and electron paramagnetic resonance spectroscopies. (Lec. 3) Pre: 401 or permission of instructor. Euler

**511 Advanced Analytical Chemistry I (I, 3)** Fundamentals of electrochemistry, including a review of electricity and how it passes through conductors, electrochemical cells, electrode reactions, ionic solutions, polarization, transport mechanisms, voltammetry. Statistical treatment of experimental data. (Lec. 3) Pre: 412 or permission of instructor. Zoski or C. Brown

**512 Advanced Analytical Chemistry II (II, 3)** Fundamentals of chromatographic and electrophoretic separations and major spectroscopic techniques. Basic theory, instrumentation, advantages, limitations, and applications of these techniques as well as new instrumental developments are discussed. (Lec. 3) Pre: 412 and MTH 243. P. Brown

**519 Theoretical Concepts in NMR (I, 3)** The physical concepts of NMR phenomena are presented, beginning with signals generated in the probe, carried through the spectrometer console, into the computer, and finally represented as a spectrum. (Lec. 3) Pre: 292, PHY 112, and MTH 141, or equivalents, or permission of instructor. Traficante

**520 Interpretation of One-Dimensional and Two-Dimensional NMR Spectra (I, 3)** Uses of chemical shifts and coupling constants are presented for interpreting one-dimensional (1D) and two-dimensional (2D) proton and carbon spectra. Includes relaxation time measurements, decoupling, and simple 2D interpretation. (Lec. 3) Pre: 292, PHY 112, and MTH 141, or equivalents, or CHM 519 or permission of instructor. Traficante

**521 Advanced Organic Chemistry I (I, 3)** Emphasis on fundamental organic structure theory and reaction mechanisms. (Lec. 3) Pre: 226 and 228 or equivalent. Vittimberga

**522 Advanced Organic Chemistry II (II, 3)** Modern synthetic reactions and their application to such areas as natural products. (Lec. 3) Pre: 521 or permission of instructor. Rosen

**524 Interpretation of Two-Dimensional NMR Spectra (II, 3)** Covers the theoretical and practical aspects of two-dimensional (2D) NMR. In-

cludes pulse sequences, instrument setup, and chemical applications. (Lec. 3) Pre: 519 and 520 or permission of instructor. Traficante

**531 Advanced Physical Chemistry I** (I, 3) Principles and applications of chemical thermodynamics and chemical statistical thermodynamics. Includes the three laws of thermodynamics, statistical distributions, statistical thermodynamic ensembles and fluctuations. Applications to ideal gases and crystals, real fluid, and chemical equilibrium. (Lec. 3) Pre: 432 or permission of instructor. Yang or Freeman

**532 Advanced Physical Chemistry II** (II, 3) Principles and applications of quantum chemistry. Includes the formal development of quantum theory and applications to electronic structure as well as other problems of chemical interest. (Lec. 3) Pre: 432 or permission of instructor. Yang or Freeman

**551, 552 Nonthesis Master's Research** (I and II, 3 each) Research on original problem for fulfillment of research requirement of nonthesis master's degree. Literature survey, laboratory work, and detailed report required. (Independent Study) Pre: permission of chairperson.

**599 Master's Thesis Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. A minimum of 6 credits is required of students who have chosen the thesis option for the master's degree. (Independent Study) S/U credit.

**608 Inorganic Reaction Mechanisms** (I or II, 3) Kinetics and mechanisms of reactions in aqueous solution: techniques, results, and theoretical interpretation. Instrumentation for studying rapid reactions in solution, relaxation methods, electron transfer rates, hydrolytic and solvolytic reactions, metal ion complexation, reactions of biochemical significance. (Lec. 3) Pre: 502 or permission of instructor. Next offered fall 1999. Kirschenbaum

**616 Applied Analytical Techniques** (II, 3) Application of analytical instrumentation and techniques to practical problems. Limitations and specific difficulties of analyzing complex matrices in practical research. Problem-oriented presentation. (Lec. 3) Pre: 511 and 512 or permission of instructor. P. Brown

**618 Theory of Separations** (II, 3) Companion to 616. In-depth presentation of theory of separation processes. Emphasis on methods development, advanced topics, and current advances using gas and liquid chromatography. (Lec. 3) Pre: 511 or permission of instructor. P. Brown

**621 Advanced Topics in Physical Organic Chemistry** (I, 3) Mechanistic aspects of organic chemistry: molecular orbital theory, thermal and photochemical cycloadditions and rearrangements. Consideration of carbenes, nitrenes, and free radicals. Evaluation of steric, stereoelectronic, and secondary orbital effects. (Lec. 3) Pre: 521 and 522 or permission of instructor. Staff

**623 Advanced Topics in Synthetic Organic Chemistry** (I, 3) Advanced topics in the synthetic aspects of organic chemistry. Synthetic reactions and techniques, strategies, and design. Conformational and stereochemical analyses, asymmetric synthesis, and natural product syntheses. (Lec. 3) Pre: 521 and 522 or permission of instructor. Staff

**642, 643, 644 Graduate Seminar** (I and II, 1 each) Results of detailed literature surveys are presented orally and in writing. Required for candidates for advanced degrees in chemistry. (Seminar) S/U credit. Staff

**691 Special Topics** (I and II, 1–3) Covers the following special research interests: a) carbohydrate chemistry, b) chemical kinetics, c) clinical chemistry, d) computer techniques in analytical chemistry, e) forensic chemistry, f) free-radical rearrangements, g) recent advances in analytical chemistry, h) light scattering, i) molecular orbital theory, j) pericyclic reactions, k) surface chemistry, l) X-ray analysis of organic molecules. (Independent Study) Pre: permission of instructor. May be repeated for a maximum of 6 credits. Staff

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**930 Workshop in Chemistry Topics for Teachers** (I and II, 0–3) Especially designed for teachers of physical sciences. Basic topics of chemistry from an advanced or pedagogical perspective. (Workshop) Pre: teacher certification. Yang, Euler, and Long

## Chinese (CHN)

Chairperson: Professor Grandin (Modern and Classical Languages and Literatures)

**101 Beginning Chinese I** (I and II, 3) Fundamentals of grammar and pronunciation, exercises in reading, writing, and conversation. (Lec. 3) Pre: no prior Chinese is required. Staff (F)

**102 Beginning Chinese II** (I and II, 3) Continuation of 101. (Lec. 3) Pre: 101 or equivalent. Staff (F)

**103 Intermediate Chinese I** (I and II, 3) Development of facility in reading narrative and expository prose; exercise in grammar, listening comprehension, and speaking. (Lec. 3) Pre: 102 or equivalent. Staff (F)

**104 Intermediate Chinese II** (I and II, 3) Continuation of 103. (Lec. 3) Pre: 103 or equivalent. Staff (F)

## Civil and Environmental Engineering (CVE)

Chairperson: Professor R. Wright

**220 Mechanics of Materials** (I and II, 3) Theory of stresses and strains, thin-walled cylinders, beam deflections, columns, combined bending and direct stresses, joints, and indeterminate beams. (Lec. 3) Pre: MCE 262 or concurrent enrollment. Staff

**221 Mechanics of Materials Laboratory** (I and II, 1) Introduction to the physical and mechanical properties of civil engineering construction materials including steel, wood, portland cement concrete, bituminous asphalt concrete, and polymers. Experimental evaluation of fundamental material properties and behavior under a variety of controlled laboratory conditions. (Lab. 3) Pre: concurrent enrollment in 220. Required for civil engineering students only. Staff

**250 Introduction to CADD for Civil Engineers** (I and II, 4) Introduces computer-aided design and drafting (CADD) and emphasizes its various applications to civil engineering. Hardware and software issues are discussed. (Lec. 3, Lab. 3) Pre: EGR 106. Karamanlidis

**315 Surveying I** (I, 3) Theory and practice of plane surveying including use, care, and adjustment of surveying instruments, boundary surveys, horizontal and vertical curves, earthwork, and topography. (Lec. 2, Lab. 3) Pre: MTH 141. Offered in fall of even-numbered years. Staff

**334 Construction Planning and Specifications** (I, 3) Introduction to construction planning; procedures involved in construction activities with major emphasis on heavy construction. (Lec. 3) Pre: 220. Offered in fall of odd-numbered years. Staff

**347 Highway Engineering** (II, 4) Principles of design of modern highways and streets including administrative and economic considerations; bituminous materials, pavements, geometric layout, drainage, construction, and maintenance. (Lec. 3, Lab. 3) Pre: EGR 106. Lee or Hunter

**352 Structural Analysis I** (I, 3) Structural systems: beams, frames, trusses; conjugate beam, virtual work, general method for indeterminate structures. Introduction to matrix methods. (Lec. 3) Pre: 220. Staff

**353 Structural Analysis II** (II, 3) Energy methods, slope deflection, moment distribution, influence lines, stability, matrix methods. Introduction to finite elements. (Lec. 3) Pre: 352. Staff

**370 Hydraulic Engineering** (II, 4) Applied hydraulics of flow in closed conduits and open channels. River and groundwater hydraulics. Analysis of hydraulic structures. Reservoir design. Principles of hydrology. (Lec. 3, Lab. 3) Pre: MCE 354. Wright

**374 Environmental Engineering** (I, 4) Urban water supply and treatment systems, sewerage treatment of municipal and industrial waste waters, stream pollution, air pollution, and disposal of solid waste materials. Methods of laboratory analysis for water and wastewater physical and chemical parameters. (Lec. 4) Pre: MTH 243 or permission of chairperson. Thiem

**381 Geotechnical Engineering** (I, 4) Engineering properties of soils, seepage, consolidation theory, calculation of stresses, failure theories, shear strength of sand, shear strength of clay. Laboratory studies of physical properties, compaction, seepage, consolidation, and shear strength. (Lec. 3, Lab. 3) Pre: 220 and credit or concurrent enrollment in MCE 354. Professor Kovacs' section is *Writing Intensive* [WI]. Kovacs, Silva, or Veyera

**391 Honors Work** (I and II, 3) Independent study under close faculty supervision. Discussion of advanced topics in civil engineering in preparation for graduate work. (*Independent Study*) Pre: junior standing or permission of chairperson. Staff

**396 Civil Engineering Analysis** (II, 3) Problems from several fields of civil and environmental engineering solved by numerical methods with particular emphasis on use of electronic digital computers. Computer assignments in the area of each student's interest. (Lec. 2, Lab. 3) Pre: EGR 106. Marcus

**397 Introduction to Civil Engineering Design** (I, 1) Preliminary planning for the integrated design project. Field trips and presentations by practicing engineers. (Lab. 3) *Required of all juniors in civil and environmental engineering.* Staff

**442 Traffic Engineering** (I, 3) Highway traffic characteristics and methods of providing for an effective, free, and rapid flow of traffic. Types of

studies, regulations, control devices and aids, planning and administration. (Lec. 2, Lab. 3) Pre: 347 or permission of instructor. Lee or Hunter

**446 Transportation Engineering** (II, 3) Transportation planning and design, technological characteristics and design considerations of major transportation systems. (Lec. 3) Pre: 347 or permission of instructor. Lee

**453 Computer Analysis of Structures** (I, 3) Introduction to matrix methods of structural analysis. Solutions of planar structures using a digital computer. (Lec. 3) Pre: 353 and 396. Staff

**450 Simulation Based Design for Civil Engineers** (I or II, 4) Advanced concepts of Computer-Aided Design (CADD) as they pertain to a) Digital Prototyping, b) Concurrent Engineering, and c) Continuous Acquisition and Lifecycle Support, Global standards, and file exchange formats. (Lec. 3, Lab. 3) Pre: 220 and 250. Karamanlidis

**460 Analysis and Design of Metal Structures** (II, 3) Properties of metal; current design codes; practice for the design of steel structural components; simplified and computer-oriented methods of analysis and design. Nonlinearities. Comprehensive design problems. (Lec. 2, Lab. 3) Pre: 352. *Not for graduate credit in civil engineering.* Tsiatas

**465 Analysis and Design of Concrete Structures** (I, 3) Current criteria and practice for design of reinforced and prestressed concrete structures. Elastic and ultimate strength analysis of beams, slabs, columns, and frames. Comprehensive design problems. (Lec. 2, Lab. 3) Pre: 353. *Not for graduate credit in civil engineering.* Tsiatas

**466 Structural Concrete Laboratory** (I and II, 1) Laboratory on structural concrete and construction technology involved in the materials aspects of the use of concrete. Cement properties, mix design, testing of fresh and hardened concrete, admixtures, reinforcement, concrete failure. (Lab. 3) Pre: 465 or concurrent enrollment in 465. *Not for graduate credit in civil engineering.* Tsiatas

**470 Water and Wastewater Transport Systems I** (II, 3) Computer analysis of water storage and transmission. Design of water distribution and wastewater collection systems. (Lec. 2, Lab. 3) Pre: 370 or 374 or permission of instructor. Thiem

**471 Water and Wastewater Treatment Systems II** (I or II, 3) Development of water quality standards. Design and analysis of physical, chemical, and biological treatment pro-

cesses and their application to water and wastewater purification systems. (Lec. 2, Lab. 3) Pre: 374 or permission of instructor. Poon

**472 Industrial Air Pollution** (I or II, 3) Sources and characteristics of urban-industrial air pollution, allowable concentrations and control, stack sampling, chemical supplements in air pollution control, diffusion of pollutants, site selection and abatement programs. Air resources management programs. (Lec. 3) Pre: permission of chairperson. Staff

**474 Water Quality Sampling and Analysis** (II, 3) Laboratory and field work including sampling of surface and groundwater, chemical and biological analyses for water, monitoring, treated effluent quality control, and detection of hazardous contaminants. (Lec. 1, Lab. 6) Pre: 374 or permission of instructor. *Offered in spring of odd-numbered years.* Thiem

**475 Water in the Environment** (I, 3) Evaluation of water as a resource and its relation to the environment: hydrologic cycle, water budgets, water uses, drought, flood, current water problems. (Lec. 3) Pre: MTH 243 and CVE 374 or permission of instructor. *Offered in spring of even-numbered years.* Urish

**478 Hazardous Waste Disposal and Solid Waste Management** (I or II, 3) Sources, collection, treatment, and disposal of hazardous wastes and solid wastes. Conservation, recovery, and reuse of material. Economics of waste treatment, disposal, and reuse. (Lec. 3) Pre: junior standing or permission of chairperson. Poon

**483 (or OCE 483) Foundation Engineering** (I or II, 3) Applications of geotechnical engineering principles to analysis and design of shallow foundations. Topics include foundation types, bearing capacity, settlement analysis, shallow foundations, earth pressures, retaining walls, introduction to deep foundations. (Lec. 3) Pre: 381. Kovacs, Silva, or Veyera

**485 Engineering Geophysics**  
See Geology 485.

**491, 492 Special Problems** (I and II, 1–6 each) Advanced work under supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) Pre: permission of chairperson. *May be repeated for a maximum of 12 credits.* Staff

**495 Civil and Environmental Engineering Systems** (I, 3) Civil and environmental engineering projects are studied, analyzed, designed, and discussed in areas of water resources, pollution control, geotechnics, structures, and transportation using systems tech-

niques. (Lec. 3) Pre: senior or graduate standing in civil engineering. Marcus

**497 Civil Engineering Design I (I, 2)** Detailed project planning, conceptual design and layout, and environmental impact for civil engineering design project. Speakers on ethics, professionalism, and professional practice. (Lab. 4) Pre: 397 and senior standing. Must be taken immediately prior to 498. Required of all seniors in civil and environmental engineering. Not for graduate credit in civil engineering. Staff

**498 Civil Engineering Design II (II, 3)** Elements of planning, design, and analysis of a civil engineering project integrating the principles learned in previous courses; a group project involving all major aspects of civil engineering design. (Lec. 1, Lab. 6) Pre: 397, 497, and senior standing. Not for graduate credit in civil engineering. Staff

**545 Pavement Design (I, 3)** Pavement types; pavement system components; stresses in the pavement structure. Design factors and criteria, pavement stabilization, structural design of flexible and rigid pavements for highways and airports, pavement maintenance and overlay design. (Lec. 3) Pre: 347 or equivalent. Offered in fall of odd-numbered years. Lee

**546 Urban and Rural Transportation**  
See Community Planning 546.

**547 Geometric Design of Highways (I, 3)** Evaluation of alternative designs. Criteria and practices of geometric design; at grade intersections, interchanges, channelization, weaving parking facilities, and road appurtenances; safety considerations, lane balancing, ramps, and terminals. (Lec. 3) Pre: 347 or equivalent. Offered in fall of even-numbered years. Lee or Hunter

**548 Bituminous Materials and Mix-Design (II, 3)** Asphalt binder, bituminous mixtures, conventional and superpave mix-design methods, material characterization and testing, fracture, fatigue, and permanent deformation, novel pavement materials and additives, and pavement recycling. (Lec. 2, Lab. 3) Pre: 347 or equivalent. Offered in even-numbered years. Lee

**549 Nonbituminous Transportation Materials and Mix-Design (I, 3)** Surficial and subgrade soils, mineral aggregates, Portland cement concretes, mix-design methods, material characterization and testing, fracture, fatigue, new nonbituminous pavement materials and additives, and pavement recycling. (Lec. 2, Lab. 3) Pre: 347 or equivalent. Offered in odd-numbered years. Next offered fall 1999. Lee or Marcus

**551 Finite Element Analysis in Civil Engineering I (I or II, 3)** Direct stiffness method. Rayleigh-Ritz and Galerkin methods. Isoparametric elements. Frames, trusses, plane stress and strain. Bending of thin plates. (Lec. 3) Pre: 453 or permission of instructor. Staff

**552 Structural Timber Design (I or II, 3)** Study of wood properties and design considerations. Design and behavior of beams, columns, beam-columns, and wood fasteners. Analysis and design of structural diaphragms, shear walls, and box beams. (Lec. 3) Pre: 352. Marcus or Tsiatas and Veyera

**556 Variational Methods in Structural Engineering (I, 3)** Introduction; principle of minimum potential energy; principle of minimum complementary energy; generalized variational formulations; principles with relaxed continuity requirements; application to structures and soils. (Lec. 3) Pre: 453 or permission of instructor. Offered every fourth year. Karamanlidis

**560 Structural Design (I or II, 3)** Behavior and design of structural systems; selected topics in steel, reinforced concrete, and prestressed concrete. (Lec. 3) Pre: 460 and 465. Offered every third year. Marcus and Tsiatas

**561 Advanced Steel Design (I or II, 3)** Selected topics in structural steel design following the LRFD specification, including plate buckling and postbuckling, torsion, plate girders, plastic design, frame stability, tall buildings, composite design, and earthquake-resistant design. (Lec. 3) Pre: 460 or permission of instructor. Offered in alternate years. Tsiatas

**565 Structural Dynamics (I or II, 3)** Simplified models and their equations of motion; analytical solution methods; Fourier analysis; Duhamel integral; nonlinearities; computer-oriented solution algorithms and their implementation. Applications. (Lec. 3) Pre: 453. Offered in alternate years. Staff

**568 (or MCE 568) Theory of Plates (I or II, 3)** Development of basic plate equations. Classical solution examples of rectangular and circular plates. Additional topics selected from: orthotropic plates, large deflections, finite element, and numerical solutions. (Lec. 3) Pre: 220 and MTH 244. Karamanlidis

**570 Sanitary Chemistry (I, 3)** Application of analytical chemistry to analysis of natural waters; physical chemistry and organic chemistry of aqueous media; chemical principles applicable to operations of sanitary engineering. (Lec. 3) Pre: permission of instructor. Thiem

**571 Sanitary Chemistry Laboratory (II, 3)** Applications of chemical laboratory procedures to control of water and wastewater treatment processes. (Lab. 9) Pre: 570. Thiem

**572 Biosystems in Sanitary Engineering (I or II, 3)** Microorganisms which constitute the biological systems in water pollution, water purification, and wastewater treatment. Application of principles of microbiology and biochemistry to analysis and design in fields of sanitary engineering and water resources. (Lec. 3) Pre: permission of instructor. Poon

**573 Theory of Water Purification and Treatment (I, 3)** Principles of modern water purification and engineering practices. Aeration, deodorization, sterilization, coagulation, filtration, water softening, iron removal, disinfection, and corrosion control. (Lec. 3) Thiem

**575 Open-Channel Hydraulics (I or II, 3)** Analysis of uniform, critical, varied, and unsteady flow in open channels. Principles will be applied to open-channel design. (Lec. 3) Pre: MCE 354. Wright

**581 (or OCE 581) Experimental Geomechanics (I or II, 3)** Advanced methods and techniques of geotechnical testing. Behavior of granular and cohesive soils with determination of engineering properties. Interpretation, evaluation, and engineering applications of test data. Emphasis on shearing strength, consolidation, bearing capacity, earth pressures, seepage, and slope stability. (Lec. 3) Pre: 381 or equivalent. Kovacs, Silva, or Veyera

**582 Seabed Geotechnics**  
See Ocean Engineering 582.

**583 (or OCE 583) Advanced Foundation Engineering (I or II, 3)** Applications of soil mechanics principles to analysis and design of pile foundations, drilled piers, flexible retaining structures, braced excavations, cofferdams, miscellaneous advanced foundation problems. (Lec. 3) Pre: 381 or equivalent. Kovacs, Silva, or Veyera

**584 Designing with Geosynthetics (I or II, 3)** Overview of geosynthetic materials, properties, test methods, and current standards. Design methods involving geotextiles, geogrids, geonets, geomembranes, and geocomposites. Applications to problems in geomechanics, geoenvironmental engineering, and transportation-related fields. (Lec. 3) Pre: 381 and credit or concurrent enrollment in 483 or equivalent. Kovacs or Veyera

**585 Soil Dynamics** (I or II, 3) Vibration characteristics, wave propagation in soils, foundation vibration theory, foundation design for vibrating loads, vibration isolation, blast vibrations, dynamic soil properties, liquefaction potential, vibratory and dynamic compaction, computer applications. (Lec. 3) Pre: 483 or equivalent or concurrent enrollment. Kovacs or Veyera

**586 Geotechnical Design of Water Containment Systems** (I or II, 3) Engineering properties of soil waste. Design of waste containment cover systems, use of geosynthetics, liner and drainage materials, slurry walls, landfills, and leachate collection systems. Landfill design for earthquakes and stability. (Lec. 3) Pre: 381 and credit or concurrent enrollment in 478. Kovacs

**587 Groundwater Flow and Seepage Pressures** (II, 3) Hydrodynamics of fluid flow through porous media. Analytical methods for steady and unsteady seepage in aquifers; theoretical analysis with practical modification of seepage problems involving foundations, drainage structures, earth dams, and dewatering. (Lec. 3) Pre: 381 and permission of instructor. Urish or Kovacs

**588 Groundwater Hydrology** (II, 3) Quantitative methods of groundwater hydrology including determination of aquifer properties and yield. Modeling of groundwater systems for management quantity of water, movement of contaminants, and well design. Field and laboratory measurements. (Lec. 3) Pre: MCE 354 and CVE 381 or equivalent. Offered in spring of even-numbered years. Urish

**591, 592 Special Problems** (I and II, 1–6 each) Advanced work under supervision of a staff member arranged to suit individual requirements of the student. (Independent Study) Pre: permission of chairperson. Staff

**596 Numerical Methods in Structural Engineering** (I or II, 3) Methods of successive approximations and numerical procedures in the solution of stress, vibration, and stability problems in structural members. Nonuniform members, elastic supports, plates, torsion. (Lec. 3) Pre: permission of chairperson. Staff

**599 Master's Thesis Research** (I and II, 1–9) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**601, 602 Graduate Seminar** (I and II, 1 each) Discussions and presentation of papers based on research or detailed literature surveys. (Seminar) Required of all graduate students, with a maximum

of 1 credit per year allowed. May be repeated for a maximum of 2 credits. Staff

**641 Pavement Evaluation and Rehabilitation** (II, 3) Pavement performance concepts. Criteria for pavement evaluation. Measurement of pavement distress and structural capacity. Analysis and interpretation of pavement evaluation data. Correlation of data with performance ratings. Formulation and evaluation of maintenance and rehabilitation alternatives. (Lec. 3) Pre: 545 or equivalent. Offered in spring of odd-numbered years. Lee

**651 Design of Highway Bridges** (I or II, 3) Design specifications and analysis methods for highway bridges. Loads. Design of steel I-beam bridges, reinforced concrete bridges, and plate girders. Orthotropic analysis. Bridge details and substructure. (Lec. 3) Pre: 561, 465, and 453. Tsiatas

**655 Finite Element Analysis in Civil Engineering II** (I, 3) Isoparametric models for three-dimensional continua, hierarchical elements. Reduced integration concepts, penalty method, discrete Kirchhoff method. Eulerian, total, and updated Lagrangian formulations. (Lec. 3) Pre: 551 or permission of instructor. Offered in fall of even-numbered years. Staff

**657 Structural Stability** (II, 3) Introduction; principal forms of equilibrium paths and their stability; conservative elastic systems; buckling of prismatic members; imperfections; plastic deformations; postbuckling of frames and reticulated structures; numerical methods; catastrophe theory. (Lec. 3) Pre: 556 or permission of instructor. Karamanlidis or Tsiatas

**665 Advanced Topics in Structural Dynamics** (I or II, 3) Equations of motion of systems and continuous bodies; analytical and numerical solution methods; large deflections and plasticity; time-stepping algorithms; active control of tall buildings; earthquake-resistant structures; applications. (Lec. 3) Pre: 565. Offered every third year. Karamanlidis or Tsiatas

**667 Probabilistic Methods in Structural Engineering** (I or II, 3) Probabilistic applications in structural analysis and design. Statistical models for forces and material strengths. Component and system structural reliability. Random vibration applications in structural engineering. (Lec. 3) Pre: introductory course on probability and 565 or OCE 522, or permission of instructor. Tsiatas

**668 Theory of Shells**  
See Mechanical Engineering 668.

**672 Water Pollution Control and Treatment of Wastewater** (I or II, 3) Wastewater character-

istics, effects, and purification in natural water, government control strategies and impacts, cost of control, theory and mathematical concepts of secondary and tertiary treatment process, their limitations, and late developments. (Lec. 3) Pre: one year of chemistry and biology, MTH 243 and CVE 572 or their equivalents, and permission of instructor. Poon

**677 Stream and Estuarine Analysis** (I or II, 3) Fundamentals and mathematical concepts of physical and biological factors applied to the evaluation of the pollution capacity of streams and estuaries. (Lec. 3) Pre: MTH 244. Wright

**681 Advanced Geotechnical Engineering I** (I or II, 3) Advanced study of geotechnical engineering principles and theory. Physical and chemical properties of soils; particulate mechanics; effective stress principle; permeability; steady-state and transient seepage; consolidation; stress distribution; miscellaneous topics. (Lec. 3) Pre: 381 or equivalent and graduate standing. Kovacs, Silva, or Veyera

**682 Advanced Geotechnical Engineering II** (I or II, 3) Advanced study of geotechnical engineering principles and theory. Stress-strain behavior; constitutive relationships; failure theories; applications of theories of elasticity, viscoelasticity, and plasticity; shear strength of sands; shear strength of clays; slope stability analysis; miscellaneous topics. (Lec. 3) Pre: 381 or equivalent and graduate standing. Kovacs, Silva, or Veyera

**687 Geotechnical Earthquake Engineering** (I or II, 3) Seismology and seismicity; surface faulting and ground motion characteristics; response spectra; dynamic soil properties; dynamic response of soil layers, embankments, and slopes; influence of local soil conditions on site response; evaluation of design earthquakes; response analysis. (Lec. 3) Pre: 483 or equivalent, or concurrent enrollment, and graduate standing. Kovacs, Tsiatas, or Veyera

**688 Marine Geomechanics**  
See Ocean Engineering 688.

**691, 692 Special Problems** (I and II, 1–6 each) Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of chairperson. May be repeated for a maximum of 12 credits. Staff

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Classics (CLA)

Section Head: Associate Professor Suter

**391 Ancient Laughter: The Comic Tradition in Greece and Rome** (*I or II, 3*) Introduction to the comic tradition in Western literature through its origins in Greece and Rome. Readings in English translation include examples of comic drama, novel, and satire. (*Lec. 3*) Suter (A) (F)

**395 Greek Mythology: Gods, Heroes, and Humans** (*I and II, 3*) Nature and function of myth in the ancient world and today: ideas of divinity, relationship of divine to human, origins of cosmos and human society, male and female principles, power hierarchies, coming of age, the heroic experience. Theories of myth analysis. Readings in English translation. (*Lec. 3*) Koken (A) (F)

**396 Myths of Rome** (*I and II, 3*) Nature and function of myth in Roman society; origins and influence of Romanitas as found in Roman literature: history, epic, lyric, novel. Roman religion: magic, animism, anthropomorphism, gods and goddesses. Readings in English translation. (*Lec. 3*) Suter (A) (F)

**397 Greek Myth and Tragedy** (*I or II, 3*) Relationship between Greek myth and classical tragedy, birth and evolution of tragedy (ancient, medieval, French, English, American), employment of the same myth for different dramatic and political purposes. Readings in English translation. (*Lec. 3*) Koken (A) (F)

See also course listings under Greek and Latin.

## Communication Skills (CMS)

**101 College Communication Skills** (*I and II, 6*) An integrated, interdisciplinary approach to the acquisition of communication skills. Instruction given in composition and oral communication utilizing a theoretical model common to both. (*Lec. 6*) Not open to students with credit or concurrent enrollment in COM 101 or WRT 101. Staff (Cw) (C)

## Communication Studies (COM)

Chairperson: Professor S. Wood

**101 Public Speaking** (*I and II, 3*) Development and improvement of fundamentals and attitudes essential to effective and ethical communication. Preparation, organization, and presentation of the fundamentals in various speaking environments. Students demonstrating proficiency may petition for advanced placement. (*Lec. 3*)

Not open to students with credit or concurrent enrollment in CMS 101. Staff (C)

**103 Interpersonal Communication** (*I and II, 3*) Impact of perception, listening, self-acceptance, nonverbal messages, and language on interpersonal communication. Emphasis on improving skills. (*Lec. 3*) Staff (C)

**200 The Art of Human Communication** (*I and II, 3*) Selected communication theories from classical to contemporary times are examined. Focus on the relationship between cultures and communication theories. Emphasis on application of theoretical principles to contemporary communication situations. (*Lec. 3*) Staff (L)

**205 Great American Speeches** (*I and II, 3*) The study of historically significant ideas, issues, and causes through the critical analysis of selected American speeches. (*Lec. 3*) Staff (L)

**206 Introduction to Communication Studies** (*I and II, 3*) Survey of the major areas within the field of speech communication. Emphasis on developing the student's ability to identify, define, formulate, investigate, and describe problems and phenomena within the discipline. (*Lec. 3*) Staff

**210 Persuasion: The Rhetoric of Influence** (*I and II, 3*) Analysis of communication influencing beliefs, attitudes, and/or behavior. Investigation of rhetorical elements of logical, emotional, and ethical appeals. Study of elements critical for effective producers and consumers of persuasion. (*Lec. 3*) Staff (L)

**215 Argumentation and Debate** (*I and II, 3*) Introduces argumentation theory through the model of academic debate. Stresses critical-thinking skills including analysis, research, organization, and written and oral presentations. Debates are conducted on important social and political issues. (*Lec. 3*) Devine

**216 Forensic Workshop** (*I and II, 1*) Open to students participating in speech or debate activities. (*Practicum*) Pre: permission of the director of debate. May be repeated for a maximum of 4 credits. Devine

**220 Small Group Communication** (*I and II, 3*) The study of communicative functions in the small group setting. Includes group dynamics, leadership, problem solving, and decision making. Emphasis on theory and application. (*Lec. 3*) Staff (S)

**231 Oral Interpretation of Literature** (*I and II, 3*) Recognition and appreciation of content and communication of thought and emotion through oral reading. Practice in the analysis

and interpretation of poetry and prose fiction. (*Lec. 3*) Quainoo (A)

**301 Systems of Communication** (*II, 3*) Investigation of communication networks in non-symbolic and symbolic systems, focusing on general systems theory, cybernetics, the human physiological system, the computer, and animal and human code systems. (*Lec. 3*) Brownell

**302 Advanced Public Speaking** (*I and II, 3*) Advanced study of public speaking and speech writing. Speaking in television and business settings. Speaking with a manuscript, writing speeches for others, and speech criticism. (*Lec. 3*) Pre: 101. Staff

**306 Research Methods in Communication** (*I and II, 3*) Basic concepts and techniques of communication research. Emphasis on analysis of existing communication research and on application of research processes to communication problems or phenomena. (*Lec. 3*) Pre: 206 or permission of instructor. Staff

**310 Contemporary Oral Communication** (*I and II, 3*) Analysis of contemporary rhetorical theories as they relate to speaking in business, civil rights, education, government, labor, law, and religion. Focus each semester on a critical contemporary issue. (*Lec. 3*) May be repeated for credit. Staff

**314 Nonverbal Communication** (*I, 3*) Examines nonverbal communication codes, including their structures, usages, and interrelationships. Stresses student understanding, analysis, and application of nonverbal communication through lecture, discussion, and experiential activities. (*Lec. 3*) Pre: junior standing and 101 or 103 or permission of instructor. Staff

**315 Environmental Dimensions of Communication** (*I, 3*) Investigation of the physical properties of the environment and how individuals' perception and design of these properties affect their communication in personal, social, and public situations. Analysis and experimentation with the ways the environment can be used to facilitate communication. (*Lec. 3*) Anderson and Brownell

**317 Advanced Argumentation and Debate** (*II, 3*) Analysis of the theories of argumentation through specialized forms of debate. Use of legislative, legal, and other situationally specific forms of debate to apply the theories of argumentation. (*Lec. 3*) Devine

**320 Oral Communication for Business and Professions** (*I or II, 3*) Examination of business and organizational communication. Emphasis on channels of communication, communication

barriers, leadership, and the development of communication skills for business and professions. (Lec. 3) Staff

**331 Contemporary Approaches to Prose Fiction (II, 3)** Oral interpretation of the short story and novel. Contemporary approaches to the oral tradition of storytelling through individual and group performances and written analysis. (Lec. 3) Quainoo

**332 Oral Interpretation of Poetry (I, 3)** Practice in the oral interpretation of poetry through oral performance and written analysis. (Lec. 3) Pre: 231 or permission of instructor. Quainoo

**333 Oral Interpretation of Black Literature (II, 3)** Study and oral presentation of literature by black American authors. Class performances, discussion, reports, and analysis of the literature. (Lec. 3) Quainoo

**337 Intercultural Communication (I and II, 3)** Study of cultural similarities and differences as they affect communication within and across cultural boundaries. (Lec. 3) Doody and Chen

**340 Electronic Media Programming (I or II, 3)** Overview of various aspects of the operation of radio, television, and cable TV, including industry structure, audience measurement (ratings), programming, and promotion. (Lec. 3) Pre: junior standing. Mundorf

**345 Gender and Communication (II, 3)** Survey of theories and research on gender and communication. Examines interface of gender and human interaction in interpersonal, group (including family), educational, organizational, mass media, and social movement contexts. (Lec. 3) Ketrow and Staff

**354 International Business Communications Exchange**  
See Business 354.

**391, 392 Honors Work (I and II, 1–3 each)** Thesis work or an equivalent independent project under faculty supervision for honor students. (Independent Study) Pre: admission to departmental Honors Program. Staff

**400 Rhetoric (I, 3)** Inquiry into standards for the evaluation and improvement of instrumental discourse. Detailed considerations of invention, disposition, and style in oral and written communication. (Lec. 3) McClure

**403 Advanced Interpersonal Communication (I, 3)** Critical study of major issues and theories of interpersonal communication. Focuses on history, models, and research, including conversation, influence, intimacy, language, and rela-

tionships. (Lec. 3) Pre: 103 or permission of instructor. Ketrow

**415 The Ethics of Persuasion (II, 3)** Relation of persuasion to ethics is examined. Purposes, means, results, and contexts are considered in making rhetorical judgments of interpersonal, political, and institutional communication. (Lec. 3) McClure

**420 Seminar in American Public Address and Criticism (II, 3)** Study of selected American speakers, speeches, and/or movements. Rhetorical analysis used to measure the impact of speakers, speeches, and social and political movements. (Seminar) Staff

**430 Political Communication (I, 3)** Analysis of political communication in campaign and nonelection situations. Examination of ghost writing; content analysis, strategies, image making of political speaking; TV and radio presentations; influences on and effects of political communication. (Lec. 3) Devlin

**435 Directing Group Performance of Non-dramatic Literature (II, 3)** Practice in Reader's Theatre and Chamber Theatre. Emphasis on direction as a rhetorical device in group work with nondramatic literature and compilation of scripts for individual and group performance. (Lec. 3) Pre: 231. In alternate years. Quainoo

**437 Managing Cultural Differences in Organizations (I and II, 3)** Exploring how to manage cultural differences in organization and to adapt to culturally diverse organizations by applying the skills of intercultural sensitivity and intercultural competence. (Lec. 3) Pre: 337 or permission of instructor. Not open to students who have credit for MGT 453, 655, or 657. Chen and Doody

**440 Telecommunications Processes and Audience Behavior (I and II, 3)** Surveys theories and research concerning role of electronic mass media in contemporary society. Focuses on interplay between mass media content and audience behavior; provides framework for analyzing current telecommunications issues. (Lec. 3) Pre: 210 or permission of instructor. Mundorf

**445 Television Advertising (II, 3)** Examination of theory and practice in television advertising. Students will acquire and analyze commercials made by professionals and create and produce television advertisements. (Lec. 3) Not for graduate credit. Devlin

**450 Organizational Communication (I and II, 3)** Surveys theory and practice of communication in organizations. Examines interface of or-

ganizational, management, and communication theories. Explores human interaction, flows and formats in organizations; stresses student analysis of organizational communication. (Lec. 3) Pre: 320. Leatham

**460 Communication and Conflict Intervention (II, 3)** An examination of the role of communication theories in conflict intervention in interpersonal, group, and organizational settings. Emphasis on applying theories through simulations, role plays, case studies, and discussions. (Lec. 3) Pre: 103 or 220. Anderson or Doody

**465 Race, Politics and Media (I, 3)** Exploration of the complex dynamics of race relations and political discourse as contextualized in the media. Rhetorical methods of analysis are used to study contemporary media coverage of race issues. (Lec. 3) Quainoo

**471, 472 Internship in Communication Studies (I and II, 1–3 each)** Provides the student with direct supervised participation in a variety of communication situations and occupations. (Practicum) Pre: 18 credits in communication studies and permission of chairperson. S/U only. Staff

**491, 492 Special Problems (I and II, 1–3 each)** Selected areas of study pertinent to communication. Instruction may be offered in class seminar or tutorial environments according to specific needs and purposes. (Independent Study) Pre: permission of chairperson. Staff

**501 Communication Theory (I, 3)** Discusses the significance of theory to the understanding of communication. Gives an overview of major theories applicable to the study of communication. Explores the relationship between theory and research and investigates emerging theories and applications of theory to emerging forms of communication. (Seminar) Staff

**502 Communication Methods (II, 3)** Exploring research methods to acquire ability to understand communication phenomenon, critique and analyze the value of communication studies, and to independently conduct research to answer communication questions and problems. (Seminar) Staff

**510 Seminar in Interpersonal Communication (I, 3)** A critical study of scholarly literature of interpersonal communication, including historical development and conceptualization, survey of current research and theoretical literature, and critique of methodologies and development or approaches. (Seminar) Staff

**520 Seminar in Media Studies (I or II, 3)** Explores impact of television, home video, multimedia and other forms of electronic communication. Discusses convergence of television, computer and telephone industries, and communication implications of multimedia and the Internet. May be repeated once under a different topic. (*Seminar*) Every second or third semester. Next offered spring 1999. Staff

**530 Seminar in Organizational Communication (I or II, 3)** In-depth examination of a topic in organizational communication. Students will review and discuss appropriate literature and author a major research paper. May be repeated once under a different topic. (*Seminar*) Every second or third semester. Next offered fall 1998. Staff

**540 Seminar in Public Discourse (I or II, 3)** In-depth examination of a topic in public discourse. Students will review and discuss appropriate literature and author a major research paper. May be repeated once under a different topic. (*Seminar*) Every second or third semester. Next offered spring 1999. Staff

**591, 592 Independent Study (SS only, 1–3 credits each)** Students will work with faculty on independent research projects designed to enhance their research skills and further emphasize the content area most germane to the student.

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

## Communications

### Communication Skills

101 College Communication Skills

### Communication Studies

101 Public Speaking  
103 Interpersonal Communication  
215 Argumentation and Debate  
220 Small Group Communication  
302 Advanced Public Speaking

### English Language Studies

112 English as a Second Language I  
122 English as a Second Language II

### Journalism

220 Media Writing  
320 Public Affairs Reporting and Writing  
321 Magazine Article and Feature Writing

### Writing

002 Writing Lab  
101 Composition  
123 College Writing for Returning Students

201 Introduction to College Research Writing  
227 Business Communications  
235 Writing with Computers  
301 Writing Nonfiction  
333 Scientific and Technical Writing

## Communicative Disorders (CMD)

*Chairperson:* Associate Professor Singer

**260 Introduction to Speech and Language Disorders (II, 3)** Introduction to speech and language disorders in children and adults; overview of symptomatology, assessment, and treatment; study of the professions of speech-language pathology and audiology. For students in communicative disorders, education, psychology, and other health-related fields. (*Lec. 3*) Staff

**261 Survey of Hearing and Deafness (II, 3)** Introduction to the science of audiology. Pathologies of the hearing mechanism, basic methods of audiometry, interpretation of the audiogram, hearing aids, and rationale and methods in hearing conservation programs. (*Lec. 3*) Staff

**372 Auditory and Speech Mechanisms (I, 3)** Structure and function of the organs of hearing and speech as they relate to normal and pathological communication; theories of cortical involvements, central and peripheral nervous systems relevant to rehabilitation procedures. (*Lec. 3*) Pre: junior standing. Staff

**373 Phonetics (I, 3)** International Phonetic Alphabet; analysis of phonetic and phonemic elements in major American English dialects; practice in transcription of standard and defective speech. (*Lec. 3*) Pre: junior standing. Staff

**374 Communication Processes (I, 3)** Psychological and cognitive processes basic to language and communication; models of language processing; explorations into biological and social bases. (*Lec. 3*) Pre: junior standing. Staff

**375 Language Development (I, 3)** Development phenomena in speech and language; causal factors of delayed speech and language; survey of evaluative and rehabilitative programs for children with deviant language development. (*Lec. 3*) Pre: junior standing. Staff

**376 Hearing and Speech Science (II, 3)** Physical properties and speech signal, analysis of the physical bases of speech production and speech perception. (*Lec. 3*) Pre: 373. Staff

**391, 392 Honors Work (I and II, 1–3 each)** Thesis work or an equivalent independent project under faculty supervision for honors students participating in the University Honors Program.

(*Independent Study*) Pre: admission to departmental Honors Program. Staff

**440 Advanced Head and Neck Anatomy**  
See Dental Hygiene 440.

**454 (554) Rehabilitative Audiology (I, II, 3)** Theoretical and methodological approaches to aural rehabilitation of the adult with impaired hearing. Topics include use of amplification, speechreading, assistive listening devices, auditory training, and case management. (*Lec. 3*) Pre: 260, 261 and three of the following—372, 373, 374, 375, 376, and senior or graduate standing with 551 as prerequisite for graduate standing. Staff

**465 Clinical Methods in Communicative Disorders (I and II, 4)** Observation of diagnosis and treatment of communicative disorders; developing interviewing, report writing, and counseling techniques; introduction to diagnostic procedures; establishing therapeutic goals, treatment, and remediation of various disorders. (*Lec. 3, Lab. 2*) Senior or graduate standing only. Pre: 260, 261, and three of the following—372, 373, 374, 375, 376. Not for graduate credit in communicative disorders. Staff

**475 Gestural Communication (II, 3)** Visual language systems with emphasis on the chereology and syntax of Ameslan, and levels of language among deaf communicators; finger spelling and sign language for educational, rehabilitative, and artistic goals studied. (*Lec. 2, Lab. 2*) Pre: junior or graduate standing. Staff

**491, 492 Special Problems (I and II, 1–3 each)** Selected areas of study pertinent to communicative disorders. Instruction may be offered in class seminar or tutorial environments according to specific needs and purposes. (*Independent Study*) Staff

**493 Cultural and Linguistics Diversity in Communicative Disorders (II, 3)** Application of concepts and information from the study of cultural and linguistic diversity to issues involving communicative incompetence and disorder. (*Lec. 3*) Kovarsky

**504 Research in Communicative Disorders (II, 3)** Types of research in speech pathology, audiology, and communication science; critiques of representative models with special emphasis on experimental research; individual pilot projects or master's thesis. (*Lec. 3*) Pre: 372, 373, 374, 375, graduate standing, or permission of instructor. Staff

**551 Measurement of Hearing I (I, 4)** Diagnostic protocols for routine audiologic assessment including pure tone, speech, and immittance



procedures. Discussion of etiology and symptomatology of hearing disorders. (Lec. 3, Lab. 2) Pre: 372, 373, 374, 375, and 376; graduate standing or permission of instructor. Singer

**552 Measurement of Hearing II** (II, 4) Behavioral assessment of peripheral and central auditory function, including speech recognition, immittance, site-of-lesion, otoscopy, speech-reading, and pseudohypacusis testing. (Lec. 3, Lab. 2) Pre: 551 or permission of instructor. In alternate years. Preece

**553 Pediatric Audiology** (I, 3) Theoretical and methodological approaches to the identification and management of children with auditory disorders. Topics discussed include auditory development, audiometric evaluation, and hearing aids. (Lec. 3) Pre: 551 or permission of instructor. Staff

**555 Hearing Aids I** (I, 3) Introduction to wearable hearing aids. Topics include: basic electronics, speech acoustics, types of hearing aids and their appropriateness, electroacoustics and psychoacoustics, and an overview of electroacoustic selection. (Lec. 2, Lab. 2) Pre: 372, 373, 374, 375, and 376; graduate standing or permission of instructor. Singer

**556 Hearing Aids II** (II, 3) Application of technological and behavioral strategies in fitting hearing aids, including aid selection and delivery, counseling, assessment of wearer performance, marketing, and legal issues. (Lec. 3) Pre: 555. Singer

**557 Electrophysiological Measures in Audiology** (II, 4) Basic electrophysiological assessment procedures and instrumentation. Otoacoustic emissions, electrocochleography, auditory brainstem response, and middle, late, and steady-state auditory evoked potentials. (Lec. 3, Lab. 2) Pre: 551 or permission of instructor. Preece

**560 Voice Disorders** (II, 3) Etiology and symptomatology of vocal pathology; intervention strategies for organic and functional voice disorders; emphasis on rehabilitation team approach to voice-resonance problems associated with cleft palate. (Lec. 3) Pre: 372, 373, 374, 375, graduate standing, or permission of instructor. Staff

**561 Phonological Disorders** (I, 3) Assessment, design, and implementation of therapeutic management programs for various speech production disorders at the articulatory and phonological levels. (Lec. 3) Pre: 372, 373, 374, 375, or equivalent, or permission of instructor. Staff

**564 Language Disorders in School-Aged Children** (II, 4) Study of communication deficits in learning-disabled school-aged children; differential diagnoses; assessment of cognitive functioning; language processing and discourse; and therapeutic strategies for training abstract and functional language. (Lec. 3, Lab. 2) Pre: graduate standing or permission of instructor. Culatta

**569 Diagnostic Procedures in Speech-Language Pathology** (I, 4) Procedures for evaluation and diagnosis in speech-language pathology. Psychometric considerations in testing. Implications of evaluation information for differential diagnosis, prognosis, referrals, and therapeutic programs. Multicultural considerations in the diagnostic process. (Lec. 4) Pre: 372, 373, 374, 375, 465 or equivalent; graduate standing or permission of instructor. Staff

**570 Clinical Practicum in Communicative Disorders** (I and II, 1–5) Supervised assessment and rehabilitation procedures with persons experiencing communicative disorders in speech-language pathology and/or audiology. Practicum sites scheduled on campus and within hospital, school, institutional, and private settings. (Practicum) Pre: graduate standing, 25 observation hours, and appropriate course work. Staff

**571 Medical Speech-Language Pathology** (I and II, 1) Prepares students to work as speech-language pathologists in medical settings. Focus on scope of practice, ethics, and the coordination, prioritizing, and delivery of clinical services in an interdisciplinary environment. (Seminar) Pre: graduate standing. S/U only. Marshall

**572 Pathologies of the Auditory System** (I, 3) Diagnostic implications of audiometry for various organic disorders; supportive audiological information relevant to medical and surgical interventions; differential data associated with otosclerosis, Meniere's disease, VIIIth cranial nerve tumors, and malingering. (Lec. 3) Pre: 372, 373, 374, 375, graduate standing, or permission of instructor. Staff

**573 Contemporary Issues in Audiology** (II, 3) Critical review of current research and controversial issues within the profession; student selects one topic for independent study. (Lec. 3) Pre: 372, 373, 374, 375, graduate standing, or permission of instructor. Staff

**580 Augmentative and Alternative Communication** (II, 2) Review of unaided (manual) approaches to communication. Discussion of aided methods using communication boards or

other mechanical electronic devices. (Lec. 2) Pre: graduate standing or permission of instructor. Staff

**581 Dysphagia** (II, 3) Basic introduction to the knowledge and skills needed by speech-language pathologists providing clinical services to dysphagic patients in medical settings. (Lec. 1) Pre: graduate standing or permission of instructor. Staff

**582 Motor Speech Disorders** (II, 4) Neurosystem pathologies and mechanisms affecting speech. Prepares students to diagnose, assess, and treat adults with acquired motor speech disorders. (Lec. 4) Pre: graduate standing or permission of instructor. Marshall

**584 Language Disorders in Developmentally Young Children** (I, 4) Study of communication deficits in developmentally young and multi-handicapped children; types of language problems; differential diagnoses; assessment of conceptual requisites and concrete language skills; and interactive therapeutic strategies. (Lec. 4) Pre: graduate standing or permission of instructor. Culatta

**585 Language Disorders in Adults** (II, 4) Provides basic information on the characteristics, assessment, and treatment of adults with acquired language disorders secondary to stroke, head injury, and progressive neurological diseases. (Lec. 4) Pre: graduate standing or permission of instructor. Marshall

**592 Disorders of Fluency** (I, 3) Study of nature and causes of stuttering; analyses of current theories and research concerning stuttering and cluttering; development of a rationale for diagnosis, case selection, and intervention. (Lec. 3) Pre: graduate standing and/or permission of instructor. Staff

**593 Multicultural Issues in Communicative Disorders** (II, 1) Exposure to state-of-the-art clinical practices with individuals from diverse backgrounds. Attention paid to developing "cultural sensitivity" and an awareness of the cultural and bilingual influences on assessment and intervention decisions. (Lec. 1) Staff

**594 Counseling in Communicative Disorders** (I, 1) Considerations in counseling in speech-language pathology and audiology. Multiple factors influencing communication between client/family and professionals. Study of clinical skills in counseling. Ethical and professional issues. (Lec. 1) Pre: graduate standing or permission of instructor. Staff

**595 Instrumentation and Computer Use in Communicative Disorders (II, 1)** Topics in applied instrumentation and computer use for students in speech-language pathology and audiology. Practical experience in calibration of instruments and the use of current professional software. (Lab. 2) *Pre: graduate standing or permission of instructor. Staff*

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

## Community Planning (CPL)

*Director:* Associate Professor Atash

**210 Introduction to Planning and Community (I, 3)** Introductory course for community planning minor. History of urban development, management and planning of cities and towns in the United States. Discussion of contemporary planning issues in urban areas. (Lec. 3) Foster

**391, 392 Directed Study in Community Planning (I and I, 1-3)** Independent work in planning for individual students or groups. (*Independent Study*) *Pre: 210 or 410 or permission of instructor. Staff*

**397 Field Work in Community Planning (I and II, 1-3)** Field work as arranged. The student works as a part-time intern in a planning agency under the supervision of a faculty advisor. (*Practicum*) *Pre: 210 or 410 or permission of instructor. Staff*

**410 Fundamentals of Community Planning Practice (II, 3)** The development of the planning profession in the United States, and the elements of planning practice. The application of planning principles, methods, and techniques pertinent to contemporary urban problems. (Lec. 3) *Not for graduate credit. Atash*

**434 (or MAF 434) Introduction to Environmental Law (II, 3)** Surveys issues arising out of laws designed to protect the environment and manage resources: right to a decent environment, government regulation versus private property rights, citizen participation in planning environmental controls. (Lec. 3) *Primarily for students not enrolled in the graduate curriculum in community planning and area development. Gordon*

**498 Community Planning Seminar (II, 3)** Seminar in community planning from an interdisciplinary perspective. (*Seminar*) *Pre: 210 or 410 or*

*permission of instructor. Not for graduate credit. Abedon*

**501 Introduction to Community Planning Practice (I, 3)** The development of community planning in the United States, history of governmental planning and evaluation of the planning profession, and the elements of planning practice. (Lec. 3) Foster

**510 Community Planning and Political and Social Change (II, 3)** Introduction to systems and central theories of determinants for social and planned change in urban and urbanizing communities. Focus on methodologies for political and social assessments. (Sem. 3) *Pre: 523 or permission of instructor. Feld*

**511 Planning and Natural Environmental Systems (I, 3)** Introduction to theories, methodologies, and substantive concerns of environmental resource analysis with attention given to coastal environmental issues. Focus on land, soils, watersheds, water quality, vegetation, air quality, wildlife, noise pollution. (Lec. 3) Westcott

**512 Development of Human Settlements (I, 3)** Structure, functions, and development of human settlements. Classical and contemporary urban theory. Emphasizes political economy of urbanization as a historical process tied to our other social processes. (Sem. 3) Feldman

**516 Seminar on the Urban Waterfront** See Marine Affairs 516.

**522 Planning Law (I, 3)** General review and discussion of legal principles and thought concerned with property rights, political power, and the legal aspects pertinent to the planning and development of public and private activities. (Lec. 3) *Pre: second-year graduate standing or permission of instructor. Ruggiero*

**523 Planning Theory (I, 3)** Critical survey of planning theories and contemporary planning concepts. Values, assumptions, and processes of various planning paradigms as related to decisions in community planning. Specific emphasis on values and ethics in planning theory. (Sem. 3) Feld

**525 Introduction to Planning Methods (I, 4)** Application of basic quantitative methods in planning: collection, analysis, and presentation of demographic, housing, and economic data. Introductory survey techniques. Introduction to computer applications in planning. (Lec. 3, Lab. 2) *Pre: one course in statistics or permission of instructor. Staff*

**526 Techniques and Methodologies of Planning Research (II, 4)** Elementary social science research methods. Introduction to methodological approaches, research design, quantitative and qualitative data collection, and computerized data analysis in community planning and related urban social science. (Lec. 3, Lab. 2) *Pre: 525. Feldman*

**530 Urban Design and Public Policy (II, 3)** Significant concepts of historical and contemporary urban form ranging from entire cities to architectural details. Emphasis on urban design methods, process, and elements. Alternatives for implementation of urban design projects. (Lec. 3) Atash

**536 International Comparisons in Urban and Regional Planning (I, 3)** Urban and regional development issues and policies in advanced and developing countries. Emphasis on population growth, urbanization, and spatial development. (Sem. 3) *In alternate years. Atash*

**537 (or REN 532) Land Resources Economics (II, 3)** The study of economic relationships of man and scarce natural and man-made resources. Supply and demand, rent theory, resources conservation, and the impact of public policy and law. (Lec. 3) Wichelns

**538 Site Planning (I, 3)** Site analysis and planning, including street design, principles of house grouping, and residential subdivision layout. Site planning standards for office development and shopping centers. (Lec. 3) Atash

**539 Environmental Law (II, 3)** Analysis of specific environmental issues and policies including facility siting, land use and constitutional issues, comprehensive planning, public trust doctrine, concurrence and state impact assessments. Independent research and presentation required. (Lec. 3) Staff

**540 Community-Based Housing (I, 3)** Analysis of local housing needs; issues and perspectives in the context of federal and nonfederal program activities. Review of public-purpose strategies to provide housing that meets community needs. (Sem. 3) *Pre: graduate standing or permission of instructor. Jensen*

**541 Urban and Rural Housing Policy (II, 3)** Assessment of urban and rural housing needs; relationship of housing to national economic policy; housing finance; production and cost characteristics; tax policy, filtering and neighborhood change; and housing policy assessments. (Sem. 3) *Pre: 410 or 501 or permission of instructor. In alternate years. Feldman*

**542 Housing and Community Development Law (II, 3)** Examination of housing and community development laws through cases and readings. Focuses on the laws and programs that have been developed to address the problem of providing affordable housing in the United States. (Sem. 3) *Pre: graduate standing or permission of instructor.* Bryant

**543 Methods of Social Policy Analysis (II, 3)** Methods and techniques of social public policy analysis as applied to social problems and the evaluation of policy options, programs, and quality of life. (Sem. 3) *Pre: 624 or permission of instructor. In alternate years.* Feld

**545 Land Development Seminar (II, 3)** A study of land management techniques including zoning, subdivision regulation, and land suitability and analysis; their use and environmental implications in land and water development. (Sem. 3) *Pre: 511 or permission of instructor.* Flynn

**546 (or CVE 546) Urban and Rural Transportation (I, 3)** Issues confronting planning for urban and rural transportation systems; the variety of policies that governments pursue in addressing issues and problems; technical and political constraints, transportation studies, and demand analysis techniques. (Lec. 3) *Pre: 410 or 501 or permission of instructor. In alternate years.* Shaw and Lee

**549 Seminar in Ecological Planning (I, 3)** Advanced seminar in ecological planning. Topics include hazardous waste, power plant siting, major transportation facilities, solid waste, aquifer protection, among others. Particular emphasis on wetlands and marine and coastal settings. (Sem. 3) *Pre: 511 or permission of instructor.* Westcott

**555 Introduction to Economic Development Planning (II, 3)** Overview of economic development planning theory and practice. Emphasis on state and local planning in industrialized countries. The planning process and analytical techniques. Business, human resource, and community development strategies. (Sem. 3) *Pre: 512 or permission of instructor. In alternate years.* Feldman

**589 Master's Project Research (I and/or II, 1–6)** A substantial, self-directed planning project, by one or several students, under guidance of a major professor. Number of credits to be determined each semester. *S/U credit.* Staff

**591, 592 Special Problems in Planning (I or II, 1–6 each)** Individual investigation of special problems in planning. (*Independent Study*) Staff

**593–596 Special Problems in Planning (I or II, 1–6 each)** Group investigation of special problems in planning. (*Independent Study*) Staff

**599 Master's Thesis Research (I or II, 1–6)** Number of credits is determined each semester in consultation with the major professor or program committee. *S/U credit.* Staff

**624 Planning Policy and Management in Urban Areas (II, 3)** City planning as applied to urban policy in cities and metropolitan areas. Includes social, economic, and physical planning in the context of community development programs and management processes. (Sem. 3) *Pre: 501, 511, 525, or permission of instructor.* Foster

**625 Central City Revitalization and Implementation (I, 3)** Advanced concentration course in central city planning. Focus on the problems of central cities and the causes of these problems. Emphasis on government policies to deal with the problems of the inner city. (Sem. 3) *Pre: 624 or permission of instructor.* Foster

**631 Community Planning Studio (I, 6)** Team projects in planning and design; research and program development; field studies and problem analysis in local and state contexts. Development and evaluation of alternative solutions. (Studio 6) *Pre: 525 and 526 or permission of instructor.* Atash

**691, 692 Special Problems in Planning (I or II, 1–6 each)** Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) Staff

**693, 694 Special Problems (I or II, 1–6 each)** Advanced work under the supervision of a staff member arranged to suit the requirements of a group of students. (*Independent Study*) Staff

## Community Service (CSV)

*Coordinator: Dean Strommer, University College*

*Note: The total number of credits in community service that may be earned toward graduation may not exceed 12.*

**301 Course-Based Community Service (I or II, 1–3)** Learning through a community service experience related to course content. Experience defined by a job description and learning contract; includes orientation and reflection. (*Practicum*) *Pre: junior standing or above, or permission of instructor. Concurrent enrollment in a course that offers community service experience. May be repeated for a maximum of 6 credits. S/U only.* Staff

**302 Community Service at URI (I or II, 2–4)** Learning through a community service project that addresses a specific community need at the University of Rhode Island. Project proposed and supervised by an instructor, and varies each semester. Includes mandatory seminar. (*Practicum*) *Pre: junior standing or above, or permission of instructor. May be repeated for a maximum of 8 credits.* Staff

**303 Service in the Community (I or II, 2–4)** Learning through a community service project that addresses a specific need in the off-campus community. Project proposed and supervised by an instructor, and varies each semester. (*Practicum*) *Pre: junior standing or above, or permission of instructor. May be repeated for a maximum of 8 credits. S/U only.* Staff

## Comparative Literature Studies (CLS)

*Coordinator: Professor Manteiga (Modern and Classical Languages and Literatures)*

**160 Masterpieces of Literature**  
See English 160.

**235 (or PHL 235) Modern Thought: Philosophy and Literature (I or II, 3)** Introduction to recent thought in philosophy and literature. Emphasis on Kierkegaard, Marx, Nietzsche, Freud, Sartre, and complementary literary texts. (Lec. 3) Staff (L)

**250 Themes and Myths (I or II, 3)** Study of the evolution and transformation of a myth or theme in several national literatures. An introduction to a comparative and interdisciplinary approach. (Lec. 3) *May be repeated for credit as often as topic changes. May be taken once for General Education credit.* Staff (A)

**335 (or ENG 335) Interdisciplinary Studies in Comparative Literature (I or II, 3)** Study of the interrelationships of two or more national literatures (in translation) with another discipline. (Lec. 3) *May be repeated for credit as often as topic changes.* Staff (A)

**350 (or ENG 350) Literary Theory and Criticism (I or II, 3)** Introduction to theories of literature and their application in the analysis of selected texts. (Lec. 3) *May be repeated for credit as often as topic changes.* Staff

**450 Studies in Comparative Literature (I or II, 3)** Detailed study of a literary movement, genre, or an aspect of literature as seen in two or more literatures. (Lec. 3) *Pre: 6 credits in literature or permission of instructor. May be repeated for credit as often as topic changes.* Staff

**510 Introduction to Comparative Literature** (I or II, 3) Theoretical and practical concerns of comparative literature: its nature and scope, methods, bibliography, and special problems. (Seminar) Pre: graduate standing or permission of chairperson. Viglionese

**520 Literary Theory and Criticism** (I or II, 3) Metacriticism: literary criticism as theory and practice and the relationship between literary and critical discourse. (Seminar) Pre: graduate standing or permission of chairperson. May be repeated once with change of topic. Staff

**530 Approaches in Comparative Literature** (I or II, 3) Study of theme/myth, movement/era, genre/forms in two or more literatures, or interrelations with other disciplines. (Seminar) Pre: graduate standing or permission of chairperson. May be repeated once with change of topic. Staff

**597 Special Problems** (I and II, 1–6) Group and/or individual investigation of special problems in comparative literature studies. (Independent Study) Staff

**599 Master's Thesis Research** (I and II, 1–6) Number of credits is determined each semester in consultation with the major professor and the Comparative Literature Studies Advisory Committee. (Independent Study) Staff

See other listings under English.

## Computer Science (CSC)

Chairperson: Professor Lamagna

**101 Computing Concepts** (I or II, 4) Capabilities and limitations of computers. Applications of computers in today's society. Overview of computing systems and programs. Students will complete several projects using a computer. (Lec. 3, Lab. 2) Not open to students who have credit in any college-level computer science course. Not open to computer science majors. Staff

**110 Survey of Computer Science** (I, 4) How computers work. Design of a simple computer. Computer software, programming, and languages. Capabilities and limitations of computers. Artificial intelligence. (Lec. 3, Lab. 2) Open only to computer science majors with 4 or fewer credits in CSC courses. Staff

**200 Computer Problem Solving for Science and Engineering** (I and II, 4) An integrated symbolic, numerical, and graphical approach to computer problem solving. Structured design; fundamental programming techniques. Computer algebra systems. Scientific, engineering, and mathematical applications. (Lec. 3, Lab. 2)

Pre: credit or concurrent enrollment in MTH 131 or 141. Not for major credit in computer science. Only one of 200, 201, or 211 may be taken for credit. Staff

**201 Introduction to Computer Programming** (I and II, 4) Computer characteristics, algorithms, data representation, program development. Students will write several programs to solve numerical and nonnumerical problems. (Lec.3, Lab. 2) Pre: MTH 111 or equivalent. Not for major credit in computer science. Only one of 200, 201, or 211 may be taken for credit. Staff (M)

**211 Introductory Programming and Design** (I and II, 4) Problem specification, solution design, and algorithm development. Object-oriented programming and program structure. Functions, selection, iteration, recursion, classes, arrays, and files. Required programs will solve numerical and nonnumerical problems. (Lec. 3, Lab. 2) Pre: prior experience with computers and programming and MTH 111 or equivalent. Only one of 200, 201, or 211 may be taken for credit. Intended for computer science and computer engineering majors. Staff

**212 Data Structures and Abstractions** (I and II, 4) Abstract data types and data structures. Pointers, linked lists, stacks, queues, binary trees, and tables. Fundamentals of software engineering. Development of object-oriented programming techniques. (Lec. 3, Lab. 2) Pre: 211 and MTH 141. Intended for computer science and computer engineering majors. Staff

**301 Fundamentals of Programming Languages** (II, 4) Organization of programming languages, data and control structures, syntax and semantics, compilers and interpreters. Block structured languages, recursion, parameter passing, run-time storage management. Procedural, functional, object-oriented, and logical languages. (Lec. 3, Lab. 2) Pre: 212. Staff

**305 Software Engineering** (I, 4) Programming environments and methodologies for the design, development, testing, and maintenance of large software systems. Student teams will develop a substantial software product from requirements to delivery using disciplined techniques. (Lec. 3, Project 3) Pre: 301. Staff

**320 Social Issues in Computing** (I, 4) Discussion of the social and ethical issues created by the use of computers. The problems that computers solve and those that they produce. Ethics and responsibilities of the computer professional. (Lec. 4) Pre: 212, junior standing, or permission of instructor. In alternate years. Staff

**340 Mathematical Foundations of Computer Science** (II, 4) Combinatorial techniques used in non-numerical computation and analysis of algorithms. Logic, proofs, enumerations, recurrence relations, graphs and networks, finite automata. Complexity analysis of several representative problems and algorithms for their solutions. (Lec. 4) Pre: 212 and credit or concurrent enrollment in MTH 215. Staff

**350 Fundamentals of Mathematical Computation** (II, 4) Symbolic, numerical, and graphical approaches to mathematical computation. Pitfalls in numerical computation. Root finding. Numerical integration and differentiation. Approximation of functions. Interpolation and curve fitting. Linear systems. Ordinary differential equations. (Lec. 3, Lab. 2) Pre: 212 and MTH 215 and 243. Staff

**402 Compiler Design** (I, 4) Grammars and languages; lexical analysis, parsing and translation, symbol tables, run-time storage administration, object code generation. Students will construct a compiler for a small programming language. (Lec. 3, Project 3) Pre: 301. Staff

**406 Computer Graphics** (II, 4) Interactive raster graphics; hardware, software, and algorithms. Point plotting, line drawing, geometrical transformations, clipping and windowing. Three-dimensional graphics including curves, surfaces, perspective, hidden objects, shading. User interfaces; graphical programming environments. (Lec. 3, Project 3) Pre: 305, MTH 215 and 243. Staff

**411 Computer Organization** (I, 4) Logical structure of computer systems viewed as a hierarchy of levels. Assembly language programming, assemblers, linkers, loaders. Computer architecture including digital logic, processor organization, instruction sets, addressing techniques, virtual memory, microprogramming. (Lec. 3, Project 3) Pre: 212, junior standing or permission of instructor. Staff

**412 Operating Systems and Networks** (II, 4) General concepts underlying operating systems and computer networks. Topics include process management, concurrency, scheduling, memory management, information management, protection and security, modeling and performance, networking and communication. (Lec. 3, Project 3) Pre: 212, junior standing or permission of instructor. Staff

**415 Introduction to Parallel Computing** (II, 4) Programming techniques to engage a collection of autonomous processors to solve large-scale numerical and non-numerical problems. Proces-

sor interconnections. Parallel programming languages and models. Performance measures. (Lec. 3, Project 3) Pre: 301. In alternate years. Staff

**436 Database Management Systems (I, 4)** Construction and management of large data systems. Data modeling, relational and object-oriented systems, main memory databases, query languages, query optimization, concurrency control, transaction management, distributed systems, disk organization, indexes, emerging technologies. (Lec. 3, Project 3) Pre: 301 or 412 or permission of instructor. Staff

**440 Algorithms and Data Structures (I, 4)** Algorithm design and analysis, advanced data structures, computational complexity. Sorting, searching including hashing and balanced trees, string pattern matching, polynomial and matrix calculations, graph and network algorithms, NP-completeness and intractability. (Lec. 3, Project 3) Pre: 340. Staff

**445 Models of Computation (II, 4)** Abstract models of computational systems. Classical models for uniprocessor, sequential, and stored program computers. New models based on recent advances in hardware, software, and communications and their implications in practice. (Lec. 3, Project 3) Pre: 340. In alternate years. Staff

**447 Discrete Mathematical Structures**  
See Mathematics 447.

**481 Artificial Intelligence (II, 4)** Theories, formalisms, techniques to emulate intelligent behavior using information processing models. Symbolic programming, search, problem solving, knowledge-based techniques, logic, theorem proving. Optional topics: natural language processing, machine learning, computer vision. (Lec. 3, Project 3) Pre: 301 or permission of instructor. In alternate years. Staff

**491 Directed Study in Computer Science (I and II, 1-4)** Advanced work in computer science. Conducted as supervised individual projects. (Independent Study) Pre: permission of chairperson. S/U credit. Staff

**492 Special Topics in Computer Science (I or II, 1-4)** Advanced topics of current interest in computer science. (Lec. 1-4) Pre: permission of instructor. Staff

**499 Project in Computer Science (I and II, 4)** Supervised work on a capstone project in computer science that prepares students for careers in industry and graduate study. (Practicum) Pre: advanced standing in computer science and de-

partmental approval. Normally taken twice in two consecutive semesters. May be repeated for a maximum of 8 credits. Not for graduate credit. Staff

**501 Programming Language Semantics (I, 4)** Design, analysis, implementation, and comparative study of major programming language families. Topics include procedural and block-structured languages, interpretive languages, concurrency, functional languages, object-oriented programming, logic programming, dataflow languages and machines. (Lec. 3, Project 3) Pre: 301. Staff

**502 Theory of Compilers (II, 4)** An advanced course in compiler construction covering advanced parsing techniques, compiler-writing tools, type checking and type inference, code optimization, and compiling nonstandard language features. (Lec. 3, Project 3) Pre: 402. In alternate years. Staff

**505 Advanced Topics in Software Engineering (I or II, 4)** Lifecycle models; software development environments; project management. Metrics, performance, and testing. Paradigms for software design and architecture. Legal and ethical issues. (Lec. 3, Project 3) Pre: 305. Staff

**509 Object-Oriented System Design (I or II, 4)** Object-oriented design and programming, the software engineering process. Traditional and current object-oriented design methods. Software reuse. Design tools. Impact of the technology on traditional software engineering. (Lec. 3, Project 3) Pre: 305 and working knowledge of an object-oriented language. Staff

**511 Advanced Computer Organization (I, 4)** Evaluation of high-performance computer systems with respect to architectures, operating systems, and algorithms. High-speed conventional machines; array processors; multiprocessors; data flow machines; RISC architectures; VLSI-based machines. (Lec. 3, Project 3) Pre: 411. In alternate years. Staff

**512 Topics in Distributed Systems (II, 4)** Advanced topics in distributed systems. Networking; standard distributed computing environments. Distributed computing algorithms. Concurrency and threading. Real-time computing, scheduling, concurrency control, load allocation. (Lec. 3, Project 3) Pre: 412. In alternate years. Staff

**517 Design and Analysis of VLSI Systems (I, 4)** Illustration and analysis of VLSI algorithms and architecture. Emphasis on design of very large-scale integrated circuits, related methodologies, and theoretical foundations. VLSI technologies,

fabrication, automated design tools for various problems. (Lec. 3, Project 3) Pre: 411 and either 340 or 447. In alternate years. Staff

**519 Computer Networks**  
See Electrical Engineering 543.

**525 (or IME 525) Simulation (II, 3)** Discrete simulation models. Comparison of discrete change simulation languages. Methodology including generation of random variates, design of simulation experiments for optimization and validation of models and results. Selected applications. (Lec. 3) Pre: 212 and 6 credits of statistics. Staff

**536 Topics in Data Management Systems (I or II, 4)** Current research and developments in database management systems. Relational, semantic, object-oriented, real-time, distributed, heterogeneous, and logic databases. Concurrency control, security, active rules, recovery, and integrity subsystems. (Lec. 3, Project 3) Pre: 436 or permission of instructor. In alternate years. Staff

**541 Advanced Topics in Algorithms (I or II, 4)** Algorithm design techniques such as dynamic programming, greedy method, branch and bound. Linear programming; NP-completeness; graph algorithms; number theoretic algorithms; approximation algorithms for NP-complete problems; probabilistic and parallel algorithms. (Lec. 3, Project 3) Pre: 440 or 445. In alternate years. Staff

**542 Mathematical Analysis of Algorithms (I or II, 4)** Mathematical techniques for the analysis of algorithms. Sums and products; finite difference calculus; properties of binomial coefficients; Stirling, harmonic, and Fibonacci numbers; recurrence relations; generating functions; asymptotic approximation. Case studies. (Lec. 3, Project 3) Pre: 440. In alternate years. Staff

**544 Theory of Computation (I or II, 4)** Finite automata, pushdown automata, formal grammars and Chomsky hierarchy, Turing machines, computability, basics of complexity theory. Advanced topics including some of the following: cryptography, interactive proofs, circuit complexity, completeness for various complexity classes, relations among complexity classes, new models of computation. (Lec. 3, Project 3) Pre: 440 or 445. In alternate years. Staff

**547 Combinatorics and Graph Theory**  
See Mathematics 547.

**548 Topics in Combinatorics**  
See Mathematics 548.

**550 Computer Algebra (II, 4)** Symbolic mathematical computation; history, use, representation of information, algorithms and heuristics. Big number arithmetic, manipulation of polynomials and rational expressions; algebraic simplification; factoring; symbolic integration. Organization and implementation of computer algebra systems. (Lec. 3, Project 3) Pre: 350, 440. Staff

**581 (or ELE 581) Special Topics in Artificial Intelligence (II, 3)** Topics of specialized or current interest, which may change. Topics may include expert systems, natural language processing, neural network models, machine learning. AI applications in remote sensing. (Lec. 3) Pre: 481 or permission of instructor. May be repeated with permission. In alternate years. Staff

**583 Computer Vision**  
See Electrical Engineering 583.

**591 Directed Study in Computer Science (I and II, 1–4)** Advanced work in computer science conducted as supervised individual projects. (Independent Study) Pre: permission of chairperson. S/U credit. Staff

**592 Special Topics in Computer Science (I or II, 1–4)** Advanced topics of current interest in computer science. (Lec. 3, Project 3) Pre: permission of chairperson. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Consumer Studies (CNS)

**210 Management in Family Living (I and II, 3)** Interaction of resources, goals, and managerial processes in the home seen in the context of the larger community. Applications primarily in the area of human resources. (Lec. 3) Pre: sophomore standing or permission of chairperson. Staff

**220 Consumer in the Economy (I and II, 3)** Application of basic economic principles to consumer problems in a complex marketplace, buyer-seller relationships, effective consumer decision making, effects of government policies on consumers. (Lec. 3) Pre: economics course. Anderson (S)

**320 Personal Finance (I and II, 3)** Personal financial planning and decisions for attaining individual and family goals. Factors that affect, protect, and enhance financial security. (Lec. 3) Pre: junior standing. Anderson

**321 Personal Finance Applications (II, 3)** Application of principles of family financial planning and decision making. Emphasis on mathematical and analytical evaluation and analysis including the use of computer software. (Lec. 3) Pre: 320. Xiao

**340 Family Housing (I and II, 3)** Evaluation and study of types of housing in relation to the family and community. Emphasis on socioeconomic factors, housing laws, and aesthetic qualities concerned with housing. (Lec. 3) Staff

**342 Housing for the Elderly (II, 3)** Aspects of housing and nearby environmental conditions and needs, alternatives, legislative programs and support services related to housing for the elderly. (Lec. 3) Pre: HDF 220 or permission of instructor. Staff

**350 Consumer Purchasing of Durable Goods (II, 3)** Decision making concerning selection of consumer durables relative to feature availability, resource depletion, and natural energy use. (Lec. 3) Staff

**401 Consumer and Managerial Problems of Families with Special Needs (II, 3)** Seminar to develop strategies for assisting families with unusual demands for consumer and managerial skills. Attention to such groups as unemployed, marginally employed, minorities, handicapped, elderly, and female-headed households. (Lec. 3) Pre: a CNS course or an HSS course or HDF 230 or permission of instructor. Staff

**415 Retirement Planning (II, 3)** Explanation and evaluation of financial information needed for effective retirement planning, including defining goals, estimating expenses, and analyzing resources. Pre: 320. Not for graduate credit. Anderson

**420 Consumer Protection (I, 3)** Effectiveness of diverse approaches to consumer protection. Analysis of techniques such as information disclosure, standards for products and services, government and private agencies, redress channels, and legislation. (Lec. 3) Pre: 220 or 320 or permission of instructor. Xiao

**422 Consumer Issues Research (II, 3)** Critical examination of issues and policies on behalf of consumer welfare; documentation and investigation skills; writing and oral presentation skills. (Lec. 3) Pre: 220 or 320 or permission of instructor. Xiao

**440 Housing Management (I, 3)** Operation and management of residential properties: resident selection, services, legal and financial considerations, promotion of property, staffing,

maintenance concerns, and safety and security. (Lec. 3) Pre: 340. Not for graduate credit. Staff

**457 (or HLT 457) Health and Safety Issues of Consumer Products (I or II, 3)** An interdisciplinary approach to solving health and safety problems arising from the use of complex consumer products. Emphasis on measurement systems, product liability, and product design. (Lec. 3) Pre: senior standing with 6 credits completed in health, consumer affairs, or other upper-level professional requirements or permission of instructor. Staff

**470 Special Problems (I and II, 2–4)** Special problems selected from home management theory, consumption economics, work simplification, and equipment depending upon the specific interests of students. (Independent Study) Staff

**477, 478 Field Experience in Consumer Affairs (I, 3)** Approved, supervised work experience related to consumer well-being. Examples include research, advocacy, education, and dissemination of information, or provision of service. (Practicum) Pre: junior standing or permission of instructor. S/U credit. Not for graduate credit. Staff

## Dental Hygiene (DHY)

Director: Associate Professor B. Brown

**100 Introduction to Dental Hygiene (II, 2)** An overview of the dental hygiene profession including basic dental anatomy, dental terminology, current infection control protocols, and preventive dentistry concepts. (Lec. 2) Brown

**101 Preclinical Dental Hygiene (I, 1)** Philosophies, concepts, and procedures needed before beginning experience in dental hygiene clinic. Emphasis on the basic concepts and principles in preventive oral health care. (Lec. 1) For dental hygiene majors only. Brown

**125 Dental Morphology, Head and Neck Anatomy (I, 4)** Study of form and function of teeth and their related structures. A detailed study of the anatomy and physiology of the structures of the head and neck. (Lec. 3, Lab. 3) For dental hygiene majors only. Kaufman, Woodward, and Brown

**126 General and Oral Histology and Embryology (II, 3)** Cytology, development and microscopic anatomy of oral cavity. (Lec. 3) Pre: 125. For dental hygiene majors only. Bhattacharya

**128 Periodontics (II, 2)** Classification of periodontal disease, clinical picture, causative fac-

tors, and types of treatment. (Lec. 2) *For dental hygiene majors only.* Nager

**135 Technique: Clinical Dental Hygiene I (I, 3)** An introduction to knowledge and skills essential for the performance of dental hygiene services. Emphasis on principles of instrumentation and perfecting clinical competence on manikin heads and laboratory partners. (Lec. 1, Lab. 6) *For dental hygiene majors only.* Staff

**136 Clinical Dental Hygiene II (II, 3)** Development of clinical skills. Application of the basic principles of oral inspection, charting, radiology, fluoride application, and dental health education. (Lec. 1, Practicum 8) *For dental hygiene majors only.* Staff

**141 Dental Specialties (I, 2)** Lectures, clinical observations, field trips, and practice devoted to the understanding and interaction of dental specialties. (Lec. 2) *For dental hygiene majors only.* Staff, Regional Dental Center, Newport

**227 General and Oral Pathology (I, 3)** Significance, signs, symptoms, and relationship of general disease to oral disease. Stress on manifestation of oral pathology and clinical recognition of atypical or abnormal oral conditions and disease. (Lec. 3) *For dental hygiene majors only.* Aschaffenberg

**231 Roentgenology (I, 2)** Lectures, demonstrations, and laboratory practice. Study of nature and behavior of X-rays, extra- and intra-oral radiographic techniques and procedures. Recognition and interpretation of information revealed by radiographic examination. (Lec. 1, Lab. 2) *For dental hygiene majors only.* Brown and Staff

**237 Clinical Dental Hygiene III (I, 4)** Continuation of 136. (Lec. 1, Practicum 12) *For dental hygiene majors only.* Staff

**238 Clinical Dental Hygiene IV (II, 4)** Continuation of 237. (Lec. 1, Practicum 12) *For dental hygiene majors only.* Staff

**244 Dental Materials and Operative Technique (I, 2)** Study of physical, chemical, and mechanical properties of materials used in dentistry. Laboratory procedures develop skill in preparation, manipulation, and use of materials relevant to the practice of dental hygiene. (Lec. 1, Lab. 3 for 10 weeks) *For dental hygiene majors only.* Bishop and Morisseau

**248 Legal and Ethical Responsibilities in Dental Practice Management (II, 2)** Ethics and legal responsibilities relating to the practice of dental hygiene and dentistry. Emphasis on principles of practice management in private prac-

tice and in the specialty areas. (Lec. 2) *For dental hygiene majors only.* Staff

**252 Community Health (II, 3)** Philosophy and background of public health practice. Review of current health concepts, practice, needs, and problems. Emphasis on methods for promotion of optimal health for all. Supervised field experiences. (Lec. 3) *For dental hygiene majors only.* Brown

**350 Dental Health Education (II, 3)** Educational philosophy, teaching methods, and acquisition of skills in methods of research. Investigation, review, interpretation, and critical evaluation of scientific literature as the basis for dental health education. (Lec. 3) *For dental hygiene majors only.* Brown

**440 (or CMD 440 or PHT 440) Advanced Head and Neck Anatomy (II, 3)** Study of structure and function of human head and neck anatomy, supplemented by dissection laboratory. Emphasis on the musculoskeletal, visceral, nervous, and vascular systems related to dental hygiene and communicative disorders. (Lec. 2, Lab. 2) *Pre: BIO 121 or equivalent.* Agostinucci

**462 Oral Care of the Aged and Medically Compromised (I, 3)** Practical approach for the health-related professional. Emphasis on recognition of oral disorders, oral health care strategies, and principles of prevention for the aged and chronically ill. (Lec. / Practicum 3) *Pre: BIO 242 and HDF 220 or permission of instructor.* *For dental hygiene majors only.* Saunders

**464 Field Experience in Community Oral Health (II, 3)** Directed field experience in dental health education in cooperation with community-based agencies. Weekly seminar. The experience will be defined by a job description and learning contract or letter of intent arranged by the instructor with the student and the agency supervisor. (Practicum) *Pre: 252 or permission of instructor.* *For dental hygiene majors only.* Brown

## Economics (ECN)

*Chairperson: Professor Mead*

**100 Introduction to Economics (I and II, 3)** General overview of concepts economists employ to address issues of public policy. Description of major institutions of present-day American economy. Historical approach to subject matter. (Lec. 3) Staff (S)

**201 Principles of Economics: Microeconomics (I and II, 3)** Principles underlying resource allocation, production, and income distribution in a market economy. Topics include demand

and supply, consumer behavior, firm behavior, market structure, and elementary welfare analysis. Institutional foundations explored. (Lec. 3) Staff (S)

**202 Principles of Economics: Macroeconomics (I and II, 3)** Principles underlying aggregate demand and aggregate supply in a market economy. Topics include national income determination, inflation, unemployment, economic growth, and international trade. Institutional foundations explored. (Lec. 3) *Pre: 201 or equivalent.* Staff (S)

**305 Competing Traditions in Economics (I and II, 3)** Introductory exposure to the history of economic thought and also to competing schools of thought within modern economics. Connections between present-day controversies and competing traditions are explored. *Pre: 201, 202. May be taken concurrently with 202.* Ramstad

**306 Introduction to Economic Research Methods (I and II, 3)** Development of supplementary skills needed to carry out economic research. Topics include: 1) widely used computer operating systems, 2) economic data sources, 3) elementary mathematical and statistical techniques, and 4) library research methods. *Pre: 201, 202. May be taken concurrently with 202.* Mead or Ramsay

**323 Intermediate Microeconomics (I, 3)** Theory of consumer behavior, the firm, market equilibrium, general equilibrium, imperfect competition, optimization over time, and linear models. Models of microeconomics are developed using calculus and linear algebra. (Lec. 3) *Pre: 201, 202 and MTH 131 or 141.* Miller

**324 Intermediate Macroeconomics (II, 3)** Theory of consumption, investment, monetary and fiscal policy, static and dynamic models, economic growth, unemployment, and inflation. Macroeconomics developed using calculus and linear algebra. (Lec. 3) *Pre: 201, 202 and MTH 131 or 141.* Lardaro

**327 Intermediate Economic Theory: Income and Employment (I or II, 3)** Measurement of national income. Theory of the determination of the general level of income, employment, and prices. Business fluctuations. (Lec. 3) *Pre: 201 or 202 or 590 or permission of instructor.* Lardaro

**328 Intermediate Economic Theory: Pricing and Distribution (I or II, 3)** Market conditions and forces affecting the pricing and production of goods and services, the allocation of resources, and the distribution of income. (Lec. 3) *Pre: 201 or permission of instructor.* Ramsay or Miller

**334 Money and Banking (II, 3)** Structure and functioning of monetary institutions. Analyses of monetary theories. The role of monetary policy. U.S. banking structure: its operations and functioning. (Lec. 3) *Pre: 201 or permission of instructor.* Barnett

**337 Business and Government (I or II, 3)** Historical and present attitudes and policies of various levels of government toward the changing structure of American business. Emphasis on legal and economic concepts of business activity. (Lec. 3) *Pre: 201 or 202 or permission of instructor.* Ramsay

**338 International Economics (I or II, 3)** Theory and evidence on international trade and finance. Includes determinants and welfare effects of foreign trade, international investment, migration, exchange rates, and the balance of payments. (Lec. 3) *Pre: 202 or permission of instructor.* Staff

**342 Public Finance (II, 3)** Examination of the theory and practice of public expenditures, revenues, and fiscal policy with major emphasis on federal fiscal affairs. (Lec. 3) *Pre: 201 or 202 or permission of instructor.* Starkey

**344 (or PSC 344) International Financial Economics (II, 3)** History, theory, and politics of the international financial system. Topics include the foreign exchange market, international banking, macroeconomic stabilization under fixed and floating exchange rates, exchange rate reform, and the global debt crisis. (Lec. 3) McIntyre

**351, 352 Assigned Work (I and II, 3 each)** Special work in economics when it can be arranged to meet the needs of individual students who desire independent work. (*Independent Study*) *Pre: 201 or 202 or permission of instructor.* S/U credit. Mead

**363 Economic Growth and Development (I or II, 3)** Basic problems in economic growth and development of so-called backward or preindustrial countries. Emphasis on population trends, agrarian reforms, capital formation, international aid programs, respective roles of private and public enterprise. (Lec. 3) *Pre: 201 or 202 or permission of instructor.* Sharif

**368 Labor Economics (I or II, 3)** Impact of industrialization on workers; survey of the basic principles of labor market organization and operation; unemployment and remedies; wage determination under union and nonunion conditions. (Lec. 3) *Pre: 201 and 202.* Miller

**375 Introduction to Quantitative Methods I (I, 3)** Mathematical techniques used in modern economic theory. Linear algebra, the calculus of several variables, constrained maximization, and differential equations. Application to economic problems. (Lec. 3) *Pre: 201 and 202 and MTH 141, or permission of instructor.* Miller

**376 Introduction to Econometrics (I, 4)** Application of econometric methods to economic problems. Econometric tools applied to micro- and macroeconomic problems. (Lec. 3, Lab. 2) *Pre: 201 or permission of instructor.* Lardaro

**381 Radical Critiques of Contemporary Political Economy (II, 3)** Radical right and radical left critiques. Radical views on values, methodology, production planning, income distribution, economic power, the military-industrial complex, imperialism, and racial and sexual discrimination. (Lec. 3) *Pre: 202 or permission of instructor.* Staff (S)

**385 Economic Development of the United States (I or II, 3)** Developmental factors in American economic life introduce students to the past and present business environment. (Lec. 3) *Pre: 201 or permission of chairperson.* Ramstad

**402 Urban Economics (I or II, 3)** Analysis of selected economic problems of urban areas. Development of methodological approaches through discussion of policy issues. (Lec. 3) *Pre: 201 or 202 or permission of instructor.* Mead

**403 Corporate Crime and Government Regulation (I, 3)** Analysis of illegal corporate activity and the problems of social control through law and enforcement. Emphasis on the regulatory process and the impact of regulation and deregulation on the concentration of capital and on health, safety, and the environment. (Lec. 3) Barnett

**404 Political Economy of Class, Race, and Gender (I, 3)** Theoretical and empirical analysis of class, race, and gender differentials in income and wealth within the framework of structural versus individual characteristics. Special attention paid to economic development, labor markets, the educational system, and the state. (Lec. 3) *Pre: 201 or permission of instructor.* Starkey

**415 Environmental Harms and Sanctions (I or II, 3)** Political economic analysis of criminal, civil, and administrative regulation and law in an ecological context. Topics include hazardous waste, environmental justice, wilderness preservation, and global issues. *Pre: junior or senior standing.* Barnett

**444 Applied Research in Economics (II, 3)** The application of economic theory, econometrics, and computing to specific problems. Emphasis on formulation of hypotheses in mathematical form, transformation into forms suitable for empirical testing, testing using the computer, report writing, and oral presentation. (Lec. 3) *Pre: 323, 324, and 376.* Staff

**445 Senior Research Project (I and II, 3)** Collaborative group research under guidance of department member. Topic jointly selected by members of group, subject to faculty approval. Written report required. (*Independent Study*) *Pre: final semester for majors in the economics B.A. program. Not for graduate credit.* Suzawa

**512 History of Economic Analysis (I, 3)** Advanced work on formative developments in economic thought from classical political economy to modern welfare economics. Emphasis on relationships between doctrines and their institutional setting. (Lec. 3) *Pre: permission of instructor.* Ramstad

**515, 516 Economic Research (I and II, 1–3 each)** Independent research. (*Independent Study*) S/U credit. Staff

**526 Economics of Labor Markets**  
See Labor and Industrial Relations 526.

**527 Macroeconomic Theory**  
See Resource Economics 527.

**528 Microeconomic Theory**  
See Resource Economics 528.

**534 Information Sources and Uses in Labor Relations and Labor Economics**  
See Labor and Industrial Relations 534.

**538 International Economics (I or II, 3)** Theory and evidence on international trade and finance. Includes determinants and welfare effects of foreign trade, international investment, migration, exchange rates, and the balance of payments. (Lec. 3) *Pre: 327 and 328 or permission of instructor.* Burkett

**544 International Financial Economics (II, 3)** History, theory, and politics of the international financial system. Topics include the foreign exchange market, international banking, macroeconomic stabilization under fixed and floating exchange rates, exchange rate reform, and the global debt crisis. (Lec. 3) *Pre: 327.* McIntyre

**552 Monetary Theory and Policy (II, 3)** Analysis of structure and functioning of monetary and banking systems; discussion of contemporary monetary theories; evaluation of monetary policies. (Lec. 3) *Pre: 334 or permission of instructor.* Barnett



**566 Economic Planning and Public Policy in Developing Nations (II, 3)** Resource and financial planning in public and private sectors of developing nations with emphasis on planning tools, allocation of domestic and foreign resources, and national economic policies. (Lec. 3) *Pre: 327 and 363 or equivalent, or permission of instructor.* Sharif

**575 Introduction to Mathematical Economics (I, 3)** Application of basic quantitative methods to economic analysis. Dynamic and static economic models will be studied with emphasis on obtaining solutions. (Lec. 3) *Pre: 327, 328, and MTH 141 or permission of instructor.* Miller

**576 Econometrics**  
See Resource Economics 576.

**590 Principles of Economics (I and II, 3)** Survey of micro- and macroeconomic theory. (Lec. 3) *Pre: graduate standing in accounting, labor and industrial relations, or M.B.A. program.* Lardaro

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

**628 Advanced Microeconomic Theory**  
See Resource Economics 628.

**676 Advanced Econometrics**  
see Resource Economics 676.

## Education (EDC)

*Chairperson:* Professor Felner

**102 Introduction to American Education (I and II, 3)** Introduction to the fundamental structure, functions, and problems of American education. Emphasis on education as both a sociocultural phenomenon and an embodiment of philosophical commitments. (Lec. 2, Rec. 1) *Not for major credit in elementary or secondary education.* Staff (S)

**250 Supervised Preprofessional Field Experience (I or II, 1)** Supervised early field experience and seminar for students wishing to explore one or more possible career choices in education. (*Practicum*) *May be repeated for credit.* S/U only. Staff

**279 Career Development Seminar (I and II, 1)** Individualized approach to career concerns, skill identification, self-awareness, career development theory, decision making. Emphasis on understanding long- and short-term goals. (*Seminar*) Staff

**302 Topics in Educational Studies (I and II, 3)** Consideration of basic purposes, values, and changes in American education as a means of analyzing selected topics drawn from foundational studies in education. Topics vary. (Lec. 3) *Pre: sophomore standing or permission of instructor.* Staff

**312 The Psychology of Learning (I and II, 3)** An analysis of learning with emphasis on principles and procedures applicable to any human teaching and learning situation. (Lec. 3) *Pre: PSY 113.* Staff (S)

**329 Music for the Elementary School Teacher**  
See Music 329.

**350 Primary School Practicum (II, 1)** Students apply methodology in a public school setting for grades K-2 for three hours each week for 10 weeks. Lessons are taught and principles of classroom management, individualized instruction, and integrated curriculum are applied. (*Practicum*) *Pre: HDF 150, 200, and acceptance into the early childhood education program.* S/U only. Trostle and Staff

**360 Foundations of American Education (I or II, 3)** An analysis of historical, social, and philosophical foundations of American education, emphasizing theory and practice in contemporary schools and the relevance and appropriateness of the educational values schools reflect. (Lec. 3) *Pre: open to students admitted to concentrations in elementary or secondary education. Students must be accepted into the education program.* Willis

**371 Educational Measurements (I and II, 3)** An analysis of concepts and procedures involved in creating, selecting, summarizing, and using tests and other measurement devices in educational settings. (Lec. 3) *Pre: 312.* Staff

**401 Development and Utilization of Instructional Materials (I and II, 3)** Methods of developing and making classroom application of selected materials: nonprojected, projected, and audio. Specific attention to utilization in the social sciences, English, reading, the natural sciences, the humanities, arithmetic, and mathematics. (Lec. 1, Lab. 4) *Pre: senior standing and 6 hours of education.* Howard

**402 The Education of Special Needs Students (I and II, 3)** Legislative, judicial, social, and psychological issues related to the assessment, identification, and remediation of special needs students' problems in the regular and special education classroom. (Lec. 3) *Pre: PSY 232 or HDF 200 and EDC 312.* Staff

**415 Adolescents and Classroom Management (I and II, 3)** Issues pertaining to adolescent development as manifested in the classroom. Emphasis upon classroom management strategies for the learning and developmental needs of adolescents. (Lec. 3) *Pre: in- or pre-service major in secondary education or permission of instructor.* Purnell

**424 Teaching of Reading (I and II, 3)** Philosophy, materials, and methods underlying the teaching of reading with special emphasis on developing understanding. (Lec. 3) *Pre: 312 or graduate standing.* Staff

**425 The Use of Trade Books in the Reading Program (I, 3)** Understanding and using children's literature as an extension of elementary school textbooks with emphasis on broadening the classroom teacher's instructional philosophy. (Lec. 3) Staff

**426 Methods and Materials in Primary School Teaching (II, 3)** Principles and practices of developing knowledge and skills in social studies, math, science, music, art, physical education, and language arts for grades pre-one, one, and two. (Lec. 3) *Pre: HDF 301. Open only to elementary education early childhood option majors. Not for graduate credit in education.* Trostle

**427 Methods and Materials in Elementary Teaching I (I and II, 3)** Language arts and reading principles and practices of guiding children in skillful use of basic means of communication (speaking, listening, writing, and reading). (Lec. 3) *Pre: PSY 113 and 232, EDC 312, concurrent enrollment in EDC 428, and permission of chairperson. Open only to elementary education majors. Not for graduate credit in education.* Staff

**428 Methods and Materials in Elementary Teaching II (I and II, 3)** Principles and practices of developing skills and knowledge in social studies, math, and science with elementary school children. (Lec. 3) *Pre: PSY 113 and 232, EDC 312, concurrent enrollment in EDC 427, and permission of chairperson. Open only to elementary education majors. Not for graduate credit in education.* Staff

**429 Emergent Literacy (II, 1)** History and foundations of beginning reading, writing, and language development, and contemporary and practical applications of literacy activities, including language experience projects and storytelling. Focuses on the young child from birth to five years. (Lec. 1) *Pre: credit or concurrent enrollment in 424. Not for graduate credit.* Trostle and Staff

**430 Methods and Materials in Secondary Teaching** (I and II, 3) Principles of education and human sciences as related to curricular materials and classroom situations. Sectioned by academic major: business, English, mathematics, modern language, science, social studies. (Lec. 3) Pre: 102, 312, PSY 232, senior standing, and permission of instructor. Concurrent enrollment in 250 required. Open only to secondary education majors. Second semester only for students in the College of Business Administration. Not for graduate credit in education. Staff

**431 Clinical Experiences for Secondary Education** (I, 1) Secondary school clinical experience, taken concurrently with secondary methods course (430) during semester prior to student teaching. Student applies content learned in methods course and prior course work to peer teaching and classroom settings. Restricted to majors. (Practicum) Not for graduate credit. S/U only. Staff

**435 The Teaching of Composition**  
See Writing 435.

**444 Teaching of Agribusiness and Natural Resources** (I, 3) Organization of instructional programs; development of resource units, teaching plans, methods, techniques, and occupational experience programs. (Lec. 3) Pre: 102 and 312. Not for graduate credit in education. McCreight

**448 Reading in the Content Areas** (I, 3) Emphasis on the development of specialized vocabulary, textbook reading techniques, and other study skills needed to read math, science, social studies, business, and other content area materials. (Lec. 3) Pre: 312 or permission of chairperson. Staff

**449 Teaching Adolescent Literature** (I, 3) The current canon of adolescent literature will be reviewed and expanded, and methodologies for literature instruction will be explored. (Lec. 3) Pre: acceptance into the English education program or permission of instructor. Not open to students who have taken LSC 531. Barton

**452 Evaluation of Elementary Students** (I, 2) Purposes and means of evaluating elementary school children will be critically analyzed. Types of tests and measurement tools will be examined, such as observation checklists, sociograms, rating scales, and portfolios. (Seminar) Pre: acceptance into the elementary education program or permission of chairperson. Not for graduate credit. Staff

**453 Individual Differences** (I, 3) Analyzing the needs of various student populations with atten-

tion given to the concomitant values, resources, and curriculum modifications necessary for success in learning. (Lec. 3) Pre: acceptance in the elementary education program or permission of chairperson. Not for graduate credit. Staff

**454 Individual Differences Field Component** (I, 1) Supervised field experience related to 453 consisting of special education, language minority, compensatory education, gifted and talented, and at-risk students. (Practicum) Pre: acceptance into the elementary education program or permission of chairperson. Not for graduate credit. Staff

**455 Language Arts Methods in Elementary Teaching** (II, 2) Language arts and reading principles and practices of guiding children in the skillful use of basic means of communication (speaking, listening, writing, and reading). (Lec. 2) Pre: acceptance into the elementary education program or permission of chairperson. Not for graduate credit. Staff

**456 Mathematics Methods in Elementary Teaching** (II, 2) Principles and practices of developing knowledge and skills in mathematics with elementary school children. (Lec. 2) Pre: acceptance into the elementary education program or permission of chairperson. Not for graduate credit. Staff

**457 Science Methods in Elementary Teaching** (II, 2) Principles and practices of developing knowledge and skills in science with elementary school children. (Lec. 2) Pre: acceptance into the elementary education program or permission of chairperson. Not for graduate credit. Staff

**458 Social Studies Methods in Elementary Teaching** (II, 2) Principles and practices of developing knowledge and skills in social studies with elementary school children. (Lec. 2) Pre: acceptance into the elementary education program or permission of chairperson. Not for graduate credit. Staff

**459 Supervised Methods Practicum** (II, 2) Supervised field experience related to evaluation of elementary students and methods courses: language arts, social studies, mathematics, and science. Students will observe and teach. (Practicum) Pre: concurrent enrollment in 455, 456, 457, and 458. Not for graduate credit. Staff

**460 Post Student Teaching Seminar** (I, 1) Consideration of curricular, social, political, and cultural issues in education based on reflection of the student teaching experience. (Seminar) Pre: concurrent enrollment in 484. Not for graduate credit. Staff

**470 Advanced Methods in Elementary Mathematics** (II, 3) Advanced study of elementary mathematics topics and methods. Math activities that promote understanding in the elementary student in areas such as geometry, number theory, and probability/statistics. Emphasizes utilization of NCTM Mathematics Standards. (Lec. 3) Pre: 484 or permission of instructor. Young or Long

**478, 479 Problems in Education** (I and II, 0-3 each) Advanced work in education conducted as seminars, supervised individual projects, or supervised field experiences. (Independent Study) Students in seminars and supervised individual projects will be graded using standard grades (A-F); students in supervised field experiences will be graded using S/U grades only.

**484 Supervised Student Teaching** (I and II) Under selected and approved critic teachers, students participate in classroom teaching and other school activities for a period determined by credit to be earned. Areas include: secondary nonvocational, S/U credit; elementary education, S/U credit; home economics, S/U credit; resource development; business; music; theatre. (Practicum) Pre: methods course(s) of department involved. Not for graduate credit in education. Staff

**485 Seminar in Teaching** (I and II, 3) Practicum for teachers, their immediate problems, use of resource materials, and cooperative help of other members of seminar. Areas include: secondary nonvocational, elementary education, home economics, resource development, business, music, physical education (S/U only), theatre. (Seminar) Pre: concurrent enrollment in 484 and permission of chairperson. Not for graduate credit in education. Staff

**486 Student Teaching in Elementary Physical Education** (I and II, 6) Under selected and approved critic teachers, students participate in classroom teaching and other school activities. (Practicum) Pre: methods courses of department. Not for graduate credit in education. Staff

**487 Student Teaching in Secondary Physical Education** (I and II, 6)  
See 486.

**488 Student Teaching in Special Physical Education** (I and II, 6)  
See 486.

**489 Student Teaching in Health Education** (I and II, 6)  
See 486.

**500 Foundations of Adult Education (I and II, 3)** Examination of fundamental structure, functions, problems, and history of adult education in America. Focus on socioeconomic factors and philosophical commitments that have shaped various programs. (Lec. 3) *Pre: graduate or senior standing and permission of instructor.* Boulmetis

**502 Foundations of Curriculum (I or II, 3)** History and analysis of foundational ideas and schools of thought about curriculum and how they shape modern practices in curriculum development, implementation, evaluation, and change in the United States. (Lec. 3) Willis

**503 Education in Contemporary Society (II, 3)** Leading educators' responses to issues and challenges confronting American education. Emphasis on identification and analysis of contemporary theories and practices reflecting the relationship between characteristics of society and educational values. (Lec. 3) Willis

**504 Adult Basic Education (I and II, 3)** Teaching of adults whose educational level is below high school completion. Physical, social, and psychological characteristics of disadvantaged adults and various techniques and materials useful in motivating and teaching them. (Lec. 3) *Pre: permission of instructor.* Staff

**505 Leadership Development in Adult Programs (I or II, 3)** Discussion of leadership concepts, styles, and implications. Discussion and practice in the use of several adult education methods and techniques for increasing the effectiveness of groups and organizations. (Lec. 3) *Pre: permission of instructor.* Staff

**506 Foundations of Education: Teaching and Learning (SS, 7)** Philosophical, cultural, and psychological foundations of American education. Focus on ideological beliefs, cultural factors, and psychological principles and practices that shape teaching and learning. Field work integrated with classroom assignments. *Pre: permission of chairperson.* Sullivan

**508 Interdisciplinary Curriculum Development (I, II, or SS, 3)** Curriculum development of interdisciplinary units for elementary and middle schools. Focus is on grade-level units which incorporate multiple subject areas. Both individual and group projects required. (Lec. 3) *Pre: teacher certification.* Staff

**512 Educational Psychology/Classroom Learning (I and SS, 3)** Survey and analysis of classroom learning literature. Particular attention paid to interaction of theory and research for instructional practice. Introduces relevant

measurement, statistical, and research concepts. (Seminar) *Pre: previous course in psychology, or permission of instructor.* Purnell

**514 Current Trends in Elementary Education (I, 3)** For teachers and administrators, the most effective use of instructional materials, media of communication, and personnel in elementary school. (Lec. 3) *Pre: 529 or permission of chairperson.* In alternate years. Next offered 1999–00. Staff

**516 Teaching English as a Second Language to Adults (II, 3)** Methods and materials for educators who teach English as a second language to adults. (Lec. 3) *Pre: permission of instructor.* Staff

**517 Teaching Social Studies in the Elementary School (I, II, or SS, 3)** Intensive research in various cross-subject topics within the social studies. Systematic analyses of learning theories and methods as they relate to the teaching of social studies in the elementary grades. (Lec. 3) *Pre: graduate or postgraduate standing.* Staff

**518 Teaching Science in the Elementary School (I or II, 3)** Emphasis on the development, preparation, use, and evaluation of materials appropriate for the elementary classroom from biology, zoology, chemistry, physics, geology, astronomy, electricity, meteorology, and oceanography. (Lec. 3) *Pre: 12 credits in science.* Staff

**520 Teaching of Arithmetic (I, 3)** For the experienced teacher, examination of the principles underlying the teaching of arithmetic in the elementary school; comprehensive survey of materials and methods available for the classroom teacher of arithmetic. (Lec. 3) *Pre: senior or graduate standing.* In alternate years. Next offered 1998–99. Staff

**521 Teaching Basic Reading to Adults (I or II, 3)** Techniques for teaching basic reading skills to illiterate adults; diagnosis, methods, and materials. (Lec. 3) *Pre: 504 or permission of instructor.* Staff

**522 Microcomputer Applications in the Classroom (I and II, 3)** Introduction to the use of microcomputers in elementary and secondary classrooms. History, current use, techniques for evaluating hardware and software, implementation issues, future developments. (Lec. 3) *Pre: senior or graduate standing.* Staff

**528 Teaching Language Arts (II, 3)** For the elementary school classroom teacher. Preparation, presentation, use, and evaluation of methods and materials for teaching the communications skills (emphasis on listening, speaking, and

writing). (Lec. 3) *Pre: senior or graduate standing.* In alternate years. Next offered 1998–99. Staff

**529 Foundations of Educational Research (I and II, 3)** Analysis of the current major research approaches to educational problems with emphasis on interpreting published research involving the language of statistics. Functional skills in basic descriptive statistics needed prior to enrolling. (Lec. 3) Purnell

**530 Qualitative Research and Evaluation (I or II, 3)** Qualitative methods, including ethnography, for obtaining and using data in describing, interpreting, and reaching warranted judgments, particularly about educational and social problems. Emphasis on developing individual projects and writing formal reports. (Lec. 3) Willis

**534 Mathematics in the Secondary School (II, 3)** Implementation of a modern mathematics program in the secondary school through a study of modern mathematics concepts, experimental programs, and instructional planning. (Lec. 3) *Pre: 15 credits in mathematics.* Croasdale

**535 Classroom Observation and Evaluation (I or II, 3)** Practicum in informal, naturalistic methods of observing and evaluating classrooms. Designed to increase teachers' and administrators' understanding of their own and others' classrooms in fostering individual and staff professional development. (Lec. 2, Lab. 2) *Pre: teaching experience, eligibility for teacher certification, or permission of instructor.* Willis

**538 Teaching the Gifted and Talented (I or II, 3)** Social, psychological, legal, and educational issues related to identification, selection, and instruction of gifted and talented students. (Lec. 3) *Pre: one undergraduate general psychology course, graduate standing, or permission of instructor.* Sullivan

**539 Evaluation and Monitoring of Occupational Training Programs (I or II, 3)** Evaluation and monitoring theory and practice for occupational training programs. Focus on development of systems for job training such as CETA, Vocational Education, and private sector programs. (Lec. 3) *Pre: 529 or permission of instructor.* Boulmetis

**540 Learning Disabilities: Assessment and Intervention**  
See Psychology 540.

**563 Teaching Reading to Multicultural Populations (I, 3)** Identification of the strengths of learners whose cultural and socioeconomic backgrounds vary, and the implications for

teaching reading. Special emphasis on the selection and development of appropriate materials and teaching strategies. (Lec. 3) Pre: 424 or permission of instructor. Staff

**564 Reading Diagnosis and Intervention (SS, 4)** Emphasizes traditional and alternative methods for diagnosing readers' weaknesses and strengths. Focuses on matching the diagnosed needs of the individual reader with appropriate instructional intervention strategies. (Lec. 4) Pre: acceptance into the master's program in reading education. Hoyt or Barton

**565 Analysis and Evaluation of Current Research in Reading (I, 3)** In-depth review of reading research on selected topics. Analysis of findings in historical perspective. Implications for reading teachers and reading programs. (Sem. 3) Pre: 424 or permission of instructor. In alternate years. Next offered 1999–00. Staff

**566, 567 Practicum in Reading (I and II, 3 each)** Supervised case studies, practicum, and seminar reports on an individual reading project at either the elementary or secondary level. (120 hours plus seminar) (Practicum) Pre: 564 or permission of instructor. Staff

**569 Middle School Curriculum (SS, 3)** Current middle school curriculum organization and materials with emphasis on the flexibility and integration of various content areas. (Lec. 3) Pre: graduate standing. Staff

**570 Elementary School Curriculum (II, 3)** Modern curriculum in the elementary school with emphasis on the needs of children. Covers language arts, social studies, science, arithmetic, and special subjects. (Lec. 3) Pre: 503, 529 or equivalent. In alternate years. Next offered 1999–00. Staff

**574 Current Trends in Secondary Education (I and II, 3)** Effective use of instructional materials, media of communication, and organization of personnel and current research. (Lec. 3) Pre: 529 or permission of chairperson. Staff

**575 Supervised Field Study/Practicum and Seminar in Education (I and II, 3)** For nonthesis candidates. Lectures, seminars, and field work. Candidates plan and conduct a field study/practicum project approved by the instructor and the student's professor. A formal proposal is developed, submitted, and approved, the project completed, and a formal paper defended. (Practicum) Pre: admission to a master's program in education and permission of instructor. May be repeated for a maximum of 6 credits. Staff

**577 Organization and Administration in Elementary School (I, 3)** Functions and duties of elementary school principals. (Lec. 3) In alternate years. Next offered 1999–00. Staff

**579 Labor Relations and Collective Bargaining in Education**  
See Labor and Industrial Relations 579.

**581 Administering Adult Programs (I or II, 3)** Administration, personnel management, resource management, recruitment, staff development, and supervision within programs dealing with adults as learners. (Lec. 3) Pre: 505 or permission of instructor. Staff

**582 Instructional Systems Development for Adult Programs (I, 3)** Designing and implementing instructional systems. Discussion of the basic tenets underlying theories of instructional technology, curriculum development, and curriculum change as they apply to adult learners in a variety of settings. (Lec. 3) Pre: 581 or permission of instructor. Staff

**583 Planning, Design, and Development of Adult Learning Systems (I, 3)** Overview of the program planning process including goal setting, needs analysis, program planning, and implementing change strategies. Discussion of effective functioning in the role of change agent within an organization. (Lec. 3) Pre: permission of instructor. Staff

**584 The Adult and the Learning Process (I and II, 3)** Examination of the adult as a learner with emphasis on the factors that affect adult learning and learning processes related to instruction. (Lec. 3) Pre: 581 or permission of instructor. Staff

**586, 587 Problems in Education (I and II, 0–3 each)** Advanced work for graduate students in education. Courses conducted as seminars or as supervised individual projects. (Independent Study) Pre: permission of chairperson. May be repeated for credit with different topic. Staff

**593 Teaching Social Studies in the Secondary School (I, II, or SS, 3)** Research and examination of the structure, functions, and problems of teaching social studies in the secondary school. Emphasis on researching current social problems as they relate to their historical antecedents. (Lec. 3) Pre: teacher certification or permission of instructor. Staff

**594 Organization and Supervision of Reading Programs (II, 3)** Various roles of the reading specialist in relation to the other line-staff personnel. Problems concerning the orientation of new teachers, reading research and develop-

ment, in-service programs, and community support. (Lec. 3) Pre: 564. In alternate years. Next offered 1999–00. Staff

**596 Organization Development in Education**  
See Human Development and Family Studies 562.

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**920 Workshop for Teachers (I and II, 1–3)** Current issues in education. Specific topics offered for inservice teachers and administrators. May be repeated with different topic. (Workshop) Pre: teacher certification. Staff

**921, 922, 923 Workshop for Teachers (I and II, 1–3 each)** Current issues in education. Specific topics offered for inservice teachers and administrators. (Workshop) Pre: certified teacher. Staff

## Ph.D. in Education (EDP)

Co-Director: Professor McKinney

**610 Core Seminar I: Issues and Problems in Educational Inquiry and Foundations (I, 3)** Examination of issues and problems related to philosophical and historical aspects of educational thought and the role of society. Empirical analysis of classroom settings is emphasized. (Seminar) Pre: admission to the Ph.D. program in education, concurrent enrollment in 612. Staff

**611 Core Seminar I: Issues and Problems in Educational Inquiry and Foundations (II, 3)** Examination of issues and problems related to philosophical and historical aspects of educational thought and the role of society. Empirical analysis of classroom setting is emphasized. (Seminar) Pre: 610 and 612, concurrent enrollment in 613. Staff

**612 Field Research I (I, 1)** Focusing on classrooms, students examine theory, define problems, collect data, and present findings. A contract is developed among students, the instructors, and field professionals which states the work to be performed. Pre: admission to the Ph.D. program in education, concurrent enrollment in 610. Staff

**613 Field Research I (II, 1)** Focusing on classrooms, students examine theory, define problems, collect data, and present findings. A contract is developed among students, the instructors, and field professionals which states the work to be performed. Pre: 612, concurrent enrollment in 611. Staff

**615 Research Methodologies (II, 3)** Four educational research methodologies (historical, qualitative, quantitative, and philosophical) are reviewed. Each methodology is examined for its contribution to knowledge and understanding of teaching and learning in an educational setting. (Lec. 3) *Pre: concurrent enrollment in 611 or permission of instructor. Staff*

**620 Core Seminar II: Issues and Problems in Human Development, Learning, and Teaching (I, 3)** Issues and problems related to human development, curriculum, teaching, and learning are examined. Ways of gathering and evaluating evidence about school and curriculum effectiveness are emphasized. (Seminar) *Pre: 610, 611, 615, concurrent enrollment in 622. Staff*

**621 Core Seminar II: Issues and Problems in Human Development, Learning, and Teaching (II, 3)** Issues and problems related to human development, curriculum, teaching, and learning are examined. Ways of gathering and evaluating evidence about school and curriculum effectiveness are emphasized. (Seminar) *Pre: 620, concurrent enrollment in 623. Staff*

**622 Field Research II (I, 2)** Focusing on the school, students examine theory, define problems, collect data, and present findings. A contract is developed among the students, instructors, and field professionals which states the work to be performed. *Pre: concurrent enrollment in 620. Staff*

**623 Field Research II (II, 2)** Focusing on the school, students examine theory, define problems, collect data, and present findings. A contract is developed among the students, instructors, and field professionals which states the work to be performed. *Pre: concurrent enrollment in 621. Staff*

**625 Quantitative Analysis in Educational Research (I, 3)** Educational research data is quantitatively analyzed. Data collected during Core Seminar I are analyzed and interpreted. Applications of the General Linear Model to a variety of research designs and analytic strategies are emphasized. (Lec. 3) *Pre: 610, 611, 615, or permission of instructor. Staff*

**630 Core Seminar III: Issues and Problems in Organizational Theory, Leadership, and Policy Analysis (I, 3)** Issues and problems related to applications of organizational theory, leadership theory, and policy analysis are studied. Core seminar examines cases related to district, state, and/or regional educational offices and agencies. (Seminar) *Pre: 620, 621, 622, 623, concurrent enrollment in 632. Staff*

**631 Core Seminar III: Issues and Problems in Organizational Theory, Leadership, and Policy Analysis (II, 3)** Issues and problems related to applications of organizational theory, leadership theory, and policy analysis are studied. Core seminar examines cases related to district, state, and/or regional educational offices and agencies. (Seminar) *Pre: 630, 632, concurrent enrollment in 633. Staff*

**632 Field Research III (I, 1)** Content includes district, state, or regional problems involving educational leadership, school organization, or public policy. A contract is developed among the students, instructors, and field personnel which states the work to be performed. *Pre: concurrent enrollment in 630. Staff*

**633 Field Research III (II, 1)** Content includes district, state, or regional problems involving educational leadership, school organization, or public policy. A contract is developed among the students, instructors, and field personnel which states the work to be performed. *Pre: concurrent enrollment in 631. Staff*

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) *S/U only. Staff*

## Electrical Engineering (ELE)

*Chairperson: Professor Ohley (Electrical and Computer Engineering)*

**201 Digital Circuit Design (I, 3)** Logic gates, Boolean algebra, combinatorial and sequential circuits, analysis and design of sequential systems, multi-input system controllers, asynchronous finite state machines. (Lec. 3) *Pre: sophomore standing. Staff*

**202 Digital Circuit Design Laboratory (I, 1)** Laboratory experience in digital electronics; logic design projects using standard integrated circuits. (Lab. 3) *Pre: credit or concurrent enrollment in 201. Staff*

**205 Microprocessor Laboratory (I and II, 3)** Hands-on familiarization with computer and microprocessor software and hardware. Computer architecture and interfacing with input and output devices. (Lec. 2, Lab. 3) *Pre: credit or concurrent enrollment in MTH 141. Staff*

**210 Introduction to Electricity and Magnetism (I, 3)** Static electric and magnetic fields; Gauss's, Coulomb's, and Ampere's laws; capacitance and inductance. Behavior of electric charges in stationary and time-varying fields.

Lumped versus distributed parameters; electric circuit concepts, principles, and theorems. (Lec. 3) *Pre: MTH 142 and PHY 213. Staff*

**212 Linear Circuit Theory (II, 3)** Kirchhoff's Laws, DC-resistive networks, dependent sources, natural and forced response of first- and second-order circuits, sinusoidal steady-state response, phasors, AC power. (Lec. 3) *Pre: MTH 243 and credit or concurrent enrollment in MTH 362. Staff*

**215 Linear Circuits Laboratory (II, 2)** DC measurements, natural and step response of first- and second-order circuits, AC measurements, impulse and frequency response, operational amplifier circuits. (Lec. 1, Lab. 3) *Pre: credit or concurrent enrollment in 212. Staff*

**220 Passive and Active Circuits (II, 3)** Electrical circuit laws and theorems, transient and steady-state response, phasors, frequency response, resonance. Diode and transistor circuits, digital logic devices. (Lec. 3) *Pre: PHY 204, 214 or ELE 210. Not open to electrical engineering majors. Staff*

**221 Electronic Instruments and Electromechanical Devices (I, 3)** Amplifiers, frequency response, feedback, field effect transistors, operational amplifier applications, electrical measurements. Magnetic circuits, transformers, electromechanical transducers, and systems, DC and AC machines. (Lec. 3) *Pre: 220. Not open to electrical engineering majors. Staff*

**282 Biomedical Engineering Seminar I (II, 1)** Seminar series given by instructor, invited experts, and students with focus on biomedical electronics, medical devices, rehabilitation engineering, and microprocessor-based medical instrumentation. (Seminar) *Pre: sophomore standing in biomedical engineering or permission of instructor. Staff*

*Admission to all 300-level courses in electrical engineering is limited to students formally transferred to the College of Engineering. Prerequisites for all 300-level courses in electrical engineering include mathematics through MTH 243, ELE 210 or PHY 214, ELE 212 and 215. Additional prerequisites are indicated with each course. Exceptions are possible, with permission of the chairperson, for advanced students in other disciplines.*

**305 Introduction to Computer Architecture (I and II, 3)** Architecture of digital computers. CPU microarchitecture. Instruction execution cycle. Instruction sets. The memory hierarchy. Pipelining, instruction level parallelism, parallel computing. Networks. Register-level design and

simulation of a simple computer. (Lec. 3) Pre: 201, 202, 205; and one of CSC 200, 201 or 211. Staff

**313 Linear Systems** (I, 3) Fourier series, Fourier transform, bilateral Laplace transform, transfer function, transient and steady-state response, natural response and stability, signal flow graphs, convolution integral, introduction to state-space analysis. (Lec. 2, Lab. 3) Pre: 212. Staff

**314 Linear Systems and Signals** (I and II, 3) Continuous-time and discrete-time systems, frequency response, stability criteria, z-transforms, filters, sampling, introduction to controls systems, and applications. (Lec. 3) Pre: 313. Staff

**322 Electromagnetic Fields I** (II, 3) Electrostatics and magnetostatics, forces on charged particles. Analysis employs vector algebra and vector calculus in orthogonal coordinates. Simple applications to engineering problems. (Lec. 3) Pre: MTH 243 and one of the following—ELE 210, PHY 204 or 214. Staff

**331 Introduction to Solid State Devices** (I, 3) Properties of solids, chiefly semiconductors, which are utilized in modern electronic devices. The physics of these materials and devices is stressed, but some time is devoted to fabrication technology and applications. (Lec. 3) Pre: PHY 306 or 341 or equivalent. Staff

**342 Electronics I** (II, 4) Introduction to semiconductor devices, diode and transistor circuits. Biasing, analysis, and design of BJT and FET amplifiers. SPICE, power amplifiers, digital logic families, TTL, ECL, CMOS. (Lec. 3, Lab. 3) Pre: 212 and 215. Staff

**343 (443) Electronics II** (I, 5) Signal flow graph analysis techniques, biasing and stability, small signal amplifiers, frequency response characteristics, operational amplifiers, SPICE, and nonlinear circuits. Computer-aided design of amplifiers and active filters. (Lec. 3, Lab. 5) Pre: 342. Staff

**382 Biomedical Engineering Seminar II** (I, 1) Seminar series given by instructor, invited experts, and students with focus on physiological system modeling, biomechanics, biomaterials, tissue engineering, artificial organs, and biosensors. (Seminar) Pre: junior standing in biomedical engineering or permission of instructor. Staff

**391, 392 Honors Work** (I and II, 1–3 each) Independent study and seminar-type work under close faculty supervision. Discussion of advanced topics in electrical engineering in prepa-

ration for graduate work. (Independent Study) Pre: junior standing and permission of chairperson. Staff

*Prerequisites for all 400-, 500-, and 600-level electrical engineering courses include mathematics through calculus (MTH 243), at least 6 credits in circuit theory, and 3 credits in electromagnetic fields. Additional prerequisites are indicated with each course. Some circuits and fields prerequisites may be waived for 482, 545, 588, and 589 for students with suitable backgrounds.*

**400 Introduction to Professional Practice** (I or II, 1) Discussions with faculty, visiting engineers, and invited speakers on ethical, social, economic, and safety considerations in engineering practice; career planning; graduate study. (Seminar) Pre: senior standing in electrical engineering or computer engineering. Not for graduate credit. Staff

**401 Lasers, Optical Systems, and Communications** (I, 4) Concepts of modern optics, coherence, diffraction, and Fourier optics, optical resonators, Gaussian beam optics, laser fundamentals, and light amplification. Course includes a design project concerning an optical system or instrument. (Lec. 3, Lab. 3) Pre: 322. Staff

**405 Digital Computer Design** (II, 4) Hardware implementation of digital computers. Arithmetic circuits, memory types and uses, control logic, basic computer organization, microprogramming, input/output circuits, microcomputers. (Lec. 3, Lab. 3) Pre: 205 or CSC 311. Staff

**408 Computer Organization Laboratory** (I and II, 4) Engineering design problems involving modern microprocessor systems, operation of ALUs, data paths, control units, input and output, memory, and networks. Computer engineering majors integrate their computers and compilers; others perform another significant project. (Lec. 2, Lab. 5) Pre: 305. Staff

**423 Electromagnetic Fields II** (I, 4) Transmission lines, Maxwell's equations, wave equation, reflection and refraction phenomena, waveguides and antennas. Design projects requiring application of electromagnetic theory and use of numerical methods. (Lec. 4) Pre: MTH 362 and ELE 322. Not for graduate credit. Staff

**427 Electromechanical Systems Laboratory** (I, 4) State-variable models. Electromechanical devices and systems in translation and rotation. Design of sensors, actuators, and systems as used in control applications. (Lec. 3, Lab. 3) Pre: 313 and 322. Staff

**432 Electrical Engineering Materials** (II, 4) Continuation of 331. Electronic and optical properties of materials, mainly semiconductors, applied to the performance and design of electronic devices. Measurements and analysis of these properties will be performed in the laboratory. (Lec. 4) Pre: 331 or equivalent. Staff

**436 Communication Systems** (I, 4) Representation of signals and noise. Basic principles of modulation and demodulation. Waveform and digital transmission systems. Design of a component of a communication system. (Lec. 4) Pre: 313 and 314. Staff

**437 Computer Communications** (II, 3) Computer networks, layering standards, communication fundamentals, error detection and recovery, queuing and delay—throughput trade-offs in networks, multiple-access channels, design issues in wide and local area networks. (Lec. 3) Pre: 436 or MTH 451 or IME 411. Staff

**444 Advanced Electronic Design** (II, 4) Design of advanced digital circuits, distributed circuits, circuit and logic simulation, interfacing, designs based on MSI and LSI components, EPROMs, and PALs. (Lec. 3, Lab. 3) Pre: 342. Staff

**447 VLSI Design and Simulation** (II, 4) Design and simulation of digital integrated circuits. Extensive use of software tools such as magic, circuit extractors, and simulators. Student designs are fabricated and tested. (Lec. 2, Lab. 5) Pre: 342. Staff

**457 Feedback Control Systems** (I, 3) Fundamental techniques for the analysis and design of linear feedback systems. Stability, sensitivity, performance criteria, Bode diagrams, Nyquist criterion, root locus techniques, state variables, and compensation methods. (Lec. 3) Pre: 313. Staff

**458 Systems Laboratory: Digital Control Laboratory** (II, 4) Design of digital control systems using state-space techniques. State feedback and observers. Laboratory includes computer simulation and hardware implementation of control laws for electromechanical systems. (Lec. 3, Lab. 3) Pre: 457 and permission of instructor. Staff

**482 Biomedical Engineering Seminar III** (II, 1) Seminar series given by instructor, invited experts, and students with focus on biomedical signals and systems, computers in medicine, technologies for health care, and biomedical ethics. (Seminar) Pre: junior standing in biomedical engineering or permission of instructor. Staff

**488 Biomedical Engineering I** (I, 4) Medical imaging: X-rays, tomographic reconstruction

techniques, angiography, radio-nuclide imaging, diagnostic ultrasound, magnetic resonance imaging, picture archiving and communication system. Modeling of physiological systems: nerve system, cardiopulmonary circulation. Design project. *Pre: senior standing in biomedical engineering or permission of instructor. Not for graduate credit. May not be taken by students who have credit in 588.* Staff

**489 Biomedical Engineering II** (II, 4) Medical instrumentation: patient safety, isolation and noise-rejection techniques, pacemaker, cardiac-assist devices. Physiological measurements: pressure, flow, biosensors. Biomedical signal processing: electrocardiography, electroencephalography. Medical instrumentation laboratories. Design project. *Pre: 488 or 588 or permission of instructor. Not for graduate credit. Not open to students who have credit in 589.* Staff

**491, 492, 493 Special Problems** (I and II, 1 each) Special engineering problems assigned to student according to his or her interests and capabilities. (*Independent Study*) *Pre: permission of instructor.* Staff

**495 Electrical Engineering Practice I** (I, II, or SS, 3) Industrial experience in electrical engineering at companies or government laboratories selected by department. Student works on a design or other engineering project under supervision of engineers from industry and URI faculty. Major written report required. (*Practicum*) *Pre: senior standing in electrical engineering and permission of chairperson. Not for graduate credit in electrical engineering.* Staff

**501 Linear Transform Analysis** (I, 3) Fourier and Laplace transform analysis of continuous-time systems, causality and spectral factorization, evaluation of inverse transforms, z-transform analysis of discrete-time systems, Hilbert transforms, discrete Fourier transforms, generalized transforms. (Lec. 3) Staff

**502 Nonlinear Control Systems** (II, 3) Analysis of nonlinear systems: phase-plane analysis, Lyapunov theory, advanced stability theory, describing functions, design of nonlinear control systems: feedback linearization, sliding control. (Lec. 3) *Pre: 503 or permission of instructor.* Staff

**503 (or MCE 503) Linear Control Systems** (I or II, 4) State-variable description of continuous-time and discrete-time systems, matrices and linear spaces, controllability and observability, pole-placement methods, observer theory and state reconstruction, MATLAB exercises for simulation and design. (Lec. 4) *Pre: 314 or MCE 366 or equivalent and MTH 215 or equivalent.* Staff

**504 (or MCE 504) Optimal Control Theory** (II, 3) Quadratic performance indices and optimal linear control, frequency response properties of optimal feedback regulators, state estimation, separation theorem, optimal control of nonlinear systems, Pontryagin's minimum principle. (Lec. 3) *Pre: 503.* Staff

**506 Digital Signal Processing** (II, 4) Digital representations of signals and noise; sampling and aliasing; design of digital-processing systems for signal parameter estimation and signal detection; digital filter structures; discrete Fourier transform and FFT algorithm, periodogram. (Lec. 4) *Pre: 501 and 509. May be taken concurrently.* Staff

**509 Introduction to Random Processes** (I, 4) Probability and random variables; random process characterizations and techniques. Useful models. Discrete and continuous systems with random inputs. Applications to detection, and filtering problems. (Lec. 4) *Pre: knowledge of calculus, linear systems, and transform methods.* Staff

**510 Communication Theory** (II, 4) Communication theory for discrete and continuous channels. Optimum-receiver principles and signal design. Fundamentals of information theory. Channel models, modulation techniques, source encoding, error control coding, the decoding of algorithms. (Lec. 4) *Pre: 509.* Staff

**511 Engineering Electromagnetics** (I, 3) Review of electrostatics and magnetostatics. Maxwell's equations, wave propagation in dielectric and conducting media. Boundary phenomena. Radiation from simple structures. Relations between circuit and field theory. (Lec. 3) Staff

**515 Quantum Electronics** (I or II, 3) Laser engineering and applications, interaction of radiation with atoms, optical resonators, electro-optic modulation, harmonic generation, parametric oscillation and frequency conversion, noise in laser amplifiers and oscillators. (Lec. 3) *Pre: PHY 341 or permission of instructor.* Staff

**525 Fiber Optic Communication Systems** (II, 3) Survey of important topics in optical communication devices and systems. The physical principles and operation of lasers, LEDs, fibers, and detectors are covered. (Lec. 3) *Pre: 423, 331, 401 or equivalent.* Lengyel

**526 Fiber Optic Sensors** (II, 3) Theory and performance of different types of intensity-, phase-, and polarization-modulated fiber optic sensors (FOS) and their application areas. Properties of

various active and passive devices used in building FOS. (Lec. 3) *Pre: 401 or equivalent.* Sunak

**527 Current Topics in Lightwave Technology** (I, 3) Current topics of importance in lightwave technology including coherent fiber optical communication systems, optical amplifiers, active and passive single-mode devices, infrared optical fibers. Material will be taken from recent literature. (Lec. 3) *Pre: 525 or equivalent.* Sunak

**531 Solid State Engineering I** (I or II, 3) Review of quantum mechanics, crystal properties, energy-band theory, introduction to scattering, generation-recombination processes, Boltzmann's transport equation, semiconductor junctions, devices. (Lec. 3) *Pre: 331 or equivalent.* Staff

**532 Solid State Engineering II** (I or II, 3) Properties of insulators, semiconductors, conductors and superconductors from quantum mechanical principles. Semiconductor physics and band theory of solids as applied to current semiconductor and optoelectronic devices. (Lec. 3) *Pre: 531 or equivalent.* Staff

**533 Bipolar Devices** (II, 3) Device physics and computer modeling of bipolar junction devices. p-n junctions, metal semiconductor contacts, heterojunctions, bipolar junction transistors, BJT modeling, small signal equivalent circuits. (Lec. 3) *Pre: 331 or permission of instructor.* Staff

**534 MOS Devices** (I, 3) Device physics and computer modeling of MOS devices, capacitors, metal semiconductor contacts, PMOS, NMOS, and DMOS transistors, short channel effects, modeling, small signal equivalent circuits. (Lec. 3) *Pre: 331 or permission of instructor.* Staff

**536 Semiconductor Electronics** (I, 3) Design of bipolar integrated circuits. Current sources, voltage references, emitter coupled pairs, op-amps and oscillators. Effects of process variations and temperature. Student integrated circuit designs are fabricated and tested. (Lec. 3) *Pre: 331 or equivalent.* Staff

**537 VLSI System Design** (I or II, 4) Very large scale digital integrated circuit design. Computer simulation and testing. Large system design using hardware description languages. In lab, students participate in the design of a chip. (Lec. 3, Lab. 3) *Pre: graduate or senior standing.* Staff

**539 Analog VLSI** (I or II, 3) Theory and techniques of analog NMOS and CMOS integrated circuits. Device modeling, circuit simulation, and chip design are studied using amplifiers, A/Ds, and switched-capacitor circuits as examples. (Lec. 3) *Pre: 537.* Daly

**542 Fault-Tolerant Computing (I or II, 3)** Fault and error modeling, reliability modeling and evaluation, fault-tolerant computer systems, digital and mixed analog/digital VLSI testing, concurrent error detection, and design for VLSI yield enhancement. (Lec. 3) *Pre: 405 or equivalent or permission of instructor. Staff*

**543 (or CSC 519) Computer Networks (I or II, 4)** Computer network architectures, data link control and access protocols for LANs, internet protocols and applications, software and hardware issues in computer communication, delay analysis, and current research in computer networking. (Lec. 4) *Pre: 437 or equivalent or CSC 412 or equivalent. Staff*

**544 Computer Arithmetic for VLSI (I or II, 4)** Hardware algorithms and implementation of fixed and floating-point adders, multipliers and dividers. Error analysis and time/gauge complexity of arithmetic operations. Design simulation and evaluation with hardware description language. (Lec. 4) *Pre: 405 or equivalent. Staff*

**545 Design of Digital Circuits (I or II, 4)** Design techniques for digital systems. Combinational circuits and synthesis and evaluation of finite-state machines. Test generation and design for testability for large digital systems. Hardware description language, exercises in the design and simulation of complex digital systems. (Lec. 4) *Pre: 405 or equivalent. Staff*

**546 Computer-Based Instrumentation (I, 3)** Design of memory systems, input-output techniques, direct memory access controllers, instrument buses, video displays, multiprocessors-coprocessors, real-time operations, device handler integration into high-level language and mass storage. (Lec. 2, Lab. 3) *Pre: 205, 314, and concurrent enrollment in 405. Ohley and Sun*

**548 Computer Architecture (I or II, 4)** Classification and taxonomy of computer architectures. RISC vs. CISC. Cache and virtual memory systems. Pipeline and vector processors. Multi-processor and multi-computer systems. Inter-processor communication networks. Dataflow machines. Parallel processing languages. (Lec. 4) *Pre: 405 or equivalent or permission of instructor. Staff*

**549 Computer System Modeling (I, 4)** Basic techniques used in computer system modeling, queuing theory, stochastic processes, Petri net, product form networks, approximation techniques, solution algorithms and complexity, computer simulation, performance studies of modern computer systems. (Lec. 4) *Pre: 548 and 509 or MTH 451. Staff*

**571 Underwater Acoustics I**  
See Ocean Engineering 571.

**575 (or MTH 575) Approximation Theory and Applications to Signal Processing (II, 3)** Interpolation; uniform approximation; least squares approximation; Hilbert space; the projection theorem; computation of best approximations; applications to the design of filters and beamformers, position location and tracking, signal parameter estimation. (Lec. 3) *Pre: advanced calculus, elements of the theory of functions of a complex variable, and elements of linear algebra. Staff*

**577, 578 Seminar in Sensors and Surface Technology (I and II, 1)** Students, faculty and invited outside speakers present and discuss selected topics related to research interests of the Sensors and Surface Technology Partnership. (Seminar) *Pre: permission of instructor. May be repeated. S/U credit. Staff*

**581 Special Topics in Artificial Intelligence**  
See Computer Science 581.

**583 (or CSC 583) Computer Vision (I, 3)** Algorithms used to extract information from two-dimensional images. Picture functions. Template matching. Region analysis. Contour following. Line and shape descriptions. Perspective transformations. Three-dimensional reconstruction. Image sensors. Interfacing. Applications. (Lec. 3) *Pre: MTH 362 or equivalent. Staff*

**584 (or STA 584) Pattern Recognition (II, 3)** Random variables, vectors, transformations, hypothesis testing, and errors. Classifier design: linear, nonparametric, approximation procedures. Feature selection and extraction: dimensionality reduction, linear and nonlinear mappings, clustering, and unsupervised classification. (Lec. 3) *Pre: 509 or introductory probability and statistics, and knowledge of computer programming. Staff*

**585 Digital Image Processing (I or II, 3)** Digital representation of images. Image improvement techniques: restoration models and spatial, point, spectral, and geometric operators. Image analysis: morphological operators, edge detection, feature extraction, segmentation, and shape analysis. (Lec. 2, Lab. 2) *Pre: 501 and 509. Staff*

**588 Biomedical Engineering I (I, 4)** Medical imaging: x-rays, tomographic reconstruction techniques, angiography, radionuclide imaging, diagnostic ultrasound, magnetic resonance imaging, picture archiving and communication system. Modeling of physiological systems: the nerve system and cardiopulmonary circulation.

Design project. (Lec. 3) *Pre: senior standing in biomedical engineering or permission of instructor. May not be taken by students who have credit in 488. Staff*

**589 Biomedical Engineering II (II, 4)** Medical instrumentation: patient safety, isolation and noise-rejection techniques, pacemaker, cardiac-assist devices. Physiological measurements: pressure, flow; biosensors. Biomedical signal processing: electrocardiography and electroencephalography. Medical instrumentation laboratories. Design project. *Pre: 588 or permission of instructor. May not be taken by students who have credit in 489. Staff*

**591, 592 Special Problems (I and II, 1–3 each)** Advanced work under supervision of a staff member arranged to suit individual requirements of student. (Independent Study) *Pre: graduate standing. May be repeated for a maximum of 6 credits. Staff*

**599 Master's Thesis Research (I and II, 1–9)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) *S/U credit.*

**601 Graduate Seminar (I or II, 1)** Seminar discussions presented by faculty and outside speakers on topics of current research interest. (Seminar) *May be repeated for a total of 2 credits. May be taken concurrently with 602. S/U credit. Staff*

**602 Graduate Seminar (I or II, 1)** Student seminars including the presentation of research results and detailed literature surveys. *May be repeated for a total of 2 credits. S/U credit. Staff*

**606 Digital Filter Synthesis (I, 3)** Review of z-transforms and discrete-time systems, properties of digital-filter networks, design of finite and infinite-impulse-response filters, accuracy considerations for coefficients and data, hardware implementation, system examples. (Lec. 3) *Pre: 506 or equivalent. Jackson*

**625 Guided Waves in Optical and IR Fibers (I, 3)** Guided electromagnetic wave aspects of optical and IR fibers, novel approximation methods for solution of vectorial and scalar wave equations in optical fibers, theory of transparency and nonlinear optical interactions in solids as applied to design of optical fibers. (Lec. 3) *Pre: 511 and 525. Mitra*

**648 Advanced Topics in Computer Architectures (I or II, 3)** Modern high-performance computer structures, parallel and distributed hardwares and softwares, instruction level parallelism, memory hierarchy, fault tolerant computing, and future generation computers. (Lec. 3) *Pre: 548. Staff*



**658 Instruction Level Parallelism (I or II, 4)** Advanced architectural methods for improving microprocessor performance. Branch effect reduction techniques based on both hardware and software. Reduced control dependencies, branch prediction, speculative execution, eager execution, disjoint eager execution. (Lec. 3) *Pre: 548 or equivalent.* Staff

**660 Advanced Topics in System Theory (I or II, 3)** Seminar for advanced students. Selected topics of current research interest. Material will be drawn primarily from recent literature. (Lec. 3) *Pre: permission of instructor.* Staff

**661 Estimation Theory (I or II, 3)** Extraction of information from discrete and continuous data, best linear estimation, recursive estimation, optimal linear filtering, smoothing and prediction, nonlinear state and parameter estimation, design and evaluation of practical estimators. (Lec. 3) *Pre: 503 and 509.* Staff

**665 Modulation and Detection (I or II, 3)** Advanced treatment of modulation and detection theory. Minimum meansquare error, maximum likelihood, and maximum posterior probability estimators. Applications to communications systems and to radar and sonar systems. (Lec. 3) *Pre: 510.* Kay or Tufts

**670 Advanced Topics in Signal Processing (I or II, 3)** Seminar for advanced students. Selected topics of current research interest. Material will be drawn primarily from recent literature. (Lec. 3) *Pre: 506 and 606.* Staff

**672 Underwater Acoustics II**  
See Ocean Engineering 672.

**677 (or OCE 677) Statistical Sonar Signal Processing (I or II, 3)** Basic results in probability and statistics, signal processing, and underwater acoustics are applied to the design of detection, estimation, and tracking in active sonar, passive sonar, and underwater acoustic communication. (Lec. 3) *Pre: MTH 451 or ELE 509, ELE 506, and ELE 571 (or OCE 571), or equivalents. ELE 510 is useful and closely related, but not required.* Stepanishen or Tufts

**691, 692 Special Problems (I and II, 1–3 each)** Advanced work under supervision of a staff member arranged to suit individual requirements of a student. (*Independent Study*) *Pre: permission of chairperson. May be repeated for a maximum of 6 credits. S/U credit.* Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) *S/U credit.*

## Engineering (EGR)

**091 Cooperative Education Internship: Part-Time (I and II, 0)** Educational work experience in a selected engineering field. Ten to 20 hours per week at the employer's facility. (*Practicum*) *Pre: matriculating status with at least junior standing and 2.50 quality point average.* Vandeputte

**092 Cooperative Education Internship: Full-Time (I and II, 0)** Educational work experience in a selected engineering field. Students will work full-time as determined by the employer. (*Practicum*) *Pre: matriculating status with at least junior standing and 2.50 quality point average.* Vandeputte

**105 Foundations of Engineering I (I, 1)** Introduction to engineering. Problem solving. (Lec. 1) Staff

**106 Foundations of Engineering II (II, 2)** Engineering problem solving. (Lec. 1, Lab. 2) *Pre: MTH 141 or concurrent registration in MTH 141.* Staff

**411 (or GER 411) Advanced Technical German (II, 3)** Seminar on advanced scientific and engineering topics in an international context. All reading, discussion, and associated writing is conducted in German. (Lec. 3) *Pre: any 400-level course in German and senior standing in an approved engineering program. Not for graduate credit.* Lengyel and Karamanlidis

## English (ENG)

*Chairperson:* Professor Donnelly

**103 Introduction to Literature**  
See Writing 103.

**160 (or CLS 160) Masterpieces of Literature (I and II, 3)** Introduction to the major works of world literature. (Lec. 3) Staff (A)

**205 Creative Writing (I and II, 3)** Various types of creative composition: essays, stories, and poetry. Students analyze work by class members and by professional writers. Only students with an aptitude for writing should elect this course. (Lec. 3) *Pre: permission of instructor.* Staff

**241, 242 American Literature I, II (I and II, 3 each)** 241: Selections from American literature, beginnings to the mid-nineteenth century. 242: Selections from American literature, mid-nineteenth century to the present. (Lec. 3) 241 *not required for 242.* Staff (A)

**243 The Short Story (I and II, 3)** Critical study of the short story from the early nineteenth century to the present. (Lec. 3) Staff (A)

**247 (or AAF 247) Introduction to Pan-African Literature (II, 3)** Comparative survey of major themes, genres, and motifs in the literature of Africa, the Caribbean, and Black America. Study of both oral and written literature with emphasis on the religious, historical, sociopolitical, and cultural ideas of black people. (Lec. 3) Staff (A)

**248 (or AAF 248) Afro-American Literature from 1900 to Present (II, 3)** Survey of modern Afro-American literature from publication of DuBois' *Souls of Black Folk* (1903) to the present. Also includes study of the literature of the Harlem Renaissance and the Black Arts Movement of the 1960s and 1970s. (Lec. 3) Staff (A)

**251, 252 English Literature I, II (I and II, 3 each)** 251: Selections from English literature, beginnings to 1798. 252: Selections from English literature, 1798 to the present. (Lec. 3) Staff (A) for 251; (A) (F) for 252.

**260 Women and Literature (I and II, 3)** Critical study of selected topics. (Lec. 3) Staff (A)

**263 The Poem (I and II, 3)** Introduction to the study of poetry. (Lec. 3) Staff (A)

**264 The Drama (I and II, 3)** Introduction to the study of drama. (Lec. 3) Staff (A)

**265 The Novel (I and II, 3)** Introduction to the study of novels. (Lec. 3) Staff (A)

**270 Literature of the Bible (I and II, 3)** Introduction to poetry and narrative in the Old Testament and the Apocrypha, primarily in the Authorized (King James) Version. (Lec. 3) Staff

**280 Shakespeare (I and II, 3)** Introduction to the major plays and poetry of Shakespeare. (Lec. 3) Staff (A)

**300 Literature into Film (I and II, 3)** Analysis of themes, techniques, and form in literature and film aimed at developing critical appreciation of printed and film narratives. Emphasis will alternate between fiction and drama. (Lec. 3) *May not be repeated.* Staff

**302 Topics in Film Theory and Criticism (I or II, 3)** Introduction to film theory and criticism. Emphasis on semiotics, auteur theory, psychoanalysis, genre studies, feminist theory, materialist critique, or cultural studies, with focus on range of popular, experimental, and documentary film traditions. *May be repeated for credit when taken with different emphasis.* (Lec. 3) Walton or Leo

**305 Advanced Creative Writing** (*I and II, 3*) For students with talent and experience in creative writing and a good reading background in the genre(s) they wish to write in, whether short fiction, drama, or poetry. (*Lec. 3*) *May be repeated.* Staff

**310 Techniques of Critical Writing** (*I and II, 3*) Practice in the writing of literary criticism. Methods of literary analysis illustrated and applied to specific works. (*Lec. 3*) Staff

**330 The Structure of American English** (*I and II, 3*) A comparison of prescriptive and descriptive grammars and their effect on our attitudes concerning American English. The influence of contemporary language studies on literary criticism and the teaching of English. (*Lec. 3*) Staff (S)

**332 The Evolution of the English Language** (*I and II, 3*) The history of English from its German origins, through the Norman Conquest, the Renaissance, and the Age of Enlightenment. Special attention to the cultural forces that molded a standard dialect. (*Lec. 3*) Staff (S)

**335 Interdisciplinary Studies in Comparative Literature**

See Comparative Literature Studies 335.

**336 The Language of Literature** (*I and II, 3*) An introduction to those linguistic theories which have recently been applied to literary style, meaning, and evaluation. Intensive study of the language of a particular writer or work. (*Lec. 3*) Staff

**337 Varieties of American English** (*I and II, 3*) A study of the regional and social varieties of American English with emphasis on and field work in New England dialects. (*Lec. 3*) Staff

**340 Literary Heritage of New England to 1860** (*I and II, 3*) Literature of New England through the colonial, national, and romantic periods to the Civil War. Field trips will be taken to important literary sites. (*Lec. 3*) Staff

**346 American Film Classics** (*I and II, 3*) Study of major American film genres (the Western, Film Noir, Screwball Comedy) and of prominent American directors (Ford, Hitchcock, Hawks). Emphasis will vary. (*Lec. 3*) *May be repeated with different topics.* Staff

**347 American Romanticism** (*I and II, 3*) Poetry and prose of the American Romantic movement. Focus on Irving, Poe, Emerson, Thoreau, Hawthorne, Melville, and others. (*Lec. 3*) Staff

**348 American Realism** (*I and II, 3*) Major developments in American Realism and Naturalism. Emphasis on the work of Twain, Howells, Crane, James, Dreiser. (*Lec. 3*) Staff

**349 Modern American Literature** (*I and II, 3*) Poetry, drama, and fiction of the period during and since World War I. Emphasis on major figures such as Frost, Eliot, Stevens, O'Neill, Faulkner, Hemingway, and others. (*Lec. 3*) Staff

**350 Literary Theory and Criticism**  
See Comparative Literature Studies 350.

**360 Africana Folk Life**  
See African and Afro-American Studies 360.

**362 (or AAF 362) Afro-American Poetry and Drama** (*I, 3*) Critical study of Afro-American poetry and drama in the continued oral and written heritage of Africa and America. Focus on Hughes, Dunbar, Walker, Bullins, Baraka, Giovanni, Baldwin. (*Lec. 3*) Staff

**363 (or AAF 363) Afro-American Fiction** (*I, 3*) Critical study of the linguistic and thematic development of the Afro-American short story and novel. Focus on Wells Brown, Dunbar, Bontemps, Hughes, Wright, Ellison, Margaret Walker, Morrison, Reed, Alice Walker, and Baldwin. (*Lec. 3*) Staff

**364 (or AAF 364) The African Novel** (*II, 3*) Critical study of contemporary African writers, with a focus on the literary traditions and issues expressed in the novel. (*Lec. 3*) *Pre: AAF 250.* Staff

**366 Greek and Roman Drama** (*I, 3*) Survey of Greek and Roman drama with special emphasis on art and achievement of major dramatists: Aeschylus, Sophocles, Euripides, Aristophanes, Plautus, Terence, and Seneca. (*Lec. 3*) Staff (F)

**367 The Epic** (*I and II, 3*) Studies in epic literature from Homer to the modern period. Historical emphasis will vary with instructor. (*Lec. 3*) Staff

**370 British Literature of the Middle Ages** (*II, 3*) Introduction to various types of medieval literature, usually read in modern English versions. Chronicle and romance, lyric and satire, visionary and homiletic writings, drama. (*Lec. 3*) Staff

**371 British Literature of the Renaissance I** (*I and II, 3*) Study of developments in sixteenth-century poetry and prose with emphasis on the nondramatic works of More, Wyatt, Sidney, Spenser, Marlow, Shakespeare, and others. (*Lec. 3*) Staff

**372 British Literature of the Renaissance II** (*I and II, 3*) Study of developments in prose and poetry of the seventeenth century, especially the works of Bacon, Donne, Johnson, Browne, Herbert, Marvell, Milton, and others. (*Lec. 3*) Staff

**374 British Literature of the Enlightenment** (*I and II, 3*) Study of major trends in verse, satire, prose, drama, and fiction from the late seventeenth and eighteenth centuries in such writers as Dryden, Congreve, Swift, Johnson, and Sterne. (*Lec. 3*) Staff

**376 British Romanticism** (*I and II, 3*) Major poetry and significant nonfiction prose of Burns, Blake, Wordsworth, Coleridge, Byron, Shelley, Keats, and others. (*Lec. 3*) Staff

**377 Victorian Literature** (*I and II, 3*) Poetry, nonfiction prose, and novels from the early Victorian to the Edwardian periods. Emphasis on writers such as Carlyle, Browning, Dickens, Tennyson, Arnold, Hardy, Hopkins, Wilde, and others. (*Lec. 3*) Staff

**379 Modern British Literature** (*I and II, 3*) Poetry, drama, nonfiction prose, and selected fiction of the modern period. Emphasis on the work of Conrad, Joyce, Lawrence, Yeats, Thomas, and others. (*Lec. 3*) Staff

**380 Chaucer** (*I and II, 3*) Selections from Chaucer's major poems, read in Middle English. (*Lec. 3*) Staff

**384 Milton** (*I and II, 3*) Poetry and prose of John Milton, with special emphasis on *Paradise Lost*. (*Lec. 3*) Staff

**385 Women Writers** (*I and II, 3*) Analysis of the poetry, drama, or fiction of women writers. Emphasis on nineteenth-century, twentieth-century, or contemporary authors. Course may be repeated for credit when taken with different emphasis. (*Lec. 3*) Staff

**394, 395 Independent Study** (*I and II, 1-3 each*) Extensive individual study and research, culminating in a substantial essay. (*Independent Study*) *Pre: permission of chairperson. May be repeated for a maximum of 6 credits.* Staff

**396 Literature of the Sea: The Rumowicz Seminar** (*I and II, 3*) Poetry and prose of the sea. Guest lecturers and field trips. (*Lec. 3*) Schoonover

**397 The Literary Landscape of Britain** (*SS, 3*) Taught in England, second summer session. Examines impact of English social and natural landscapes on, and their treatment in, selected

literary works. (Lec. 3) *Usually taught in conjunction with HIS 397.* Staff (F)

**399 Special Topics in Literature (I and II, 3)** Specialized topics in the study of literature offered by specialists in the field. (Lec. 3) Staff

**445 Ethnic Images in American Literature (II, 3)** Critical study of writings by and about various ethnic groups in American literature. (Lec. 3) Staff

**446 Modern Drama (I and II, 3)** Studies in representative works by modern American, British, Irish, and continental playwrights. (Lec. 3) Staff

**447 Modern British and American Poetry (I and II, 3)** Studies in major contributions and movements in British and American poetry from 1900 to present. (Lec. 3) Staff

**448 Traditions of the American Novel (I and II, 3)** Studies in the development of the American novel up to 1900. (Lec. 3) Staff

**458 Traditions of the British Novel (I and II, 3)** Studies in the development of the British novel up to 1900. (Lec. 3) Staff

**468 Traditions of the Continental Novel (I and II, 3)** Studies in major developments of the European novel (excluding England and Ireland) up to 1900. (Lec. 3) Staff

**469 The Modern Novel (I and II, 3)** Studies in major developments in the novel since 1900, with primary emphasis on the British, American, or the continental novel. (Lec. 3) Staff

**472 Shakespeare's Plays (I and II, 3)** Critical studies in Shakespeare's drama. *May be repeated once with alternate syllabus.* (Lec. 3) Staff

**474 (or AAF 474) Topics in Pan-African Literature (II, 3)** Intensive study of specific authors, literary movements, or comparative themes in African and Afro-American literatures. (Lec. 3) *May be repeated for credit when taken with different topics.* Staff

**477 Traditions of British Drama (I and II, 3)** Studies in major developments in British drama up to 1900. (Lec. 3) Staff

**485 American Authors (I and II, 3)** Intensive study of the work of one or two outstanding American writers. May be repeated, barring duplication of writers being studied. (Lec. 3) Staff

**486 British Authors (I and II, 3)** Intensive study of the work of one or two outstanding British writers. May be repeated, barring duplication of writers being studied. (Lec. 3) Staff

**488 (or WRT 488) Traditions of Nonfiction (I, 3)** Intensive historical study of a nonfiction form (essay, autobiography, documentary, true crime account, or science text). Form varies with each course offering. (Lec. 3) *May be repeated for credit.* Staff

**494 Internship in English (I, 3)** Practical job experience related to the English major. Exploration of career skills, goals, job search strategies. Placements in publishing and other environments. 120 hours, weekly one-hour class meeting. (Practicum) *Pre: complete application, permission of instructor. Not for graduate credit.* Stein

**499 Senior Seminar (I and II, 3)** Intensive study of literature and literary criticism as a discipline through selected works and authors, English and American, culminating in a substantial research project. (Seminar) *Open only to senior English majors. Not for graduate credit.* Staff

*All 500-level courses require graduate standing or permission of instructor. All courses except ENG 510 and 512 may be repeated if emphasis changes.*

**501 Workshop in Creative Writing (I or II, 3)** Close supervision and discussion of creative writing, including poetry, nonfiction, short prose forms, scripts, and novels. (Lec. 3) Staff

**510 Introduction to Professional Study (I or II, 3)** Orientation to the major discourses, critical frameworks, and databases constituting graduate research in language and literary studies, including computer-assisted research methodologies. (Lec. 3) Staff

**512 Modern Rhetorical Theory**  
See Writing 512.

**514 Studies in Critical Theories (I or II, 3)** Introduction to historical or contemporary studies in critical theory; e.g., modernity and postmodernity, aesthetics, politics, interpretative traditions, audiences. May explore semiotic, psychoanalytic, materialist, feminist, postcolonial, and cultural theories. (Lec. 3) Staff

**520 Studies in Composition and Reading Research**  
See Writing 520.

**530 Studies in Language and Linguistics (I or II, 3)** Investigation into the structure or evolution of spoken and written English. Use of contemporary linguistic theory to describe the language of regions/countries, literary genres/authors, or historical periods. (Lec. 3) Staff

**535 Old English (I, 3)** Introduction to the language and literature. (Lec. 3) Mensel

**540 Studies in American Texts Before 1815 (I or II, 3)** Cultural texts and topics of the Western Hemisphere before 1815: literary and nonliterary writings and genres; exploration and captivity narrative; African transmissions; critical theory; culture, gender, race, and class. (Lec. 3) Staff

**543 Studies in Nineteenth-Century American Texts (I or II, 3)** Literary and nonliterary cultural texts, genres, and topics of the Western Hemisphere. May include media; oral, industrial, and popular cultures; critical theory and the analysis of discourses; issues of class, gender, and race. (Lec. 3) Staff

**545 Studies in American Texts After 1900 (I or II, 3)** Modern, contemporary, and postmodern cultural texts, genres, and topics of the Western Hemisphere; e.g., literary and nonliterary writings, performance modes, media, theory, and cultural studies of race, genre, and class. (Lec. 3) Staff

**550 Studies in British Texts Before 1700 (I or II, 3)** Literary and nonliterary cultural texts and genres of the medieval, Renaissance, and Restoration periods. May include oral and written forms; the roles of audience, gender, class, and other social relations. (Lec. 3) Staff

**553 Studies in British Texts 1700–1832 (I or II, 3)** Literary and nonliterary cultural texts and genres during the Restoration, Augustan, Enlightenment, and Romantic periods; e.g., drama, media, rhetoric, theory, and discourse analysis of gender, class, race, and other social relations. (Lec. 3) Staff

**555 Studies in Nineteenth-Century British Texts (I or II, 3)** Literary and cultural texts and genres during the nineteenth century. May include drama and other performance modes; critical theory and the analysis of discourses; representations of class, gender, and race. (Lec. 3) Staff

**557 Studies in British Texts After 1900 (I or II, 3)** Modern, contemporary, and postmodern cultural texts; e.g., literary and nonliterary writings, drama, colonial and European cultural relations, film, theory, and cultural studies of institutional life and other social relations. (Lec. 3) Staff

**560 Studies in European Texts (I or II, 3)** Introduction to the study of European texts in translation. May include different historical periods; literary and nonliterary writings; theory; film; rhetoric; and issues of culture, gender, race, class, and sexuality. (Lec. 3) Staff

**570 Studies in Postcolonial Texts** (I or II, 3) Investigation of similarities and differences between nonoccidental and occidental genres; traditions and practices of postcolonial oral, written, and visual cultural forms from Africa, Australia, New Zealand, the Americas, India, Ireland, and Scotland. (Lec. 3) Staff

**590 Selected Topics** (I or II, 1–3) Selected topics in American and British literature and topics of special interest not covered by traditional department offerings. (Independent Study) Staff

**595 Master's Project** (I or II, 1–6) Number of credits to be determined each semester in consultation with the major professor or director of graduate studies. S/U only. Staff

All 600-level (seminar) courses require graduate standing or permission of instructor. Courses include: specialized topics, intensive readings, occasional lectures, and frequent presentation of ongoing research by students. A substantial research project is required. May be repeated if emphasis changes.

**601 Seminar in Creative Writing** (I or II, 3) Seminar for advanced students under supervision of a staff member arranged to suit individual project requirements of students. (Seminar) Staff

**605 Seminar in Genres** (I or II, 3) In-depth study of a single or several genres and/or subgenres, such as epic, drama, or horror film. (Seminar) Staff

**610 Seminar in Historical Periods** (I or II, 3) Selected topics of relevance for historical periods. Periods emphasized are medieval, sixteenth- and seventeenth-century British, eighteenth- and nineteenth-century British, North American, and postcolonial. (Seminar) Staff

**615 Seminar in Authors** (I or II, 3) In-depth and critical study of selected works of one or two authors from any historical period, genre, or medium; theories and traditions of authorship; authorship and gender. (Seminar) Staff

**620 Seminar in Culture and Discourse** (I or II, 3) Contrasting theoretical conceptions of culture, discursive practices, hegemony, the public and private spheres, and related concerns; may cross any historical formation or period. (Seminar) Staff

**625 Seminar in Media** (I or II, 3) Critical and theoretical conceptions of one or more media across any historical formation or period. (Seminar) Staff

**630 Seminar in Canons** (I or II, 3) Critical and theoretical conceptions of canons and canonicity, including emerging or revisionist canons. (Seminar) Staff

**635 Seminar in Subjectivities** (I or II, 3) Critically investigates class, race, gender, sexuality, and/or other subject positions as they are constructed by literary or other media. Might emphasize reading and writing communities, form and ideology, or identity politics. (Seminar) Staff

**640 Seminar in Interdisciplinary Studies** (I or II, 3) Critically investigates the formation of disciplines and the implications of their intersections; e.g., theory, practice, and politics of literature and the visual arts, music, medicine, jurisprudence, ethnography, psychology, science, economics. (Seminar) Staff

**645 Seminar in Rhetoric and Composition** (I or II, 3) Critical and theoretical conceptions of rhetoric and rhetoricality with varying historical periods and/or connections to cultural studies, literature, and composition studies. (Seminar) Staff

**650 Seminar in Critical Theory** (I or II, 3) In-depth study of one or several critical theories such as psychoanalytic, feminist, postcolonial, and cultural studies. (Seminar) Staff

**660 Seminar in Special Topics** (I or II, 3) Topics of special interest not covered by other offerings. (Seminar) Staff

**690 Independent Graduate Study** (I or II, 1–6) Number of credits is determined each semester in consultation with the major professor, director of graduate studies, and chairperson. Staff

**691, 692 Independent Graduate Study** (I or II, 3 each) Advanced study of an approved topic under the supervision of a staff member. (Independent Study) Staff

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## English Language Studies (ELS)

Acting Director: Ronesi

**112 English as a Second Language I** (I and II, 3) Equivalent to WRT 101, but restricted to students whose mother tongue is not English who need special assistance in expressing themselves in English. Intermediate level. (Lec. 3) Staff (Cw)

**122 English as a Second Language II** (I and II, 3) Continuation of 112 for foreign students demonstrating need. Advanced level. (Lec. 3) Staff (Cw)

**200 English Language Fellows Training Course** (I and II, 3) Principles and practice of learning a foreign language in small collaborative groups. A training course for proficient speakers of English who have been admitted to the English Language Fellows Project. (Lec. 3) Pre: admission to the English Language Fellows Project. Staff

**201 Content-Based English Language Studies** (I and II, 1) Small tutorial sections, taken concurrently with other courses through the English Language Fellows Project, for nonnative speakers who wish to continue studying English while taking other courses. (Lab. 2) Pre: permission of English Language Fellows Project director. Maximum of 3 credits each semester; may be repeated for a total of 12 credits. S/U only. Ronesi

## Entomology (ENT)

Chairperson: Associate Professor Sullivan (Plant Sciences)

**385 (or BIO 381) Introductory Entomology** (I, 3) Introduction to the diverse components of entomology, emphasizing basic principles of insect morphology, physiology, behavior, and ecology. Current topics in insect biodiversity and management strategies. (Lec. 3) Pre: BIO 104A or 112 and BIO 104B or 113, or equivalent. LeBrun

**386 (or BIO 382) Introductory Entomology Laboratory** (I, 1) Insect structure, function, and systematics with field studies in ecology, survey, and collection of beneficial and pest insects in their natural environment. (Lab. 3) Pre: 385 or concurrent enrollment in 385. LeBrun

**390 (or AVS 390) Wildlife and Human Disease** (I, 3) Introduction to the important diseases of humans carried by wildlife, including surveillance, epidemiology, transmission, public health impact, and prevention. Interdisciplinary approach with emphasis on problem solving using real-life examples. (Lec. 3) Pre: BIO 104B or 113; BIO 262 or ENT 385 or equivalent. Mather

**519 Insect Biological Control** (II, 3) Natural regulation of pest abundance. Theoretical issues and practical experience in the use of biological controls for managing insect and weed prob-

lems. (Lec. 2, Lab. 1) Pre: 385 or permission of instructor. In alternate years. Next offered spring 2000. Casagrande

**520 Insect Morphology and Physiology (II, 3)** An introduction to the structure and function of the insects and related arthropods. (Lec. 2, Lab. 2) Pre: 385 or permission of instructor. In alternate years. Next offered 1999–00. LeBrun

**529 Systems Science for Ecologists (I, 3)** Concepts and techniques for computer analysis and simulation of complex biological systems. (Lec. 3) Pre: MTH 141, BIO 262, or permission of instructor. Logan

**533 Graduate Writing in Life Sciences (II, 3)** Graduate writing skills for the life and environmental sciences; writing and editing journal articles, proposals; rhetorical analysis of scientific writing. (Lec. 2, Lab. 2) Pre: WRT 101 or equivalent or permission of instructor. Graduate standing or senior status. Next offered spring 1999. Logan

**544 Insect Ecology (I, 2)** Ecology of insects and other terrestrial arthropods at the physiological, individual, population, community, and ecosystem levels. Pre: permission of instructor. In alternate years. Next offered 1999–00. Ginsberg

**550 Insect Taxonomy and Systematics (I, 3)** External morphology of insects and taxonomy of major families. (Lec. 2, Lab. 2) Pre: 385. In alternate years. Next offered fall 1999. Alm

**555 Insect Pest Management (II, 3)** Evaluation of past and present pest-control strategies in light of insect ecology. Development of pest-management systems emphasizing biological control, resistant plants, and ecosystem redesign. (Lec. 3) Pre: PLS 200 or ENT 385 or permission of instructor. Casagrande

**561 Aquatic Entomology (I, 3)** Biology of insects in aquatic environments, including systematics, morphology, and ecology. Field trips emphasize relations between species and habitat and the role of insects in aquatic management programs. (Lec. 2, Lab. 3) Pre: 385 or permission of instructor. In alternate years. Next offered fall 1998. Logan

**571 (or MIC 571) Insect Microbiology (II, 3)** A two-part investigation of insect-microbe associations, concentrating on the comparative pathobiology of microbial agents in the insect host and the transmission of disease organisms by the insect vectors. (Lec. 3) Pre: 385 and MIC 211, or permission of instructor. In alternate years. Next offered 1998–99. LeBrun

**586 Medical and Veterinary Entomology** See Biological Sciences 572. In alternate years. Next offered fall 1998.

**591, 592 Special Problems in Entomology (I and II, 1–3 each)** Advanced independent research projects supervised by members of the research staff and unrelated to thesis research. Projects developed to meet individual needs. (Independent Study) Pre: permission of chairperson. Staff

**599 Master's Thesis Research (I and II, 1-6)** Number of credits determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit only. Staff

## Environmental Sciences (EVS)

Dean: Professor Leinen

**598 Nonthesis Master's Research (I and II)** Independent investigation to satisfy research requirement under nonthesis option of M.S. degree in environmental sciences. Substantial paper required. (Independent Study)

**599 Master's Thesis Research (I and II)** To be taken by students in the Master of Science in environmental sciences degree program. Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**699 Doctoral Dissertation Research (I and II)** To be taken by students in the Ph.D. in environmental sciences degree program. Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Exercise Science (EXS)

Co-Chairpersons: Associate Professor O'Leary and Associate Professor Seleen (Physical Education and Exercise Science)

**530 (PED) Research Methods and Design in Physical Education and Exercise Science** See Physical Education and Exercise Science 530.

**531 (PED) Advanced Experimental Techniques in Exercise Science (II, 3)** In-depth analysis of research studies in the field. Advanced research technique studied and applied to problems in exercise science. (Lec. 3) Pre: 530 or permission of instructor. Staff

**559 (PED) Principles of Exercise Testing and Interpretation (I or II, 3)** Theory and practical

application of exercise testing and interpretation. Includes information on testing of athletes as well as clinical testing and interpretation. (Lec. 3) Pre: BIO 343 or permission of instructor. Manfredi or Staff

**562 (PED) Advanced Exercise Physiology (I or II, 3)** Advanced study of the physiological factors limiting physical performance and work capacity with emphasis on the effects of physical conditioning on health and fitness. (Lec. 3) Pre: BIO 343 or permission of instructor. Manfredi

**563 (PED) Fitness Programs for the Middle-Aged and Elderly (I or II, 3)** Provides the professional physical educator with an in-depth knowledge of scientific principles applicable to the administration of adult physical fitness programs. Client characteristics, screening, program supervision, liability, recruitment, and adherence. (Lec. 3) Pre: graduate standing or permission of instructor. Staff

**564 (PED) Physiology of Aging (I or II, 3)** Library searches, reports, and discussion of topics of current research on the physiology of aging. Subject matter adapted to meet interests of staff and students. (Lec. 3) Pre: BIO 242 or permission of instructor. Manfredi

**565 (PED) Cardiovascular Rehabilitation (I or II, 3)** Focus on cardiac rehabilitation, underlying pathology and pathophysiology, diagnostic and prognostic testing, and principles of rehabilitation. Special emphasis on exercise intervention and lifestyle change. (Lec. 3) Pre: BIO 343 or permission of instructor. Lamont or Staff

**581 (or PSY 581) Psychological Aspects of a Healthy Lifestyle (I or II, 3)** Psychosocial variables involved in health maintenance and recovery from disease with emphasis on compliance in exercise. A review of models and research identifies client needs and counseling methods. (Lec. 3) Pre: graduate standing, PSY 113 and 232, or permission of instructor. Staff

**582 (PED) Sport Psychology** See Physical Education and Exercise Science 582.

**591 (PED) Special Problems** See Physical Education and Exercise Science 591.

**592 (PED) Internship in Physical Education and Exercise Science** See Physical Education and Exercise Science 592.

**595 (PED) Independent Study** See Physical Education and Exercise Science 595.

**599 (PED) Master's Thesis Research** See Physical Education and Exercise Science 599.

## Film Studies

Coordinator: Professor Leo

### Art

215 Video and Filmmaking I  
316 Video and Filmmaking II

### Art History

374 Topics in Film

### English

300 Literature into Film  
302 Topics in Film Theory and Criticism  
346 American Film Classics

### History

358 Recent America in Film

### Italian

315 Italian Cinema

*In addition, special topics in film studies are offered through AAF 300 Special Topics in African and Afro-American Studies (AAF 300H Black Images in Film) and ART 303 Topics in Studio (ART 303H Video Art).*

## Finance (FIN)

Chairperson: Professor Lai (Finance and Insurance)

**301 Financial Management** (I and II, 3) An analysis of the investment and financing issues facing domestic and multinational business firms. (Lec. 3) Pre: ECN 201, ACC 202, and BAC 202, or permission of instructor. Proficiency test available. Staff

**322 Security Analysis** (I and II, 3) Problems in investing funds from the point of view of individual and institutional investors. Particular attention is given to analysis of current investment theories and international implications. (Lec. 3) Pre: credit or concurrent enrollment in 301. Staff

**331 Financial Institutions and Markets** (I and II, 3) Comprehensive analysis of financial institutions and the markets in which they operate. Emphasis on the internal operations of the institutions. (Lec. 3) Pre: ECN 201, ACC 202, and BAC 202, or permission of instructor. Staff

**341 Fundamentals of Real Estate** (I or II, 3) Analysis of real estate principles. An examination of land utilization, valuation, financing techniques, urban development, property rights, markets, and government regulation. (Lec. 3) Pre: ECN 201. Staff

**401 Advanced Financial Management** (I or II, 3) Intensive research on selected current topics

relating to the financial management of the firm. Extensive use of the case method. (Lec. 3) Pre: 301 or permission of instructor. Not for graduate credit for students in the College of Business Administration. Staff

**420 Speculative Markets** (I or II, 3) Examination of the concepts of forward pricing and its applications to the area of commodity and financial futures and options. (Lec. 3) Pre: 301 or permission of instructor. Staff

**425 Portfolio Theory and Management** (I or II, 3) Examination of portfolio theory and current portfolio management practices from the individual and institutional view. Techniques for portfolio building, management, and performance evaluation are discussed. (Lec. 3) Pre: 322 or permission of instructor. Not for graduate credit for students in the College of Business Administration. Staff

**433 Bank Financial Management** (I or II, 3) Nature of the financial decisions facing the management of an individual bank. Current bank financial practices, research, and appropriate banking models considered. (Lec. 3) Pre: 301, 331, or permission of instructor. Not for graduate credit for students in the College of Business Administration. Staff

**441 Financial Theory and Policy Implications** (I or II, 3) Examination of the determinants of long-run financial success of the firm. Includes a study of how the capital budgeting process is linked to capital structure management. (Lec. 3) Pre: 301. Not for graduate credit. Staff

**452 Multinational Finance** (I or II, 3) Methods of financing multinational corporations. Foreign exchange, translation of financial statements, multinational funds flow and international liquidity, international financial reporting and tax policy, international money, stock, and bond markets. (Lec. 3) Pre: 301 or permission of instructor. Not for graduate credit for students in the College of Business Administration. Staff

**455 Global Investment Management** (I or II, 3) Detailed analysis of the problems encountered in the process of investing funds in international capital markets. Particular attention is devoted to multi-currency dimensions, foreign information sources, and foreign regulations. (Lec. 3) Pre: 301, 322. Staff

**460 Basic Managerial Economics** (I or II, 3) Introduction to the classic theories of demand, production, and cost management in the context of modern financial theory. Includes empirical model building using microcomputers. (Lec. 3) Pre: 301. Not for graduate credit. Staff

**491, 492 Directed Study** (I and II, 1–3 each) Directed readings and research work involving financial problems under the supervision of members of the staff. Plan of study required. (Independent Study) Pre: permission of instructor. Not for graduate credit for students in the College of Business Administration. Staff

**493 Internship in Finance** (I or II, 3) Approved, supervised work experience with participation in management and problem solving related to finance. Fifteen working days (or 120 hours). (Practicum) Pre: junior standing and proposal approved by the College of Business Administration. May be repeated for a maximum of 6 credits. Not for graduate credit. S/U only. Staff

**601 Financial Management** (I and II, 4) Functions and responsibilities of financial managers. Examination of financial issues, both internal to the firm and arising from interaction with the financial system. Financial statement analysis, structure, valuation, markets, capital budgeting, working capital. (Lec. 4) Pre: ACC 610, ECN 590, BAC 520 and 530. Staff

**602 Advanced Financial Management** (I or II, 3) Case studies and selected readings emphasizing the application of financial theory and analytical techniques to financial management. (Lec. 3) Pre: 601 or equivalent. Staff

**622 Security and Investment Analysis** (I or II, 3) Analysis of the problems of investing funds and managing investments. Use of the latest investment theories and their implementation via quantitative techniques will be explored. (Lec. 3) Pre: 601 or equivalent. Staff

**625 Advanced Portfolio Theory and Security Analysis** (I or II, 3) An examination of advanced theories and practices in portfolio building and maintenance. Issues related to security price behavior are also examined. (Seminar) Pre: 601 or equivalent. Staff

**633 Depository Institutions and Financial Management** (I or II, 3) Study of the financial decisions facing the management of depository institutions. Current financial practices and problems explored. Models for bank managers will be considered. (Lec. 3) Pre: 601 or equivalent. Staff

**641 Advanced Financial Theory** (I or II, 3) Analysis of the theoretical framework for corporate decision making related to financial planning, capital budgeting decisions, dividend policy, and capital structure decisions. Emphasis on current research developments. (Seminar) Pre: 601 or equivalent. Staff

**652 Advanced International Financial Management** (I or II, 3) Analysis of issues relevant to the international financial manager. The financial operations of multinational enterprises are examined through both the theoretical and the case approach. (Seminar) Pre: 601 or equivalent. Staff

**660 Managerial Economics** (I and II, 3) The applications of economic theory and methodology to business problems. (Lec. 3) Pre: 601, MSI 600, 620, and 640. Staff

**671 Seminar in Finance** (I or II, 3) Independent research. Individual topics based on readings and research interests of the students. (Seminar) Pre: 601. Staff

**691, 692 Directed Study in Finance** (I and II, 1–3 each) Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of instructor. Staff

**693 Internship in Finance** (I and II, 3) Participation in management and/or problem solving under the supervision and guidance of a sponsoring agency with evaluation by the College of Business Administration. (Practicum) Pre: proposal acceptance by College of Business Administration, no previous internship credit, and graduate standing. S/U credit. Staff

**697 Doctoral Research Seminar** (I and II, 3) Provides a rigorous analysis of current research questions and research techniques used to address those questions in the academic discipline. Recent developments and current issues addressed. (Seminar) Pre: enrollment in Phase II of the Ph.D. program in business administration. Staff

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) Pre: enrollment in Phase III of the Ph.D. program in business administration. S/U credit.

## Fisheries Science and Technology (FST)

Chairperson: Professor Rhodes (Fisheries, Animal and Veterinary Science)

**201 Health Emergencies at Sea and Distress Communications** (II, 3) First-response and continuing medical aid at sea. The International Medical Code. Use of radio for emergency and extended treatment. BLS cardiopulmonary resuscitation certification. (Lec. 3) Staff

**231 General Seamanship and Marine Safety** (II, 3) Principles and practices of seamanship. Watch standing. Routine and emergency evolutions. Basic fiber and wire rope splicing. Fire prevention, firefighting, and fire safety. Real fires will be fought. (Lec. 2, Lab. 3) Staff

**315 Living Aquatic Resources** (II, 3) Survey of major aquatic resource groups; life histories, distribution, and exploitation of representative finfishes, mollusks, and crustacea in major fisheries ecosystems; management practices and patterns of fisheries development. (Lec. 3) Pre: MRD 200 and BIO 113 or at least one semester of general animal biology. Recksiek

**321 World Fishing Methods** (II, 3) Survey of the fish-catching methods of the world; methods of fish detection; development of the basic techniques used in fishing gear construction and maintenance. (Lec. 3) Pre: MRD 200 or permission of instructor. DeAlteris

**341 Marine Propulsion Systems** (I, 4) Detailed study of marine propulsion systems including gasoline, diesel, and steam. Emphasis on the principles and practices of construction, operation, maintenance, and testing. (Lec. 3, Lab. 3) Wing

**342 Marine Auxiliary Systems** (II, 4) Detailed study of ship's auxiliary systems, including AC and DC electrical generating and distribution systems, the application of hydraulics to operate deck machinery and steering systems, and refrigeration systems used aboard ship. (Lec. 3, Lab. 3) Wing

**343 Vessel Repair and Maintenance** (II, 3) In-depth study of the design, construction, and repair of vessels made of wood, fiberglass, and metal. Emphasis on the use of each material, its comparative cost, and good maintenance techniques. (Lec. 2, Lab. 3) Wing

**391, 392 Special Problems and Independent Study** (I and II, 1–3 each) Special work to meet individual needs of students in various fields of fisheries and marine technology. (Independent Study) Staff

**415 Fishery Science** (I, 3) Classification of resource groups, fishing methods, fisheries mensuration, biology of aquatic resource animals, fisheries ecology, population analysis, aquatic resource management, fish and shellfish farming. (Lec. 2, Lab. 3) Pre: 315. Recksiek

**421 Design of Fish Capture Systems** (I, 3) Detailed study of the design considerations and methods of construction of specific representative commercial and scientific sampling fish

capture gear. Full-scale and model nets are designed, constructed, and tested. (Lec. 2, Lab. 3) Pre: 321 or permission of instructor. DeAlteris

**510 Applied Problems in Marine Fisheries Ecology** (I, 3) A study of the interaction between the marine environment and the fisheries, the effects of the environment on individual fish, the life histories of fish, fish behavior, and fish migration. (Lec. 2, Lab. 3) Pre: permission of instructor. DeAlteris

**516 Early Life History of Aquatic Resource Animals** (II, 3) Biology and ecology of juvenile and planktonic commercially important species; dynamics of reproduction, fecundity, growth, distribution, and behavior as modulated by the physical environment; identification, enumeration, and sampling. (Lec. 2, Lab. 3) Pre: 415 and STA 308. Recksiek

**521 Evaluation of Fish Capture System** (II, 3) Evaluation of fish capture system behavior and performance using empirical, theoretical, model scaling, and statistical analysis techniques. Field and laboratory measurement procedures. (Lec. 2, Lab. 3) Pre: 421 or permission of instructor. DeAlteris

**591, 592 Special Problems** (I and II, 1–3 each) Advanced work under the supervision of a staff member arranged to suit individual needs of students in various fields of fisheries and marine technology. (Independent Study) Pre: graduate standing or permission of chairperson. Staff

## Food Science and Nutrition (FSN)

Chairperson: Professor Caldwell

**110 Introduction to Dietetics** (II, 1) Description of the educational and experiential requirements of a registered dietitian. Career opportunities discussed. Designed for students entering the dietetics major. (Lec. 1) English

**207 General Nutrition** (I and II, 3) Fundamental concepts of the science of nutrition with application to the individual, the community, and the world. Proficiency test available. (Lec. 3) Staff (N)

**236 Computer Applications in Food Science and Nutrition** (I, 2) Basic computer operation and the use and comparison of microcomputer software programs in food science and nutrition. (Lec. 1, Lab. 2) Pre: 207 and 237. English

**237 Introductory Food Science** (II, 3) Survey of basic principles of food science and technology. Proficiency test available. (Lec. 3) Constantinides

**276 Food, Nutrition, and People (I, 3)** Practical applications of nutrition policy. Current issues in the socioeconomic, cultural, and psychological influences on food and nutrition behavior. (Lec. 3) Pre: 207 and 237. Fey-Yensan

**337 Applied Food Science (I and II, 3)** Application of the basic principles of food science. Physical and chemical changes in foods during processing, storage, and preparation. Laboratory application including assessment of food quality. (Lec. 2, Lab. 3) Pre: 237, CHM 124 and 126. Staff

**347 Nutritional Evaluation of Food Processing (II, 3)** Effect of processing, from origin to consumption, upon the nutrient content of food. Emphasis on relationship between food processing and nutrient retention and availability. (Lec. 3) Pre: 207, 237, and CHM 124. Staff

**375 Food-Service Management I (I, 3)** Administrative responsibilities in planning, organizing, staffing, leading, and evaluating food-service systems. Emphasis on menu planning, purchasing, and food cost control. (Lec. 3) Pre: 207 and 237. English

**376 Food-Service Management II (II, 4)** Administrative responsibilities in planning, organizing, staffing, leading, and evaluating food-service systems. Emphasis on food production, staffing, and labor cost control. Experience in a food-service facility. (Lec. 3, Lab. 2) Pre: 375. English

**378 Sensory Evaluation of Foods (I, 3)** Nature of the sensory response; chemistry of compounds responsible for flavor and odor; measurement of taste, odor, color, and texture; design and methodology of panel testing. (Lec. 2, Lab. 2) Staff

**386 Food Sanitation (II, 3)** Principles of sanitation as applied to the foodservice and food-processing industry. Emphasis on bacteria and other organisms causing food-borne illness, pest control, sanitation, and safe food handling. (Lec. 3) Pre: 237, MIC 201, or permission of instructor. Constantinides

**394 Nutrition in the Life Cycle I (I, 3)** Current issues in maternal and child nutrition with emphasis on nutrient requirements and food habit development; delivery of cost-effective quality nutrition services based on needs assessment, program planning, and evaluation. (Lec. 3) Pre: 276. Sebelia

**395 Nutrition in the Life Cycle II (II, 3)** Current issues in nutrition for the adolescent and aging with emphasis on nutrient requirements related

to physiological changes; screening initiatives; program development to reduce risk of nutrition-related diseases. (Lec. 3) Pre: 394. Fey-Yensan

**410 Senior Seminar in Dietetics (I, 1)** Current issues in the field of dietetics. Topics include evaluation of journal articles, registration, licensing, and certification; cost-effectiveness of nutrition services. (Seminar) Pre: 395 and senior standing. Not for graduate credit. Greene

**421 Food Analysis (II, 4)** Principles and procedures for the chemical and physical analysis of foods. Emphasis on the determination of common food constituents and the instrumentation for their analysis. (Lec. 1, Lab. 6) Pre: 431. Constantinides

**422 (or MIC 422) Biotechnology of Industrial Microorganisms (II, 3)** Application of microorganisms to industrial processes. Culture handling and strain development. Regulation and control of fermentation products. (Lec. 3) Pre: BCH 311 and an advanced course in microbiology, or permission of instructor. Traxler

**431 Biochemistry of Food (I, 3)** Introduction to the chemistry and biochemistry of the essential components common to foods of plant and animal origin. (Lec. 3) Pre: BCH 311 or equivalent. Fischl

**432 Food Processing (II, 3)** Changes involved in behavior of foods in unit operations such as fermentation, canning, chilling, freezing, dehydration, and concentration for processing and preservation. (Lec. 2, Lab. 3) Pre: 431 and MIC 211. Lee

**433 Food Quality (II, 3)** Technological problems of procurement, manufacture, transportation, grading, packaging, and storage of food products. Field trips required. (Lec. 2, Lab. 3) Pre: 431 and MIC 211. Staff

**434 Marine Food Processing (II, 4)** Theory and application in processing of finfish, shellfish, and seaweed from harvesting to product development, including identification of current issues. (Lec. 3, Lab. 3) Pre: 432 or permission of instructor. Lee

**435 Food Product Development (I, 4)** Fundamentals of food product development from concept to production. Product design, formulation, basics of ingredient functions, manufacturing product evaluation, and safety and regulation. Individual product development project assignment. (Lec. 3, Lab. 3) Pre: 337 or 431 or permission of instructor. Lee

**438 Food Chemistry Laboratory (II, 3)** Principles and techniques of basic and applied food research. Investigation of special food problems. Writing and evaluation of technical reports on research findings. (Lec. 1, Lab. 6) Pre: 431 or permission of instructor. Fischl

**441 Advanced Human Nutrition (I, 3)** Comprehensive study of principles of nutrition. Physiological and metabolic processes and interrelationships involving nutrients. Factors affecting nutritional health status and requirements during life span. (Lec. 3) Pre: 207, BIO 242, BCH 311, or permission of instructor. Gerber

**444 Nutrition and Disease (II, 3)** Effect of disease on metabolism and nutritional requirements; implications for dietary change, and factors affecting acceptance of such change. (Lec. 3) Pre: 441 or permission of instructor. Caldwell

**447 Food Engineering**  
See Chemical Engineering 447.

**451, 452 Field Experience in Food Science and Nutrition (I and II, 1–3 each)** Individual supervised field experience and seminar in community, educational, government, health-oriented, and commercial activities and services related to food science and nutrition. (Practicum) Pre: permission of chairperson. May be repeated for a maximum of 6 credits. Not for graduate credit in food science and nutrition. Staff

**458 Nutrition Education (I and II, 3)** Principles and practices of teaching individuals and groups to translate nutrition knowledge into action. Emphasis on research in and evaluation of nutrition education. (Lec. 3) Pre: 395, 441, or permission of instructor. Sebelia

**461 Food Safety (II, 3)** Safety and status of food-borne substances and additives. Chemical-biologic mechanisms and factors influencing toxicity. Toxicological testing methods. Risks versus benefits. Legal and regulatory aspects. (Lec. 3) Pre: 431 or permission of instructor. Staff

**491, 492 Special Projects (I and II, 1–3 each)** Advanced work under supervision of staff member. Arranged to suit individual requirements of student. (Independent Study) Pre: senior standing and permission of chairperson. Staff

**502 Physical Chemistry and Properties of Food (I, 3)** Principles of physical chemistry and properties of food material. Analysis of changes in physical properties and interaction of food components during physical processing. Application of underlying principles in food formulation and processing. (Lec. 2, Lab. 2) Pre: 431 or permission of instructor. Lee



**503 Food Science and Nutrition Research Methods (I, 4)** Theory and practice in techniques and methods as applied to research in food science and nutritional science. (Lab. 8) *Pre: permission of instructor.* Simpson

**504 Research Methods in Dietetics (SS, 3)** Research methods and techniques applied to the field of dietetics. Research project designed by each student. (Lec. 3) *Pre: 951, 952, and 953, or permission of instructor.* Greene

**505 Methods in Nutrition Research (II, 3)** Theory and laboratory experience in research methodology related to nutrition. Critical review of articles, completion of laboratory projects, and preparation of a research proposal. (Lec. 2, Lab. 2) *Pre: 444 and STA 308 or permission of instructor.* Greene

**511 Food Science and Nutrition Seminar I (I and II, 1)** Reports and discussions of current topics in food science and nutrition, as well as oral reports of theses and dissertation research topics in progress. (Seminar) *Pre: graduate standing or permission of chairperson.* Staff

**512 Food Science and Nutrition Seminar II (I and II, 1)** Critical review of oral presentations given in 511. Provides student with experience in communicative skills necessary to evaluate and critique scientific presentations. Attendance is required of all graduate students in residence when not enrolled in 511. (Seminar) *Pre: graduate standing.* S/U credit. Staff

**523 Water Pollution Microbiology**  
See Microbiology 523.

**525 Water Pollution Microbiology Laboratory**  
See Microbiology 525.

**526 (or BMS 526) Lipid Chemistry (I, 3)** Advanced course in the chemistry of biologically important lipids such as the fatty acids, neutral glycerides, phospholipids, steroids, and the chemistry and biochemistry of the carotenoids. (Lec. 3) *Pre: BCH 581. In alternate years. Next offered 1999–00.* Gerber and Simpson

**532 Seafood Quality (II, 3)** Biochemical and microbiological deterioration of seafoods, methods utilizing these reactions for quality assessment, and processes to inhibit these reactions for preservation of fresh seafoods. (Lec. 1, Lab. 4) *Pre: 421, 432 or permission of instructor. In alternate years. Next offered 1998–99.* Lee

**548 Separations for Biotechnology**  
See Chemical Engineering 548.

**551 Topics in Human Nutrition I (I, 3)** Digestion, absorption, and metabolic role of macronutrients and their interrelationships. Influence

of environmental and physiological factors on nutrient use and energy balance. Critical review of the literature. (Lec. 3) *Pre: 441, BIO 242, and BCH 311, or permission of instructor.* Gerber

**552 Topics in Human Nutrition II (II, 3)** Absorption, metabolism, and role of micronutrients and their interrelationships. Critical review of the literature and implications for public policy. (Lec. 3) *Pre: 441, BIO 242, and BCH 311, or permission of instructor.* Caldwell

**591, 592 Special Research Problems (I and II, 1–4 each)** Advanced work under supervision of a staff member. Arranged to suit individual requirements of students. (Independent Study) *Pre: permission of chairperson.* Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**691, 692 Research in Food Science and Nutrition (I and II, 1–3 each)** Assigned research on an advanced level. Students are required to outline the problem, conduct the necessary literature survey and experimental work, and present their observations and conclusions in a report. (Independent Study) Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**951 Dietetics Seminar: Clinical Nutrition (I and II, 1–2)** Discussion of current topics in clinical nutrition related to supervised experience. Limited to students enrolled in the Rhode Island AP4 Program. (Seminar) Greene

**952 Dietetics Seminar: Community Nutrition (I and II, 1–2)** Discussion of current topics in community nutrition related to supervised experience. Limited to students enrolled in the Rhode Island AP4 Program. (Seminar) Greene

**953 Dietetics Seminar: Food-Service Management (I and II, 1–2)** Discussion of current topics in food-service management related to supervised experience. Limited to students enrolled in the Rhode Island AP4 Program. (Seminar) Greene

## French (FRN)

*Section Head: Professor Morello*

**101 Beginning French I (I and II, 3)** Fundamentals of grammar and pronunciation; exercises in reading, writing, and conversation. (Lec. 3) *Pre: no prior French is required.* Staff (F)

**102 Beginning French II (I and II, 3)** Continuation of 101. (Lec. 3) *Pre: 101 or equivalent.* Staff (F)

**103 Intermediate French I (I and II, 3)** Development of facility in reading texts of moderate difficulty; supplemented by further work in grammar, conversation, and composition. (Lec. 3) *Pre: 102 or 131 or equivalent.* Staff (F)

**104 Intermediate French II (I and II, 3)** Continuation of 103. (Lec. 3) *Pre: 103 or equivalent.* Staff (F)

**105 Basic Conversation (I and II, 1)** Practice in basic French conversational skills. (Lec. 1) *Pre: credit or concurrent enrollment in 103 or 104. May be repeated once for a maximum of 2 credits.* Staff

**131 Refresher Course in French (I and II, 3)** Rapid one-semester review of beginning French structures and vocabulary. For students with one or two years of high school French who are not ready for 103 or higher level. (Lec. 3) *Pre: one or two years of precollege French or permission of section head. Not open to students with credit in 101 or 102. Not for major credit in French.* Staff (F)

**201 French Pronunciation (I and II, 1)** The sounds of French; relationship between spelling and pronunciation; regional variation. Practice in pronouncing French prose and poetry. (Lab. 2) *Pre: 104 or equivalent or permission of instructor.* Rogers

**204 French Composition I (I and II, 3)** Practice in writing French; topics selected from everyday events and readings in French; emphasis on vocabulary building; some grammar study, frequent compositions. (Lec. 3) *Pre: 104 or equivalent or permission of instructor.* Staff

**207 French Oral Expression I (I and II, 3)** Training in the spontaneous use of oral French. Students will extend the quantity and quality of spoken French that they are able to produce. Special focus on narration or story-telling in French. (Lec. 3) *Pre: 104 or equivalent or permission of instructor.* Staff

**303 The French in North America (I or II, 3)** Surveys the background and current status of the French diaspora in North America, including Acadians, Quebecers, French Canadians, and French Americans, with special emphasis on the literary, artistic, and other contributions of these groups to the civilization(s) of the continent. Taught in French. (Lec. 3) *Pre: 204 or 207 or permission of instructor.* Chartier

**304 French Composition II** (I, 3) Writing of literary French. Frequent compositions and critiques with emphasis on the stylistic devices. Recommended for those concentrating in French. (Lec. 3) Pre: 204. Staff

**307 Oral Expression II** (II, 3) Discussion, short speech making, pronunciation, everyday vocabulary, and improvement of conversation. Matters of current interest in French selected by instructor and students. (Lec. 3) Pre: 207. Staff

**309 French Culture and Literature to 1789** (I and II, 3) Survey of the significant developments in the arts, society, and literature in France from the Middle Ages to the French Revolution. (Lec. 3) Pre: 204 or permission of instructor. Staff

**310 Modern French Culture and Literature** (I and II, 3) Survey of the significant developments in the arts, history, and literature in France from the French revolution to the present. (Lec. 3) Pre: 204 or permission of instructor. Staff

**315, 316 French Internship Abroad** (I and II, 3) Supervised work experience in a French-speaking country for advanced language students. (Practicum) Pre: 200-level French course or equivalent or permission of instructor. Staff

**318 French Across the Curriculum** (I and II, 1) Reading and discussion of original French texts in conjunction with courses throughout the university curriculum. Designed to maintain and improve French language skills and to enrich study through exposure to texts in the original language. (Lec. 1) Pre: permission of instructor. May be repeated. Staff

**391 Literature to 1789 in Translation** (I and II, 3) Major developments in French literature from the Middle Ages through 1789. Reading in translation of selected literary works from representative authors. (Lec. 3) Not for major credit in French. Staff (A)

**392 Nineteenth-Century Literature in Translation** (I or II, 3) Reading in translation of selected literary works from representative nineteenth-century authors. (Lec. 3) Not for major credit in French. Staff (A) (F)

**393 Twentieth-Century Literature in Translation** (I or II, 3) Reading in translation of selected literary works from representative twentieth-century authors. (Lec. 3) Not for major credit in French. Staff (A) (F)

**394 Literary Topics in Translation** (I or II, 3) Selected topics in French literature in translation. (Lec. 3) Not for major credit in French. Staff

**402 French Phonetics** (II, 3) Introduction to articulatory phonetics, phonetic notation, and phonetic transcription. Rudiments of recognizing and reproducing French intonation patterns. Laboratory in phonetics and intonation. (Lec. 3) Pre: 201 or permission of instructor. Rogers

**408 The French Language: Past, Present, and Future** (II, 3) Introduction to the history and present state of French. Study of standard and colloquial French, dialects, regional variations, language of youth and professions. Current tendencies; the Francophone movement. (Lec. 3) Pre: 304 or permission of instructor. Rogers

**412 Topics in French Culture and Literature** (I and II, 3) Topics in French literature and culture. (Lec. 3) Pre: 309 or 310 or permission of instructor. May be taken more than once for credit on different topics. Staff

**473 French Canadian Literature** (I, 3) Early historical and biographical works, but primarily the novel, poetry, and theatre of the twentieth century. (Lec. 3) Pre: 309 or 310 or permission of instructor. Chartier

**474 African Literature in French** (I, 3) Authors of Africa and the Diaspora; includes Camara, Cécile, Dadie, Senghor. (Lec. 3) Pre: 309 or 310 or permission of instructor. Hammadou

**480 Business French** (I or II, 3) Study of concepts and terminology relating to the French business world. (Lec. 3) Pre: junior standing, credit or concurrent enrollment in at least one 300-level French language course. Morello

**497, 498 Directed Study** (I and II, 3 each) For the advanced student. Individual research and reports on problems of special interest. (Independent Study) Pre: acceptance of a project by a staff member and approval of section head. Staff

**501 Advanced Composition** (II, 3) Stylistics to prepare undergraduate and graduate French majors to write expository French prose. (Lec. 3) Pre: graduate standing or permission of instructor. In alternate years. Staff

Note: Courses 513–594 include lectures, discussions, readings, individual research, and a research paper.

**513 Seminar in Medieval Literature** (I, 3) Pre: graduate standing or permission of instructor. Staff

**523 Seminar in Sixteenth-Century Literature** (I, 3) Pre: graduate standing or permission of instructor. Staff

**533 Seminar in Seventeenth-Century Literature** (I, 3) Pre: graduate standing or permission of instructor. Morello

**544 Seminar in Eighteenth-Century Literature** (II, 3) Pre: graduate standing or permission of instructor. Staff

**554, 555 Seminar in Nineteenth-Century Literature** (I and II, 3 each) Pre: graduate standing or permission of instructor. Touloudis and Chartier

**564 Seminar in Modern Poetry** (I, 3) Pre: graduate standing or permission of instructor. Staff

**565 Seminar in Twentieth-Century Theatre** (II, 3) Pre: graduate standing or permission of instructor. Staff

**566 Seminar in Twentieth-Century Prose** (I, 3) Pre: graduate standing or permission of instructor. Touloudis

**594 Special Topics** (I and II, 3) Group and/or individual investigation of special problems in French language, literature, and civilization. (Independent Study) Pre: acceptance of project by a staff member and permission of chairperson. Staff

**599 Master's Thesis Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Genetics

Coordinator: Associate Professor Mottinger

### Aquacultural Science and Pathology

476 The Genetics of Fish

### Biochemistry

342 Human Genetics and Human Affairs

### Biological Sciences

203 Introduction to Evolutionary Genetics

352 Genetics

454 Genetics Laboratory

554 Cytogenetics

573 Developmental Genetics

579 Advanced Genetics Seminar

### Microbiology

502 Techniques in Microbial and Molecular Genetics

552 Microbial Genetics

561 Recent Advances in Molecular Cloning

### Plant Sciences

250 Plant Breeding and Genetics

352 General Genetics

355 Genetics Laboratory

472 Plant Improvement II

## Geography (GEG)

*Chairperson:* Professor Juda (Marine Affairs)

**100 The Geography of Human Ecosystems** (I and II, 3) The evolution of human environments from the Stone Age to the contemporary megapolis and the emergent world city in terms of man-earth-space-resource relationships. (Lec. 3) Gordon (S)

**101 World Geography** (I, 3) An examination of major world regions. Basic geographic concepts are presented. Physiographic, political, economic, social, and cultural influences are addressed in a spatial context. (Lec. 3) Gordon (S)

**103 Economic Geography** (I and II, 3) Surveys the geographic backgrounds of economic activities. Populations and the resources of agriculture, industry, and commerce in terms of their world and regional distribution. (Lec. 3) Marti

**104 Political Geography** (I and II, 3) Pattern of political units throughout the world; special emphasis on boundaries, newly independent nations, and other aspects of political control over territory. (Lec. 3) Staff (S)

## Geology (GEL)

*Chairperson:* Professor Hermes

**100 Environmental Geology** (I and II, 3) Geologic processes, how they affect people and vice versa; geologic hazards, earthquake impact, shoreline development, offshore oil, waste disposal, water, energy and other resources, climate change. (Lec. 3) Cain, Frohlich, and Staff (N)

**101 Geological Field Trips** (I, 1) Field trips to coastal, glacial, and bedrock terrains. The relation of structures and materials to the history of the earth, mineral resources, and our environment. (Lab. 2) *In alternate years. Next offered 1999–00.* Frohlich

**102 Evolution and Extinction of the Dinosaurs** (II, 3) General introduction to the dinosaurs. Variety, habits, warm-bloodedness, and extinction discussed. Pterosaurs and bird origins presented. (Lec. 3) Fastovsky (N)

**103 Understanding the Earth** (I and II, 4) Processes operating within and upon the earth. Relationship of plate tectonics to volcanism, earthquakes, and mountain building. Development and modification of landscapes by rivers, glaciers, wind, waves, and ground water. Environmental implications of geologic processes. (Lec. 3, Lab. 2) Cain, Fastovsky, or Hermes (N)

**110 The Ocean Planet**  
*See Oceanography 110.*

**203 Field Geology** (I, 3) Emphasis on the development of skills in geologic mapping and the construction of geologic maps. Field trips required. (Lec. 2, Lab. 3) *Pre: 100, 103, or permission of instructor.* Murray

**210 Landforms: Origin and Evolution** (II, 4) Development, distribution, and geologic significance of landforms produced by rivers, glaciers, coastal processes, weathering, and other geomorphic agents. Interpretation of landforms through field studies, topographic maps, and aerial photographs. (Lec. 3, Lab. 2) *Pre: 103 or permission of instructor.* Veeger

**240 Prehistoric Life** (II, 4) The history of life, from its origins to the first multicellular animals, to humans. Special emphasis on the origin of fishes, birds, mammals, and humans. (Lec. 3, Lab. 2) *Pre: 102 or 103 or BIO 104B or 113 or permission of the instructor. Offered in even-numbered years.* Fastovsky

**277 Coastal Geologic Environments** (II, 3) Geologic processes in coastal environments such as barriers, lagoons, estuaries, bays, and rocky headlands. Impact of coastal geologic hazards such as hurricanes, winter storms, and sea-level rise. Response of people to hazards. Field trips, small-group project required. (Lec. 3) *Pre: 103.* Boothroyd

**301 Earth's Depleting Resources** (I, 3) Origin, distribution, extraction, and importance of various non-renewable resources: energy sources, metals, building and industrial materials, water. Strategic materials, their world distribution and role in world affairs. (Lec. 3) *Pre: 103 or permission of instructor.* Cain

**320 Earth Materials** (I, 4) Hand-sample identification and characterization of minerals and rocks, including crystallography, composition, classification, origin, and relationship to geological occurrence; also includes aspects of soil-forming minerals, ore deposits, and other mineral resources. (Lec. 3, Lab. 2) *Pre: 103, credit or concurrent enrollment in CHM 101 or 103.* Hermes

**321 Rocks and Geologic Processes** (II, 4) The study of igneous and metamorphic processes related to plate tectonics, and the interpretation of Earth history and events from features preserved in rocks. Application of the polarizing microscope to the study of rocks in thin section, combined with geochemical and phase equilibria approaches. Introduction to computer mod-

eling of igneous and metamorphic processes. (Lec. 3, Lab. 2) *Pre: 320.* Hermes

**350 Evolution**  
*See Biological Sciences 350.*

**370 Structure of the Earth** (II, 4) Stress and strain relationships they pertain to rocks. Manifestations of these phenomena in geologic structures and criteria for recognizing them. (Lec. 3, Lab. 2) *Pre: PHY 213 and 285 or 111 and 185 or permission of instructor.* Murray

**401 Ore Deposits** (II, 3) Origins of metallic ore deposits; factors localizing deposits; mining methods; uses of metals; environmental effects; discussion of specific metals and mining districts. (Lec. 2, Rec. 1) *Pre: 301 or 320 or equivalent or permission of instructor. Next offered spring 2000.* Cain

**421 Geochemistry** (I, 3) Introduction to thermodynamics of rock and minerals, stable isotopes, geochronology, and cosmochemistry. Emphasis on the geochemistry of igneous and metamorphic rocks. (Lec. 3) *Pre: CHM 112, GEL 321, and MTH 132 or 142, or permission of instructor.* Murray

**450 Introduction to Sedimentary Geology** (I, 4) Principles underlying formation and composition of lithofacies and sedimentary environments. Methods, procedures, and techniques used to study sedimentary processes, depositional environments, sediment and rock sequences, and paleogeography. (Lec. 3, Lab. 2) *Pre: graduate or advanced undergraduate standing in environmental, resource, or engineering major.* Boothroyd

**465 Introduction to Geophysics** (I, 3) Physical properties of earth and the application of geophysical methods to explore the earth's interior for natural resources. Introductory interpretation of gravity, magnetic, seismic, and radiometric surveys. (Lec. 2, Lab. 2) *Pre: 103, PHY 112, MTH 132.* Frohlich

**468 Ground-Water Chemistry** (I, 4) Introduction to the chemical processes controlling water chemistry in low-temperature environments. Chemical weathering, ion exchange, redox, mineral equilibrium, isotopes, and chemical modeling of aqueous systems. (Lec. 3, Lab. 2) *Pre: CHM 101, 102, 112, 114; GEL 103, 320. Offered in odd-numbered years. Next offered fall 1999.* Veeger

**480 Summer Field Camp** (SS, 4–8) Geologic field mapping and principles. (Practicum) *Pre: 210, 240, 321, 370, 450 recommended. Course not offered through URI; prior approval of selected*

camp required by the Department of Geology. Recommended between junior and senior years. Not for graduate credit in geology. Staff

**483 Hydrogeology (I, 4)** Study and interpretation of groundwater flow systems and the interaction between groundwater and the geologic framework, including: groundwater flow, aqueous geochemistry, groundwater resource evaluation, and groundwater in geologic processes. (Lec. 3, Lab. 2) Pre: 103, 210, and MTH 141 or 131, or permission of instructor. Veeger

**485 (or CVE 485) Environmental Engineering Geophysics (II, 3)** Field and lab methods of determining physical rock constants such as density, porosity, permeability, electrical conductivity, and seismic velocity, with applications in geology and environmental engineering. (Lec. 2, Lab. 2) Pre: 103, MTH 132 or 142, PHY 111 and 185 or 213 and 285, and junior standing, or permission of instructor. In alternate years. Next offered 1999–00. Frohlich and Urish

**488 Geological Evolution of North America (II, 4)** The evolution of the major sedimentary basins in North America is presented within a tectonic framework. Regional paleoenvironments and paleogeography through time are reconstructed from faunas and facies. Ten-day field trip. (Lec. 3, Lab. 2) Pre: 450 or permission of instructor. Fastovsky

**491 Special Topics (I and II, 1–3)** Advanced work for undergraduates under the supervision of a faculty member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of instructor. Not for graduate credit in geology. Staff

**499 Senior Thesis (I and II, 3)** Independent research. Student selects an area of study and works in close conjunction with a faculty member of his or her choice. (Independent Study) Pre: senior standing and permission of instructor. Not for graduate credit in geology. Staff

**515 Glacial Geology (I, 3)** Investigation of glacial environments and processes including areas with presently existing glaciers. Emphasis on the development of glacial landscapes and deposits. Field trips in New England area. (Lec. 2, Lab. 3) Pre: graduate or advanced undergraduate standing in environmental, resource, or engineering major. Boothroyd

**530 Igneous Petrology (II, 3)** Tectonic and chemical basis for igneous phenomena stressing the association concept of igneous activity. Evaluation of the criteria used in petrogenetic interpretations. (Lec. 2, Lab. 3) Pre: 321 or per-

mission of instructor. In alternate years. Next offered spring 2000. Hermes

**531 Metamorphic Petrology (II, 3)** Facies concept and other methods of interpreting metamorphic mineral assemblages. Chemical and fabric changes during metamorphism, including principles of structural petrology. (Lec. 2, Lab. 3) Pre: 321 or permission of instructor. In alternate years. Next offered spring 2001. Murray

**550 Sedimentary Processes and Environments (II, 3)** Physical processes of sedimentation with emphasis on river, shoreline, estuarine, and lagoon environments. Emphasis on field study including 9-day field trip. (Lec. 3) Pre: graduate or advanced undergraduate standing in environmental, resource, or engineering major. Offered in spring of odd-numbered years. Boothroyd

**554 Sedimentary Petrology (I, 3)** The detailed interpretation of siliciclastic and carbonate fabrics and textures in thin section and hand sample. Emphasizes aspects of diagenesis, including cementation, replacement, recrystallization, pedogenesis, and porosity evolution. Skeletal elements and paleoenvironmental context presented. (Lec. 3) Pre: 240 and 450 or permission of instructor. In alternate years. Next offered spring 2000. Fastovsky

**565 Geophysical Models (II, 3)** Model interpretation of gravity, magnetic, and geoelectric field surveys with geologic constraints. Conversion of quantitative geophysical models into geologic/hydrologic structures. (Lec. 2, Lab. 2) Pre: MTH 132, PHY 112 or equivalent. Offered in spring of odd-numbered years. Frohlich

**568 Isotopes in Hydrogeology (II, 3)** Use of environmental isotopes in groundwater studies; dating groundwater, delineating flow paths and identifying recharge areas; geochemical evolution of groundwater and assessment of contamination. (Lec. 3) Pre: 483 and 468 or permission of instructor. Offered in even-numbered years. Veeger

**577 Coastal Geologic Hazards (II, 3)** Geologic hazards in the coastal zone and their impact on people. Includes waves, storm-surge, mass-wasting, and sea-level rise. Geologic effectiveness of engineering structures and management techniques. Emphasis on field study. (Lec. 2, Lab. 3) Pre: graduate or advanced undergraduate standing in environmental, resource, or engineering major. Offered in spring of even-numbered years. Boothroyd

**580 New England Geology (I, 3)** Review of the bedrock geology of New England, and its applications for the Appalachian/Caledonides

mountain chain and theories of orogenesis. Mandatory field trips. (Lec. 3) Pre: 321, 370, or permission of instructor. Offered in fall of odd-numbered years. Murray

**581 Topics in Tectonic Geology (I, 3)** Review of selected topics in continental and oceanic tectonics. (Sem. 3) Pre: permission of instructor. Offered in fall of even-numbered years. Murray and Fox

**583 Ground-Water Modeling (II, 3)** Numerical modeling of ground-water flow and solute transport. Numerical methods, model conceptualization, assumptions, boundary conditions, and complex aquifer systems. Modeling exercises including full-scale modeling project using MODFLOW. (Lec. 2, Lab. 3) Pre: 483, or NRS 461 or CVE 588, or permission of instructor. Offered in odd-numbered years. Veeger

**590, 591 Special Problems (I and II, 1–3 each)** Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of instructor. S/U credit for 591. Staff

**592 Nonthesis Master's Research (I and II, 3)** Independent research for fulfillment of research requirement of nonthesis master's degree. Detailed report required. (Independent Study) Pre: permission of chairperson. S/U credit. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**930 Workshop in Geology Topics for Teachers (I and II, 0–3 each)** Especially designed for teachers of physical sciences. Basic topics of geology from an advanced or pedagogical perspective. (Workshop) Pre: teacher certification. Staff

Note: For other related courses, see OCG 540, 625, 628, 643, 644, 645, 646, 649, 651, 652, 678, 681; OCE 582, 688; and CVE 581, 585, 587, 588, 677, 681, 682, 687.

## German (GER)

Section Head: Professor Grandin

**101 Beginning German I (I and II, 3)** Fundamentals of grammar and pronunciation; exercises in reading, writing, and conversation. (Lec. 3) Pre: no prior German is required. Staff (F)

**102 Beginning German II (I and II, 3)** Continuation of 101. (Lec. 3) Pre: 101 or equivalent. Staff (F)

**103 Intermediate German I** (*I and II, 3*) Development of facility in reading narrative and expository prose; exercise in grammar, listening comprehension, and speaking. (Lec. 3) *Pre: 102 or equivalent.* Staff (F)

**104 Intermediate German II** (*I and II, 3*) Continuation of 103. (Lec. 3) *Pre: 103 or equivalent.* Staff (F)

**105, 106 Basic Conversation I, II** (*I and II, 1 each*) 105: Practice in conversational skills. (Lec. 1) *Pre: credit or concurrent enrollment in 103.* 106: Continued practice in conversational skills. (Lec. 1) *Pre: credit or concurrent enrollment in 104.* Staff

**111, 112 Intensive Beginning German** (SS, 4 each) Study of the fundamentals of German with special emphasis on listening and speaking skills. (Lec. 4) *Pre: 111 or equivalent for 112. Not for major credit in German.* Staff

**113, 114 Intensive Intermediate German** (SS, 4 each) Practice in listening and speaking. Development of basic reading and writing skills. Review of grammatical structure. (Lec. 4) *Pre: 112 or equivalent for 113; 113 or equivalent for 114.* Staff

**201, 202 Intermediate Conversation I, II** (*I and II, 1 each*) Conversation skills for students who have completed intermediate German. 202: Continuation of 201. (Lec. 3) *Pre: 104 or permission of instructor.* Staff

**205, 206 Conversation and Composition** (*I and II, 3 each*) Development of facility in spoken and written German using contemporary writings and topics; special emphasis on general classroom discussion. (Lec. 3) *Pre: 104 or equivalent.* Staff

**215, 216 Advanced Conversational German** (SS, 4 each) Intensive practice in speaking and listening, with some attention to writing skills. (Lec. 4) *Pre: 114 or equivalent.* Staff

**221 Introduction to Business German** (SS, 1) Conversational practice in German with emphasis on the acquisition of vocabulary pertinent to international business. (Lec. 1) *Pre: 112 or equivalent.* Staff

**305 Advanced Conversation** (*I, 3*) Intensive practice in spoken German based on matters of current interest in German-speaking countries. (Lec. 3) *Pre: 206 or equivalent. In alternate years.* Staff

**306 Advanced Composition** (*II, 3*) Training in various forms of writing by means of frequent

compositions and critiques. (Lec. 3) *Pre: 206 or equivalent. In alternate years.* Staff

**315, 316 Language Study Abroad** (*I and II, 3–5 each*) Credit for advanced language study in a German-speaking country. (Practicum) *Pre: 206 or equivalent and permission of section head.* Staff

**327 Introduction to German Studies and Literature** (*I or II, 3*) Major developments and figures in German culture, literature, art, and society of the twentieth century. (Lec. 3) *Pre: 206 or permission of instructor.* Kirchner

**328 Introduction to German Cultural History and Literature** (*I or II, 3*) Overview of major German cultural developments starting with the "Germany" of the Romans and ending with unification. Significant figures and developments in literature, art, and society. (Lec. 3) *Pre: 206 (or equivalent) or permission of instructor.* Kirchner

**392 Masterpieces of German Literature** (*II, 3*) Literary works in English translation from 1800 to the present. (Lec. 3) *Not for major credit in German.* Staff (A) (F)

**408 (or LIN 408) The German Language: Past and Present** (*I, 3*) Introduction to the history and present state of the German languages. Study of standard and colloquial German, dialects, Swiss and Austrian variations, language of youth and professions. Analysis of various test types. Tendencies in present-day German. (Lec. 3) *Pre: 305 or permission of instructor. Not for graduate credit.* Hedderich

**411 Advanced Technical German**  
See Engineering 411.

**421 Business German** (*I and II, 3*) Study of the concepts and terminology of the German language common to the realm of international business. Intended for advanced students of business and German. (Lec. 3) *Pre: junior standing, credit or concurrent enrollment in 305 and 306. Next offered fall 1998.* Hedderich

**441, 442 German Literature of the Eighteenth Century** (*I and II, 3 each*) Principal literary movements of the century as illustrated by leading writers of the time. (Lec. 3) *Pre: 206 or equivalent. 441 is not required for 442. In alternate years. Next offered 1998–99.* Grandin

**452 German Literature of the Nineteenth Century** (*I and II, 3*) Principal literary movements of the century as illustrated by leading writers of the time. (Lec. 3) *Pre: 206 or equivalent. In alternate years. Next offered 1999–00.* Staff

**485, 486 Special Studies** (*I and II, 1–3 each*) Special topics in German literature not empha-

sized in other courses. (Seminar) *Pre: one semester of German at the 300 level or permission of section head. May be repeated with a change in topic. In alternate years. Next offered 1998–99.* Staff

**497, 498 Directed Study** (*I and II, 1–3 each*) Designed particularly for the advanced student. Individual research and reports on problems of special interest. (Independent Study) *Pre: acceptance of project by a staff member and permission of section head.* Staff

**586 Seminar in German Studies** (*I, II, and SS, 1–3*) Topics in German literature and civilization. (Seminar) *Pre: graduate standing or permission of instructor. May be repeated with different topics.* Staff

**598 Directed Studies** (*I, II, and SS, 1–3*) Individual research on problems of special interest. (Independent Study) *Pre: graduate standing, acceptance of project by a staff member, and permission of chairperson. May be repeated with different topics.* Staff

**987, 988 German Play Production** (SS, 1 each) Study and production of a German play or plays. (Workshop) *Pre: 215 and 216 or equivalent. Students may enroll concurrently in 485, 486. S/U only.* Staff

## Gerontology

Acting Director: Professor P. Clark

### Human Development and Family Studies

220 Gerontology: Theory and Application  
221 Work with the Aging  
420 Human Development During Adulthood  
421 Death, Dying, and Bereavement  
431 Family and the Elderly  
440 Environmental Context of Aging  
520 Developmental Issues in Later Life  
527 Health Care Policy and the Elderly  
529 Practicum Seminar in Gerontology  
555 Gerontological Counseling

### Consumer Studies

342 Housing for the Elderly

### Dental Hygiene

462 Oral Care of the Aged and Medically Compromised

### Exercise Science

563 Fitness Programs for the Middle-Aged and Elderly  
564 Physiology of Aging

### Food Science and Nutrition

395 Nutrition in the Life Cycle II

**Human Science and Services**

530 Multidisciplinary Health Seminars for the Elderly

**Nursing**

349 Aging and Health

**Physical Education and Exercise Science**

416 Aging and Leisure

**Sociology**

438 Aging in Society

**Greek (GRK)**

Section Head: Associate Professor Suter

**101 Ancient Greek I** (I, 3) Grammar and syntax of Attic Greek, reading practice. (Lec. 3) *Pre: no previous Greek is required.* Staff (F)

**102 Ancient Greek II** (I and II, 3) Continuation of 101. (Lec. 3) *Pre: 101 or equivalent.* Staff (F)

**109, 110 Introduction to Ancient Greek Culture** (I or II, 3 each) Aspects of Greek culture: literature, religion, myth, philosophy, art, private life, athletics, archaeology. Readings in English translation. (Lec. 3) Staff (F)

**301 Intermediate Greek I** (I, 3) Grammar review; readings selected in accordance with students' needs and interests. (Lec. 3) *Pre: 102 or equivalent.* Suter (F)

**302 Intermediate Greek II** (II, 3) Readings selected in accordance with interests of students. (Lec. 3) *Pre: 301 or permission of instructor. May be repeated for credit with a different topic.* Suter (F)

**310 Greek Across the Curriculum** (I or II, 1) Reading of original Greek texts and discussion in conjunction with courses throughout the University curriculum. Designed to maintain language skills and to enrich the study of different subjects by texts in the original language. (Lec. 1) *Pre: 301 or permission of instructor.* Suter, Zeyl, and Hollinshead

**497, 498 Directed Study** (I or II, 1–6 each) Individual readings and research. (*Independent Study*) *Pre: acceptance of project by staff member and approval of chairperson. May be repeated for credit with a different topic.* Suter

**Health (HLT)**

Co-Chairpersons: Associate Professor O'Leary and Associate Professor Seleen (Physical Education and Exercise Science)

**123 Foundations of Health** (I and II, 3) Development of attitudes and practices that lead to more healthful living. Personal and community health problems are studied. (Lec. 3) Staff (S)

**172 First Aid** (I and II, 1) Basic instruction and practice in accident prevention and first aid procedure. Students successfully meeting requirements will receive a Standard First Aid Certificate. (Lec. 1, Lab. 1) *Not open to students with credit or concurrent enrollment in 272.* Seleen

**272 Advanced First Aid** (I and II, 2) Instruction and practice in advanced first aid and emergency care techniques and skills. Fulfills requirements for Red Cross Advanced First Aid Certificate. (Lec. 1, Lab. 2) Seleen

**356 Methods and Materials in Health Education** (I or II, 3) Curricular materials for school and public health education; evaluation of techniques and current methodology for use in elementary and secondary schools. (Lec. 3) Staff

**357 Principles of Community Health** (II, 3) Principles of community health with emphasis on problems of health departments, public and private agencies, and schools in the community health education program. (Lec. 3) *Pre: 123, 367, or permission of chairperson.* Staff

**367 School Health Program** (I or II, 3) Organization of the school health program in relation to the community health program. Emphasis on health instruction, health services, and healthful school environment. (Lec. 3) Staff

**377 Current Health Problems** (I or II, 3) Health problems of current importance on an individual, community, national, and international basis. Content application. Solutions to health problems. Includes the school, community, and public health approaches to these problems. (Lec. 3) *Pre: 367 or permission of chairperson.* Staff

**380 Organization of Community Health Services** (I or II, 3) An examination of the health services delivery system in the United States with emphasis on the role and function of state and local health agencies. Agency visits required. (Lec. 3) *Pre: 357 or permission of instructor.* O'Donnell

**391 Directed Study**

See Physical Education and Exercise Science 391.

**457 Health and Safety Issues of Consumer Products**

See Consumer Studies 457.

**484 Supervised Field Work**

See Physical Education and Exercise Science 484.

**486 Field Experience Seminar**

See Physical Education and Exercise Science 486.

**560 Seminar**

See Physical Education and Exercise Science 560.

**591 Special Problems**

See Physical Education and Exercise Science 591.

**592 Internship**

See Physical Education and Exercise Science 592.

**595 Independent Study**

See Physical Education and Exercise Science 595.

**599 Master's Thesis Research**

See Physical Education and Exercise Science 599.

**Health Services Administration (HSA)**

Coordinator: Professor Grubman-Black (B.G.S. Program)

**360 Health Services Administration** (I or II, 3) Introduction to key concepts and principles in health services administration through both didactic and experiential means. (*Seminar*) *Pre: admission to the B.G.S. program as a health services administration major and a minimum of 60 credits.* Staff

**380 Introductory Practicum in Health Services Administration** (I or II, 3) Didactic and experiential introduction to the delivery of health services including acute care, long-term care, nursing homes, and special services problems such as hepatitis, tuberculosis, and HIV. (*Practicum*) *Pre: admission to the B.G.S. program as a health services administration major and a minimum of 75 credits.* Staff

**480 Advanced Practicum in Health Services Administration** (I or II, 6) An intensive experience in a health care setting selected by the student, combined with class meetings. (*Practicum*) *Pre: admission to the B.G.S. program as a health services administration major and a minimum of 90 credits. Not for graduate credit.* Staff

**Hebrew (HBW)**

Chairperson: Professor Morello (Modern and Classical Languages and Literatures)

**101 Beginning Hebrew I** (I or II, 3) Fundamentals of grammar and pronunciation; exercises in reading, writing, and conversation. (Lec. 3) *Pre: no prior Hebrew is required.* Jagolinzer (F)

**102 Beginning Hebrew II** (*I or II, 3*) Continuation of 101. (*Lec. 3*) *Pre: 101 or equivalent.* Jagolinzer (F)

**103 Intermediate Hebrew I** (*I and II, 3*) Development of facility in reading narrative and expository prose; exercise in grammar, listening comprehension, and speaking. (*Lec. 3*) *Pre: 102 or equivalent.* Staff (F)

**104 Intermediate Hebrew II** (*I and II, 3*) Continuation of 103. (*Lec. 3*) *Pre: 103 or equivalent.* Staff (F)

## History (HIS)

*Chairperson:* Associate Professor Honhart

**111 History of Ancient Greece and Rome** (*I, 3*) From the Greek and Latin settlements to the Germanic invasions with emphasis on political, social, economic, and aesthetic developments. Includes rise of the Christian church. (*Lec. 3*) Staff (F) (L)

**112 History of Medieval Europe** (*II, 3*) Primarily western Europe. Continuation of 111. Medieval church, feudalism, revival of town life, commerce, industry, and money economy, rise of national states, and development in the arts. (*Lec. 3*) Rollo-Koster (F) (L)

**113 History of Western Civilization from the Late Middle Ages to 1789** (*I and II, 3*) Introductory course treating Western civilization in its broadest sense from the late Middle Ages to the French Revolution and the beginnings of industrialization. (*Lec. 3*) Staff (F) (L)

**114 History of Western Civilization Since 1789** (*I and II, 3*) Continuation of 113. Western civilization of the present time. (*Lec. 3*) Staff (F) (L)

**115 The History of Science to 1800** (*I, 3*) A survey of the developments of science from Ancient Greece through the Scientific Revolution of the seventeenth and eighteenth centuries. (*Lec. 3*) Briggs (L)

**116 The History of Science Since 1800** (*II, 3*) A survey of the developments of science in society over the last two centuries. (*Lec. 3*) Briggs (L)

**118 Women in European History** (*II, 3*) Attitudes toward women, their role in society, women's work, and the feminist movement. Emphasis on nineteenth and twentieth centuries with background material from earlier periods. (*Lec. 3*) Staff (L)

**123 Modern British Civilization** (*I or II, 3*) An introduction to British culture in the nineteenth and twentieth centuries. Surveys of the impact of the Industrial Revolution, political developments, and social change; also Britain's role in the world, Ireland, and the world wars. (*Lec. 3*) Staff (F) (L)

**130 History and the Sea** (*I or II, 3*) The history of seafaring from ancient times to the twentieth century. The course considers the political, military, economic, and social history of the maritime world. (*Lec. 3*) Mather (L)

**132 Introduction to Russian and Soviet History** (*I or II, 3*) Selected topics in the development of Russian civilization since the ninth century. (*Lec. 3*) Thurston (F) (L)

**141 History of the United States to 1877** (*I or II, 3*) Colonial and Revolutionary periods, and economic, social, and political development of the United States through the Civil War and Reconstruction. (*Lec. 2, Rec. 1*) Staff (L)

**142 History of the United States Since 1877** (*I or II, 3*) General social, economic, and political development from 1877 to the present. (*Lec. 2, Rec. 1*) Staff (L)

**145 Women in American History** (*I or II, 3*) American women from the colonial period to the present. Emphasis on institutionalization of the Victorian ideal, women in the labor force, and origins of liberation ideology. (*Lec. 3*) Strom (L)

**150 (or AAF 150) Introduction to Afro-American History** (*I or II, 3*) Survey of Afro-American history from African origins to the current racial confrontation. (*Lec. 3*) Weisbord (L)

**171 East Asian Culture and History** (*I or II, 3*) Introduction to the culture and history of East Asia. Emphasis on the literary, artistic, and philosophical traditions of East Asia, especially those aspects which relate to and influence contemporary developments. (*Lec. 3*) George (F) (L)

**176 The Islamic Middle East: From Muhammad to the Mongols** (*I and II, 3*) History of the Islamic Middle East from the rise of Islam in the seventh century through the Mongol conquests in the thirteenth century. (*Lec. 3*) Staff (F) (L)

**177 The Islamic Middle East: From the Mongols to Modern Times** (*I or II, 3*) History of the Islamic Middle East from the Mongol invasions of the thirteenth century to the present. Includes the Ottoman Empire, the impact of European colonialism, the rise of nationalism, the Arab-Israeli conflict, and the Iranian revolution. (*Lec. 3*) Staff (F) (L)

**180 Introduction to Latin American Civilization** (*I or II, 3*) Social, cultural, and political history of the Latin American region from the preconquest era to the present time. (*Lec. 3*) Pegueros (F) (L)

**300 Ancient Greece: Hellenic and Hellenistic Period from the Trojan Wars to Alexander the Great, 800 B.C.–300 B.C.** (*II, 3*) Social, economic, political and intellectual development of Greece from the Archaic to Hellenistic period. (*Lec. 3*) *Pre: 111 or GRK 109 or 110 or permission of instructor.* Staff

**303 From Republic to Empire: Ancient Rome** (*I, 3*) Social, economic, political, and intellectual history of Ancient Rome, covering the foundation of the city, the Roman Republic and Empire, and the spread of Christianity. From about 750 B.C. to about 300 A.D. (*Lec. 3*) *Pre: 111 or 112 or permission of instructor.* Staff (F)

**304 Western Europe in the High Middle Ages** (*I, 3*) Primarily France and England in the twelfth and thirteenth centuries. Emphasis on the Medieval Gothic-Catholic culture, the rise of towns, and the development of a money economy. (*Lec. 3*) Rollo-Koster (F) (L)

**305 The Renaissance** (*II, 3*) Europe in transition during the fourteenth through the early sixteenth centuries. The economic, social, and religious backgrounds of the Renaissance. Emphasis on culture and artistic developments. (*Lec. 3*) Rollo-Koster (F) (L)

**306 The Protestant and Catholic Reformation I** (*I, 3*) Change of European society resulting from the Protestant Reformation and Catholic Reaction; rise of secular states and emerging national states; effects of religious crises upon culture and society. (*Lec. 3*) Staff (F) (L)

**307 The Protestant and Catholic Reformation II** (*II, 3*) Catholic and Counter Reformation, Northern Renaissance, wars of religion, social and cultural manifestations of the early Baroque. (*Lec. 3*) Staff (F) (L)

**308 Between Eve and Mary: Women in the Middle Ages** (*I and II, 3*) History of women in western Europe from about 500 A.D. to about 1500 A.D. Understanding the variety of medieval women's experiences (rich or poor, secular or religious, urban or rural) and how women were perceived by their society. (*Lec. 3*) Rollo-Koster

**309 The French Revolution and Napoleon** (*I, 3*) Examination of the Revolution and Napoleonic eras with emphasis on the connections among economic, social, and political developments. Special attention to problems in interpretation. (*Lec. 3*) *Pre: junior standing.* Staff (L)

**310 History of Europe: 1815–1914** (I, 3) Major political, economic, and intellectual developments in Europe from the defeat of Napoleon I to the outbreak of World War I; emphasis on the Revolutions of 1848, unification of Italy and Germany, impact of the Industrial Revolution, nationalism and imperialism, background of World War I. (Lec. 3) *Pre: junior standing.* Thurston (F) (L)

**311 History of Europe Since 1914** (II, 3) Detailed study of developments from 1914 to present: wars, postwar adjustments, communist and fascist ideologies, history of individual states, and social and intellectual trends. (Lec. 3) *Pre: junior standing.* Honhart (F) (L)

**314 Seventeenth- and Eighteenth-Century European Cultural History** (I, 3) Intellectual and social movements of the Age of Reason and the Age of Enlightenment. (Lec. 3) Briggs (F) (L)

**321 History of England: 1485–1660** (I, 3) Political, economic, and religious change from the beginning of the Tudor dynasty to the Puritan Revolution and the Commonwealth. (Lec. 3) Staff (L)

**323 History of England: 1815–1896** (I, 3) Impact of industrialization and urbanization on political, economic, religious, and cultural forces in the Victorian age. (Lec. 3) Staff (L)

**324 History of England Since 1896** (II, 3) History of Britain since 1896, with emphasis upon its changing role as a world power, the impact of economic change on politics and society, and the development of the social welfare state. (Lec. 3) Staff (L)

**326 German History to 1914** (I, 3) Survey of German history to 1914 with emphasis on the eighteenth and nineteenth centuries. (Lec. 3) Honhart (F)

**327 German History Since 1914** (II, 3) The collapse of Germany's social and political order between 1914 and 1945 and the subsequent creation of antagonistic liberal and socialist societies in West and East Germany. Emphasis on national socialism. (Lec. 3) Honhart (F) (L)

**328 The Holocaust** (I or II, 3) Study of Nazi efforts to exterminate Jews and others in Europe. Focuses on Nazi programs and policies; Jewish experiences; and the responses of the outside world. (Lec. 3) *Pre: junior standing.* Weisbord (L)

**330 History of France Since 1815** (II, 3) French political and social history from the end of the First Empire to the Fifth Republic. Complexities

of class divisions and their repercussions on French political history. (Lec. 3) Staff (F)

**332 History of Imperial Russia** (I, 3) Russian society, politics, and world view from the modernizing reforms of Peter the Great to the installation of parliamentary government in 1905. Emphasis on student writing, analysis of documents, trends, interconnections. (Lec. 3) Thurston (F) (L)

**333 History of the Soviet Union** (II, 3) From industrialization and regrouping in the 1890s, an examination of the new political and economic system that emerged from revolutions and civil war. Literature studied as forum for debate about the just society. Regular informal writing. (Lec. 3) Thurston (F) (L)

**335 American Colonial History to 1763** (I, 3) American history from the founding of the colonies to the end of the French and Indian War, including developments within the colonies as well as their relationship with England. (Lec. 3) *Pre: 141 or equivalent.* Cohen

**336 The American Revolution and Confederation: 1763–1789** (I, 3) Social, political, and economic aspects of the Revolution and Confederation periods. (Lec. 3) *Pre: 141 or permission of instructor.* Cohen

**337 Creation of the Union: America from 1789–1848** (I or II, 3) The development of the new nation through the Jacksonian years, with emphasis on the transformation of society and politics. (Lec. 3) Schwartz

**339 Emergence of Industrial America: 1877–1917** (I, 3) Growth and consolidation of business, urbanization, and the Populist and Progressive movements. America's emergence as a world power. (Lec. 3) *Pre: 142 or permission of instructor.* Klein

**340 United States History from 1917 to 1945** (I or II, 3) Social, political, and economic developments between the World Wars. Emphasis on domestic affairs; special attention to the involvement of the United States in World War II. (Lec. 3) Klein and Findlay (L)

**341 United States History Since 1945** (I or II, 3) Social, political, and economic developments since the end of World War II. Equal emphasis upon the domestic sphere and the role of the United States in the world. (Lec. 3) Klein and Findlay (L)

**344 History of the North American Indian** (I or II, 3) Native North Americans from pre-Columbian times to present. Emphasis on ideo-

logical conflict between Indians and whites. (Lec. 3) Staff (F)

**346 Immigration to Ethnicity in Modern America** (I, 3) Nature of population movements to the United States in nineteenth and twentieth centuries, formation of ethnic communities and their internal dynamics, role of ethnic groups in American social, cultural, and political history. (Lec. 3) Findlay (L)

**349 History of American Labor** (I or II, 3) Changes in work, lifestyle, and political consciousness of American workers in nineteenth and twentieth centuries; conflicts between labor and capital, and relationship to emergence of labor movements. (Lec. 3) Molloy

**350 Family Matters: History of Family Life in the United States** (I or II, 3) The experiences of America's families from European settlement to the present. Emphasis on how family life has varied over time, from place to place, and among different ethnic and social groups and according to gender. (Lec. 3) *Pre: junior standing or permission of the instructor.* Schwartz

**351 American Women in the Nineteenth Century** (II, 3) Emphasis on women's paid and unpaid labor, culture, and domestic arts; the emergence of the women's rights movement; the impact of industrialization and urbanization; and changing notions of sexuality. (Lec. 3) Strom

**352 American Women in the Twentieth Century** (II, 3) Emphasis on the history of women's work and sexuality; women in the labor, civil rights, and feminist movements; and images of women in popular culture. (Lec. 3) Strom

**353 United States Diplomatic History to 1914** (I or II, 3) Analysis of the people, ideas, and institutions which shaped the rise of the United States from thirteen colonies to the most powerful nation in the world. (Lec. 3) Staff (L)

**354 United States Diplomacy in the Twentieth Century** (I or II, 3) Analysis of people, ideas, and institutions which have shaped American relations with the rest of the world from World War I to the present. (Lec. 3) Staff (L)

**357 History of Religion in the United States** (I, 3) Background, emergence of evangelical Protestant synthesis, disintegration of this synthesis, and development of a pluralistic religious community in modern America. (Lec. 3) Findlay

**358 Recent America in Film** (II, 3) An investigation of American culture and history since 1930



using films as the major resource for study, with emphasis on the Great Depression, World War II, sexual interaction, and race relations. (Lec. 1, Lab. 4) Strom

**359 (or AAF 359) History of Slavery in America** (I or II, 3) Origins, development, and demise of slavery, with emphasis on the area that currently constitutes the United States. (Lec. 3) Schwartz

**360 American Culture 1865–1940** (I or II, 3) Explores the nature and sources of American culture with emphasis on the diversity of its origins and forms of expression. (Lec. 3) Klein (L)

**362 History of Rhode Island** (II, 3) History of Rhode Island from the first English settlement to the present day. Social, political, and economic aspects of internal development and the relation of the state to the region and the nation. (Lec. 3) Pre: 141 and 142. Staff

**365 Civil War and Reconstruction** (I or II, 3) American history during the period 1850–1877, giving equal emphasis to the background of the Civil War, the war itself, and the social, political, and economic aspects of Reconstruction. (Lec. 3) Klein and Strom

**374 History of Modern China** (II, 3) Political, social, economic, and cultural development of China since 1800 with emphasis on the development of Chinese nationalism and on the rise, theory, and practice of Chinese communism. (Lec. 3) George (F)

**375 History of Modern Japan** (I, 3) Background and significance of the Meiji restoration (1868) and modernization; the development of Japanese militarism, the fall of the Japanese Empire, and the emergence of the “New Japan.” (Lec. 3) George (F)

**376 Women in Muslim Societies** (I or II, 3) Examines gender relations in the modern Middle East through novels, poetry, and oral histories, as well as through historical and anthropological studies. (Lec. 3) Staff (F) (L)

**377 Revolution in Islam** (I or II, 3) Examines the history of revolutionary ideology in Islamic thought and places modern revolutions—such as the Iranian revolution of 1978—within a broader context of both Sunni and Shi’i radical activism. (Lec. 3) Staff (F) (L)

**378 Arab-Israeli Conflict** (I or II, 3) An examination of the roots of Arab nationalism and modern political Zionism; conflict between the World Wars; the creation of the state of Israel and the causes of continuing conflict since its creation. (Lec. 3) Staff (F)

**381 History of Colonial Latin America** (I, 3) The interaction of American-Indian civilizations with European and African elements in the Spanish and Portuguese empires of the New World, concluding with the wars for independence. (Lec. 3) Pegueros (F) (L)

**382 History of Modern Latin America** (II, 3) Historical analysis of the political, cultural, and social-economic dimensions of tradition, reform, and revolution in Latin America since 1810. (Lec. 3) Pegueros (F) (L)

**384 The Caribbean: New World/Third World** (I or II, 3) Historical and contemporary development of the Caribbean world, emphasizing efforts by the regions’ peoples to achieve political, economic, and cultural independence from external domination. (Lec. 3) Pegueros (F) (L)

**385 Revolution and Unrest in Central America and the Caribbean** (II, 3) Historical origins of social unrest in Central America and the Spanish-speaking Caribbean. Cuban and Nicaraguan revolutions, civil conflict in Guatemala and El Salvador, U.S. policy. (Lec. 3) Pre: 180, 381, or 382 are recommended, but are not prerequisites. Pegueros (F)

**388 (or AAF 388) History of Sub-Saharan Africa** (I, 3) Ancient and medieval Africa, and the impact of Islam; the “Glorious Age” of the Sudanic empires; the slave trade and the age of exploration; the period of European partition and the rise of African nationalism. (Lec. 3) Pre: junior standing. Staff (F)

**391 Directed Study or Research** (I and II, 3) Special work arranged to meet the needs of individual students who desire advanced work. (Independent Study) Pre: permission of chairperson. May be repeated for a total of 6 credits with permission of instructor and chairperson. Staff

**393 Topics in History** (I and II, 1–3) Subject, course content, and years offered will vary according to expertise and availability of instructors. (Seminar) May be repeated for credit with permission of chairperson. Staff

**397 The Historical Landscape of Britain** (SS, 3) Taught in England. Examines the impact of political, military, religious, economic, and social change in the past six or seven centuries on the landscape of village and field and town and country. (Lec. 2, Lab. 3) Usually taught in conjunction with ENG 397. Gutchen (F)

**398 History Through Science Fiction** (II, 3) Ideas about history in popular culture as seen in the literary genre of science fiction. (Lec. 3) Briggs and Klein (L)

**401 Advanced Topics in European History** (I or II, 3) Subject and course content will vary from semester to semester. Student work will emphasize historiographical analysis and the use of specialized research materials. (Lec. 3) Pre: junior, senior, or graduate standing in history or permission of instructor. May be repeated for credit with permission of chairperson. Staff

**441 Advanced Topics in American History** (I or II, 3) Subject and course content will vary from semester to semester. Student work will emphasize historiographical analysis and the use of specialized research materials. (Lec. 3) Pre: junior, senior, or graduate standing in history or permission of instructor. May be repeated for credit with permission of chairperson. Staff

**481 Advanced Topics in Asian or Latin American History** (I or II, 3) Subject and course content will vary from semester to semester. Student work will emphasize historiographical analysis and the use of specialized research materials. (Lec. 3) Pre: junior, senior, or graduate standing in history or permission of instructor. May be repeated for credit with permission of chairperson. Staff

**495 Seminar in History** (I or II, 3) Development of skills in historical research and writing and in the critical analysis of historical works. Topics vary. (Seminar) Pre: completion of 401, 441, or 481, with the same instructor, or permission of the department. This course is required of undergraduate history majors. May be repeated for credit with different topic with permission of instructor. Staff

**496 History Computer Workshop** (I or II, 3) Development of skills in historical research and writing and in the critical analysis of historical works. Topics vary. (Seminar) Pre: completion of 401, 441, or 481, or permission of instructor. This course (or HIS 495) is required of and open only to undergraduate history majors. May be repeated for credit with different topic with permission of instructor. Not for graduate credit. Staff

**502, 503 Special Readings in European History** (I and II, 3 each) Intensive tutorial work, research, and readings in European history. (Independent Study) Pre: graduate standing, permission of instructor, and concurrent audit of parallel 300-level course. May be repeated. Staff

**506 Seminar in European History** (I or II, 3) Selected topics in European history, with intensive reading of important secondary and/or primary sources; critical written analysis of historical method, research, and modes of interpretation. (Seminar) Pre: graduate standing or

permission of instructor. Briggs, Honhart, Mather, Rollo-Koster, Thurston, Weisbord, or Staff.

**507 Seminar in United States History (I or II, 3)** Selected topics in United States history, with intensive reading of important secondary and/or primary sources; critical written analysis of historical method, research, and modes of interpretation. (Seminar) Pre: graduate standing or permission of instructor. Cohen, Findlay, Klein, Mather, Schwartz, Strom, Weisbord, or Staff

**508 Seminar in Asian or Latin American History (I or II, 3)** Selected topics in Asian or Latin American history, with intensive reading of important secondary and/or primary sources; critical written analysis of historical method, research, and modes of interpretation. (Seminar) Pre: graduate standing or permission of instructor. George, Pegueros, or Staff

**536, 537 Special Readings in American History (I and II, 3 each)** Intensive tutorial work, research, and readings in American history. (Independent Study) Pre: graduate standing, permission of instructor, and concurrent audit of parallel 300-level course. May be repeated. Staff

**544 Colloquium in Worker History**  
See Labor and Industrial Relations 544.

**588, 589 Special Readings in Asian or Latin American History (I and II, 3 each)** Intensive tutorial work, research, and readings in Asian or Latin American history. (Independent Study) Pre: graduate standing and permission of instructor. Concurrent audit of parallel 300-level course required. May be repeated. Staff

**591 Directed Study or Research (I and II, 3)** Directed readings, research, or study designed to meet the particular needs of individuals or small groups of graduate students. (Independent Study) Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Home Economics (HEC)

**400 Home Economics Seminar (II, 1)** Didactic and experimental learning in the areas of home economics. Historic perspective, current issues, and futuristic trends in home economics. (Seminar) Pre: HSS 320 and field experience. Intended for general home economics majors. Not for graduate credit. Staff

## Home Economics Education (HED)

**595 Master's Project: Action Research (I and II, 1–6)** Candidates plan and carry out an action research project approved by the instructor. Number of credits is determined each semester in consultation with the major professor. Pre: admission to a master's program in home economics education, a course in research methods, and permission of chairperson. May be repeated for a maximum of 6 credits. Staff

## Honors Program (HPR)

Director: Professor G. Johnson

Honors courses (HPR) are open only to eligible students. See page 39 of this catalog or the Honors Program brochure for requirements. Sections of honors courses that have been approved for General Education credit in particular areas are so marked.

**101 Analytical Thinking in the Humanities (I and II, 3)** Identification and comparison of analytical and critical methods employed by humanistic disciplines. Practice in their application. (Seminar) Staff (A)

**102 Analytical Thinking in the Social Sciences (I and II, 3)** Identification and comparison of the analytical and critical methods employed in the social sciences. Practice in their application. (Seminar) Staff (S)

**103 Analytical Thinking in the Natural Sciences (I and II, 3)** General themes in science as the basis for studying the "scientific method" and methods of analytical thinking common to problem solving in the sciences. (Seminar) Staff (N)

**104 Analytical Thinking in the Letters (I and II, 3)** Identification and comparison of analytical and critical methods employed by historians and philosophers. Practice in their application. (Seminar) Staff (L)

**105 Honors Study in Fine Arts and Literature (I and II, 3)** Exploration of themes, topics, and techniques in the fine arts and in literature. (Seminar) Spring 1999: *Understanding the Moving Image—Film and Television*. Zorabedian (A); Spring 1999: *The Influence of Art on Fashion in the 20th Century*. Welters (A)

**106 Honors Study in Foreign Language and Culture (I and II, 3)** Exploration of themes and topics relating to foreign languages and cultures. (Seminar) Staff (F)

**107 Honors Study in Letters (I and II, 3)** Exploration of themes and topics in the field of letters. (Seminar) Fall 1998: *Literature and the Environment*. Cook (L)

**108 Honors Study in Mathematics (I and II, 3)** Exploration of topics and creative use of problem solving in mathematics. (Seminar) Fall 1998: *Computer Skills and Concepts*. Fay Wolfe (M)

**109 Honors Study in Natural Sciences (I and II, 3)** Exploration of themes and topics in the natural sciences. (Seminar) Spring 1999: *Biology for the Citizen*. Heppner (N); Spring 1999: *The Evolution of Life on Earth*. Abell (N)

**110 Honors Study in Social Sciences (I and II, 3)** Exploration of themes and topics in the social sciences. (Seminar) Fall 1998: *Special Honors Section of WMS 150*. Hughes (S); Spring 1999: *Sherlock Holmes on Evidence, Knowledge, and Human Nature*. Silverstein (S); Spring 1999: *Making Connections: School and Human Service Agencies*. McKinney and Hicks (S)

**111 Honors Study in English Communication (I and II, 3)** Exploration of the elements of English communication. (Seminar) Staff (C)

**112 Honors Study in Writing (I and II, 3)** Exploration of the elements of writing. (Seminar) Fall 1998: *Special Honors Section of WRT 101—New Public Spaces for Writers and Writing*. Reynolds (Cw)

**113 Honors Course in Philosophy (I and II, 1–4)** (Seminar) Fall 1998: *Special Honors Section of PHL 217—Justice, Community, and Friendship*. Johnson (L)

**114 Honors Course in History (I and II, 1–4)** (Seminar) Spring 1999: *Special Honors Section of HIS 180—Introduction to Latin American Civilizations*. Pegueros (L)

**115 Honors Course in Political Science or Economics (I and II, 1–4)** (Seminar) Spring 1999: *Special Honors Section of ECN 100—Ecology, Economy, and Society*. Starkey (S)

**116 Honors Course in Sociology or Anthropology (I and II, 1–4)** (Seminar)

**117 Honors Course in Psychology (I and II, 1–4)** (Seminar)

**118 Honors Course in Speech Communication or Journalism (I and II, 1–4)** (Seminar) Fall 1998: *Special Honors Section of COM 101—Public Speaking*. Brown (C); Fall 1998: *Special Honors Section of COM 103—Interpersonal Communication*. Derbyshire (C); Spring 1999: *Special Honors Section of COM 101—Public Speaking*. August

(C); Spring 1999: *Special Honors Section of COM 103—Interpersonal Communication*. Derbyshire (C)

**119 Honors Course in Interdisciplinary Studies** (I and II, 1–4) (Seminar) Fall 1998: *Service America*. Narasimhan. (S) Fall 1998: *Understanding Visual Communication*. Schroeder (A)

**121 Honors Course in Mathematics** (I and II, 1–4) (Seminar) Fall 1998: *Special Honors Section of MTH 108—Recreational Problem-Solving*. Lewis (M)

**122 Honors Course in Physical Sciences** (I and II, 1–4) (Seminar)

**123 Honors Course in Biological Sciences** (I and II, 1–4) (Seminar)

**124 Honors Course in Fine Arts** (I and II, 1–4) (Seminar)

**125 Honors Course in Language or Literature** (I and II, 1–4) (Seminar)

**201, 202 Honors Colloquium** (I and II, 3 each) (Lec. 2, Rec. 1) Spring 1999: *The Literacy Challenge in America*. Brady

**203 The Prepared Mind: Critical and Analytical Problem Solving** (II, 3) Introduction to problem solving through the development of creativity, critical thinking, and communication skills. Focus on individual development in these areas. (Seminar) Staff (L)

**301, 302 Honors Tutorial** (I and II, 3 each) (Practicum) Fall 1998 and Spring 1999: *Administrative Internship*. Staff

**311 Honors Tutorial in Fine Arts** (I and II, 1–3) (Seminar) Fall 1998: *Men in the Dark—Masculinity in American Cinema*. Zorabedian

**312 Honors Tutorial in Language or Literature** (I and II, 1–3) (Seminar) Fall 1998: *Film Theory and Criticism*. Leo; Spring 1999: *Special Honors Section of ENG 346—American Film Classics*. Cook

**313 Honors Tutorial in Philosophy** (I and II, 1–3) (Seminar)

**314 Honors Tutorial in History** (I and II, 1–3) (Seminar) Spring 1999: *Labor and Ethnic History in Rhode Island*. Molloy

**315 Honors Tutorial in Political Science or Economics** (I and II, 1–3) (Seminar) Fall 1998: *Fundamental Freedoms*. Wood

**316 Honors Tutorial in Sociology or Anthropology** (I and II, 1–3) (Seminar)

**317 Honors Tutorial in Psychology** (I and II, 1–3) (Seminar)

**318 Honors Tutorial in Speech Communication or Journalism** (I and II, 1–3) (Seminar)

**319 Honors Tutorial in Interdisciplinary Studies** (I and II, 1–3) (Seminar) Fall 1998: *Science and Pseudoscience—A Critical Look at Some Claims About the Natural World*. Wolke; Fall 1998: *Federal Courts and Federal Jurisdiction*. Hagopian; Spring 1999: *Religions of the World and Global Change*. Stein; Spring 1999: *The Nature of Educative Experience*. Willis

**321 Honors Tutorial in Mathematics** (I and II, 1–3) (Seminar)

**322 Honors Tutorial in Physical Sciences** (I and II, 1–3) (Seminar)

**323 Honors Tutorial in Biological Sciences** (I and II, 1–3) (Seminar)

**331, 332 Honors Tutorial in Human Science and Services** (I and II, 1–3 each) (Seminar)

**341, 342 Honors Tutorial in Business** (I and II, 1–3 each) (Seminar) Spring 1999: *Advertising in Society—Art, Images, and Meaning*. Schroeder

**351, 352 Honors Tutorial in Nursing** (I and II, 1–3 each) (Seminar)

**361, 362 Honors Tutorial in Engineering** (I and II, 1–3 each) (Seminar)

**371, 372 Honors Tutorial in Resource Development** (I and II, 1–3 each) (Seminar)

**381, 382 Honors Tutorial in Pharmacy** (I and II, 1–3 each) (Seminar)

**401, 402 Honors Project** (I and II, 3 each) (Independent Study)

**411, 412 Honors Seminar** (I and II, 3 each) (Seminar) Fall 1998: *Minds and Brains—Philosophy of Psychology*. Arieuw and Silverstein.

## Human Development and Family Studies (HDF)

Chairperson: Associate Professor Schaffran

**150 Personal Development** (I and II, 3) Emphasis on self-understanding and human relationships in general. Influence of societal roles, groups interaction, and contemporary cultural issues of individual development. (Lec. 3) Staff

**200 Life-Span Development I** (I, 3) For students who intend to enter a profession dealing with children. Physical, social, mental,

emotional growth and development, and interrelations among them from birth to puberty. (Lec. 3) Cohen

**201 Life-Span Development II** (II, 3) For students entering the human services. Introduction to social, mental, emotional growth and development, and interrelations among them. Emphasis on adolescence through senescence. (Lec. 3) Cohen

**202 Research Perspectives in Human Development and Family Studies** (I and II, 3) Introduction to research processes in human development and family studies. Emphasis on reading and evaluating the research literature and preparing and presenting literature reviews. (Lec. 3) Pre: admission to the human development and family studies program. Kalymun

**203 Introduction to Work with Children** (I and II, 3) Theory and practice in care, teaching, and guidance of preschool children. Lectures, discussion, and participation in a preschool program. (Lec. 2, Lab. 2) Pre: 200. Warford or Brooks

**220 Gerontology: Theory and Application** (I, 3) Introduction to the study of aging processes: biological, psychological, and social theories. Health, social, and other age-related problems will be examined in the classroom and through interaction with older people. (Lec. 3) Staff (S)

**221 Work with the Aging** (II, 3) Includes theoretical, ethical, and practical aspects of work with the aging. Each student will have ongoing field experience in a setting with older people. Own transportation desirable. (Lec. 2, Lab. 2) Pre: 220. Staff

**230 Marriage and Family Relationships** (I and II, 3) Male-female and other close relationships in courtship and family systems as influenced by personality and culture in a changing society. Professional and functional orientation. (Lec. 3) Schroeder

**297 Contemporary Issues in Student Development** (I or II, 1–3) Student orientation, leadership, and training practices presented by various Student Affairs and other University programs, such as Student Life, Residential Life, Health Services, University College, and Affirmative Action. (Seminar) May be repeated for up to 6 credits. S/U only. Staff

**298 Contemporary Issues in Student Development** (I or II, 1–3) Student leadership models and practices in various student development

settings, such as Student Affairs, Student Life, Residential Life, University College, and Health Services. (Seminar) Staff

**301 Curriculum in Early Childhood (I, 3)** Program planning and teaching techniques that foster development of the young child in all curriculum areas. Includes Piagetian assessment and three hours per week in a local child care setting. (Lec. 2, Lab. 3) Pre: 203 and admission to the early childhood education program, or permission of instructor. Warford

**302 Literature for Children (I or II, 3)** Literary heritage of American children and criteria for the selection and presentation of literature to children. (Lec. 3) Pre: junior standing. Staff

**303 Early Childhood Practicum (II, 3)** Supervised teaching in the Child Development Center with children through kindergarten age. Includes curriculum design and working with special needs children. (Lec. 2, Lab. 3) Pre: 301 or permission of instructor. Warford

**310 Adolescent Growth and Development (I and II, 3)** Physical, psychological, social, and emotional growth and development of the individual during adolescent years. (Lec. 3) Pre: 200 or PSY 232. Staff

**350 Human Relations Laboratory (I or II, 1)** Understanding individual behavior in the context of a social group; discussion and selected group dynamics techniques. (Lab. 2) Pre: 150, 200, and permission of chairperson. S/U credit. Staff

**357 Family and Community Health (I and II, 3)** Health maintenance throughout life. Specific health concerns of various age groups. Community and world health needs and agencies concerned with meeting these needs. (Lec. 3) Pre: junior standing. Staff

**380 Field Experiences in Community Agencies (I and II, 6–12)** Supervised experience in community agencies. The experience will be defined by a job description and learning contract approved by the course instructor, relevant agency supervisor, and the student during the semester prior to enrollment in the course. (Practicum) Pre: concurrent enrollment in 381, junior standing, and permission of instructor. S/U only. Kalymun or Schroeder

**381 Field Experience Seminar (I, II, or SS, 1)** Group discussion of field experience in 380 and related academic assignments. (Seminar) Pre: concurrent enrollment in 380 and permission of instructor. May be repeated for a maximum of 2 credits. Kalymun or Schroeder

**400 Child Development: Advanced Course (I and II, 3)** Presentation of theory of human development and consideration of some of the classical and current investigations in the field. (Lec. 3) Pre: 200 or equivalent. Cohen or Brooks

**406 Growth and Development During Infancy (I or II, 3)** Study of developmental sequences from birth to two years with emphasis on biological, psychological, social, and environmental influences affecting growth. Laboratory periods consist of observation and experience with infants in various settings. (Lec. 2, Lab. 2) Pre: 200. Staff

**420 Human Development During Adulthood (I or II, 3)** Major social and cultural factors influencing development after physiological maturity and prior to senescence. Major theorists and normal crises of adulthood. (Lec. 3) Pre: 201. Staff

**421 Death, Dying, and Bereavement (I or II, 3)** Exploration of human death, dying, and bereavement. Focus on biomedical, psychological, and sociocultural dimensions of the topic. (Lec. 3) Knott

**424 Design and Delivery of Services for Mentally Retarded Adults (II, 3)** Study of community-based services for mentally retarded adults. Offered for students who are interested in gerontology and/or who are planning careers in the multidisciplinary field of mental retardation. (Lec. 3) Pre: 220 or permission of instructor. Staff

**430 Family Interaction (I and II, 3)** Interdisciplinary approach to the dynamics of intrafamily relationships, interactions of family units and family members with elements of the sociocultural environment. (Lec. 3) Pre: 230. Schroeder

**431 Family and the Elderly (I or II, 3)** Emphasis on the elderly in analysis of intergenerational organization and relationships. Cultural values, psychosocial factors, economic considerations, and societal trends relative to family life. (Lec. 3) Kalymun

**432 Perspectives on Parenting (I or II, 3)** Comprehensive study of central issues, research, and recent developments in the field of parenting; the impact of the behavioral sciences and social change on parents. (Lec. 3) Pre: 200 or permission of instructor. Cohen

**433 Family Life Education (I or II, 3)** Interdisciplinary consideration of relationships between the sexes during childhood and adolescence, including: family health, normal psychosexual development, marriage, ethics, sex education,

teaching of family relations. (Lec. 3) Pre: 230 or permission of chairperson. Schroeder

**434 Children and Families in Poverty (I or II, 3)** Interdisciplinary approach to understanding culturally and economically deprived people. Some experience working with such individuals or groups. (Lec. 3) Pre: senior standing in the major or permission of instructor. Rae

**437 (or SOC 437) Law and Families in the United States (I or II, 3)** Seminar to investigate family roles, relationships, rights, and responsibilities as defined by the law. Emphasis on explicit and implicit family policy revealed in the various branches of law. (Seminar) Pre: 230 or SOC 212 or permission of instructor. Staff

**440 Environmental Context of Aging (I or II, 3)** Identifies theories and domains of person-environment interaction. Study of the normal aging-related changes as design determinants of the physical milieu. Emphasis on assessment and analysis of environment-behavior issues. (Lec. 3) Pre: 220 or permission of instructor. Kalymun

**450 Introduction to Counseling (I and II, 3)** Introduces students in human sciences to interviewing and counseling skills in both professional and paraprofessional settings. Integrates theory, practice, and application by didactic and experimental learning. (Lec. 3) Pre: senior or graduate standing, or permission of chairperson. Staff

**455 Assessment in Early Childhood (II, 3)** An overview of cognitive, affective, and psychomotor assessments used by early childhood educators. Consideration of various types of assessment, evaluation of assessment techniques, and examination of current trends and practices. (Lec. 3) Pre: student teaching or equivalent and permission of instructor. In alternate years. Next offered spring 2000. Horm-Wingerd

**456 Assessment Practicum (II, 3)** Supervised experience in completing cognitive, affective, and psychomotor assessments of young children. (Practicum) Pre: credit or concurrent enrollment in 455. In alternate years. Next offered spring 2000. Horm-Wingerd

**497 Special Problems (I and II, 1–3)** Open to qualified seniors who wish to do advanced work primarily consisting of lab or field experiences. Students must obtain written approval from proposed faculty supervisor prior to registration. Pre: senior standing and permission of chairperson. May be repeated for no more than 9 credits. Not for graduate credit. S/U only. Staff

**498 Special Problems (I and II, 1–3)** Open to qualified seniors who wish to do advanced work. Conducted as a seminar or supervised individual project. Students must obtain written approval from proposed faculty supervisor prior to registration. *Pre: senior standing and permission of chairperson. May be repeated for no more than 9 credits. Not for graduate credit. Staff*

**500 Human Development Seminar (I or II, 3)** Contemporary research issues emerging in the human development literature at five stages of development (infancy, childhood, adolescence, adulthood, and old age), with emphasis placed on continuity and transition across the life span. *(Seminar) Pre: 400 or 420 or equivalent, or permission of instructor. Staff*

**501 Seminar in Early Childhood Education (I or II, 3)** Seminar in trends and model programs in early childhood education. Special attention to substantive evaluation and program design issues for the professional early childhood educator. *(Seminar) Pre: student teaching or equivalent classroom experience or permission of instructor. Staff*

**502 Cognitive Aspects of Early Childhood (I or II, 3)** Impact of theory and research in cognitive development and its relation to language, learning, and thinking. Special attention to Piaget's impact on current research and educational programs. *(Seminar) Pre: 200, 201, or permission of instructor. Staff*

**503 Social Development: Infancy Through Adolescence (I or II, 3)** Seminar providing in-depth examination and critique of theory and research in social development. Implications for diverse populations and applications for human service settings will be drawn. *(Seminar) Offered in alternate years. Staff*

**504 Contemporary Theories of Ego Development (I or II, 3)** Surveys of the recent theoretical constructs which synthesize the cognitive and psychosocial traditions into a developmental view of the ego. The relevance of the psychology of women to this synthesis is also considered. *(Seminar) Pre: graduate standing and permission of instructor. In alternate years. Staff*

**505 Human Sexuality and Counseling (I or II, 3)** Historical, cultural, and developmental issues in human sexuality and counseling. Implications for self and client understanding through personal exploration and desensitization to sensitive topics. *(Lec. 3) Pre: graduate standing or permission of instructor. Rae*

**520 Developmental Issues in Later Life (I or II, 3)** Theoretical and philosophical foundations for understanding the normal changes, pathological developments, clinical assessments, and intervention strategies associated with later life. *(Seminar) Pre: graduate standing. Clark*

**527 Health Care Policy and the Elderly (I or II, 3)** Present and future problems in policy development to meet health care needs of the elderly. Consideration of historical aspects, demographic change, policy models. *(Seminar) Pre: graduate standing. Clark*

**529 Practicum Seminar in Gerontology (I or II, 1)** A seminar focusing on adult development and aging. Designed for graduate students in gerontology to exchange results of original research or practical experiences through reports and discussions. *(Seminar) Pre: graduate standing or permission of instructor. May be repeated for a maximum of 3 credits. Kalymun*

**530 Family Theory Seminar (I, 3)** Intensive study of theories in the family field, integrated with contemporary family issues, and family therapy. *(Seminar) Pre: 430 or permission of instructor. Rae*

**535 Families Under Stress: Coping and Adaptation (I, 3)** Theoretical models of family interaction, development, and stress as applied to understanding of family behavior in managing stress or events. Concepts of stress, vulnerability, adaptability, coping, regenerative power, social supports, and related research. *(Seminar) Pre: 430, 570, or equivalent graduate course work in family development or family sociology and permission of instructor. Maynard*

**550 Vocational Information and Career Development (I or II, 3)** Classification and description of jobs and industries; study of occupational trends; needs of special groups entering the labor market; vocational development theories and counseling for long-range career planning. *(Lec. 3) Pre: 450 and graduate standing. Staff*

**551 Counseling Theory and Techniques (I or II, 3)** Theoretical foundation and practice of counseling and therapy in various settings. *(Lec. 3) Pre: 450 or permission of instructor. Staff*

**553 Counseling Practicum (I or II, 3)** Advanced counseling and therapy issues. Multiple sessions using tapes and critiques to assess growth and competence of the clinician. Limited enrollment. *(Practicum) Pre: 450, 551, advanced standing, and permission of instructor. Staff*

**554 Individual Appraisal in Human Services (II, 3)** Nature of the appraisal process and data essential to understanding the educational, vocational, and social needs of persons. Emphasis is on a team approach to counseling services and the utilization of case materials. *(Seminar) Pre: 551 and 570. Douglas*

**555 Gerontological Counseling (I or II, 3)** An overview of the developmental process of later life, particularly relevant to counselors and therapists. Clinical counseling implications and therapeutic strategies will be emphasized. *(Lec. 3) Pre: 420, 450, or equivalent, and graduate standing. In alternate years. Staff*

**559 Gender Issues in Therapy (I or II, 3)** Systemic integration of the issues and therapeutic dilemmas growing out of society's changing views of women and men. Emphasis on research, therapist self-awareness, and evaluation of current therapies. *(Seminar) Pre: 450 or equivalent and graduate standing or permission of instructor. Rae*

**560 Group Procedures in Counseling (I or II, 3)** Principles and techniques of group counseling and therapy as applied to education, counseling, and student personnel work. A practical and theoretical approach with emphasis on facilitation techniques, leadership patterns, and counseling skills. Enrollment is limited. *(Lec. 2, Lab. 4) Pre: 551 and permission of instructor. Staff*

**562 Organization Development in Human Services (I or II, 3)** Theory and technology of organization development as applied in human service agencies; entry diagnosis, implementation, and evaluation strategies, skills practice in consulting and training; evaluation and research of change efforts. *(Lec. 2, Lab. 4) Pre: prior or concurrent enrollment in 560 or permission of instructor. Knott*

**563 Marital and Family Therapy I (I, 3)** Major theoretical perspectives, including system theory as related to therapy. Communication and relationship skills, negotiation and behavioral contracting, treating specific relationship problems, therapy evaluation. *(Seminar) Pre: 430 and permission of instructor. Staff*

**564 Marital and Family Therapy II (II, 3)** Major contemporary theories of family therapy and the development of family therapy as a unique intervention strategy; special consideration of issues and problems commonly confronted in conducting family therapy. *(Seminar) Pre: 563. Maynard*

**565 Family Therapy Practicum (I, II, or SS, 3)** Supervised clinical experience in marriage and family therapy. Case materials will be presented by students, and taped segments of actual counseling sessions will be reviewed. (Lec. 1, Lab. 5) *Pre: admission to MFT program or permission of instructor. May be repeated for a maximum of 18 credits.* Staff

**566 Theoretical and Clinical Problems (II, 3)** Examination of major ongoing and emerging theoretical issues in family therapy. The implications of these problems in clinical practice with families. (Lec. 3) *Pre: 564 and graduate standing.* Staff

**567 Principles and Practices of College Student Personnel Services (I, 3)** Survey of the historical, psychological, organizational, and educational factors which have evolved and combined to form student personnel work. (Lec. 3) *Pre: graduate standing and permission of instructor.* Douglas

**568 Organization and Administration of College Student Personnel Services (II, 3)** Systematic analysis of current practices in the alignment and operation of student personnel services, with continuing review of their interrelationships with the total educational program. (Lec. 3) *Pre: 567.* Douglas

**569 Assessment in Family Therapy (I or II, 3)** Administration and interpretation of assessment instruments for treatment, planning, and evaluation. Ethical, legal, and theoretical issues related to family systems assessment are discussed. (Seminar) *Pre: graduate standing or permission of instructor.* Adams

**570 Research in Human Development and Family Studies (I and II, 3)** Historical, philosophical, and procedural foundations of scientific inquiries into individuals and families. Explores the various ways to acquire information about human development and family relationships. (Lec. 3) *Pre: graduate standing or permission of instructor.* Staff

**578 Ethical, Legal, and Professional Concerns in Family Therapy (I, 3)** Ethical, legal, and professional issues encountered by family therapists in the delivery of services. These aspects of therapy practice along with systemic theory are cornerstones of competent practice. (Seminar) *Pre: 563 and 565, 530 and 535, and concurrent enrollment in 583.* Maynard

**580, 581 Professional Seminar (I and II, 3 each)** A two-semester sequence. Internship supervision. First semester emphasizes legal,

ethical, and professional issues and assignments; second semester emphasizes implementation of case study and research requirements. (Seminar) *Pre: concurrent enrollment in 583, 584, advanced standing, and permission of instructor.* Staff

**583, 584 Master's Internship (I and II, 3 or 6 each)** Supervised field experience in various settings. Culminating experience integrates program theory and skills. (Practicum) *Pre: concurrent enrollment in 580 for 583, 581 for 584. S/U only.* Staff

**590 Higher Education Law (I or II, 3)** An overview of the effect of federal and state legal systems on university administration and service delivery. Reviews authorities and agencies, major court decisions, and the application of substantive and procedural law principles. (Lec. 3) *Pre: graduate standing or permission of instructor. In alternate years.* Staff

**595 Master's Project: Action Research (I and II, 1–6)** Number of credits is determined each semester in consultation with the major professor. Minimum of 6 credits is required of students who have chosen the action-thesis option. (Independent Study) *S/U credit.*

**597, 598 Advanced Study (I and II, 1–3 each)** Survey of important research contributions significant to the understanding of human development and relationships. (Independent Study) Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. Minimum of 6 credits is required of students who have chosen the thesis option. (Independent Study) *S/U credit.*

## Human Science and Services (HSS)

*Program Head: Professor McKinney*

**120 Introduction to Human Science and Services (I and II, 3)** Survey of contemporary human service needs and delivery systems with emphasis on historical development, values, ethics, agency structures and functions, and consumers. (Lec. 3) *Pre: any one of the following—ECN 100, PSC 113, SOC 102, PSY 113, HDF 200 or 201.* McKinney

**140 Ways of Knowing in Human Science and Services I (I and II, 1)** Examination of the human service field; exploration and identification of educational and career goals. (Seminar) *Pre: 120 or concurrent registration.* McKinney

**141 Ways of Knowing in Human Science and Services II (I and II, 2)** Exploration and identification of education and career goals; documentation of learning experiences; development of program of study. (Seminar) *Pre: 120 or concurrent registration, 140.* McKinney

**170 Field Experience in Human Science and Services I (I and II, 2–6)** Didactic and experiential learning in student-selected settings. Emphasis on achievement of pre-established learning goals leading to selected competencies. Goals established by the students, instructor, and site supervisor. (Practicum) *Pre: admission to the human science and services program and permission of instructor.* Staff

**270 Field Experience in Human Science and Services II (I and II, 2–6)** Didactic and experiential learning in student-selected settings. Emphasis on achievement of pre-established learning goals leading to selected competencies. Goals established by the students, instructor, and site supervisor. (Practicum) *Pre: admission to the human science and services program and permission of instructor.* Staff

**320 Introduction to Research in Human Science and Services (II, 3)** Consideration of the philosophy, principles, methods, and materials involved in research in the human sciences. Emphasis also on research reading, writing, and presentation skills. (Lec. 3) Staff

**350 Foundations of Public Policy in Human Services (I and II, 3)** The analysis of recent public policy proposals in various areas of human services through differing ideological assumptions of traditional and contemporary views of helping professionals. (Lec. 3) Staff (S)

**370 Field Experience in Human Science and Services (I or II, 6–12)** Supervised field experience in human service agencies. Prior to placement, the student must develop a learning contract in consultation with the agency and his or her faculty advisor. (Practicum) *Pre: junior standing in human science and services and permission of instructor. S/U only.* McKinney

**399 Senior Project in Human Science and Services (I and II, 3)** Supervised project conducting research or creating a product for a human services agency. (Independent Study) *Pre: senior standing in human science and services.* McKinney

**470 Fourth-Year Field Experience in Human Science and Services (I and II, 2–6)** Didactic and experiential learning in student-selected settings. Emphasis on achievement of pre-

established learning goals leading to selected competencies. Goals established by the students, instructor, and site supervisor. (*Practicum*) *Pre: admission to the human science and services program and permission of instructor. Not for graduate credit.* Staff

**480 Senior Seminar in Human Science and Services (I or II, 3)** Interdisciplinary capstone seminar, with content developed to fit learning goals and programs of study of the students. Portfolio development and assessment as culminating experience. (*Seminar*) *Pre: senior standing in human science and services and permission of instructor. Not for graduate credit.* Staff

**491, 492 Special Problems (I or II, 1–3 each)** Advanced work in the human services under the supervision of a faculty member. (*Independent Study*) *Pre: permission of instructor and the Division of Interdisciplinary Studies. Not for graduate credit in human development and family studies.* Staff

**530 Multidisciplinary Health Seminars for the Elderly (I or II, 3)** Field experience for students in various health disciplines. Development of assessment techniques, curricular materials, and team delivery of health seminars to the elderly at community sites. (*Sem.* 3) *Pre: graduate standing or permission of instructor.* Clark and Staff

**540 Philanthropy in American Culture: Historical, Theoretical, and Practical Principles (I, 3)** Aspects of the fundraising process necessary for support of organizations in society's independent sector. Emphasis on philosophy, fundraising techniques and strategies, utilization of human resources, and process management. (*Lec.* 3) *Pre: graduate standing or permission of instructor.* Staff

**590 Seminar in Human Science (I or II, 3)** Investigation of human science as lived experience, reflective inquiry, and reflective practice. Development and presentation of individual projects embodying these characteristics of human science. (*Sem.* 3) Willis

## Industrial and Manufacturing Engineering (IME)

*Chairperson:* Professor Knight

**220 Introduction to Industrial Engineering (I, 3)** Role of industrial and manufacturing engineers. Facilities, product, and process design; industrial studies based on visits to actual manufacturing facilities. (*Lec.* 3) *Pre: MTH 142.* Staff

**240 Manufacturing Processes (II, 3)** Introduction to manufacturing processes. Metrological systems, various unit processes in manufacturing, and numerical control of machine tools. Processes, measurement, accuracy, and precision as they relate to deformation, structure, and state of material. (*Lec.* 2, *Lab.* 3) *Pre: CHM 101, PHY 204 or 214, credit or concurrent enrollment in CVE 220.* Stucker

**325 Computer Solutions in Industrial and Manufacturing Engineering (II, 3)** Introduction to microcomputers including extensive computer laboratory experience. Problems in manufacturing, mathematical programming, inventory and production systems, methods and other systems where a computer is needed to reach a solution. Numerical methods. (*Lec.* 2, *Lab.* 3) *Pre: 220, EGR 106, and MTH 141.* Staff

**340 (or CHE 340) Materials Processing and Metrology I (I, 3)** An introduction to the fundamentals of materials processing and metrology. Includes laboratory demonstrations and experiments in machining, casting, and metrology. (*Lec.* 3) *Pre: CHE 333 or 437 and CVE 220.* Stucker or Staff

**391, 392 Special Problems in Industrial Engineering (I and II, 1–3 each)** Independent study and seminar work under close faculty supervision. Discussion of advanced topics in preparation for graduate work. (*Independent Study*) *Pre: junior standing and permission of chairperson.* Staff

**404 Engineering Economy (I and II, 3)** Effects of economics on engineering decisions in design, selection, and replacement of equipment and evaluation of project proposals. Theory of depreciation and obsolescence. (*Lec.* 3) *Pre: ECN 201 and MTH 142. Not for graduate credit in industrial and manufacturing engineering.* Shao or Staff

**411 Probability and Statistics for Engineers (I, 3)** Introduction to probability and statistics in engineering applications including data analysis, probability theory, random variables, probability distributions, moment-generating functions, sampling and sampling distributions, statistical estimation, and hypothesis testing. (*Lec.* 3) *Pre: MTH 243 or permission of instructor.* Wang

**412 Statistical Methods for Engineers (II, 3)** Study of statistical methods in engineering applications including random samplings, statistical inference, linear regression, design and analysis of experiment, statistical quality control, and reliability analysis. (*Lec.* 3) *Pre: 411, MTH 243, or permission of instructor.* Wang

**432 Operations Research: Deterministic Models (I, 3)** Introduction to major areas of operations research and their application to systems analysis. Linear programming, game theory, elementary network analysis, and related topics. (*Lec.* 3) *Pre: MTH 243, 362, or equivalent.* Shao or Sodhi

**433 Operations Research: Stochastic Models (II, 3)** Introduction to inventory and replacement models, queuing theory, simulation, simple stochastic models, and their relation to selected problems. (*Lec.* 3) *Pre: 411 and MTH 243.* Shao or Sodhi

**443 Machining and Machine Tools (II, 3)** Machine tool motions, power requirements, and machining times. Mechanics and economics of metal machining. Introduction to numerical control and computer-aided programming of CNC machine tools. (*Lec.* 3) *Pre: CVE 220 and IME 240 or 340.* Knight

**444 Assembly and Handling Automation (I, 3)** Types and economics of automatic assembly systems. Analyses of automatic feeding and orienting techniques for small parts. Application of robots in assembly. (*Lec.* 3) *Pre: MCE 263 and IME 240 or 340.* Staff

**446 (or MCE 446) Metal Deformation Processes (II, 3)** Study of the characteristics of metal flow under different loading conditions. Theories, capabilities, and limitations of a wide range of deformation processes applied to industrial metalworking. (*Lec.* 3) *Pre: 240 or 340, CVE 220, and CHE 333.* Dewhurst

**449 (or MCE 449) Product Design for Manufacture (I, 3)** Techniques for analyzing product structures for ease of assembly and manufacture. Manual, robot, and high-speed mechanized assembly systems considered for mechanical and electronic products. Covers choice of material and processes in early design. (*Lec.* 3) *Pre: 240 or 340, 443, or permission of instructor.* Dewhurst or Knight

**450 Computer-Aided Industrial and Manufacturing Engineering (I, 3)** Algorithm formulation and computer-aided problem solving in engineering economics, materials processing and forming, design for assembly, robotics, and operations research. Extensive computer laboratory experience on individual microcomputers. (*Lec.* 3) *Pre: 404, 412, 432, or permission of instructor.* Staff

**451 Industrial Engineering Systems (II, 3)** Design and analysis of facilities and materials handling in systems of production. Location and layout planning of facilities. (*Lec.* 3) *Pre: 325, 404, 412, 432, 433.* Shao or Sodhi

**491, 492 Special Problems (I and II, 1–6 each)**

Advanced work under the supervision of a member of the staff and arranged to suit the individual requirements of the student. (*Independent Study*) Pre: permission of chairperson. May be repeated for a maximum of 12 credits. Staff

**500 Network Application in Industrial Engineering (II, 3)**

Industrial systems problems that can be formulated in terms of flows in networks. Critical path scheduling, transportation problems, allocation, sequencing, line balancing, etc. (Lec. 3) Pre: 432 or permission of instructor. In alternate years. Shao

**513 (or STA 513) Statistical Quality Assurance (I, 3)**

Topics in statistical quality control systems. Single, multiple, and sequential sampling. Design and analysis of a wide variety of statistical control systems used in conjunction with discrete and continuous data, for several kinds of data emission. (Lec. 3) Pre: 412 or equivalent. Wang

**514 Special Topics in Statistical Quality Assurance (II, 3)**

Quality control evaluation and monitoring systems for short-run production processes; analysis of critical specifications in small limited sample opportunities; sequential analyses; statistical procedures for troubleshooting; small sample strategies. (Lec. 3) Pre: 412 or equivalent or permission of instructor. Wang

**525 Simulation**

See Computer Science 525.

**533 Advanced Statistical Methods for Research and Industry (I, 3)**

Estimation and testing; regression and correlation; analysis of variance and related topics. Applications in industrial operations and engineering research. (Lec. 3) Pre: 411 or permission of instructor. Wang

**540 Production Control and Inventory Systems (I, 3)**

Theory and practice of industrial production control and inventory systems. A broad spectrum of mathematical models for static, dynamic, perpetual, and periodic inventory systems as they affect and relate to production. (Lec. 3) Pre: 432 or permission of instructor. Shao or Sodhi

**541 Materials Processing and Metrology II (I, 3)**

Continuation of 340. Engineering analyses in the processing of materials. Dynamic coupling, tool-work-piece interaction, energy and thermal analysis; mechanics of material removal and displacements; advanced topics in mechanical electrical systems for processing of materials. (Lec. 3) Pre: 240 or 340, or permission of instructor. Staff

**542 Introduction to Computer-Aided Manufacturing (I, 3)**

Use of computers in manufacturing. Planning and control of manufacturing facilities and operations. Group technology, flow lines, optimization of machining conditions, numerical and adaptive control, automation, robotic applications. (Lec. 3) Pre: 443 or permission of instructor. Stucker

**543 Fundamentals of Machining (II, 3)**

Fundamental treatment of the mechanics and economics of metal machining and grinding. Includes an introduction to numerical control and computer-aided programming of CNC machine tools. (Lec. 3) Pre: CVE 220 and IME 240 or 340 or permission of instructor. Not for graduate credit for students with credit in 443. Knight

**544 Automatic Assembly (I, 3)**

Types and economics of automatic assembly systems. Analysis of automatic feeding and orienting techniques for small parts. Application of robots in assembly. Economics of assembly systems for printed circuit boards. (Lec. 3) Pre: 240 or permission of instructor. Not for graduate credit for students with credit in 444. Staff

**545 Manufacturing Systems: Analysis, Design, Simulation (I, 3)**

Problems in manufacturing system analysis and design. Quantitative models and simulation methods applied to production planning, control, scheduling, resource allocation, and decision making in various types of manufacturing systems. (Lec. 3) Pre: 433 or permission of instructor. Shao or Sodhi

**546 Advanced Metal Deformation Processes (II, 3)**

Theory of metal flow under different loading conditions. Prediction of metal forming process capabilities. Advanced topics include effects of anisotropy and mechanics of powder forming. (Lec. 3) Pre: 340 or permission of instructor. Not for graduate credit for students with credit in 446. Dewhurst

**549 (or MCE 549) Advanced Product Design for Manufacture (I, 3)**

Techniques for analyzing product structures for ease of assembly and manufacture. Considers mechanical and electronic products and choice of materials and processes. A design project and term paper are required. (Lec. 3) Pre: 240 or 340 and credit or concurrent enrollment in 444 or permission of instructor. Not for graduate credit for students with credit in 449. Dewhurst or Knight

**550 Design for Producibility (II, 3)** Project work on product development, collaboration with industry, and submission of design project report. Concentration on effect of design deci-

sions on manufacturing efficiency and cost. (*Independent Study*) Pre: 449 or 549. Knight

**555 Engineering Applications of Mathematical Programming (I, 3)**

Sensitivity analysis and pricing problems, practical problems in degeneracy and duality, decomposition methods for large-scale systems, applied convex, integer, nonlinear, and quadratic programming methods. An introduction to stochastic programming. (Lec. 3) Pre: 432 or permission of instructor. In alternate years. Staff

**565 Theory of Scheduling (II, 3)**

Sequencing problems, finite sequencing for a single machine n/m job shop problems with analytical and heuristic procedures, networks applied to scheduling, queuing systems in scheduling, probabilistic scheduling problems. Survey of selected literature. (Lec. 3) Pre: 432 or permission of instructor. In alternate years. Next offered 1999–00. Staff

**591, 592 Special Problems (I and II, 1–6 each)**

Advanced work under supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) Pre: permission of chairperson. May be repeated for a maximum of 12 credits. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit. Staff

**610 Topics in Applied Queuing Theory (I, 3)**

Poisson and Erlang queues, imbedded chains, M/G/1 and G/M/1 queues, and related topics in queuing theory. Analysis of a wide variety of queues with an applications orientation. (Lec. 3) Pre: 433 or permission of instructor. In alternate years. Next offered 1999–00. Staff

**634 Design and Analysis of Industrial Experiments (II, 3)**

Further development of topics in analysis of variance. Randomized blocks, Latin squares and related designs, factorial experiments, confounding and fractional replications, and split-plot designs. Design and analyses of engineering experiments. (Lec. 3) Pre: 533. Staff

**660 Methods of Optimization (II, 3)**

Methods of optimization: indirect, direct elimination, climbing. Geometric programming. Problems and other topics in applied optimization. (Lec. 3) Pre: CSC 550 or permission of instructor. In alternate years. Next offered 1999–00. Staff

**691, 692 Advanced Special Problems in Industrial Engineering (I and II, 1–6 each)**

Advanced work under the supervision of a staff



member arranged to suit the individual requirements of the student. (*Independent Study*) Pre: permission of chairperson. May be repeated for a maximum of 12 credits. Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U only. Staff

## Insurance (INS)

Chairperson: Professor Lai (Finance and Insurance)

**301 Fundamentals of Risk Management and Insurance (I and II, 3)** Basic course in risk management and insurance. Emphasis on personal risk management and the personal lines coverages: homeowner's insurance, personal automobile insurance, and basic life insurance policies. (Lec. 3) Proficiency test available. Staff

**414 Commercial Property and Liability Insurance (I, 3)** Analysis of commercial property and liability risk exposures and their related coverages. Coverages includes general property and liability insurance and specialized topics for marine, fidelity, surety, and professional liability exposure. (Lec. 3) Not for graduate credit. Staff

**425 Life Insurance (II, 3)** Analysis of the many types of life insurance and health insurance contracts, computation of premiums and reserves, and contract interpretation. Included is an analysis of the uses of life insurance contracts. (Lec. 3) Note: This course is preparation for the Rhode Island state licensing examination in life and accident and health insurance and for Part I of the charter life underwriter examination. Not for graduate credit. Staff

**433 Social Insurance (I, 3)** Analysis of the network of state and federal economic security programs including the OASDHI system, unemployment compensation, temporary disability programs, and the workers' compensation system. (Lec. 3) Pre: ECN 201 and 202, or permission of instructor. Staff

**471 Topics in Insurance (II, 3)** Analysis of selected topics and current issues in the insurance marketplace. Topics will vary from semester to semester. (*Seminar*) Pre: FIN 331, INS 301 and 425, or permission of instructor. Staff

**491, 492 Directed Study (I and II, 3 each)** Directed readings and research work including insurance problems under the supervision of a staff member. (*Independent Study*) Pre: permission of instructor and junior or senior standing. Staff

**493 Internship in Insurance (I or II, 3)** Approved, supervised work experience with participation in management and problem solving related to insurance. Fifteen working days (or 120 hours). (*Practicum*) Pre: junior standing and proposal approved by the College of Business Administration. May be repeated for credit. Not for graduate credit in insurance. S/U only. Staff

**691, 692 Directed Study in Insurance (I and II, 1–3 each)** Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) Pre: permission of instructor. Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) Pre: enrollment in Phase III of the Ph.D. program in business administration. S/U credit.

## Irish (IRE)

Chairperson: Professor Morello (Modern and Classical Languages and Literatures)

**391 Irish Literature in Translation to 1607 (I, 3)** Reading and analysis in English of Irish Gaelic literature through the Classical Age. (Lec. 3) Next offered fall 1998. McNab (F)

**392 Irish Literature in Translation from 1608 (II, 3)** Reading and analysis in English of Irish Gaelic literature from the end of the Classical Age through the Gaelic Revival. (Lec. 3) Next offered spring 1999. McNab (F)

## Italian (ITL)

Section Head: Professor Trivelli

**101 Beginning Italian I (I and II, 3)** Elements of the language, pronunciation, grammar, inductive reading; exercises in reading, writing, and conversation. (Lec. 3) Pre: no prior Italian is required. Staff (F)

**102 Beginning Italian II (I and II, 3)** Continuation of 101. (Lec. 3) Pre: 101 or equivalent. Staff (F)

**103 Intermediate Italian I (I and II, 3)** Development of facility in reading texts of moderate difficulty, supplemented by further work in grammar, conversation, and composition. (Lec. 3) Pre: 102 or equivalent. Staff (F)

**104 Intermediate Italian II (I and II, 3)** Continuation of 103. (Lec. 3) Pre: 103 or equivalent. Staff (F)

**105 Basic Conversation (I and II, 1)** Practice in basic Italian conversation skills. (Lec. 1) Pre: credit or concurrent enrollment in 103 or 104. May be repeated once for maximum of 2 credits. Staff

**205, 206 Conversation and Composition (I and II, 3 each)** Intensive course in conversation and composition. Promotes facility in speaking and understanding idiomatic Italian. (Lec. 3) Pre: 104 or permission of chairperson. Staff

**301, 302 Civilization of Italy (I and II, 3 each)** The most important aspects of Italian civilization. 301: From the Middle Ages to the end of the Renaissance. 302: From the seventeenth century to the present. (Lec. 3) Pre: 205 or 206 or permission of chairperson. Staff

**305 Advanced Conversation and Composition (I or II, 3)** Intensive practice in spoken and written Italian. (Lec. 3) Pre: 205 or 206 or permission of chairperson. Staff

**309 Techniques of Translation (I or II, 3)** Principles and techniques of translating written Italian into English and vice versa. Text materials of different types used in practical work: scientific, journalistic, business, and literary language. (Lec. 3) Pre: 205 or 206 or permission of chairperson. Viglione

**315 Italian Cinema (I or II, 3)** Representative Italian films and their directors through viewing and discussions of films, lectures, and readings. (Lec. 3) Pre: 205 or 206 or permission of chairperson. Sama

**325, 326 Introduction to Italian Literature (I and II, 3 each)** Appreciation of literature. Representative texts of Italian narrative, drama, and lyric poetry. Elements of the methods of criticism. (Lec. 3) Pre: 205 or 206 or permission of chairperson. Staff (A)

**391, 392 Masterpieces of Italian Literature (I and II, 3 each)** Reading in English translation of selected Italian authors of greatest significance. 391: Medieval and Renaissance. 392: Post-Renaissance to twentieth century. (Lec. 3) Not for major credit in Italian. Viglione (A) (F) for 391; (A) for 392.

**395 Dante's Divine Comedy (I or II, 3)** Reading in English translation of Dante's chief work. (Lec. 3) Not for major credit in Italian. Viglione (A) (F)

**408 The Italian Language (I or II, 3)** Advanced study of the structure of the Italian language. Analysis of linguistic elements as found in representative authors from the thirteenth to twentieth century. (Lec. 3) Pre: one 300-level course or permission of instructor. Viglione

**455 Selected Italian Authors** (I or II, 3) Works of one or more major authors of Italian literature. Specific author(s) are designated the semester before the course is given. (Lec. 3) *Pre: one 300-level course or permission of instructor.* Staff

**465 Topics in Italian Literature** (I or II, 3) Special topics or themes in Italian literature not treated or emphasized in other courses. (Lec. 3) *Pre: one 300-level course or permission of instructor.* Trivelli

**480 Business Italian** (I or II, 3) Study of concepts and terminology relating to the Italian business world. (Lec. 3) *Pre: junior standing, credit or concurrent enrollment in at least one 300-level Italian course, or permission of instructor.* Trivelli

**481 The Works of Dante Alighieri** (I or II, 3) Dante's works with special attention given to analysis and interpretation of the *Divine Comedy* from the social, religious, philosophical, and political viewpoints of the Middle Ages. (Lec. 3) *Pre: one 300-level course or permission of instructor.* Viglionese

**497, 498 Directed Study** (I and II, 3 each) Designed particularly for the advanced student. Individual research and reports on problems of special interest. (*Independent Study*) *Pre: acceptance of project by a staff member and approval of chairperson.* Staff

## Japanese (JPN)

*Chairperson:* Professor Morello (Modern and Classical Languages and Literatures)

**101 Beginning Japanese I** (I and II, 3) Fundamentals of grammar and pronunciation, exercises in reading, writing, and conversation. (Lec. 3) *Pre: no prior Japanese is required.* Staff (F)

**102 Beginning Japanese II** (I and II, 3) Continuation of 101. (Lec. 3) *Pre: 101 or equivalent.* Staff (F)

**103 Intermediate Japanese I** (I and II, 3) Development of facility in reading narrative and expository prose; exercise in grammar, listening comprehension, and speaking. (Lec. 3) *Pre: 102 or equivalent.* Staff (F)

**104 Intermediate Japanese II** (I and II, 3) Continuation of 103. (Lec. 3) *Pre: 103 or equivalent.* Staff (F)

## Journalism (JOR)

*Chairperson:* Antone Silvia

**110 Introduction to the Mass Media** (I and II, 3) Surveys newspapers, magazines, radio, movies, television, advertising, and emerging technologies. Examines economic and news functions of each. Considers First Amendment, legal and ethical problems, restrictions, and social consequences of media. (Lec. 3) *Recommended for nonmajors. Not for major credit in journalism.* Staff (L)

**115 Foundations of American Journalism** (I and II, 3) Introduction to basic theories and principles of American journalism, and some of the major issues journalists confront. Examines news media audiences, effects, freedom, and responsibility. (Lec. 3) *For journalism majors only.* Staff

**210 History of American Journalism** (I, 3) Development of American newspapers, magazines, and broadcast industry with analysis of the ideas that have changed American journalism. Exploration of the journalists' experience at periods in American history; the effects of economic and social changes on the press. (Lec. 3) *Pre: 110 or 115 or permission of instructor. In alternate years. Next offered fall 2000.* Staff

**211 History of Broadcasting** (I, 3) Survey of broadcasting. Examines its pioneers and the impact of significant historical events as covered by radio and television. Considers the origins of modern news shows, talk-show formats, magazine broadcasts, and quiz shows. (Lec. 3) *Pre: 110 or 115. In alternate years. Next offered fall 1999.* Staff

**220 Media Writing** (I and II, 3) An introduction to writing for newspapers, magazines, broadcasting, and public relations. Includes consideration of objectivity, information gathering, language use, clarity and style, legal and ethical concerns. (Lec. 2, Lab. 2) *Pre: WRT course with a grade of C or better, passing a departmentally administered entrance exam, ability to type.* Staff

**230 Introduction to Radio and Television News** (I or II, 3) Beginning course in the principles and techniques of radio and television news gathering and writing. Stress is placed on copy formats, broadcast style, and basic production techniques. Frequent out-of-class and off-campus assignments. (Lec. 2, Lab. 2) *Pre: 220 with a grade of C or better.* Staff

**310 Mass Media Law** (I, 3) Role of government and the law in the communication of news, including basic laws affecting freedom of the press, journalists' privileges and responsibilities, privacy, broadcasting, and advertising. Case studies. (Lec. 3) *Pre: junior standing and 110 or 115 and one 300-level journalism skills course or permission of instructor.* Staff

**311 Media Criticism in America** (II, 3) Examines news media performance in the United States by studying the works of media critics, both historical and contemporary. Practice in media monitoring and writing media criticism. (Lec. 3) *Pre: 110 or 115 or permission of instructor. Next offered spring 1999.* Staff

**313 Other Voices: Alternative Media in the United States** (II, 3) Critical analysis of nontraditional media in the United States, including black, religious, feminist, gay and lesbian press, as well as broadcast stations operated by and for minority groups. (Lec. 3) *Pre: 110 or 115. In alternate years. Next offered spring 2000.* Staff

**320 Public Affairs Reporting and Writing** (I or II, 3) Practice in gathering and writing news of public affairs, including local and state government, courts, law enforcement. Introduces public records, alternatives to straight news story, interviewing techniques, rewriting. Frequent out-of-class and off-campus assignments. (Lec. 2, Lab. 2) *Pre: 220 with a grade of C or better.* Staff

**321 Magazine Article and Feature Writing** (I or II, 3) Planning, researching, and writing articles and feature stories for magazines and newspapers. Discussion of markets, freelance and job opportunities. Articles written and submitted to publications. (*Seminar*) *Pre: 220 with a grade of C or better, or permission of instructor.* Staff

**330 Television News** (I or II, 3) Intermediate course in news gathering and writing for television. Emphasizes reporting, writing, anchoring, and producing. Group work leads to production of a half-hour studio newscast. Frequent out-of-class and off-campus assignments. (Lec. 2, Lab. 2) *Pre: 230 with a grade of C or better.* Staff

**331 Electronic News Gathering** (I or II, 3) Skill development in the visual technology of television news. Techniques of single-camera field production are stressed. Introduction to fundamentals of video tape editing; practice in ENG photography and editing. Frequent out-of-class and off-campus assignments. (Lec. 2, Lab. 2) *Pre: 230 with a grade of C or better.* Staff

**340 Public Relations**

See Public Relations 340.

**341 Editing for Publication I** (I, 3) An introduction to editing for the print media, including newspapers, magazines, and public relations. Focuses on taking work written by others and preparing it for publication. Includes consideration of legal and ethical issues. (Lec. 2, Lab. 2) *Pre: 220 with a grade of C or better. Staff*

**342 Editing for Publication II** (II, 3) An introduction to designing and producing for the print media, including newspapers, magazines, and newsletters. Extensive use of computers and desktop-publishing technology. Includes consideration of legal and ethical issues. (Lec. 2, Lab. 2) *Pre: 341 with a grade of C or better. Staff*

**345 Journalism Internship** (I and II, 3 or 6) Supervised experience in: (a) reporting and writing; (b) editing; (c) radio news; (d) television news; (e) public relations. Requires a minimum of 120 hours (3 credits) or 240 hours (6 credits). Weekly one-hour class meeting. Maximum of 6 credits allowed toward graduation. (Practicum) *Pre: journalism majors and minors and public relations minors only. Prerequisite courses depend on internship. Permission of instructor and application required. S/U only. Staff*

**410 Mass Media Issues** (II, 3) Critical analysis of current issues affecting journalists and society in general, based on readings, videotapes, case studies, and discussion. Emphasis on ethics and decision making. (Lec. 3) *Pre: 110 or 115 and senior standing or permission of instructor. Not for graduate credit. Staff*

**415 Perspectives on Reporting** (I, 3) Critical assessment of reporting through the reading and analysis of various types of reporting, including literary journalism, muckraking, investigative reporting, and New Journalism. (Seminar) *Pre: 110 or 115 and junior standing. Not for graduate credit. Staff*

**420 Advanced Reporting and Writing** (I or II, 3) Planning, developing, and writing complex news stories for publication. Emphasizes story-idea generation, information gathering from multiple sources, using public records and documents, and advanced interviewing techniques. Frequent out-of-class and off-campus assignments. (Lec. 2, Lab. 2) *Pre: junior standing and 320 with a grade of C or better. Not for graduate credit. Staff*

**430 Advanced Television News** (II, 3) Practical experience in longer, more specialized news formats. Students write, videotape, and edit televi-

sion pieces throughout the semester, leading to a project of documentary length. (Lec. 2, Lab. 2) *Pre: 320 and 330 or 331, each with a grade of C or better. Not for graduate credit. Staff*

**440 Independent Study** (I and II, 1–3) Individual reading programs, research, or project in journalism or mass media. (Independent Study) *Pre: junior standing and submission to chairperson of proposal signed by supervising faculty member. Not for graduate credit. Staff*

**441 Public Relations Practices**  
See Public Relations 441.

**445 Special Topics in Journalism** (I or II, 3) Subject, course content, and years offered will vary according to expertise and availability of instructors. (Independent Study) *Pre: permission of instructor. May be repeated for credit with different topic. Not for graduate credit. Staff*

## Labor and Industrial Relations (LRS)

Director: Professor Schmidt

**432 Industrial Sociology**  
See Sociology 432.

**520 Labor Union Government and Structure** (I or II, 3) Structure, functions, responsibilities, and programs of unions and union leadership. Emphasis on policies and decision making. Evaluation of labor and management performance. Consideration of administrative problems associated with growth of white collar unions. (Lec. 3) *Pre: credit or concurrent enrollment in 544. Molloy*

**521 (or PSC 521) International and Comparative Trade Unions and Labor Relations** (I or II, 3) Comparative labor and industrial relations systems, including union, management, and government functions and roles; also the functions of international organizations in labor relations. (Lec. 3) *Pre: 544 or permission of Labor Research Center director. Rothstein or Staff*

**526 (or ECN 526) Economics of Labor Markets** (I or II, 3) The theory of labor market behavior, and application of theory for public policy analysis in areas such as discrimination, unemployment, and education. (Lec. 3) *Pre: ECN 201 and 202 or 590 or equivalent. Staff*

**531 Employment Law** (I or II, 3) Analysis of legislation protecting worker health, employment, income security, including OSHA, workers' compensation, equal opportunity, fair labor standards, Walsh-Healy and Davis-Bacon, pension

funds, unemployment compensation, and social security. (Lec. 3) *Pre: permission of Labor Research Center director. Tabor*

**533 Negotiating Pension, Health, and Employee Assistance Programs** (I, II, or SS, 3) An analysis of employee assistance plans (EAPs), health fringe benefits, and pension plans and their negotiation within both private and public sectors. (Lec. 3) *Pre: permission of instructor and Labor Research Center director. Staff*

**534 (or ECN 534) Information Sources and Uses in Labor Relations and Labor Economics** (I or II, 3) Analysis and use of data and information sources specific to the professional fields of labor and industrial relations and labor economics. A major project utilizing personal computer software is required. (Lec. 3) *Pre: 526 and BAC 500 and 530 or permission of instructor. Not for graduate credit for M.B.A. or M.S. in accounting students. Staff*

**541 Labor Relations Law** (I or II, 3) Legal framework for private and public sector collective bargaining. Regulation of activities with emphasis on individual rights, collective rights, and policy considerations of federal and state courts, the NLRB, and state labor boards in determining society's rights. Case studies. (Lec. 3) *Pre: 544 or permission of instructor. Grossman*

**542 Labor Relations and Collective Bargaining** (I or II, 3) Collective bargaining literature, theories, and practice. Bargaining approaches, techniques, and dynamics will be stressed through the analysis of comprehensive case studies. (Lec. 3) *Pre: 541 and 544 or permission of Labor Research Center director. Staff*

**543 Labor Relations and Collective Bargaining: Public Sector** (I or II, 3) Public sector (state, municipal, federal, police, fire, K–12 education, and higher education) collective bargaining theory, practice, and legal foundations. Comprehensive case studies. (Lec. 3) *Pre: credit or concurrent enrollment in 542 or permission of Labor Research Center director. Grossman*

**544 (or HIS 544) Colloquium in Worker History** (I or II, 3) Selected topics in American worker history with an emphasis on the most recent literature in the field. (Sem. 3) *Pre: graduate standing or permission of instructor. Molloy*

**545 Labor Dispute Settlement** (I or II, 3) Reading, procedures, and cases in the settlement of labor disputes in both private and public sectors. Emphasis on arbitration, mediation, and fact finding. (Lec. 3) *Pre: 541 and 542 or permission of Labor Research Center director. Staff*

**546 Alternative Dispute Resolution Processes and Applications (I, II, or SS, 3)** Examination of mediation, fact finding, arbitration, and other conflict resolution processes as alternatives to litigation in a variety of dispute situations; e.g., community, environmental, divorce, landlord-tenant, prison, racial, commercial. (Lec. 3) *Pre: permission of instructor.* Staff

**579 (or EDC 579) Labor Relations and Collective Bargaining in Education (I, II, or SS, 3)** Collective bargaining in public and private educational sectors, K-12, higher education; literature, theory, practice, and legal foundations in education. Comprehensive case studies will be used. (Lec. 3) Croasdale

**580 Professional Seminar: Labor and Industrial Relations (II, 3)** Advanced labor relations seminar of variable coverage and focus; adjusted yearly to consider most recent labor relations developments. Major research paper required. (Sem. 3) *Pre: final semester graduate standing in labor and industrial relations and permission of Labor Research Center director.* Staff

**581 Internship: Labor and Industrial Relations (I, II, and SS, 3-6)** Variable length internship with a trade union, a public or private sector personnel or industrial relations department, or a governmental administrative or regulatory agency, under the supervision of both an LRC faculty member and a member of the affiliated organization. May be taken as one 6-credit unit or two 3-credit units. (Practicum) *Pre: graduate standing in labor and industrial relations and permission of Labor Research Center director. S/U only.* Staff

**590, 591 Directed Readings and Research in Labor and Industrial Relations (I, II, and SS, 3 each)** Readings and research under the direction of LRC-associated faculty to meet individual student requirements. (Independent Study) *Pre: graduate standing in labor and industrial relations and permission of Labor Research Center director and instructor.* Staff

## Landscape Architecture (LAR)

*Chairperson:* Associate Professor Sullivan (Plant Sciences)

**201 Survey of Landscape Architecture (I, 3)** Introduction to landscape design theory and composition as an applied art form. (Lec. 3) Hanson (A)

**202 Origins of Landscape Development (II, 3)** Examines the impact of environment, social history, philosophy, art, and literature on architec-

ture and landscape development from ancient to modern times. Emphasis on European Renaissance through contemporary United States. (Lec. 3) Hanson (L)

**243 Landscape Architecture Graphics (I, 4)** Introduction to landscape graphic communication techniques with emphasis on design and construction drawing and perspective illustration. (Lec. 2, Studio 4) Simeoni

**244 Basic Landscape Architectural Design (II, 4)** Introduction to the development of outdoor space with emphasis on the design process and the manipulation of spatial volumes. (Lec. 2, Studio 4) *Pre: 243.* Simeoni

**300 Computers in Landscape Architecture (II, 4)** Intensive course in computer usage for landscape architects. Focus on the application of landscape architecture computer-aided design software to project development. (Lec. 2, Studio 4) *Pre: junior standing in landscape architecture.* Simeoni

**301 Landform Expression (I, 2)** Examines the three-dimensional relief of the Earth's surface as a physical design element. Introduction to methods of land measurement, graphic depiction, and sculptural interpretation. (Lec. 1, Lab. 2) *Pre: 244 and MTH 111. Intended for landscape architecture majors only.* Staff

**343 Landscape Architecture Studio I (I, 4)** Landscape concepts in graphic form. Emphasis on preparing landscape plans for small- to intermediate-scale properties. Students study in a professional studio environment. (Lec. 2, Studio 4) *Pre: 201, 202, and 244. Intended for landscape architecture majors only.* Staff

**344 Landscape Architecture Studio II (II, 4)** Continuation of landscape concepts and graphics. Emphasis on drawing landscape plans for intermediate- to larger-scale properties. Advanced rendering. (Lec. 2, Studio 4) *Pre: 301, 343, and 345. Concurrent or prior enrollment in 346. Intended for landscape architecture majors only.* Hanson

**345 Landscape Construction I (I, 4)** A comprehensive survey of construction materials and their uses in landscape construction. (Lec. 2, Studio 4) *Pre: 244. Intended for landscape architecture majors only.* Green

**346 Landscape Construction II (II, 4)** The study of soil adjustment; grading, drainage, cut and fill, reshaping of earth surfaces. (Lec. 2, Studio 4) *Pre: 301 and 345. Intended for landscape architecture majors only.* Green

**353 (or PLS 353) Landscape Plants I (I, 3)** Identification and description under fall conditions; classification and adaptation of the important trees and shrubs including broadleaf evergreens and their value in ornamental plantings. (Lec. 1, Lab. 4) *Pre: BIO 101 or BIO 112.* Simeoni

**354 (or PLS 354) Landscape Plants II (II, 3)** Identification and description under winter and spring conditions; classification and adaptation of the coniferous evergreens, vines, and groundcovers and their value in ornamental plantings. (Lec. 2, Lab. 2) *Pre: 353.* Simeoni

## 399 Internship

See Plant Sciences 399.

**443 Planting Design (I, 4)** The use of plant materials in landscape composition. Combines spatial definition of various land uses with plant selection. Preparation of plans, details, and specifications. (Lec. 2, Studio 4) *Pre: 344 and 354. Intended for landscape architecture majors only. Not for graduate credit.* Hanson

**444 Landscape Architecture Studio III (I, 4)** Relationships between principles of landscape design and elements of the environment that contribute to development of ecologically based plans. Client conferences and specifications for woody ornamental plants. (Lec. 2, Studio 4) *Pre: 344 and 346. Intended for landscape architecture majors only. Not for graduate credit.* Green

**445 Landscape Architecture Studio IV (II, 4)** Study of comprehensive landscape architectural projects. Coordination of research, preparation of contract documents, and office procedures. (Lec. 2, Studio 4) *Pre: 443 and 444. Intended for landscape architecture majors only. Not for graduate credit.* Staff

**447 Professional Landscape Architectural Practice (II, 3)** Professional practice, ethics, marketing design services, preparation of contract documents, and effective time management. (Lec. 3) *Pre: senior standing in landscape architecture. Not for graduate credit.* Green

## 491, 492 Special Projects and Independent Study

See Plant Sciences 491, 492.

## Languages (LAN)

*Chairperson:* Professor Morello (Modern and Classical Languages and Literatures)

**191 Beginning Foreign Language I (I and II, 3)** Fundamentals of grammar and pronunciation; exercises in reading, writing, and conversation in a foreign language not included in regular

departmental offerings. (Lec. 3) *Pre: no prior experience in a specific language is required. May be repeated for credit for different languages. Choice of specific language to be taught subject to availability of staff and student demand.* Staff (F)

**192 Beginning Foreign Language II (I and II, 3)** Continuation of 191. (Lec. 3) *Pre: 191 or equivalent in same language as 191. May be repeated for credit for different languages. Choice of specific language to be taught subject to availability of staff and student demand.* Staff (F)

**193 Intermediate Foreign Language I (I and II, 3)** Development of facility in speaking, listening comprehension, writing, and reading texts of moderate difficulty in a language not included in regular departmental offerings. (Lec. 3) *Pre: 192 or equivalent in the same language as 192. Choice of specific language to be taught subject to availability of staff and student demand.* Staff (F)

**194 Intermediate Foreign Language II (I and II, 3)** Continuation of 193. (Lec. 3) *Pre: 193 or equivalent in the same language as 193. Choice of specific language to be taught subject to availability of staff and student demand.* Staff (F)

## Latin (LAT)

*Section Head:* Associate Professor Suter

**101 Beginning Latin I (I and II, 3)** Latin grammar and syntax. Exercises in reading prose. (Lec. 3) *Pre: no previous Latin is required.* Staff (F)

**102 Beginning Latin II (I and II, 3)** Continuation of 101. (Lec. 3) *Pre: 101 or equivalent.* Staff (F)

**301 Intermediate Latin (I, 3)** Grammar review; readings such as Petronius' *Satyricon*. (Lec. 3) *Pre: 102 or equivalent.* Suter (F)

**302 Intermediate-Advanced Latin (II, 3)** Study of Latin texts from different time periods and different genres; syllabus changes on a four-year rotational basis. (Lec. 3) *Pre: 301 or permission of instructor. May be repeated for a maximum of 12 credits with different topics.* Suter (F)

**310 Latin Across the Curriculum (I or II, 1)** Reading of original Latin texts and discussion in conjunction with courses throughout the University curriculum. Designed to maintain language skills and to enrich study of different subjects by using texts in the original language. (Lec. 1) *Pre: 301 or permission of instructor.* Suter, Zeyl, Hollinshead

**497, 498 Directed Study (I or II, 1–6 each)** Individual readings and research. (*Independent Study*) *Pre: acceptance of a project by a staff member; approval of section head. May be repeated for credit with different topic.* Staff

## Latin American Studies (LAS)

*Committee Chairperson:* Associate Professor Morin

**397 Directed Study for Senior Research Project (I, 3)** Research in a particular area of Latin American studies. Project must be approved by the LAS Committee. (*Independent Study*) *Pre: approval of LAS Committee and instructor.* Staff

*The following are related courses offered in the Departments of Communication Studies, Economics, History, Modern and Classical Languages and Literatures, Political Science, and Sociology and Anthropology.*

### Anthropology

303 New World Prehistory  
315 Cultures and Societies of Latin America  
470 Problems in Anthropology

### Communication Studies

337 Intercultural Communication

### Economics

338 International Economics  
363 Economic Growth and Development

### History

180 Introduction to Latin American Civilization  
382 History of Modern Latin America  
391 Directed Study or Research  
508 Seminar in Asian or Latin American History

### Political Science

201 Introduction to Comparative Politics  
431 International Relations  
432 International Government

### Portuguese

335, 336 Topics in the Literature of the Portuguese-Speaking World  
497, 498 Directed Study

### Spanish

305 Early Spanish-American Literature and Culture  
306 Modern Spanish-American Literature and Culture  
393 Modern Hispanic-American Literature in Translation  
470 Topics in Hispanic Literature  
488 Spanish-American Poetry and Drama  
489 The Spanish-American Narrative

497, 498 Directed Study  
570 Topics in Hispanic Literature and Culture  
572 Evolution of Spanish-American Culture and Thought  
574 Interpretations of Modern Spanish-American Thought  
590 The Hispanic Presence in the United States

## Letters (LET)

*Coordinator:* Associate Dean Dvorak, Arts and Sciences

**151 Topics in Letters (I or II, 3)** Study of the history of thought, of the search for values, of the attempt to define the human condition, as reflected in written texts, both past and present. (*Seminar*) *May be repeated for credit with different topic.* Staff (L)

**351 Topics in Letters (I or II, 3)** Study of the history of thought, of the search for values, of the attempt to define the human condition, as reflected in written texts, both past and present, at an advanced level. (*Seminar*) *Pre: junior standing. May be repeated for credit as often as the topic changes.* Staff (L)

## Library and Information Studies (LSC)

*Director:* Professor Tryon

*Students in good standing may take up to six hours of graduate-level Library and Information Studies courses in their senior year with the permission of the Director of the Graduate School of Library and Information Studies.*

**502 Management of Library and Information Services (I and II, 3)** The scientific analysis of library administration; from the community survey and formulation of goals and objectives to case studies on public and technical services, staffing and personnel problems, and buildings. (Lec. 3) McCarthy

**503 Collection Development (I and II, 3)** Introduction to process, practices, and problems of collection building, maintenance, and evaluation regardless of format or subject of material, type of institutional setting, or community or client group served. (Lec. 3) McCarthy and Tryon

**504 Reference and Information Services (I and II, 3)** Practical experience in the use of basic information sources with readings and discussion on the philosophy and administrative aspects of reference work. (Lec. 3) Gilton

**505 Organization of Library Materials** (*I and II, 3*) Introduction to the principles and practice of descriptive and subject cataloging and classification systems with an introduction to Library of Congress classification. Includes OCLC searching and tagging. (*Lec. 3*) Ma

**506 Technical Services** (*I or II, 3*) Principles and policies in the acquisition, organization, conservation, and circulation of materials in libraries and information centers. Includes examination of automation of library processes. (*Lec. 3*) *Pre: 501.* Vocino

**507 Research and Evaluation in Library and Information Services** (*I and II, 3*) Introduction to research methods, with an emphasis on critical reading of published research and evaluation of library and information services. (*Lec. 3*) Eaton or McCarthy

**508 Introduction to Information Science and Technology** (*I, II, SS, 3*) Introduction to the organization, retrieval, and analysis of information, and the technologies used to control the manipulation and dissemination of information in library and information settings. Carson or Ma

**510 History of Books and Printing** (*I or II, 3*) The art and craft of book production through the ages; printers, methods, and materials with consideration given to the role of the book in cultural development. (*Lec. 3*) Tryon

**512 History of Libraries and Librarianship** (*I or II, 3*) The development of libraries and librarianship within a cultural, social, and economic context from antiquity to the present. (*Lec. 3*) Tryon

**513 Intellectual Freedom and Censorship** (*I or II, 3*) Historical development and current status of the concept of intellectual freedom and the restraints that past and present societies have imposed on it. Special attention given to the librarian's role in defense of intellectual freedom. (*Lec. 3*) McCarthy and Tryon

**520 School Library Media Services** (*I or SS, 3*) The role of the library media specialist as teacher, information specialist, and instructional consultant, with emphasis on creating instructional programs and services in schools. Summer or fall semester prior to practicum. (*Lec. 3*) *Pre: completion of 21 hours including core courses, 502–505, or permission of instructor.* McCarthy

**521 Public Library Service** (*I or II, 3*) Methods for management and planning in public libraries for creating programs, and for evaluating services and their effects on the public served. The

identification of alternative solutions to budgeting and personnel management problems. (*Lec. 3*) *Pre: 502.* Staff

**522 College and University Library Service** (*I or II, 3*) Study of the functions, organization, management, and services of college and university libraries. (*Lec. 3*) *Pre: 502.* Tryon

**523 Special Library Service** (*I or II, 3*) Organization, management, and procedures as they apply to special libraries with particular emphasis on the diversity of special library functions. (*Lec. 3*) *Pre: 502.* Stankus

**524 Library Instruction: Philosophy, Methodology, and Materials** (*II, 3*) An introduction to all aspects of instructing a diverse clientele in effective library use. Philosophy, cognition aspects, methodologies, media and administration, and coordination and evaluation of library instruction will be considered. (*Lec. 3*) *Pre: 504 or permission of instructor.* Gilton

**528 Media in the Library** (*I or II, 3*) The role of multimedia materials in library and information settings, including the selection, evaluation, organization, and utilization of audiovisual hardware and software, and an introduction to emerging communication technologies. (*Lec. 3*) Carson

**529 Theory and Production of Library Media Communications** (*I or II, 3*) Introduction to the design and production of graphic, photographic, audio, video, and computer-based materials for library and information environments through the application of basic communication, perception, and learning theories. (*Lec. 3*) Carson

**530 Reading Interests of Children** (*I or II, 3*) A survey of children's literature as it relates to the reading interests and information needs of children. Emphasis is on collection building, reference, reading guidance, and book promotion. (*Lec. 3*) *Pre: 503 or permission of instructor.* Eaton

**531 Reading Interests of Young Adults** (*I or II, 3*) Overview of young adult literature in the context of the special interests and information needs of adolescence. Emphasis on the building, use, and promotion of the young adult collection. (*Lec. 3*) *Pre: 503 or permission of instructor.* Eaton and Rosenzweig

**535 Public Library Services to Children and Young Adults** (*II, 3*) Public library services to children and young adults, with emphasis on the development of programs to meet library goals and objectives. (*Lec. 3*) *Pre: 502 or permission of instructor.* Eaton

**536 Storytelling** (*I or II, 3*) Selection, adaptation, and presentation of stories for children of all ages, including attention to sources of materials, planning the story hour, and training and practice in the art of storytelling. (*Lec. 3*) Daigneault

**537 Health Sciences Librarianship** (*II, 3*) Serves as an introduction to the field. Covers the literature, vocabulary, computer applications, reference tools, information retrieval, and environments relating to health sciences libraries. (*Lec. 3*) *Pre: 502 and 504 or permission of instructor.* Kellerman

**538 Law Librarianship** (*I, 3*) Introduction to legal bibliography and research and to a broad range of problems involved in the administration and operation of various kinds of law libraries. (*Lec. 3*) *Pre: 502 and 504 or permission of instructor.* Svengalis

**539 Business Reference** (*I, 3*) An introduction to all aspects of business reference sources and information services, including unique statistical and investment information on companies and industries. (*Lec. 3*) *Pre: 504.* Gilton

**540 Library Materials in the Humanities** (*I or II, 3*) Library resources in the humanities, including the major works, serial publications, and reference and bibliographical materials. (*Lec. 3*) *Pre: 503 and 504.* Gilton

**541 Library Materials in the Social Sciences** (*I or II, 3*) Library resources in the social sciences, including the major works, serial publications, and reference and bibliographical materials. (*Lec. 3*) *Pre: 503 and 504.* Tryon and Brenneman

**542 Library Materials in Science and Technology** (*I or II, 3*) Library resources in science and technology, including the major works, serial publications, and reference and bibliographical materials. (*Lec. 3*) *Pre: 503 and 504.* Stankus

**543 Government Publications** (*I or II, 3*) Survey of the publishing activities and publications of national, state, and local governments with emphasis on the publications of the United States government. (*Lec. 3*) *Pre: 504.* Gilton

**544 Information Science for Librarians** (*I or II, 3*) An introduction to the interdisciplinary study of information science related to information (data) collection, analysis, processing, transmission, utilization, and communication, with emphasis on bibliographic data and its retrieval in modern libraries and information centers. (*Lec. 3*) *Pre: 502 and 504 or permission of instructor.* Carson and Ma

**545 Indexing and Abstracting** (*I, II, or SS, 3*)

Principles and techniques of indexing for the purpose of information storage and retrieval. Includes periodical indexing, book indexing, automatic indexing, abstracting, and thesaurus construction. (*Lec. 3*) *Pre: 504.* Kellerman

**546 Computer Systems in Library Automation** (*I or II, 3*)

Introduction to principles of systems analysis and the tools of analysis. Study of computer hardware and software and the application of new technologies to library operations and services. (*Lec. 3*) *Pre: permission of instructor.* Ma

**547 Online Searching and Services** (*I or II, 3*)

Introduction to computerized information retrieval and the provision of computerized information services in libraries, including hands-on experience. (*Lec. 3*) *Pre: 504.* Julia Tryon and Kellerman

**549 Information Storage and Retrieval** (*I or II, 3*)

Theory and methods of analyzing, storing, and retrieving primarily bibliographic information and their applications in libraries and information services. Operation, monitoring, and evaluation of manual and computerized retrieval systems. (*Lec. 3*) Ma

**550 Advanced Cataloging** (*I or II, 3*)

Theory and problems in descriptive and subject cataloging and classification with emphasis on the use of Library of Congress subject headings and classification. Includes editing of original and copy cataloging for OCLC. Emphasis is on microforms, serials, rare books, music and sound recordings. (*Lec. 3*) *Pre: 505.* Ma

**561 Library Effectiveness: Research and Evaluation** (*I, 3*)

Introduction to types and methods of research, applications of published research and research techniques to the evaluation and improvement of library and information services. (*Lec. 3*) *Pre: 15 hours of library science or permission of instructor.* Eaton

**562 Administration of Special Collections, Archives, and Manuscripts** (*I, 3*)

Principles and techniques for administering manuscript and archival repositories, including acquisition policies, appraisal criteria, methodology, and preservation practices. (*Lec. 3*) *Pre: core courses or permission of instructor.* Maslyn

**564 Introduction to Library Preservation** (*I or II, 3*)

Organization, management, principles, and techniques as they apply to the development and administration of a library preservation program. Includes causes of deterioration of materials, deacidification, and reformatting and selecting for preservation. (*Lec. 3*) Dodge

**565 Rare Book Librarianship** (*I or II, 3*)

Organization, management, principles, and techniques as they apply to the development and administration of rare book collections. (*Lec. 3*) *Pre: 510 or permission of instructor.* Tryon

**571 Database Management Systems for Information Services** (*I or II, 3*)

Provides concepts of database management systems (DBMS) for the design and use of bibliographic and nonbibliographic databases. Includes DBMS models, query processing, file organization; security, accuracy, and privacy of databases, and evaluation of DBMSs. (*Lec. 3*) *Pre: 548 or equivalent knowledge and permission of instructor.* Staff

**591, 592, 593 Independent Work** (*By appt., 1–3 each*)

Supervised reading or investigation in areas of special interest to students who obtain written approval for such study prior to registration for the semester for which it is proposed. (*Independent Study*) *Pre: 18 hours of library science with a B average. May be repeated for a maximum of 3 credits.* Staff

**595 Professional Field Experience** (*I and II, 1–3*)

Directed field experience applying theory to practice in libraries, information centers, and related organizations under the joint supervision of a member of the faculty and the professional staff of the cooperating institutions. (*Practicum*) *Pre: completion of at least 18 hours of library science with a B average. 45 hours per credit. May be repeated for a maximum of 3 credits.* Staff

**596 Professional Field Experience: School Library Media Practicum and Seminar** (*II, 9*)

Directed field experience applying theory to practice in school library media centers under the joint supervision of a faculty member and the professional staff of the cooperating school. (*Lec./Lab. 9*) *Pre: 520 and completion of at least 18 hours of library science with a B average. 45 hours per credit.* McCarthy

**597 Selected Topics** (*I and II, 3*)

Selected topics in library and information studies of current and special interest not covered in existing course offerings. Topics announced prior to each offering. (*Lec. 3*) *Pre: permission of instructor.* Staff

**Linguistics (LIN)**

*Section Head: Professor Rogers*

**100 Language in Society** (*I or II, 3*) Topical approach to the study of language, varying from semester to semester and including, but not restricted to, such topics as the relationship of language to culture, society, behavior, geography, computers, and other languages. (*Lec. 3*) Staff

**200 Language and Culture**

See Anthropology 200.

**202 Introduction to the Study of Language Evolution** (*II, 3*)

The construction of theoretical models; the reconstruction of earlier stages of language, based on the structure of modern languages and their families. (*Lec. 3*) *Pre: 200, 220, or ENG 330.* Rogers (S)

**220 (or APG 220) Introduction to the Study of Language** (*I or II, 3*)

Introduction to the analysis and description of a language's sounds, forms, syntax, and meaning; the relationship of linguistics to other disciplines; and a survey of major schools of linguistic thought. (*Lec. 3*) Rogers and Arakelian (S)

**302 Morphology and Phonology** (*I or II, 3*)

Analysis of phonological and morphological systems other than those of English; extensive practical and comparative exercises. (*Lec. 3*) *Pre: 220 or ENG 330.* Rogers

**320 (or APG 320) Sociolinguistics** (*I, 3*)

Presentation of the major areas of micro- and macro-sociolinguistics: speech acts, registers, repertoires, language attitudes, social correlates of phonological and syntactic features and changes. (*Lec. 3*) *Pre: 200 or 220.* Rogers, Martin, and Pollnac

**330 Dynamics of Language Distribution** (*II, 3*)

Geolinguistic survey of present-day distribution of languages and of factors affecting their spread and decline. Minority and colonial languages; language maintenance efforts; language contact phenomena. (*Lec. 3*) *Pre: 220.* Rogers

**408 The German Language: Past and Present**

See German 408.

**414 Romance Linguistics** (*II, 3*)

Evolution of the major literary Romance languages from late Latin with emphasis on phonology and morphology. The diffusion and dialectal fragmentation of Romance. (*Lec. 3*) *Pre: 202 or FRN 205, SPA 205, ITL 205, or permission of section head. Some knowledge of Latin recommended but not required. Not for graduate credit.* Rogers

**420 Second Language Acquisition** (*II, 3*)

An evaluation of current trends and developments in the understanding of second language learning; analysis of second language acquisition research and its practical implications. (*Seminar*) *Pre: 200 or EDC 312 or 3 credits of language courses numbered 300 or above, or permission of section head. Next offered spring 2000.* Hammadou

**431 Applied Linguistics in the Language**

**Laboratory** (I, 1) Principles of contrastive phonology and syntax and their application to the preparation, use, and evaluation of tape drills. Use of language laboratory equipment monitoring student exercises. Recommended for prospective teachers of language. (Lab. 2) Pre: 9 credit hours of language courses at the 300 level or above, or permission of section head. Staff

**497, 498 Directed Study** (I and II, 3 each)

Individual research and reports on problems of special interest. (Independent Study) Pre: 220 and acceptance of project by staff member and approval of section head. Staff

*The following are related courses offered in the Departments of Communicative Disorders, English, Modern and Classical Languages and Literatures, Philosophy, and Psychology.*

CMD	373	Phonetics
CMD	375	Language Development
ENG	330	The Structure of American English
ENG	332	The Evolution of the English Language
ENG	336	The Language of Literature
ENG	337	Varieties of American English
ENG	530	Studies in Language and Linguistics
FRN	503	History of the French Language
ITL	408	The Italian Language
PHL	440	Philosophy of Language
PSY	388	The Psychology of Language

**Literature in English Translation**

*Coordinator:* Professor Robert Manteiga, (Modern and Classical Languages and Literatures)

*The following courses are offered in the Department of Modern and Classical Languages and Literatures and may be used for major credit in comparative literature studies. They may not be used for major credit in English or languages. (CLA 391, 395, 396, 397 may be used for major credit in Classics; RUS 391, 392 may be used for major credit in Russian.)*

**Comparative Literature Studies**

235	Modern Thought: Philosophy and Literature
250	Themes and Myths
335	Interdisciplinary Studies in Comparative Literature
350	Literary Theory and Criticism
450	Studies in Comparative Literature

**Classics**

391	Ancient Laughter: The Comic Tradition in Greece and Rome
395	Greek Mythology: Gods, Heroes, and Humans

396	Myths of Rome
397	Greek Myth and Tragedy

**French**

391	Literature to 1789 in Translation
392	Nineteenth-Century Literature in Translation
393	Twentieth-Century Literature in Translation
394	Literary Topics in Translation

**German**

392	Masterpieces of German Literature
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**Italian**

391, 392	Masterpieces of Italian Literature
395	Dante's <i>Divine Comedy</i>

**Russian**

391, 392	Masterpieces of Russian Literature
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**Spanish**

391, 392	Spanish Literature in Translation
393	Modern Hispanic-American Literature in Translation

*The following courses are offered in the Department of English and may be used for major credit in comparative literature studies and in English. They may not be used for major credit in languages.*

**English**

160	Masterpieces of Literature
335	Interdisciplinary Studies in Comparative Literature
350	Literary Theory and Criticism
366	Greek and Roman Drama
367	The Epic
468	Traditions of the Continental Novel
560	Studies in European Texts

*Literature in English translation courses and literature courses are offered in the Department of English and the Department of Modern and Classical Languages and Literatures, and constitute part of the offerings for a major in comparative literature studies.*

**Management (MGT)**

*Chairperson:* Associate Professor Dugal

**110 Introduction to Business** (I and II, 3)

Nature, philosophy, objectives, and scope of American business system. Emphasis on the interrelations of the functional areas. (Lec. 3) *Not open to juniors and seniors in the College of Business Administration.* Staff (S) Professor Sink's section is Writing Intensive [WI]

**300 Introduction to Management and Supervision** (I, 3)

Functions of human resources management including group behavior, inter-

personal relations, recruitment, and justice determination. Emphasis on developing analytical skills applied to personnel-related problems in organizational settings. (Lec. 3) *Not open to business administration majors; no credit if 303 has been taken.* Staff

**301 Organization and Management Theory I** (I and II, 3)

Management processes, organizational theory and behavior, organizational structure, international business, ethics, and environmental analysis. Emphasis on developing conceptual and analytical skills. (Lec. 3) Staff

**302 Organizational Behavior** (II, 3)

Introduction to organizational behavior; theory of human relations in industry; individual and group dynamics as well as motivational theories applied to current business issues, international business, and technological changes. (Lec. 3) Pre: 301. Staff

**303 Personnel Administration** (I or II, 3)

Role of the personnel department in an organization. Employer-employee problems at various internal levels and their impact on the organization and its environment. Covers such areas as manpower planning, the recruitment process, training, employee relations, pension planning, and occupational safety in the public and private sectors. Cases and lectures. (Lec. 3) Pre: 301 recommended. Staff

**306 Skills Development in Organizational Behavior** (I, 3)

Developing the managerial skills and competencies of leadership, motivation, conflict resolution, and interpersonal relations through dynamic cases, experiential exercises, and personal development sessions. (Lec. 3) Pre: 301, 302, or permission of instructor. Staff

**321 Labor Problems** (I, 3)

Historical development of labor unions, changing composition of the labor force. Factors determining wage levels and employment in the firm and market. Analysis of mobility and occupational and regional wage differentials; the power of unions to raise wages; the role of investments in the human agent as a factor in economic growth. (Lec. 3) Pre: ECN 201 or permission of instructor. Staff

**326 Office Technology Management** (I or II, 3)

Planning and using office automation systems, including word processing, office management, and communications. (Lec. 3) Pre: junior standing or permission of chairperson. Staff

**380 Business and Society** (I, 3)

Contemporary environmental issues confronting domestic and international management—pollution, government regulation, insider trading, equal opportunity, business ethics—are investigated. (Lec. 3) Staff



**401 Women in Business and Management** (II, 3) Analysis of sex-role behavior in the workplace. The history, current status, and future prospects of women and men in business and the organizational response to the changing work force. (Lec. 3) Pre: 301 recommended. Not for graduate credit. Beauvais or Cooper

**402 Leadership and Motivation** (I or II, 3) Examination of theory and research in the areas of leadership and motivation in organizational settings. Emphasis on application of theory in developing essential leadership skills within individuals and in creating effective motivational programs within organizations. (Lec. 3) Pre: 301, 302, or permission of instructor. Staff

**407 Organization and Management Theory II** (I, 3) Analysis of complex organizational situations emphasizing managerial problems dealing with structure, coordination, control, and integration. Conceptual skills for organizational analysis, including model and systems approaches. (Lec. 3) Pre: 301 or permission of instructor. Staff

**408 Organization Development and Change** (I or II, 3) Behavioral science applications to the planning of systematic organizational change and development. Theory, concepts, techniques, and cases for change agents and managers of change. (Lec. 3) Pre: 301, 407, or permission of instructor. Staff

**410 Business Policy** (I and II, 3) Case analysis is used to study strategic issues and problems of mission and goal setting, planning, implementing, and controlling in domestic and multinational firms. (Lec. 3) Pre: 301, ACC 202, FIN 301, MSI 309, MKT 301, BSL 333, senior standing in the College of Business Administration, or permission of instructor. Not for graduate credit. Staff

**422 Labor Law and Legislation** (II, 3) Federal and state labor relations statutes and court and agency decisions pertaining to private and public employment, regulations of trade unions, equal opportunity, wage and hour laws. (Lec. 3) Pre: 321 or permission of instructor. Staff

**423 Labor Relations** (II, 3) Public interest in labor relations and problems involved in collective bargaining. Major adjustments of public and private management to changes in labor policy of federal and state governments, community, and labor unions. (Lec. 3) Pre: 303. Not for graduate credit. Staff

**426 Training and Development Theory and Practice** (I, 3) Development of education programs in industry. Teaching and learning strategies. Needs assessment. Evaluation. (Lec. 3) Pre:

PSY 113 and senior standing. Not for graduate credit. Staff

**431 Advanced Management Seminar** (I or II, 3) Integrated approach to problems in major areas of business management with emphasis on administrative and executive viewpoint. (Seminar) Pre: 301. Staff

**435 Compensation Administration** (II, 3) Concepts, models, theories, and legislation related to the employee compensation process. Discussion and skill acquisition in job analysis, job evaluation, wage surveys, and performance appraisal. (Lec. 3) Pre: 303 or permission of instructor. Not for graduate credit. Staff

**437 Human Resource Planning, Selection, and Placement** (I, 3) Recruitment, selection, and placement of human resources. Integration of human resource plans with organizational strategic plans. Career planning and development. Affirmative action and equal opportunity aspects of selection and placement. (Lec. 3) Pre: ECN 368, MGT 303, or permission of instructor. Not for graduate credit. Staff

**453 International Dimensions of Business** (I, 3) Introduction to the international aspects of business, including the cultural, legal, and political environment faced by the multinational corporation. (Lec. 3) Pre: senior standing or permission of chairperson. Not for graduate credit. Staff

**480 Small Business Management** (I, 3) Investigation and evaluation of the small business enterprise. Current literature studied to enable the student to understand and appreciate the small business. Required project performed with a small organization. (Lec. 3) Pre: senior standing in the College of Business Administration or permission of instructor. Staff

**482 Entrepreneurship** (II, 3) Procedures for starting and operating one's own business including the following topics: the business idea, personality traits, feasibility analysis, business plan, and functional area basics. Intended for nonbusiness majors. (Lec. 3) Pre: senior or graduate standing and permission of chairperson. Not open to students with credit in REN 325. Comerford

**491, 492 Special Problems** (I and II, 3 each) Lectures, seminars, and instruction in research techniques, literature, and other sources of data in organizational management, industrial relations, and law with application to specific individual projects. (Independent Study) Pre: permission of chairperson. Not for graduate credit. Staff

**493 Internship in Management** (I or II, 3) Approved, supervised work experience with participation in management and problem solving related to management. Fifteen working days (or 120 hours). (Practicum) Pre: junior standing and proposal approved by the College of Business Administration. May be repeated for credit. Not for graduate credit. S/U only. Staff

**626 Organizational Behavior** (I, 3) Incorporates the insights gleaned from the disciplines of psychology, sociology, anthropology, and the social sciences of politics, economics, and history in the study of the behavior of organizations and of their principal actors. (Lec. 3) Pre: 630 or equivalent. Staff

**627 Advanced Organizational Theory and Behavior** (II, 3) Previous knowledge of classical and traditional management thought used to provide concepts, analytical approaches, and skills for understanding how behavioral sciences influence complex organizational systems. (Lec. 3) Pre: 626. Staff

**630 Organizational Theory and Behavior** (I and II, 4) Management applied to business objectives, policies, organizational staffing and control. Interpersonal dynamics in organizational settings. Role of human resource management. Emphasis on individual and structural factors affecting decision making. (Lec. 4) Pre: graduate standing. Staff

**635 Consulting and Management Practice** (I or II, 3) Review of the theory and practice of effective consulting and development of consultation skills. (Practicum) Pre: 630 or permission of instructor. Staff

**638 Seminar in Management** (I or II, 3) Class discussion of typical cases, original research work in the field of management with discussion of data collected and analyzed by individual students. (Seminar) Pre: permission of chairperson. Staff

**639 Advanced Topics in Management** (I or II, 3) Integrated approach to problems in major areas of business management with emphasis on administrative and executive viewpoint. (Seminar) Pre: permission of chairperson. Staff

**640 Compensation Administration** (I or II, 3) Compensation and performance appraisal systems. Theory and techniques used to determine job worth. Special issues in compensation management, such as relating pay to performance through appraisal techniques and pay compression. (Lec. 3) Pre: 630. Staff

**641 Human Resource Development (I or II, 3)**

Techniques used in procurement and development of human resource. Planning through recruitment, selection, and placement to training and development. Integration of HRD process with organizational strategic plans. (Lec. 3) Pre: 630. Staff

**655 International Business Management (I, 3)**

Examines the problems and characteristics of international management by focusing on the role of the multinational corporation in a cross-cultural setting. (Lec. 3) Pre: 630 or equivalent. Staff

**656 Japanese Business Systems (I or II, 3)**

A comparative study of Japanese business management systems by means of readings, case studies, and lectures. Focus on management practices in Japanese firms and problems of coping with environmental factors in Japan and the United States. (Lec. 3) Pre: 630 or permission of instructor. Staff

**657 International Comparative Management and Culture (I or II, 3)**

An interdisciplinary course which examines the effects of culture on managerial behavior and decision making. (Lec. 3) Pre: 630. Staff

**670 Business Environmental Analysis (II, 3)**

Advanced analysis of increasingly complex inter-relationships between the business organization and its environment. Emphasis on conceptual foundations of business and the impact of contemporary sociopolitical issues on management decision making. (Lec. 3) Pre: 630 or permission of chairperson. Staff

**681 Administrative Policy and Decision Making (I and II, 3)**

Case studies of management problems and evaluation of alternative solutions by integrating functional areas of business. Discussion of ethical, social, and regulatory environments in domestic and multinational firms. Includes the M.B.A. written comprehensive examination. (Lec. 3) Pre: all M.B.A. 500-level first-tier courses or equivalent and a minimum of 21 M.B.A. credits which must include MGT 630, MKT 601, FIN 601, ACC 610, or permission of instructor. Staff

**691, 692 Directed Study in Management (I and II, 1–3 each)**

Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of instructor. Staff

**693, 694 Internship in Management (I and II, 3 each)**

Participation in management and/or problem solving under the supervision and

guidance of a sponsoring agency with evaluation by the College of Business Administration. (Practicum) Pre: proposal acceptance by the College of Business Administration, no previous internship credit, and graduate standing. S/U credit. Staff

**695 Managerial Skills Development (I, II, and SS, 3)**

Assessment, feedback, and development of managerial skills; leadership, group decision making and problem solving, negotiation, making presentations, giving feedback, listening. (Lec. 3) Pre: 630. Staff

**696 Strategic Decision Making (I, II, and SS, 3)**

Development of the skills and competencies in strategic thinking; use of critical analysis in the diagnosis of organizational and management problems. Serves as foundation for policy course and case method. (Lec. 3) Pre: graduate standing. deLodzia

**697 Doctoral Research Seminar (I and II, 3)**

Provides a rigorous analysis of current research questions and research techniques used to address those questions in the academic discipline. Recent developments and current issues addressed. (Seminar) Pre: enrollment in Phase II of the Ph.D. program in business administration. Staff

**699 Doctoral Dissertation Research (I and II)**

Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) Pre: enrollment in Phase III of the Ph.D. program in business administration. S/U credit

**Management Science and Information Systems (MSI)**

Chairperson: Professor Ebrahimipour

**301 Foundations of Computer Technology in Business (I or II, 3)**

Applied computer techniques used to solve business problems. Computers, various software programs, and case studies will be used to facilitate intelligent and informed decision making. (Lec. 3) Restricted to nonbusiness majors. Staff

**309 Operations Management (I and II, 3)**

Operations management problems in global and domestic environments. Operations strategy, service, and manufacturing; forecasting; inventory management; production and material requirements planning; scheduling; just-in-time; and quality management. (Lec. 3) Pre: BAC 110 and 202 or permission of instructor. Staff

**310 Applications of Microcomputer Software in Business (I and II, 3)**

In-depth study of micro-

computer software used in business applications. Emphasis on spreadsheets, data management, presentation graphics, and communication software. Student projects and microcomputer lab assignments required. (Lec. 3) Pre: BAC 110. Staff

**320 (420) Business Applications Program-**

**ming (I or II, 3)** Techniques for the development of business software applications using appropriate hardware platforms and software environments. Emphasis on creation and manipulation of data structures used in business systems. (Lec. 3) Pre: BAC 110. Staff

**350 Managerial Decision Support Systems (I and II, 3)**

Methodologies and information technologies that support decision making. Emphasis on the use of PC-based analytical software for solving managerial problems; case studies and group problem solving. (Lec. 3) Pre: BAC 110 and 202. Staff

**410 Information Technology in Business Organizations (I or II, 3)**

An overview of existing and developing information technologies used in business organizations. Topics include computer hardware and software, business information systems, operating systems, data communications, and local- and wide-area networks. (Lec. 3) Pre: 310, 320, or permission of instructor. Not for graduate credit for students in the College of Business Administration. Staff

**420 Business Data Communications and Networking (I or II, 3)**

Introduction to data communications and computer networks within the context of modern business organizations. Emphasis on current technologies and their impact on management information systems. (Lec. 3) Pre: 310 or permission of instructor. Not for graduate credit. Staff

**430 Management System Analysis and Design (I or II, 3)**

Concepts, methods, and tools used in the design, development, operation, and evaluation of computer-based information systems. (Lec. 3) Pre: 310 or permission of instructor. Staff

**440 Management of Databases (I or II, 3)**

Concepts and methods in management of data: creation, design, and implementation; data models; integrity; and security. Use of database management systems software. (Lec. 3) Pre: 310, 320, or permission of instructor. Staff

**450 Forecasting (I or II, 3)**

Forecasting for advanced students in all areas of business administration. Introduction to time series analysis including decomposition of the multiplicative model, exponential smoothing, and ARIMA processes. A variety of software systems

are employed, with special emphasis on micro-computer systems. (Lec. 3) Pre: BAC 110 and 202 or permission of instructor. Staff

**455 Analysis of Managerial Data (I or II, 3)** Theory and application of selected statistical methods, including linear models, sampling, and analysis of surveys. Emphasis will be placed on the extraction of information from large data sets and the utilization of statistical information in the decision-making process. (Lec. 3) Pre: BAC 110 and 202 or permission of instructor. Not for graduate credit for students in the College of Business Administration. Staff

**460 Management of Quality Control and Improvement (I or II, 3)** Principles of quality management including control charts, process management, and other techniques, with emphasis on the effect of these principles on decision making in various organizations. (Lec. 3) Pre: BAC 110 and 202 or permission of instructor. Staff

**465 Advanced Operations Management (I or II, 3)** Advanced topics in operations management such as demand management; multi-item, multi-location inventories; capacity planning and control; theory of constraints; and time-based competition in manufacturing and service operations. (Lec. 3) Pre: 309 or permission of instructor. Staff

**470 Advanced Managerial Decision Support Systems (I or II, 3)** Development and presentation of decision support, executive information, and expert systems. Emphasis on the collaborative solution and the presentation of cases. (Lec. 3) Pre: 350. Staff

**480 Managerial Application of Simulation (I or II, 3)** Evaluation and design of computer simulation models for operational and strategic decision making. (Lec. 3) Pre: BAC 110 and 202 or permission of instructor. Staff

**491, 492 Special Problems (I and II, 1–3 each)** Lectures, seminars, and instruction in operations research techniques, with emphasis on student research projects. (*Independent Study*) Pre: permission of instructor. Staff

**493 Internship in Management Science and Information Systems (I or II, 3)** Approved supervised work experience with participation in management and problem solving related to management science and information systems. Fifteen working days (or 120 hours). (*Practicum*) Pre: junior standing and proposal approved by the College of Business Administration. May be repeated for credit. Not for graduate credit in

management science and information systems. S/U only. Staff

**495 Seminar in Management Science and Information Systems (I or II, 3)** Preparation and presentation of papers on selected topics. (*Seminar*) Pre: 350. Not for graduate credit in management science and information systems. Staff

**600 Managing with Information Resources (I and II, 2–3)** Concepts of information technologies and systems as they relate to the information-age organization. Major focus is on how the various information resources can be managed to facilitate organizational effectiveness. Topics include information and communication technologies, decision support and information systems, technology-enabled process re-engineering, and information architecture. (Lec. 2–3) Pre: BAC 500 or permission of instructor. Staff

**601 Business Research Methods: Linear Models (I, 3)** Theory and application of regression and correlation analysis, analysis of variance, and experimental design. (Lec. 3) Pre: BAC 500, 520, 530 or permission of instructor. Staff

**602 Business Research Methods: Multivariate Analysis (II, 3)** Introduction to multivariate analysis with emphasis on business applications. Topics include factor analysis, cluster analysis, discriminate functions, and multivariate analysis of variance. (Lec. 3) Pre: 601 or permission of instructor. Staff

**605 Business Microcomputer Applications (I, 3)** Microcomputer technology and applications in business. Hardware, software, selection of microcomputer systems, and use of commercial software packages. Student projects and microcomputer laboratory sessions required. (Lec. 3) Pre: BAC 500. Staff

**620 Quantitative Methods for Management (I and II, 2–3)** Survey of principal operations research/management science models. Linear programming, network, and other mathematical programming models; simulation, decision analysis, and other probabilistic models. (Lec. 2–3) Pre: BAC 500, 520, and 530 or waiver examinations. Staff

**630 Management Statistics with SAS and Personal Computer Software (II, 3)** Second course in statistical analysis for M.B.A. students. Introduces SAS computer languages and personal software. Regression, business experimental designs, time series, business index numbers, and decision theory. (Lec. 3) Pre: BAC 500, 520, and 530 or waiver examinations. Staff

**640 Operations Management (I and II, 2–3)** The management of manufacturing and service operations. Topics include flow processes, inventories, scheduling, capacity, and operations strategy. (Lec. 2–3) Pre: BAC 500, 520, 530. Staff

**664 Health Information Systems (I or II, 3)** Concepts associated with the design, implementation, management, and evaluation of administrative and clinical health information systems. (Lec. 3) Pre: BAC 500 or equivalent or permission of instructor. Staff

**675 Applied Time Series Methods and Business Forecasting (I and II, 3)** Study of time series methods. Construction and use of autoregressive integrated moving averages (ARIMA) forecasting models. Applications to strategic decision actions. (Lec. 3) Pre: 601. Staff

**684 Advanced Mathematical Programming Methods in Management (II, 3)** Introduction to integer, nonlinear, and dynamic programming. Emphasis on application of modern mathematical optimization techniques in single-stage and multiple-stage management decision problems. (Lec. 3) Pre: 620 or permission of instructor. Staff

**691, 692 Directed Study in Management Science and Information Systems (I and II, 1–3 each)** Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) Pre: permission of instructor. Staff

**693, 694 Internship in Management Science and Information Systems (I and II, 3 each)** Participation in management and/or problem solving under the supervision and guidance of a sponsoring agency with evaluation by the College of Business Administration. (*Independent Study*) Pre: proposal approved by the College of Business Administration, no previous internship credit, and graduate standing. S/U credit. Staff

**695 Seminar in Management Science and Information Systems (I or II, 3)** Preparation and presentation of papers on selected topics in management science and information systems. (*Seminar*) Pre: 620. Staff

**697 Doctoral Research Seminar (I and II, 3)** Provides a rigorous analysis of current research questions and the research techniques used to address those questions in the academic discipline. Recent developments and current issues addressed. (*Seminar*) Pre: enrollment in Phase II of the Ph.D. program in business administration. Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) *Pre: enrollment in Phase III of the Ph.D. program in business administration. S/U credit.*

## Marine Affairs (MAF)

*Chairperson:* Professor Juda

**100 Human Use and Management of the Marine Environment (I, 3)** Examination of uses and management efforts in the coastal and ocean environment. Assessment of problems arising from those uses and attempts to conserve resources, protect the environment, and minimize use conflicts in the context of changing technological capabilities, knowledge, and values. (*Lec. 3*) Juda

**120 New England and the Sea (II, 3)** An examination of the human and environmental impacts of the sea and its uses on the New England and Gulf of Maine region. Considers marine resource use and management from colonial to modern times. (*Lec. 3*) Krausse

**220 Introduction to Marine and Coastal Law (II, 3)** Basic principles of marine and coastal law in the United States. An integration of coastal zone, outer continental shelf, fisheries, marine pollution, and admiralty laws. (*Lec. 3*) Nixon

**312 The Politics of the Ocean (I or II, 3)** Survey of decision making with respect to the marine environment at the international, national, and local levels. Special emphasis on laws and treaties of the United States and the United Nations. (*Lec. 3*) *Pre: 100.* Staff

**320 Shipping and Ports (I or II, 3)** An introduction to waterborne movement of cargo. An examination of shipping and port operations, innovations in maritime transportation systems, and the interplay of the operators, shipping, and ports. (*Lec. 3*) *Pre: 100.* Marti

**330 World Fishing (I or II, 3)** The role of marine fisheries and aquaculture in world food production. Social, economic, legal, and scientific issues in fisheries management. (*Lec. 3*) *Pre: 100.* Dyer

**410 Senior Seminar in Marine Affairs (I and II, 3)** Advanced work in the management of the coastal and marine environment, with special emphasis on case studies and student projects. Seniors only. (*Seminar*) *Required for seniors in marine affairs. Not for graduate credit in marine affairs.* Gordon or Dyer

**413 Peoples of the Sea**  
See Anthropology 413.

**415 Marine Pollution Policy (I, 3)** Introduction to management techniques for marine pollutants (biodegradable materials, nutrients, petroleum, metals, synthetic organics, radioactive materials, plastics, heat, and dredge spoils) with emphasis on strategies to limit environmental impacts. (*Lec. 3*) *Pre: junior standing or above. Not for graduate credit.* Burroughs

**434 Introduction to Environmental Law**  
See Community Planning 434.

**456 Polar Resources and Policy (I, 3)** Description of Arctic and Antarctic natural resources and examination of current issues associated with their development. Analysis of alternative management regimes with reference to treaties and continuing international negotiations. (*Lec. 3*) Burroughs

**461 Coastal Zone Management (I, 3)** Examination of activities and management efforts in the coastal zone of both developed and developing countries and their impacts on the environment. Resolution of use conflicts. (*Lec. 3*) West

**465 GIS Applications in Coastal and Marine Management (II, 3)** The use of geographical information systems (GIS) technology in coastal and marine settings. Database acquisition and management are emphasized. Case application in coastal zone management, artificial habitat, and fisheries management. (*Lec. 3*) Gordon or Krausse

**471 Island Ecosystem Management (II, 3)** An ecosystem approach to the sustainable development and environmental management of mid-oceanic islands in the Caribbean and the Pacific Ocean. Topics include tourism, reef fishery, cultural heritage, and marine conservation. Simulation game on island-wide management process. (*Lec. 3*) Krausse

**472 Marine Recreation and Tourism Management Seminar (II, 3)** Analysis of domestic and international case studies emphasizing identification of and solutions to problems of coastal recreation and tourism. Use of experiential learning. Emphasis placed on presentation, leadership, and negotiation skills. (*Seminar*) West

**475 Human Responses to Coastal Hazards and Disasters (II, 3)** Examines the impact of hazards and disasters on human population inhabiting the coastal zone. Sets human adaptations to coastal hazards and disasters in an historical context. Extracts lessons learned for comparative analysis. (*Lec. 3*) Dyer

**482 Quantitative Methods in Marine Affairs (II, 3)** Introduction to descriptive and inferential statistics in geography and marine affairs. Emphasis on the spatial application of statistical tests with particular utility to the geographer and marine affairs student. (*Lec. 3*) *Pre: STA 220 or equivalent for undergraduate students.* West

**484 Environmental Analysis and Policy in Coastal Management (I, 3)** Analysis of environmental policy strategies as applied in federal and state coastal management programs. Emphasis on coastal environmental assessment and program evaluation techniques, hazards management, regulatory frameworks, and environmental ethics. (*Lec. 3*) Gordon

**490 Field Experience in Marine Affairs (I and II, 3–6)** Supervised undergraduate internship within an approved work setting designed to provide students with on-the-job experience relevant to their academic training and career goals. Students are responsible for securing internship positions and learning contract. (*Practicum*) *Pre: permission of instructor, senior standing recommended. Not for graduate credit.* Staff

**491, 492 Special Problems (I and II, 3 each)** Individual guidance in major readings and methods of research. (*Independent Study*) *Pre: permission of chairperson.* Staff

**493 International Field Course in Coastal Management (I and II, 1–2)** Project-oriented course in coastal management. Students will collect field data overseas during the fall/spring intersession, with report writing completed during the following spring semester. (*Practicum*) *Pre: permission of instructor. May be repeated for up to 3 credits.* West

**499 Directed Study (I and II, 1–3)** Individual research and reports on problems of special interest, including honors thesis research. (*Independent Study*) *Pre: permission of instructor.* Staff

**502 Research Methods in Marine Affairs (II, 3)** Emphasis on the application of alternative research methods utilized in a typical interdisciplinary study. Development of specific research projects. (*Lec. 3*) *Pre: 482 or permission of chairperson.* Staff

**511 Ocean Uses and Marine Sciences (I, 3)** Introduction to selected ocean uses focusing on the interplay of public policy and marine science. Emphasis on policy implications of uses such as resource and energy extraction. (*Lec. 3*) Burroughs

**512 (or PSC 512) Marine Science and Policy Analysis (II, 3)** The role of ocean science in initiation, forecasting, implementation, and evaluation of public policy is examined through waste disposal, protected areas, and oil development, among other topics. (*Seminar*) *Pre: 511 or permission of instructor.* Burroughs

**515 Marine Pollution Policy (I, 3)** Introduction to management techniques for marine pollutants (biodegradable materials, nutrients, petroleum, metals, synthetic organics, radioactive materials, plastics, heat, and dredge spoils) with emphasis on strategies to limit environmental impacts. (*Lec. 3*) *Pre: junior standing or above.* Burroughs

**516 (or CPL 516) Seminar on the Urban Waterfront (I, 3)** The urban environment and its evolution, structure, and function as it pertains to metropolitan waterfronts and small recreational harbors. Emphasis on the permitting process, public participation, marine recreation, and management issues. Field trip and student project required. (*Seminar*) Krausse

**520 Seminar in Coastal Margin Management (II, 3)** Nature of oil, mineral, and fishery resources on the continental shelf and environmental issues are reviewed. Emphasis on the utility of data for policy development. (*Seminar*) Burroughs

**521 Coastal Zone Law (I, 3)** Examination of the authority of different levels and agencies of government to make decisions affecting coastal regions. Survey of existing and proposed state and national legislation affecting coastal regions. (*Lec. 3*) Nixon

**523 Fisheries Law and Management (II, 3)** Examination of the relationship between law and fisheries policy on the international and national levels, law relating to fisheries, jurisdictional levels, function of law in implementing fisheries management policy. (*Lec. 3*) Nixon

**530 International and Domestic Coastal Area Management Seminar (I, 3)** Using international and national coastal management case studies, this seminar focuses on coastal management problems using an interdisciplinary project-orientated approach to problem solving. Emphasis is placed on development of leadership, presentation, and negotiation skills. (*Seminar*) West

**544 Water Resources Law (II, 3)** A comprehensive examination of key legal concepts within surface and groundwater law. Legal issues are

framed within local, state, regional, federal, and international management and administrative settings. (*Lec. 3*) *Pre: graduate standing or approval of instructor.* Gordon

**562 Admiralty Law (I, 3)** Fundamentals of admiralty law: collisions at sea, bills of lading, marine insurance, and rights of seamen. Case studies of marine transportation problems and their resolution by law. (*Lec. 3*) Nixon

**563 Maritime Transportation (I, 3)** Passenger and commodity transportation. Analysis of the relationship between transportation services and the spatial distribution of activities. Emphasis on multimodal transport and bulk commodities. (*Lec. 3*) *Pre: senior or graduate standing or permission of instructor.* Marti

**564 Port Operations and Policy (II, 3)** Analysis of coastal and international trade routes and the response of ports. Special emphasis on the container revolution, liquid natural gas transportation, and deep-water ports for supertankers. (*Lec. 3*) Marti

**565 Cruise Ship Operations, Marketing, and Ports (I, 3)** Explores the many facets of the cruise ship industry from the points of view of social, management, and policy science. Designed to familiarize the student, utilizing an interdisciplinary approach, with the genesis, current status, and future roles of this dynamic industry. (*Seminar*) *Pre: graduate standing, or seniors with permission of instructor.* Marti

**571 Marine Geography (I, 3)** The marine region as a unique complex of physical and cultural elements. The purpose is to analyze functional relationships within the region and to assess forms of regional organization and control. (*Lec. 3*) Staff

**577 (or PSC 577) International Ocean Law (I, 3)** Principles of international law as they relate to ocean management problems. Jurisdiction in zones, such as territorial seas, exclusive economic zones, and the high seas will be examined, as well as the problems posed by zonal approaches to ocean-use management. Juda

**578 International Ocean Organizations (II, 3)** International organizations involved in marine-related activities, including their planning, management, regulatory, and assistance functions. Attention to the impact of organizations on ocean management efforts in the developed and developing world. (*Lec. 3*) *Pre: 577 or permission of instructor.* Juda

**582 Estuarine Management (I, 3)** Options, governing structures, and management techniques for estuarine areas are considered, with emphasis on field and laboratory exercises. (*Lec. 3*) Burroughs

**586 Environmental Impact Assessment and Analysis (I, 2)** Centers on an impact assessment of a proposed coastal community project and includes the development of project alternatives, associated impacts, preparation of a public hearing, and final report. Relevant methods and procedures are reviewed. (*Practicum*) *Pre: matriculated graduate status or permission of instructor. 586 may not be used for program credit unless 587 is completed in the same academic year.* West

**587 Environmental Assessment Meeting and Report (II, 2)** Continuation of 586, which must be taken in the same academic year. Focus is on the public meeting and the completion of written report prepared in 586. (*Practicum*) *Pre: 586.* West

**589 Master's Project Research (I or II, 3)** Preparation of a major research paper for M.M.A. students under the guidance of a graduate faculty member. (*Independent Study*) *Pre: graduate standing in the M.M.A. program. S/U credit.* Staff

**591, 592 Directed Study or Research (I and II, 3 each)** Areas of special research interest of graduate students. (*Independent Study*) *Pre: permission of chairperson.* Staff

**595 Problems of Modernization in Developing Nations**  
See Resource Economics 595.

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) *S/U credit.* Staff

**602 Federal Ocean Policy and Organization (II, 3)** Ocean policy development and implementation by the executive and legislative branches of government. Allocation of powers and analysis of the decision-making process for the oceans. (*Lec. 3*) Juda

**651, 652 Marine Affairs Seminar (I and II, 3 each)** Interdisciplinary seminar conducted by marine affairs program faculty supplemented by guest speakers from industry and government. Focuses on problems of marine resources development and management at the local, state, national, and international policy levels. (*Seminar*) Burroughs, Dyer, Gordon, Juda, Krausse, Marti, Nixon, and West

## Marine and Environmental Topics

### Animal and Veterinary Science (AVS)

- 101 Introduction to Animal Science
- 323, 324 Animal Management I, II

### Anthropology (APG)

- 413 (or MAF) Peoples of the Sea

### Aquacultural Science and Pathology (ASP)

- 281 Introduction to Aquaculture
- 381 Shellfish Aquaculture
- 400 Diseases of Cultured Fishes
- 401 Pathobiology
- 476 The Genetics of Fish
- 483 Salmonid Aquaculture
- 486 Applied Physiology of Fish
- 555, 556 Pathology Rotation
- 581 Current Topics in Molluscan Aquaculture
- 584 Advanced Aquaculture Systems
- 586 Fish Nutrition

### Biological Sciences (BIO)

- 112 General Botany
- 113 General Zoology
- 130 Topics in Marine Biology
- 141 Introduction to the Biology of Marine Animals
- 262 Introductory Ecology
- 286 Humans, Insects, and Disease
- 345 Marine Environmental Physiology
- 355 Marine Invertebrates of Southern New England
- 418 Marine Botany
- 441 Environmental Physiology of Animals
- 442 Mammalian Physiology
- 445, 545 Endocrinology I, II
- 458 Limnology
- 465 Biology of Algae
- 466 Vertebrate Biology
- 467 Animal Behavior
- 501 Systematic Zoology
- 541 Comparative Physiology of Marine Animals
- 560 Seminar in Plant Ecology
- 561 Behavioral Ecology
- 562 Seminar in Behavioral Ecology
- 563 Ichthyology
- 566 Herpetology
- 567 Natural Selection
- 568 Ornithology
- 570 Field Biology of Fishes
- 664 Phytoplankton Ecology
- 666 Biology of Metamorphosis
- 668 Biology of Reproduction in Animals
- 675 Advanced Ecology Seminars

### Chemical Engineering (CHE)

- 212 Chemical Process Calculations
- 403, 404 Introduction to Ocean Engineering Processes I, II

- 534 (or OCE) Corrosion and Corrosion Control
- 535 (or OCE) Advanced Course in Corrosion
- 548 (or FSN) Separations for Biotechnology

### Civil and Environmental Engineering (CVE)

- 374 Environmental Engineering
- 470 Water and Wastewater Transport Systems I
- 471 Water and Wastewater Treatment Systems II
- 474 Water Quality Sampling and Analysis
- 475 Water in the Environment
- 478 Hazardous Waste Disposal and Solid Waste Management
- 570 Sanitary Chemistry
- 572 Biosystems in Sanitary Engineering
- 573 Theory of Water Purification and Treatment
- 581 (or OCE) Experimental Geomechanics
- 583 (or OCE) Advanced Foundation Engineering
- 586 Geotechnical Design of Water Containment Systems
- 587 Groundwater Flow and Seepage Pressures
- 588 Groundwater Hydrology
- 672 Water Pollution Control and Treatment of Wastewater
- 677 Stream and Estuarine Analysis
- 681, 682 Advanced Geotechnical Engineering I, II

### Community Planning (CPL)

- 434 (or MAF) Introduction to Environmental Law
- 511 Planning and Natural Environmental Systems
- 545 Land Development Seminar
- 549 Seminar in Ecological Planning

### Economics (ECN)

- 415 (or REN) Environmental Harms and Sanctions

### Electrical Engineering (ELE)

- 677 (or OCE) Statistical Sonar Signal Processing

### Entomology (ENT)

- 385 (or BIO 381) Introductory Entomology
- 529 Systems Science for Ecologists
- 555 Insect Pest Management
- 561 Aquatic Entomology

### Environmental Sciences (EVS)

- 598 Nonthesis Master's Research
- 599 Master's Thesis Research
- 699 Doctoral Dissertation Research

### Fisheries Science and Technology (FST)

- 315 Living Aquatic Resources
- 321 World Fishing Methods
- 341 Marine Propulsion Systems

- 342 Marine Auxiliary Systems
- 343 Vessel Repair and Maintenance
- 415 Fishery Science
- 421 Design of Fish Capture Systems
- 510 Applied Problems in Marine Fisheries Ecology
- 516 Early Life History of Aquatic Resource Animals
- 521 Evaluation of Fish Capture Systems

### Food Science and Nutrition (FSN)

- 434 Marine Food Processing
- 532 Seafood Quality

### Geology (GEL)

- 100 Environmental Geology
- 103 Understanding the Earth
- 210 Landforms: Origin and Evolution
- 277 Coastal Geologic Environments
- 301 Earth's Depleting Resources
- 401 Ore Deposits
- 450 Introduction to Sedimentary Geology
- 468 Ground-Water Chemistry
- 483 Hydrogeology
- 550 Sedimentary Processes and Environments
- 568 Isotopes in Hydrogeology
- 577 Coastal Geologic Hazards
- 581 Topics in Tectonic Geology
- 583 Ground-Water Modeling

### Marine Affairs (MAF)

- 100 Human Use and Management of the Marine Environment
- 120 New England and the Sea
- 220 Introduction to Marine and Coastal Law
- 312 The Politics of the Ocean
- 320 Shipping and Ports
- 330 World Fishing
- 410 Senior Seminar in Marine Affairs
- 415, 515 Marine Pollution Policy
- 456 Polar Resources and Policy
- 461 Coastal Zone Management
- 465 GIS Applications in Coastal and Marine Management
- 471 Island Ecosystem Management
- 472 Marine Recreation and Tourism Management Seminar
- 475 Human Responses to Coastal Hazards and Disasters
- 482 Quantitative Methods in Marine Affairs
- 484 Environmental Analysis and Policy in Coastal Management
- 490 Field Experience in Marine Affairs
- 493 International Field Course in Coastal Management
- 502 Research Methods in Marine Affairs
- 511 Ocean Uses and Marine Sciences
- 512 (or PSC) Marine Science and Policy Analysis

- 516 (or CPL) Seminar on the Urban Waterfront  
 520 Seminar in Coastal Margin Management  
 521 Coastal Zone Law  
 523 Fisheries Law and Management  
 530 International and Domestic Coastal Area Management Seminar  
 544 Water Resources Law  
 562 Admiralty Law  
 563 Maritime Transportation  
 564 Port Operations and Policy  
 565 Cruise Ship Operations, Marketing, and Ports  
 571 Marine Geography  
 577 (or PSC) International Ocean Law  
 578 International Ocean Organizations  
 582 Estuarine Management  
 586 Environmental Impact Assessment and Analysis  
 587 Environmental Assessment Meeting and Report  
 602 Federal Ocean Policy and Organization  
 651, 652 Marine Affairs Seminar
- Marine Resource Development (MRD)**  
 200 Introduction to Marine Resource Development  
 270 Basic Scuba Diving in Science and Technology  
 290 Small Boats: Their Equipment and Operation  
 380 Inshore and Coastal Navigation  
 390 Vessel Operations  
 433 Research Diving Methods  
 481, 482 Applied Problems in Marine Resource Development I, II
- Mechanical Engineering and Applied Mechanics (MCE)**  
 354 Fluid Mechanics  
 415 Experimentation in Fluid Mechanics and Thermal Science  
 434 Thermal Environmental Engineering  
 551, 653, 654 Fluid Mechanics I, II, II  
 652 Experimental Methods in Fluid Mechanics
- Microbiology (MIC)**  
 102 Exploring the Microbial World  
 211 Introductory Microbiology  
 523 (or FSN or NRS) Water Pollution Microbiology
- Natural Resources Science (NRS)**  
 100 Natural Resource Conservation  
 212 Introduction to Soil Science  
 286 Analysis and Presentation of Environmental Data  
 300 Seminar in Natural Resources  
 301 Introduction to Forest Science  
 302 Fundamentals of Forest Management  
 304 Field Ornithology
- 305 Principles of Wildlife Management  
 309 Wildlife Management Techniques Laboratory  
 312 Methods in Soil and Water Analysis  
 324 Biology of Mammals  
 351 Soil Morphology Practicum  
 395 Research Apprenticeship in Natural Resources Science  
 399 Natural Resources Internship  
 402 Wildlife Biometrics  
 406 Wetland Wildlife  
 407 Nongame and Endangered Species Management  
 409 Concepts in GIS  
 410 Fundamentals of GIS  
 412 Soil-Water Chemistry  
 423 Wetland Ecology  
 424 Wetlands and Land Use  
 425, 525 Wetland Field Investigations  
 426 Soil Microbiology  
 440 Ecosystem Processes in Land and Water Management  
 441 Methods in Ecosystem Analysis  
 450 Soil Conservation and Land Use  
 451 Soil and Water Conservation Technology  
 461 Watershed Hydrology and Management  
 471 Soil Morphology and Mapping  
 500 Graduate Seminar in Natural Resources  
 505 Biology and Management of Migratory Birds  
 509 Concepts of GIS and Applications in Environmental Science  
 510 Soil-Water Relations  
 522 Advanced GIS Analysis of Environmental Data  
 526 Microbial Ecology of Soils and Sediments  
 532 Conservation Biology  
 534 Ecology of Fragmented Landscapes  
 555 Applied Coastal Ecology  
 567 Soil Genesis and Classification  
 568 Recent Advances in Natural Resources Science  
 582 Seminar in Soil Ecology and Biochemistry
- Ocean Engineering (OCE)**  
 101 Introduction to Ocean Engineering  
 215, 416 Ocean Engineering Seminar I, II  
 216 Introduction to Ocean Engineering Design  
 307 Introduction to Engineering Wave Mechanics and Littoral Processes  
 310 Basic Ocean Measurement  
 311 Coastal Measurements and Applications  
 395 Ocean Systems Design Proposal  
 421 Marine Structure Design  
 425 Coastal Experiments  
 471 Underwater Acoustics  
 495 Ocean Systems Design Project  
 510 Engineering Ocean Mechanics
- 514 Engineering Wave Mechanics and Nearshore Processes  
 515 Marine and Vehicle Hydrodynamics  
 522 Dynamics of Waves and Structures  
 560 Introduction to Data Collection Systems  
 561 Introduction to the Analysis of Oceanographic Data  
 565 Ocean Laboratory I  
 571, 672 (or ELE) Underwater Acoustics I, II  
 572 Underwater Acoustic Transducers  
 575 Marine Bioacoustics  
 582 (or CVE) Seabed Geotechnics  
 605, 606 Ocean Engineering Seminar  
 611 Coastal and Estuarine Environmental Modeling  
 614 Coastal Modeling  
 623 Random Waves and Vibrations  
 661 Analysis of Oceanographic Data Systems  
 666 Ocean Laboratory II  
 673 Advanced Course in Underwater Acoustic Propagation  
 674 Nonlinear Acoustics  
 675 Processing of Underwater Acoustic Data  
 676 Acoustic Radiation from Underwater Vibrators  
 688 (or CVE) Marine Geomechanics
- Oceanography (OCG)**  
 110 (or GEL) The Ocean Planet  
 123 Oceans, Atmospheres, and Global Change  
 131 Volcanoes and the Environment  
 401 General Oceanography  
 451 Oceanographic Science  
 480, 580 Introduction to Marine Pollution  
 491 Ocean Studies  
 501 Physical Oceanography  
 505 Marine Analytical Chemistry  
 510 Descriptive Physical Oceanography  
 521 Chemical Oceanography  
 523 Organic Geochemistry of Natural Waters  
 524 Chemistry of the Marine Atmosphere  
 531 Synoptic and Dynamic Meteorology  
 533 Graduate Writing in Marine and Environmental Sciences  
 540 Geological Oceanography  
 561 Biological Oceanography  
 574 Biology of Marine Mammals  
 576 (or MIC) Marine Microbiology  
 605 Dynamical Oceanography  
 606 Aquatic Community Ecology  
 610, 611 Geophysical Fluid Dynamics I, II  
 613 Waves  
 614 Tides  
 620 Chemical Distributions  
 623 Physical Chemistry of Seawater  
 625 Organic Geochemistry of Sediments  
 628 High-Temperature Geochemistry  
 631 Seminar in Marine and Atmospheric Chemistry

- 640 Marine Particles
- 643 Subduction Zones
- 644 Global Paleoclimatology
- 645 Petrology of the Oceanic Crust
- 646 Deep-Sea Sediments and Processes
- 649 Plankton Paleoecology
- 651 Marine Stratigraphy
- 652 Marine Geophysics
- 655 Paleomagnetism and Geomagnetism
- 661 (or BIO) Phytoplankton Taxonomy
- 663 (or BIO) Phytoplankton Physiology
- 664 (or BIO) Phytoplankton Ecology
- 665 Marine Bio-Optics and Remote Sensing
- 666 Zooplankton
- 667 (or BIO) Advanced Phytoplankton Seminar
- 668 Productivity of Ocean Margins
- 669 Marine Fish Ecology and Production
- 670 Fish Population Dynamics
- 671 Marine Zooplankton Ecology
- 673 Fisheries Oceanography
- 678 Low-Temperature Geochemistry and Isotope Geology
- 679 (or BIO) Animal Communication
- 681 Marine Pollution
- 689 Coastal Marine Ecosystems
- 695 Seminar in Oceanography

#### Physical Education and Exercise Science (PEX)

- 346 Skin and Scuba Diving, Beginners
- 347 Skin and Scuba Diving, Advanced

#### Physics (PHY)

- 130 Physics and Climatic Change
- 483, 484 (or AST) Laboratory and Research Problems in Physics

#### Plant Sciences (PLS)

- 205, 305 Population, Environment, and Plant Biology I, II
- 222 Ecology of the Home Landscape
- 361 Weed Science
- 401, 402 Plant Sciences Seminar
- 405 Propagation of Plant Materials
- 407 Environmental Education: Theory and Experiential Learning
- 436 Floriculture and Greenhouse Crop Production
- 440 Diseases of Turfgrasses, Trees, Shrubs, and Ornamental Shrubs
- 441 Plant Disease Laboratory
- 442 Advanced Turf Management
- 463 Principles of Plant Disease Control
- 471, 472 Plant Improvement I, II
- 475 (or NRS) Plant Nutrition and Soil Fertility
- 476 Environmental Plant Physiology
- 501, 502 Graduate Seminar in Plant Sciences
- 511 The Nature of Plant Disease
- 512 Plant Growth and Development
- 572 (or BCH) Plant Biochemistry
- 576 Environmental Plant Physiology

#### Political Science (PSC)

- 402 Environmental Policy and Politics

#### Public Health (MPH)

- 520 Introduction to Environmental Health

#### Resource Economics (REN)

- 110 Multimedia Presentation of Environmental Issues
- 310 Economics for Environmental Resource Management and Policy
- 336, 410 Fisheries Economics
- 341 Economics of Food and Natural Resource Markets
- 432 Environmental Economics and Policy
- 435 Aquacultural Economics
- 460 Economics of Ocean Management
- 470 Natural Resource Allocation and the Leadership Process
- 501 Graduate Seminar in Natural Resources Economics
- 514 Economics of Marine Resources
- 522 Mathematical Programming for Natural Resource Management
- 534 Economics of Natural Resources
- 540 Applied Resource Economics
- 543 Economic Structure of the Fishing Industry
- 595 (or MAF or PSC or SOC) Problems of Modernization in Developing Nations
- 602 Research Methodology
- 630 Resource Analysis
- 634 Economics of Resource Development
- 635 Marine Resources Policy
- 677 Econometric Applications in Resource Economics

#### Statistics (STA)

- 550 Ecological Statistics

### Marine Resource Development (MRD)

*Coordinator:* Associate Professor DeAlteris (Fisheries, Animal and Veterinary Science)

**200 Introduction to Marine Resource Development** (I and II, 3) Introduction to the estuarine, coastal, and marine environments and the science and technology involved in the use and preservation of these environments. (Lec. 2, Lab. 3) DeAlteris, Castro, or Recksiek

**270 Basic Scuba Diving in Science and Technology** (I, 3) Rigorous introduction to scuba diving including equipment, diving physics, no-decompression and decompression diving, basic skills, and safety. Emphasis on development of basic knowledge and skills appropriate for a diving scientist or technician. Open Water Diver Certification by the National Association of Un-

derwater Instructors is provided. (Lec. 2, Lab. 3) *Pre:* scuba diving physical examination and demonstration of strong swimming skills. DeAlteris

**290 Small Boats: Their Equipment and Operation** (I, 3) Principles and practices of vessel operation, from outboard skiffs to small trawlers. Basic nomenclature, navigation, and ship-handling. Rigging and working gear used in marine resource development. (Lec. 2, Lab. 3) Wing

**380 Inshore and Coastal Navigation** (I, 3) Theory and practice of navigation for operators of vessels working up to 100 miles offshore. Chart work, tides, currents, instruments, visual and electronic aids, graphical and mathematical dead reckoning. (Lec. 2, Lab. 3) DeAlteris

**381 Mid-Ocean Navigation** (I or II, 3) Theory and practice of celestial navigation. Solution of the navigational spherical triangle. Compass calibration by celestial observation. Great circle sailing. The day's work of the professional ocean navigator. (Lec. 3) *Pre:* 380. Staff

**390 Vessel Operations** (I, 3) Vessel operations in commercial applications including commercial fishing, dive boat, and recreational fishing. Preparation for U.S. Coast Guard license examination. (Lec. 2, Lab. 3) *Pre:* 290 or permission of instructor. Wing

**433 Research Diving Methods** (I, 3) Underwater methods used to assess biological, physical, chemical, and geological characteristics of estuarine and coastal environments are presented and used to investigate seasonal changes in these parameters in the Narragansett Bay environment. (Lec. 2, Lab. 3) *Pre:* scuba certification and permission of instructor. DeAlteris and Castro

**481 Applied Problems in Marine Resource Development I** (I, 3) The application of field, laboratory, and analysis methods to the investigation of ecological problems in the estuarine, coastal, and marine environments. The emphasis is on the development of techniques used to study and interpret biological, chemical, geological, and physical processes. (Lec. 2, Lab. 3) *Pre:* 200, STA 308, or permission of instructor. DeAlteris or Castro

**482 Applied Problems in Marine Resource Development II** (II, 3) The application of field, laboratory, and analysis methods to the investigation of ecological problems in the estuarine, coastal, and marine environments. The emphasis is on the integration of the methods into multidisciplinary investigations of specific problems in selected habitats of Narragansett Bay



and Rhode Island Sound. (Lec. 1, Lab. 5) Pre: 481. DeAlteris or Castro

**491, 492 Special Problems and Independent Study (I and II, 1–3 each)** Special work to meet individual needs of students in marine resource development. (*Independent Study*) DeAlteris, Recksiek, or Wing

## Marketing (MKT)

*Chairperson:* Professor Della Bitta

**301 Marketing Principles (I and II, 3)** An introduction to marketing from a managerial viewpoint. Examines social, economic, technological, legal, ethical, and other environmental factors and their impact on product, price, promotion, and distribution decisions in a worldwide market. (Lec. 3) *Proficiency test available if course was taken at a non-AACSB program prior to transfer to the University.* Staff

**311 Consumer Behavior (I and II, 3)** A review of the consumer decision-making process and factors that influence consumers, including ethical issues. Implications for cross-cultural marketing are examined. (Lec. 3) Pre: 301. Staff

**321 Social Issues in Marketing (II, 3)** Functioning of the market in an affluent society. Effect of marketing decisions by firms placed in the perspective of the collective interest of all participants in society. (Lec. 3) Pre: 301 or permission of instructor. Staff

**331 Fundamentals of Advertising (II, 3)** Condensed but comprehensive introduction to advertising. Basic for advanced study of specific phases of advertising. (Lec. 3) Pre: 301 or permission of instructor. Staff

**341 Professional Selling (I, 3)** Fundamentals of the selling process with emphasis on sales theory, selling techniques, ethics of selling, and the salesperson's role in the marketing process. (Lec. 3) Pre: 301 or permission of instructor. Staff

**405 Marketing Communications (I, 3)** The "communications mix" is explored in terms of a total promotional program. Characteristics of advertising media, sales promotion, public relations, and publicity are surveyed. (Lec. 3) Pre: 301 or permission of instructor. Not for M.B.A. graduate credit. Staff

**406 Product Management (I, 3)** Development of product policies and strategies in a competitive environment. Emphasis on organization of the product management function, planning and developing new products, adjusting product strategies, and deleting products. (Lec. 3)

Pre: 301 or permission of instructor. Not for M.B.A. graduate credit. Staff

**407 Channels of Distribution (II, 3)** Functions of distribution channels in society with emphasis on forces which shape their configuration and efficiency. Study of channel management with focus on channel development, control, policy, and practice. (Lec. 3) Pre: 301 or permission of instructor. Not for M.B.A. graduate credit. Staff

**408 Pricing Decisions (II, 3)** Analysis of pricing problems and environmental factors influencing pricing decisions. Emphasis on behavioral dimensions of demand and the effects of cost, competition, product characteristics, and the firm's objectives. (Lec. 3) Pre: 301 or permission of instructor. Not for M.B.A. graduate credit. Staff

**409 Marketing Policy and Problems (II, 3)** Summary course, with emphasis on decision making in all marketing areas and on use of the case method. (Seminar) Pre: 311, 415, and senior standing. Not for graduate credit. Staff

**415 Marketing Research (I and II, 3)** Describes the nature and scope of marketing research activities. Reviews research designs, sampling, measurement, analysis, and other issues with focus on providing marketing information to management. (Lec. 3) Pre: BAC 202 or equivalent, MKT 301. Not for M.B.A. graduate credit. Staff

**434 Advertising Strategy and Management (II, 3)** Analysis and development of advertising strategies and campaigns. Uses skills from advertising, consumer behavior, marketing research, and other marketing courses. (Lec. 3) Pre: 331, 415, or permission of instructor. Not for M.B.A. graduate credit. Staff

**442 Sales Management (II, 3)** Planning, organization, and control of sales operations. Emphasis on the sales manager's functions, problems, and responsibilities. (Lec. 3) Pre: 301, 341, or permission of instructor. Not for M.B.A. graduate credit. Staff

**445 Direct Marketing (I and II, 3)** An introduction to direct marketing strategy and techniques. Topics include databases, electronic media, direct mail, catalogs, direct response advertising, telemarketing, and the role of direct marketing in the marketing mix. (Lec. 3) Pre: 301. Not for M.B.A. graduate credit. Staff

**451 International Marketing (I and II, 3)** Planning and organizing for international marketing operations from a commercial point of view. Differences in market arrangements; legal, cultural, and economic factors in various countries.

Strategy of product pricing promotion, channels. (Lec. 3) Pre: 301. Not for M.B.A. graduate credit. Staff

**491, 492 Directed Study (I and II, 1–3 each)** Independent study supervised by department faculty. Seminar meetings concerned with specific marketing topics. (*Independent Study*) Pre: permission of chairperson. Not for graduate credit. Staff

**493 Internship in Marketing (I or II, 3)** Approved, supervised work experience with participation in management and problem solving related to marketing. Fifteen working days (or 120 hours). (Practicum) Pre: junior standing and proposal approved by the College of Business Administration. May be repeated for credit. Not for graduate credit in marketing. S/U only. Staff

**601 Managerial Marketing (I, 4)** Analysis of marketing problems and determination of marketing policies in product development, promotion, pricing, channel selection; legal aspects. (Lec. 4) Pre: ECN 590, BAC 520 and 530, or equivalent, or permission of instructor. Staff

**611 Buyer Behavior (I or II, 3)** Analysis of major factors influencing the behavior and demand of consumers. Emphasis on using these factors to identify and segment target markets and to assess the effects of these factors on markets. (Lec. 3) Pre: 601 or permission of instructor. Staff

**615 Marketing Research (I or II, 3)** Marketing information needs and appropriate means of providing the requisite information are analyzed. Several major marketing decision areas and their research implications are examined in depth. (Lec. 3) Pre: 601, BAC 520 and 530, ECN 590, or permission of instructor. Staff

**631 Advertising Management (I or II, 3)** A course oriented toward managers responsible for planning, appraising, and administering advertising and promotion activities. (Lec. 3) Pre: 601 or permission of instructor. Staff

**651 International Marketing Management (I and II, 3)** Marketing policy making for the multinational firm; organizing for international marketing; its opportunities, pricing, channels, promotion, and research. (Lec. 3) Pre: 601 or permission of instructor. Staff

**661 Product Management (I or II, 3)** Development of product policies and strategies. Emphasis on organizing the marketing function to deal with various product-related activities including new product development, life cycle strategies, and product deletion. (Lec. 3) Pre: 601 or permission of instructor. Staff

**691, 692 Directed Study in Marketing** (I and II, 1–3 each) Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) Pre: permission of instructor. Staff

**693 Internship in Marketing** (I and II, 3) Participation in management and/or problem solving under the supervision and guidance of a sponsoring agency with evaluation by the College of Business Administration. (*Practicum*) Pre: proposal approved by the College of Business Administration, no previous internship credit, and graduate standing. S/U credit. Staff

**695, 696 Seminar in Marketing** (I and II, 3 each) Preparation and presentation of papers on selected topics in marketing. (*Seminar*) Pre: 601 or permission of instructor. Staff

**697 Doctoral Research Seminar** (I and II, 3) Provides a rigorous analysis of current research questions and research techniques used to address those questions in the academic discipline. Recent developments and current issues addressed. (*Seminar*) Pre: enrollment in Phase II of the Ph.D. program in business administration. Staff

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) Pre: enrollment in Phase III of the Ph.D. program in business administration. S/U credit.

## Mathematics (MTH)

Chairperson: Professor Finizio

**010 Basic Math** (I and II, 3) Real numbers; operation with fractions and decimals. Proportions and related problems. Basic algebra: solving first-degree equations and systems of equations. Applications. (Lec. 3) S/U only. Credits may not be used toward the minimum credits required for graduation or for General Education. Staff

**099 Basic Algebra and Trigonometry** (I and II, 3) Review of basic algebra and trigonometry: operations of real numbers and algebraic expressions, negative and fractional exponents, polynomials and fractional expressions, equations and systems of equations, inequalities, right triangle trigonometry and applications. (Lec. 3) For students not sufficiently prepared to take other mathematics courses. Credits may not be used toward the minimum credits required for graduation or for General Education. S/U only. Staff

**107 Introduction to Finite Mathematics** (I and II, 3) Concepts and processes of modern mathematics concerned with sets, the theory of probability, and statistics. Role of these concepts in today's social and physical sciences. (Lec. 3) Pre: passing a placement test. Not open to mathematics majors. Staff (M)

**108 Topics in Mathematics** (I and II, 3) Introduces the nonmathematics student to the spirit of mathematics and its applications. Presupposes no mathematical background beyond University admission requirements. Emphasis is on development of reasoning ability as well as manipulative techniques. (Lec. 3) Pre: passing a placement test. Not open to mathematics majors. Staff (M)

**111 Precalculus** (I and II, 3) Equations of first and second degree, systems of equations. Inequalities. Functions and graphs. Exponential, logarithmic, and trigonometric functions. Applications. Introduction to analytic geometry. Complex numbers. Designed for students who need to strengthen their background in mathematics below calculus. (Lec. 3) Pre: passing a placement test. Not for credit for mathematics majors. Staff (M)

**131 Applied Calculus I** (I and II, 3) Basic topics in calculus for students who do not need all the topics in 141. Limits, derivatives, and integrals of algebraic, logarithmic, and exponential functions. Applications including graphing, maxima and minima problems, etc. (Lec. 3) Pre: passing a placement test. Not for major credit in mathematics. Not open to students with credit or concurrent enrollment in 141. Staff (M)

**132 Applied Calculus II** (I, II, and SS, 3) Continuation of 131. Topics related to trigonometric functions, integration by parts and partial fractions, partial derivatives, infinite series. Applications to problems such as optimization, probability theory, simple differential equations. (Lec. 3) Pre: 131 or 141 or permission of chairperson. Not for major credit in mathematics. Not open to students with credit or concurrent enrollment in 142. Staff (M)

**141 Introductory Calculus with Analytic Geometry** (I and II, 4) Topics in analytic geometry, functions and their graphs, limits, the derivative, applications to finding rates of change and extrema and to graphing, the integral, and applications. (Lec. 3, Rec. 1) Completion of four units of high school mathematics, including trigonometry, recommended. Pre: passing a placement test. Not open to students with credit or concurrent enrollment in 131. Staff (M)

**142 Intermediate Calculus with Analytic Geometry** (I and II, 4) Continues the study of calculus for the elementary algebraic and transcendental functions of one variable. Topics include the technique of integration, improper integrals, indeterminate forms, and calculus using polar coordinates. (Lec. 3, Rec. 1) Pre: 141 or permission of chairperson. Not open to students with credit or concurrent enrollment in 132. Staff (M)

**208 Mathematics for Elementary School Teachers** (I or II, 3) Selected topics in mathematics central to the elementary school curriculum, including: problem solving; number systems; functions and relations; probability and statistics; geometry. (Lec. 3) Pre: admission to elementary education program and prior completion of General Education mathematics requirement. Not open to mathematics majors or mathematics education majors. Long

**215 Introduction to Linear Algebra** (I and II, 3) Detailed study of finite dimensional vector spaces, linear transformations, matrices, determinants and systems of linear equations. (Lec. 3) Pre: 131, 141, or equivalent. Staff

**243 Calculus for Functions of Several Variables** (I and II, 3) Topics include coordinates for space, vector geometry, partial derivatives, directional derivatives, extrema, Lagrange multipliers, and multiple integrals. (Lec. 3) Pre: 142. Staff

**244 Differential Equations** (I and II, 3) Classification and solution of differential equations involving one independent variable. Applications to the physical sciences. Basic for further study in applied mathematics and for advanced work in physics and engineering. (Lec. 3) Pre: 243. Staff

**307 Introduction to Mathematical Rigor** (I, 3) Introduction to the language of rigorous mathematics: logic, set theory, functions and relations, cardinality, induction, methods of proof. Emphasis on precise written and oral presentation of mathematical arguments. (Lec. 3) Pre: 141. Staff

**316 Algebra** (II, 3) Theory and structure of groups. Topics from ring theory, principal ideal domains, unique factorization domains, polynomial rings, field extensions, and Galois theory. (Lec. 3) Pre: 215 and 307 or concurrent registration in 307. Staff

**322 Concepts of Geometry** (I, 3) Survey of geometrical systems including non-Euclidean, affine, and projective spaces and finite geometries. A modern view of Euclidean geometry

using both synthetic and analytic methods. (Lec. 3) Pre: 215 or permission of instructor. Staff

**362 Advanced Engineering Mathematics I** (II, 3) Algebra of complex numbers, matrices, determinants, quadratic forms. Linear differential equations with constant coefficients. Partial differential equations. (Lec. 3) Pre: 243. Not for major credit in mathematics. Staff

**363 Advanced Engineering Mathematics II** (I, 3) Laplace and Fourier transforms. Analytic functions. Cauchy's theorem and integral formula. Power series in the complex domain. Laplace and Fourier inverse integrals. Introduction to probability. (Lec. 3) Pre: 362 or equivalent. Not for major credit in mathematics. Staff

**381 History of Mathematics** (I, 3) General survey course in development and philosophy of mathematics. Provides a cultural background and foundation for advanced study in various branches of the subject. (Lec. 3) Pre: 142 or equivalent. Staff

**382 Number Theory** (II, 3) Some of the arithmetic properties of the integers including number theoretic functions, congruences, diophantine equations, quadratic residues, and classically important problems. (Lec. 3) Pre: 141 or permission of instructor. Staff

**391 Special Problems** (I and II, 1–3) Advanced work under the supervision of a member of the staff and arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of chairperson. Staff

**393 Undergraduate Seminar** (I or II, 1) Preparation and presentation of selected topics in oral and written form. (Seminar) Pre: permission of chairperson. Staff

**418 Matrix Analysis** (I, 3) Canonical forms, functions of matrices, characteristic roots, applications to problems in physics and engineering. (Lec. 3) Pre: 215 or 362 or permission of instructor. Staff

**420 Topics in Foundations** (I, 3) Especially designed for teachers of mathematics. Basic topics of mathematics from an advanced viewpoint, selected from sets, logic, mathematical structures, number theory, geometry. Coordinated with EDC 520 for students taking both concurrently. (Lec. 3) Pre: 142 or permission of instructor. Not for major or minor credit in mathematics. Staff

**425 Topology** (I, 3) Abstract topological spaces and continuous functions. Generalizations of some classical theorems of analysis. (Lec. 3) Pre: 307 or concurrent registration in 307. Staff

**435 Introduction to Mathematical Analysis I** (I, 3) Sets and functions, real topology, continuity and uniform continuity, derivatives, the Riemann integral, improper integrals. Detailed proofs emphasized. (Lec. 3) Pre: 307. Staff

**436 Introduction to Mathematical Analysis II** (II, 3) Sequences and series of functions, implicit and inverse function theorems, topology of Euclidean space, transformation of multiple integrals. Detailed proofs emphasized. (Lec. 3) Pre: 435. Staff

**437, 438 Advanced Calculus and Application I, II** (I and II, 3 each) Sequences, limits, continuity, differentiability, Riemann integrals, functions of several variables, multiple integrals, space curves, line integrals, surface integrals, Green's theorem, Stokes' theorem, series, improper integrals, uniform convergence, Fourier series, Laplace transforms. Applications to physics and engineering emphasized. (Lec. 3) Pre: 243 for 437, 437 for 438. Staff

**441 Introduction to Partial Differential Equations** (I, 3) One-dimensional wave equation. Linear second order partial differential equations in two variables. Separation of variables and Fourier series. Nonhomogeneous boundary value problems. Green's functions. (Lec. 3) Pre: 244 or 442. Staff

**442 Introduction to Difference Equations** (I or II, 3) Introduction to linear and nonlinear difference equations; basic theory, z-transforms, stability analysis, and applications. (Lec. 3) Pre: 243. Staff

**444 Ordinary Differential Equations** (II, 3) Introduction to fundamental theory of ordinary and functional-differential equations. Series and numerical methods. Topics from stability, periodic solutions, or boundary-value problems. Applications to physics, engineering, biology. (Lec. 3) Pre: 244 or 362 or 442. Staff

**447 (or CSC 447) Discrete Mathematical Structures** (I or II, 3) Concepts and techniques in discrete mathematics. Finite and infinite sets, graphs, techniques of counting, Boolean algebra and applied logic, recursion equations. (Lec. 3) Pre: junior standing or better in physical or mathematical sciences, or in engineering, or permission of instructor. Staff

**451 Introduction to Probability and Statistics** (I and II, 3) Theoretical basis and fundamental tools of probability and statistics. Probability spaces, properties of probability, distributions, expectations, some common distributions and elementary limit theorems. (Lec. 3) Pre: 243 or equivalent. Staff

**452 Mathematical Statistics** (II, 3) Continuation of 451 in the direction of statistics. Basic principles of statistical testing and estimation, linear regression and correlation. (Lec. 3) Pre: 451. Staff

**456 Introduction to Random Processes** (II, 3) Conditional probability and expectation. Mean and covariance functions. Calculus of random processes. Introduction to Gaussian processes, Poisson processes, stationary processes, and Markov chains with applications. (Lec. 3) Pre: 451 or equivalent. Staff

**461 Methods of Applied Mathematics** (I, 3) Topics selected from vector analysis, elementary complex analysis, Fourier series, Laplace transforms, special functions, elementary partial differential equations. Emphasis on development of techniques rather than mathematical theory. (Lec. 3) Pre: 244 or 362 or 442. Staff

**462 Functions of a Complex Variable** (II, 3) First course in the theory of functions of a single complex variable, including analytic functions, power series, residues and poles, complex integration, conformal mapping and applications. (Lec. 3) Pre: 243 or equivalent. Staff

**464 Advanced Engineering Mathematics III** (II, 3) Topics from Fourier series and integrals. Partial differential equations and boundary value problems. Bessel functions and Legendre polynomials. Conformal mappings. (Lec. 3) Pre: 362 and 363 or permission of instructor. Not for graduate credit in mathematics. Staff

**471 Introduction to Numerical Analysis I** (I, 3) Interpolation, solution of nonlinear equations, numerical evaluation of integrals, special topics. (Lec. 3) Pre: 243, CSC 201 or equivalent, or permission of instructor. Staff

**472 Introduction to Numerical Analysis II** (II, 3) Numerical solution of ordinary differential equations, systems of linear equations, least squares, approximation, special topics. (Lec. 3) Pre: 243, CSC 201 or equivalent, or permission of instructor. Staff

**492 Special Problems** (I and II, 1–3) Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of chairperson. Staff

**513 Linear Algebra** (I, 3) Linear spaces and transformations, linear functionals, adjoints, projections, diagonalization, Jordan form of matrices, inner products; positive, normal, self-adjoint, and unitary operators; spectral theorem, bilinear and quadratic forms. (Lec. 3) Staff

**515, 516 Algebra I, II** (I and II, 3 each) Groups, rings, modules, commutative algebra. (Lec. 3) Pre: 316. In alternate years. Next offered 1998–99. Staff

**525 Topology** (II, 3) Topological spaces, separation properties, connectedness, compactness, uniformities. Function spaces, spaces of continuous functions, and complete spaces. (Lec. 3) Pre: 425 or equivalent. In alternate years. Next offered spring 1999. Staff

**535, 536 Measure Theory and Integration** (I and II, 3 each) Elements of topology and linear analysis. Lebesgue measure and integration in  $\mathbb{R}$ , in  $\mathbb{R}^n$ , and in abstract spaces. Convergence theorems. Bounded variation, absolute continuity, and differentiation. Lebesgue-Stieltjes integral. Fubini and Tonelli theorems. The classical Banach spaces. (Lec. 3) Pre: 435. Staff

**545, 546 Ordinary Differential Equations I, II** (I and II, 3 each) Existence and uniqueness theorems. Continuous dependence on parameters and initial conditions. Singularities of the first and second kinds, self-adjoint eigenvalue problems on a finite interval. Oscillation and comparison theorems. Introduction to delay and difference equations. Elements of stability theory of Lyapunov's second method. (Lec. 3) Pre: 435. In alternate years. Next offered 1999–00. Staff

**547 (or CSC 547) Combinatorics and Graph Theory** (I, 3) Enumeration: generating functions, recurrence relations, classical counting numbers, inclusion-exclusion, combinatorial designs. Graphs and their applications: Euler tours, Hamilton cycles, matchings and coverings in bipartite graphs, the four-color problem. (Lec. 3) Pre: 215 or equivalent. In alternate years. Next offered fall 1998. Staff

**548 (or CSC 548) Topics in Combinatorics** (I, 3) Topics such as Ramsey theory, Polya theory, network flows and the max-flow-min-cut variations, applications in operations research; finite fields and algebraic methods; block designs, coding theory, other topics. (Lec. 3) Pre: 547 or permission of instructor. In alternate years. Next offered fall 1999. Staff

**550 Probability and Stochastic Processes** (I, 3) Review of probability theory. Generating functions, renewal theory, Markov chains and processes, Brownian motions, stationary processes. (Lec. 3) Pre: 437 or 435 and 451, or permission of instructor. In alternate years. Next offered fall 1998. Staff

**551 Mathematical Statistics** (II, 3) Theory of estimation and hypothesis testing. Large sample methods. Regression and analysis of variance.

(Lec. 3) Pre: 437 or 435 and 451, or permission of instructor. In alternate years. Next offered spring 1999. Staff

**561 Advanced Applied Mathematics** (II, 3) Linear spaces, theory of operators. Green's functions, eigenvalue problems of ordinary differential equations. Application to partial differential equations. (Lec. 3) Staff

**562 Complex Function Theory** (I, 3) Rigorous development of theory of functions. Topology of plane, complex integration, singularities, conformal mapping. (Lec. 3) Pre: 435 and 436 or 437 and 438 and permission of instructor. In alternate years. Next offered fall 1999. Staff

**572 Numerical Analysis** (II, 3) Further numerical methods of solution of simultaneous equations, partial differential equations, integral equations. Error analysis. (Lec. 3) Staff

**575 Approximation Theory and Applications to Signal Processing**  
See Electrical Engineering 575.

**591, 592 Special Problems** (I and II, 1–3 each) Advanced work under the supervision of a member of the department arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of chairperson. Staff

**599 Master's Thesis Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**629, 630 Functional Analysis I, II** (I and II, 3 each) Banach and Hilbert spaces, basic theory. Bounded linear operators, spectral theory. Applications to analysis. Application to a special topic such as differential operators, semigroups and abstract differential equations, theory of distributions, or ergodic theory. (Lec. 3) Pre: 536 or permission of instructor. Staff

**641 Partial Differential Equations I** (I, 3) First order systems. The Cauchy-Kowalewsky theorem. The Cauchy problem. Classification of partial differential equations. Hyperbolic equations. Mainly the theory of the subject. Students interested in techniques for the solution of standard equations should take 441. (Lec. 3) Pre: 215, 435, and 462. In alternate years. Next offered fall 1998. Staff

**642 Partial Differential Equations II** (II, 3) Elements of potential theory. Elliptic equations. Green's function. Parabolic equations. Introduction to the theory of distributions. (Lec. 3) Pre: 641. In alternate years. Next offered spring 1999. Staff

**691, 692 Special Topics I, II** (I and II, 3 each) Advanced topics of current research in mathematics will be presented with a view to expose the students to the frontiers of the subject. (Independent Study) Pre: permission of chairperson. Staff

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**930 Workshop in Mathematics Topics for Teachers** (I and II, 0–3) Especially designed for teachers of mathematics. Basic topics of mathematics from an advanced or pedagogical perspective. (Workshop) Pre: teacher certification. Not for degree credit. Staff

## Mechanical Engineering and Applied Mechanics (MCE)

Chairperson: Professor Sadd

**201 Graphics for Mechanical Engineering** (I, 3) Introduction to the principles of graphic representation in mechanical design, with emphasis on computer-aided drafting. Orthographic projection. Isometric and auxiliary views. Sections. Dimensioning. (Lec. 2, Lab. 3) Staff

**262 Statics** (I and II, 3) Newton's laws of force systems in equilibrium and their effects on particles, systems of particles, and rigid bodies. Both scalar and vector methods of analysis are developed. (Lec. 3) Pre: EGR 105 and MTH 141. Staff

**263 Dynamics** (I and II, 3) Kinematic and kinetic study of motion of particles, systems of particles, and rigid bodies, acted upon by unbalanced force systems, using both scalar and vector methods; development of methods of analysis based on the direct application of Newton's laws, work-energy and impulse-momentum principles. (Lec. 3) Pre: 262. Staff

**301 Application of Mechanics in Design** (I, 3) Concepts of engineering design, material selections, two- and three-dimensional stress analysis, failure theories, reliability concepts, fracture and fatigue, finite-element applications, and case studies. (Lec. 3) Pre: CVE 220 and concurrent registration in CHE 333. Ghonem, Sadd, Shukla, and Taggart

**302 Design of Machinery** (II, 3) Analysis of mechanisms including linkages, gear trains, and cam-follower systems. Graphical and analytical synthesis techniques, computer-aided linkage design, and detailed design of linkages includ-

ing bearing and material selection and sizing. (Lec. 3) Pre: 263 and 301. Datseris and Jouaneh

**313 Introduction to Mechanical Engineering Experimentation (I, 2)** Introduction to experimental practice. Report writing, statistical and other measures of data uncertainty, propagation of uncertainty, curve fitting. Basic instrumentation for measuring pressure, temperature, velocity, and stress. Computer-assisted data acquisition. (Lec. 1, Lab. 3) Pre: EGR 106 and PHY 205. Lessmann and Staff

**314 Experimental Problems in Solid Mechanics (II, 2)** Experimental methods related to the mechanical behavior of solids. Topics to include strain gauge principles, dynamic response of instruments, transducer design, and material characterization experiments. Additional experiments to incorporate topics such as microstructural characterization, creep response, fracture mechanics, and optical methods. (Lec. 1, Lab. 3) Pre: CVE 220 and MCE 313. Ghonem and Shukla

**341 Fundamentals of Thermodynamics (I and II, 3)** Basic principles and laws of thermodynamics and their relation to pure substances, ideal gases, and real gases. Use of thermodynamic property tables. Development of concepts of reversibility and availability. First and Second Law application to engineering systems; power and refrigeration cycles. (Lec. 3) Pre: 263, MTH 243, and credit or concurrent enrollment in PHY 205. Ibrahim, Pence, and Zhang

**354 Fluid Mechanics (I and II, 3)** Physical properties of fluids, development of continuity, energy, and momentum concepts using vector methods; application to problems involving viscous and nonviscous fluids including boundary layer flows, flows in closed conduits and around immersed bodies. (Lec. 3) Pre: 263, EGR 106, and MTH 244 or 461. Faghri, Lessmann, and Pence

**366 System Dynamics (II, 3)** Systems analysis emphasizing control and vibration. Time and frequency domain techniques. Modeling of typical mechanical, hydraulic, pneumatic, and thermal systems. Transfer functions and block diagram methods. Elementary control laws. (Lec. 3) Pre: 372. Palm and Jouaneh

**372 Engineering Analysis I (I, 3)** Application of advanced mathematical methods and computer software to solution of mechanical engineering problems with emphasis on the techniques of engineering analysis. (Lec. 3) Pre: EGR 106, MTH 244, and junior standing. Faghri, Taggart, and Staff

**401 Mechanical System Design (I, 3)** Comprehensive design of mechanical systems ranging from consumer products to production machinery, addressing issues such as economic feasibility, and reliability. Utilization of CAD software, design problem formulation, and structure of the open-ended solution process. (Lec. 1, Lab. 4) Pre: 301, 302. Jouaneh and Staff

**402 Thermal Systems Design (II, 3)** Comprehensive projects using applied thermodynamics, including psychometrics, combustion, and chemical and phase equilibrium. Economic and environmental evaluation, simulation, and optimization of components such as heat exchangers, piping systems, and prime movers. (Lec. 3) Pre: 448. Ibrahim and Zhang

**415 Experimentation in Fluid Mechanics and Thermal Science (II, 2)** This experimental course aims to build on foundations given in 313 and to provide opportunities to apply experimental tools to a wide range of topics in fluid mechanics, heat transfer, and thermodynamics. (Lec. 1, Lab. 3) Pre: 313 and concurrent registration in 448. Ibrahim, Pence, and Zhang

**426 Advanced Mechanics of Materials (I, 3)** Introduction to continuum mechanics: stress, strain and deformation, constitutive equations. Theories of failure. Shear center and unsymmetrical bending of beam. Curved beams. Energy method. Torsion. (Lec. 3) Pre: CVE 301. Ghonem, Shukla, and Kim

**431 Computer Control of Mechanical Systems (I, 3)** Use of computers to control mechanical systems. Advanced control algorithms. Computer-aided design methods. Digital control algorithms and software implementation. Interfacing and digital controller hardware. (Lec. 3) Pre: 366. Palm

**434 Heating, Ventilation, and Air Conditioning (II, 3)** Application of the principles of thermodynamics and heat transfer to environmental problems. Topics will include thermal control of living spaces, solar heating and cooling, heat pumps, minimum energy consumption. (Lec. 3) Pre: 354 and 448. Zhang

**437 Turbomachinery Design (I, 3)** Application of the principles of thermodynamics and fluid mechanics to the design of rotating machinery such as turbines, compressors, centrifugal and axial flow pumps. (Lec. 3) Pre: 341 and 354. Lessmann

**438 Internal Combustion Engines (I, 3)** Principles, design, and operation of internal combustion engines, including cycles, combustion, fuels, detonation, carburetion, cooling, supercharging, ignition, friction, and lubrication. Gasoline and diesel, two- and four-stroke cycles, and performance of various engines including the Wankel rotary. (Lec. 3) Pre: 341. Ibrahim

**439 Applied Energy Conversion (II, 3)** Modern power systems including steam and gas turbines, nuclear power stations, fuel cells, and thermionic and thermoelectric devices. (Lec. 3) Pre: 448 or permission of instructor. Staff

**440 Mechanics of Composite Materials (II, 3)** Introduction to the basic concepts of the mechanical behavior of composite materials. Analysis and performance of fiber-reinforced composites. Special design considerations and experimental characterization of composites. (Lec. 3) Pre: 314 and CVE 220, or permission of instructor. Shukla and Taggart

**446 Metal Deformation Processes**  
See Industrial and Manufacturing Engineering 446.

**448 Heat and Mass Transfer (I, 3)** Transfer of heat by conduction, convection, and radiation in steady and unsteady states. Theory and application of dimensional analysis; heat and mass transfer in equipment such as heat exchangers and steam condensers. (Lec. 3) Pre: 341 and 372. Not for graduate credit. Staff

**449 Product Design for Manufacture**  
See Industrial and Manufacturing Engineering 449.

**455 Advanced Fluid Mechanics (I, 3)** Continuation of 354. Selected topics in advanced fluid mechanics including potential flows, compressible flow, fluid machinery, and electric and magnetic field effects. (Lec. 3) Pre: 354. Lessmann and Staff

**464 Vibrations (II, 3)** Elementary theory of mechanical vibrations, including the one-degree-of-freedom system, multimass systems, vibration isolation, torsional vibration, beam vibration, critical speeds, and vibration instruments. (Lec. 3) Pre: 366 or permission of instructor. Staff

**465 Experimental Mechanics (I, 3)** Theory and application of various experimental techniques used in solid mechanics such as acoustic emission, holography, interferometry, strain gauges, brittle coatings, and photoelasticity. (Lec. 2, Lab. 3) Pre: 314 and CVE 220. Shukla

**466 Introduction to Finite Element Method** (II, 3) Application of the finite element method to problems in mechanical engineering including plane elasticity, heat transfer, and fluid mechanics. Basic concepts, matrix formulation, interpolation functions, basic element types, and implementation to problem solution. (Lec. 3) Pre: 301 and 372. Taggart and Sadd

**491, 492 Special Problems** (I and II, 1–6 each) Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) Pre: permission of chairperson. May be repeated for a maximum of 12 credits. Not for graduate credit. Staff

**501, 502 Graduate Seminar** (I and II, 1 each) Discussions, presentation of papers based on research, or detailed literature surveys. Attendance is required of all students in graduate residence. (*Seminar*) S/U credit. Staff

**503 Linear Control Systems**  
See Electrical Engineering 503.

**504 Optimal Control Theory**  
See Electrical Engineering 504.

**506 Expert Systems for Mechanical Design and Manufacturing** (I, 3) Expert systems structure; knowledge bases, inference engines, and artificial intelligence languages. Applications to mechanical design and manufacturing problems. Graph theory and expert systems for mechanism design; features for design and manufacturing. (Lec. 3) Pre: 401 or equivalent. Datseris

**523 Advanced Kinematics I** (II, 3) Analytical kinematic and dynamic analysis of planar mechanisms, graph theory, topological synthesis, topological analysis, Burmester theory, mechanism design software. (Lec. 3) Pre: 302 or equivalent. Datseris

**530 Real-Time Monitoring and Control** (I or II, 3) Fundamentals of the development of real-time software for monitoring and control. Synchronous programming, timing, interrupt programming, operator's console control, and scheduling. Laboratory exercises. (Lec. 3) Pre: graduate standing or permission of instructor. Jouaneh

**532 Precision Machine Design** (I or II, 3) Fundamentals of design and the integration of precision mechanical components and machines. Quasi-static and dynamic errors, sensors, contact and noncontact bearings, power generation devices, and system integration. (Lec. 3) Pre: 401 or graduate standing. Datseris or Jouaneh

**541 Advanced Thermodynamics I** (I or II, 3) Advanced study of classical thermodynamics with emphasis on basic concepts, laws, and thermodynamic relationships. Selected topics of current interest including areas of irreversible thermodynamics, statistical mechanics, and the thermodynamics of solids. (Lec. 3) Pre: 341 or permission of instructor. Ibrahim and Zhang

**545 Heat Transfer** (I, 3) Conduction in two and three dimensions and conducting systems with radiation and fluid motion. Solutions obtained by mathematics, computer-numerical methods, and analog devices. (Lec. 3) Pre: 448. Faghri and Zhang

**546 Convection Heat Transfer** (II, 3) Relationship between heat transfer and fluid flow with emphasis on the solution of governing equations by exact methods, integral methods, and similarity techniques. (Lec. 3) Pre: 448. Faghri and Zhang

**549 Advanced Product Design for Manufacture**  
See Industrial and Manufacturing Engineering 549.

**550 Theory of Continuous Media** (I, 3) Basic course for first-year graduate students which develops and unifies the laws of mechanics as applied to the behavior of continua. Application to solids and fluids. (Lec. 3) Pre: CVE 220, MCE 354, 372, or permission of instructor. Sadd

**551 Fluid Mechanics I** (I, 3) Basic treatment of real fluid flows using the continuum mechanics approach. Exact solutions of the governing equations. Laminar shear flows and boundary layer theory, turbulent transition. (Lec. 3) Pre: 354 or equivalent. Lessmann and Staff

**561 Computational Methods in Solid Mechanics** (I or II, 3) Finite and boundary element methods based on variational and weighted residual concepts; practical implementation to field problems in elasticity, plasticity, and heat conduction. (Lec. 3) Pre: 372 and one graduate course in elasticity or heat conduction. Sadd and Taggart

**562 Computational Methods in Fluid Flow and Heat Transfer** (I or II, 3) Computational techniques and applications for practical problems concerning multidimensional fluid flow, heat and mass transfer, and chemical reactions. (Lec. 3) Pre: undergraduate work in fluid mechanics and heat transfer or permission of instructor. Faghri

**563 Advanced Dynamics** (I and II, 3) Dynamics of a system of particles, Lagrange's equations

from an advanced point of view. Variational methods, nonconservative and nonholonomic systems; matrix-tensor specifications of rigid body motions, normal coordinates. Hamilton's equation of motion, canonical transformation, Hamilton-Jacobi theory. (Lec. 3) Pre: 366 and 372 or equivalent. Datseris

**564 Advanced Vibrations** (I, 3) Theory of vibration of systems with concentrated masses and stiffness; systems with one degree of freedom, vibration isolation systems with many degrees of freedom, matrix methods, dynamic vibration absorbers, torsional vibration, approximate numerical methods. Experimental methods and design procedures. (Lec. 3) Pre: 464. Palm

**565 Wave Motion and Vibration of Continuous Media** (II, 3) Wave motion and vibrations of strings, rods, beams, plates, and membranes; dynamic elasticity theory; Rayleigh surface waves; solutions using separation of variables and integral transforms. (Lec. 3) Pre: 372, 464, or equivalent. Sadd and Shukla

**566 The Mechanics of Robot Manipulators** (I or II, 3) Detailed analysis of the kinematics, dynamics, and control of industrial-type robot manipulator systems. (Lec. 3) Pre: 302, 366, or permission of instructor. Palm and Jouaneh

**568 Theory of Plates**  
See Civil Engineering 568.

**571 Theory of Elasticity I** (I, 3) Development of the basic field equations; generalized Hooke's law; general concepts of stress and strain; plane problems; stress functions; Saint Venant torsion and flexure; introduction to three-dimensional problems. (Lec. 3) Pre: CVE 220 or equivalent. Ghonem, Sadd, Shukla, and Taggart

**576 Fracture Mechanics** (II, 3) Fundamentals of linear elastic fracture mechanics, stress analysis viewpoint, energy viewpoint, two-dimensional and three-dimensional problems, elastic-plastic considerations, and crack extension behaviors. (Lec. 3) Pre: 426 or permission of instructor. Ghonem and Shukla

**577, 578 Seminar in Sensors and Surface Technology** (I and II, 1) Students, faculty, and invited outside speakers present and discuss selected topics related to research interests of the Sensors and Surface Technology Partnership. (*Seminar*) Pre: permission of instructor. May be repeated. S/U credit. Staff

**599 Master's Thesis Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

**623 Advanced Kinematics II** (I, 3) Planar, curvature theory, spatial kinematics: homogeneous transformations, screw theory, quaternions, dual numbers, angles, and vectors, applications to robot and machine tool calibration. (Lec. 3) Pre: 523 or permission of instructor. Datseris

**646 (or CHE 646) Radiation Heat Transfer** (I or II, 3) Radiant exchange between surfaces. Radiative properties of surfaces. Exchange among nonideal surfaces. Gas-radiative exchange. Radiative exchange with volume emitters. Furnace design applications. (Lec. 3) Pre: 545 or CHE 644 or permission of instructor. Staff

**652 Experimental Methods in Fluid Mechanics** (II, 3) An overview of measurement techniques and instrumentation used in the current practice of experimental fluid mechanics. Course emphasizes hot wire, hot film, and laser anemometry. Provides practical laboratory experience. (Lec. 2, Lab. 3) Pre: 551 or permission of instructor. Lessmann

**653 Fluid Mechanics II** (II, 3) Continuation of 551, including turbulent modeling, turbulent shear flows and boundary layers, incompressible irrotational flows, and selected topics such as an introduction to non-Newtonian fluid behavior, geophysical flows, or numerical methods. (Lec. 3) Pre: 551. Lessmann and Staff

**654 Fluid Mechanics III** (I, 3) Two- and three-dimensional compressible flows, numerical methods for the solution of compressible and incompressible parabolic and elliptic problems. Other advanced topics of current interest. (Lec. 3) Pre: 551. Lessmann and Staff

**666 Nonlinear Mechanics** (I and II, 3) Dynamics of nonlinear systems, free and forced oscillations; graphical methods, integral curves, singular points, limit cycles and stability. Van der Pol equation, perturbation methods, approximate methods, application to ecological systems. (Lec. 3) Pre: 564. Staff

**668 (or CVE 668) Theory of Shells** (I or II, 3) Development of basic shell equations. Classical solution examples for membrane shells and shells of revolution with bending. Additional topics selected from variational methods, finite element techniques, reinforced and composite shells. (Lec. 3) Pre: 568 or permission of instructor. Sadd and Karamanlidis

**671 Theory of Elasticity II** (II, 3) Continuation of 571, including advanced topics selected from: complex variable methods; displacement potentials and stress functions for three-dimensional problems; thermoelasticity; variational, approximate, and numerical methods; anisotropic

solutions. (Lec. 3) Pre: 571. Sadd and Taggart

**678 Micromechanics** (II, 3) Mechanics of material behavior from the microstructural viewpoint; mathematical modeling of inclusions, inhomogeneities, dislocations, granular and porous structures; constitutive equation development. Applications to metals, composites, ceramics, and other materials with microstructure. (Lec. 3) Pre: 571, materials background of CHE 333 or higher. Ghonem and Taggart

**679 Theory of Plasticity** (II, 3) Formulation and solution of inelastic material behavior, physical phenomena of yielding plastic flow, plastic stress-strain laws, yield criteria, plane problems, torsion, slip lines, limit analysis, creep. (Lec. 3) Pre: 571 or permission of instructor. Ghonem and Taggart

**680 Advanced Topics in Solid Mechanics** (I or II, 3) Advanced studies in the mechanics of solids with specific topics determined by current department interests. Designed for students with at least one year of previous graduate studies. (Lec. 3) Pre: permission of instructor. May not be repeated. Staff

**691, 692 Special Problems** (I and II, 1–6 each) Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of chairperson. May be repeated for a maximum of 12 credits. Staff

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Medical Technology (MTC)

Director: Adjunct Associate Professor Paquette

**102 Introduction to Clinical Laboratory Science** (I, 1) An introduction to the health care and medical laboratory fields including specialty areas of medical laboratory science, professional organizations, credentialing, and the health care team approach. (Lec. 1) Paquette

*The clinical courses in medical technology (MTC 405–416) require senior standing and are open only to students who have been accepted into an affiliated Hospital School of Medical Technology.*

**405 Pathophysiology** (I, 2) An introduction to pathology. The correlation between pathological processes and clinical symptoms and the course of disease is studied. (Practicum) Hospital Staff

**406 Clinical Immunology** (II, 2) Formation, structure, and action of antigens and antibodies. Methods of immunization. The laboratory emphasizes serological procedures in the diagnosis of disease. (Practicum) Hospital Staff

**407 Clinical Microscopy** (I, 2) Lectures and laboratory practice in the analyses of body fluids. (Practicum) Hospital Staff

**409 Clinical Microbiology I** (I, 4) The relationship of bacteria and bacterial diseases of man, with emphasis on the application of procedures to medical diagnosis. Fungi, viruses, the rickettsias, and human parasites are also studied. (Practicum) Hospital Staff

**410 Clinical Microbiology II** (II, 4) Continuation of 409. (Practicum) Hospital Staff

**411 Clinical Chemistry I** (I, 4) The chemistry of body constituents and their relationship to diagnosis of human disease. Principles and methods of analysis are emphasized. (Practicum) Hospital Staff

**412 Clinical Chemistry II** (II, 4) Continuation of 411. (Practicum) Hospital Staff

**413 Immunohematology I** (I, 2) Instruction in drawing and processing blood and in ascertaining compatibility. Donor-recipient blood and tissue reactions are studied in detail. (Practicum) Hospital Staff

**414 Immunohematology II** (II, 2) Continuation of 413. (Practicum) Hospital Staff

**415 Hematology I** (I, 3) Morphology of the blood and blood-forming organs and the study of abnormalities associated with disease. The dynamics and diagnostic tests of hemostasis are also discussed. (Practicum) Hospital Staff

**416 Hematology II** (II, 3) Continuation of 415. (Practicum) Hospital Staff

**483 Introductory Diagnostic Microbiology** See Microbiology 483.

**501 (or MIC 501) Advanced Clinical Microbiology I** (I or II, 3) Current methodology employed in the processing of clinical microbiology specimens, isolation and identification of pathogenic microorganisms, and determination of antimicrobial susceptibility. (Lec. 3) Pre: 409 or MIC 432 or equivalent. Blazek-D'Arezzo, Heelan, and Mello

**502 Advanced Clinical Chemistry I** (I or II, 3) The pathophysiologic mechanisms as they correlate to clinical chemistry data. Topics include mechanisms of pathology and analytical techniques. (Lec. 3) Pre: 411 or equivalent. Camara and Sheff

**510 Clinical Laboratory Management** (I or II, 3) Supervisory management principles applicable to the clinical laboratory. Includes the processes of supervision, decision making, job performance and evaluation, communications, organizational behavior, and labor relations in the modern laboratory. (Lec. 3) *Pre: 400-level medical technology internship or equivalent.* Aucoin

**512 Special Problems in Clinical Laboratory Science** (I or II, 3) Assigned research on an advanced level. Students required to outline problem, conduct the necessary research or experimental work, and present observations and conclusions in a written and oral report. (Independent Study) *Pre: 400-level medical technology internship or equivalent.* Paquette

**513 (or MIC 513) Advanced Clinical Immunology** (I or II, 3) Theory, application, and techniques used in clinical immunology: immunochemistry, serology, immunohematology, immunopathology. (Lec. 3) *Pre: 406 or MIC 533 or equivalent.* LaFazia and Meglio

**520 Advanced Hematology** (I or II, 3) Special problems, advanced techniques, and methodology in hematology; laboratory approach emphasized. (Lec. 3) *Pre: 415 or equivalent.* Barker

**530 Advanced Immunohematology** (I or II, 3) Blood grouping and blood banking with emphasis on recent advances. Techniques used for identification of immune disorders, component preparation, tests to determine compatibility. (Lec. 3) *Pre: 413 or equivalent.* Kenney and Lewis

**541 Advanced Clinical Microbiology II** (I or II, 3) Current research and clinical methodology in clinical mycology, parasitology, mycobacteriology, epidemiology, and infectious disease serology. (Lec. 3) *Pre: 409 or MIC 432 or equivalent.* Blazek-D'Arezzo, Heelan, and Mello

**543 Advanced Clinical Chemistry II** (I, II, or SS, 3) A comprehensive study of pathophysiologic mechanisms as they relate to clinical chemistry. Topics include immunochemistry, automation, enzymology, pharmacology, and endocrinology. (Lec. 3) *Pre: 411 or equivalent.* Camara and Sheff

**551 Topics in Biochemistry for the Clinical Scientist**

See Biochemistry 551.

**561 Introduction to Cytotechnology** (I, 3) A review of cell and tissue structure, principles of microscopy, and cytological staining methods; overview of organization and management of

cytology labs. (Practicum) *Pre: open only to students who have been accepted into an affiliated hospital school of cytotechnology.* Clinical Staff

**562 Special Topics in Cytotechnology** (II, 3) Special projects in cytology, cytopathology, or cytotechnology. Students will investigate or review a topic and present a written and oral report. (Practicum) *Pre: open only to students who have been accepted into an affiliated hospital school of cytotechnology.* Clinical Staff

**563 Cytopathology** (I, 3) Cytopathology and clinical aspects of cervical dysplasia, carcinoma in situ, and invasive squamous cell carcinoma. Endometrial and endocervical carcinoma and other genital tract cancers will be considered. (Practicum) *Pre: open only to students who have been accepted into an affiliated hospital school of cytotechnology.* Clinical Staff

**564 Medical Cytology** (II, 3) Benign and malignant cytology of the gastrointestinal, respiratory, and urinary tracts; study of exfoliative cells in urine, serious effusions, cerebrospinal fluid, and breast secretions. (Practicum) *Pre: open only to students who have been accepted into an affiliated hospital school of cytotechnology.* Hospital Staff.

**565 Cytology Practicum I** (I, 6) Microscopic evaluation and screening of benign cytological smears from cervical dysplasia, carcinoma in situ, and invasive malignant tumors of the female genital tract. (Practicum) *Pre: open only to students who have been accepted into an affiliated hospital school of cytotechnology.* Hospital Staff

**566 Cytology Practicum II** (II, 6) Microscopic evaluation and screening of cytological smears from the gastrointestinal, urinary, respiratory, and central nervous systems and from other body fluids. (Practicum) *Pre: open only to students who have been accepted into an affiliated hospital school of cytotechnology.* Clinical Staff.

**571 (or APS 571) Biotechnology Product Evaluation and Development** (I, II, or SS, 3) The process through which candidate products produced using recombinant DNA technology are evaluated for safety and efficacy, including conductance of clinical trials, economic issues, and regulatory affairs. (Lec. 3) *Pre: graduate standing and permission of chairperson.* Campbell, Paquette, and Tente

**590 Special Problems in Clinical Chemistry** (I, II, or SS, 1–6) Intensive tutorial work, research, and readings in clinical chemistry. (Independent Study) *Pre: graduate standing and permission of chairperson.* Paquette

**591 Special Problems in Clinical Microbiology** (I, II, or SS, 1–6) Intensive tutorial work, research, and readings in clinical microbiology. (Independent Study) *Pre: graduate standing and permission of chairperson.* Paquette

**592 Special Problems in Hematology** (I, II, or SS, 1–6) Intensive tutorial work, research, and readings in hematology. (Independent Study) *Pre: graduate standing or permission of chairperson.* Paquette

**593 Special Problems in Immunohematology** (I, II, or SS, 1–6) Intensive tutorial work, research, and readings in immunohematology. (Independent Study) *Pre: graduate standing and permission of chairperson.* Paquette

**594 Special Problems in Biotechnology** (I, II, or SS, 3) Intensive tutorial work, research, and readings in biotechnology. (Independent Study) *Pre: graduate standing and permission of chairperson.* Paquette and Tente

## Microbiology (MIC)

*Chairperson:* Professor Sperry (Biochemistry, Microbiology, and Molecular Genetics)

**102 Exploring the Microbial World** (I, 3) A guided tour of aquatic and disease-causing microorganisms, emphasizing their impact on humans. The role of microorganisms in evolution, environmental and human health, biotechnology, and natural product prospecting. (Lec. 3) Hufnagel (N)

**201 Introductory Medical Microbiology** (I and II, 4) Required of all students in nursing, dental hygiene, and pharmacy. Lecture and laboratory designed to illustrate microbiological principles and techniques. For students in allied health professions. (Lec. 3, Lab. 3) *Pre: one semester of biology and one year of chemistry.* Not open to students with credit in 211. Staff

**211 Introductory Microbiology** (I or II, 4) Introduction to microorganisms. Morphology, structure, metabolism, genetics, growth, populations in natural habitats, and their effects on the environment. For biological sciences majors. (Lec. 3, Lab. 3) *Pre: two semesters of biology, one semester of organic chemistry, which can be taken concurrently.* Not open to students with credit in 201. Staff

**333 Immunology and Serology** (I, 3) Introduction to the immune response; host resistance to infection; immunopathology; antibodies, antigens, and use of serological techniques. (Lec. 3) *Pre: 201 or 211.* Laux



**401 Quantitative Cell Culture**

See Biochemistry 401.

**403 Introduction to Electron Microscopy**

See Biochemistry 403.

**405 (or BCH 405) Electron Microscopy**

**Laboratory (I, 2)** Introduction to the practical aspects of electron microscopy. Emphasis on acquisition of the following skills: tissue preparation, ultramicrotomy, operations of the electron microscope, and darkroom procedures. (Lab. 6) *Pre: credit or concurrent enrollment in 403. Hufnagel*

**412 Food Microbiology (II, 3)** Analysis of water and milk; examination of dairy and other food products. (Lec. 2, Lab. 4) *Pre: 201 or 211 and one semester of biochemistry, which may be taken concurrently. Staff*

**413 Advanced Microbiology Lecture I (I, 3)**

The physiology, genetics, developmental, and molecular biology of microorganisms. (Lec. 3) *Pre: 211, credit or concurrent enrollment in BCH 311 and BIO 352, or permission of instructor. Cohen and Nelson*

**414 Advanced Microbiology Lecture II (II, 3)**

The structural, developmental, and physiological diversity of microorganisms; symbiotic relationships, molecular basis of ecology, and the role of microorganisms in the soil and water environment. (Lec. 3) *Pre: 211, credit or concurrent enrollment in BCH 311, or permission of instructor. Nelson and Hufnagel*

**415 Advanced Microbiology Laboratory I (I, 2)**

Introduction to techniques and methods for advanced study of microbial genetics, physiology, molecular, and developmental biology of microorganisms. (Lab. 6) *Pre: concurrent enrollment in 413 or permission of instructor. Cohen and Nelson*

**416 Advanced Microbiology Laboratory II (II, 2)**

Techniques and methods for the advanced study of microorganisms with emphasis on the study of representative groups of microorganisms and the application of these techniques to soil and aquatic environments. (Lab. 6) *Pre: concurrent enrollment in 414 or permission of instructor. Hufnagel and Nelson*

**421 Cell Biology and Cancer**

See Biochemistry 421.

**422 Biotechnology of Industrial Microorganisms**

See Food Science and Nutrition 422.

**432 Pathogenic Bacteriology (II, 3)** The more important microbial diseases, their etiology,

transmission, diagnosis, and control. Laboratory, emphasis on methods of diagnosis. (Lec. 2, Lab. 3) *Pre: 201 or 211 or one semester of organic chemistry. Sperry*

**451 Laboratory in Cell Biology**

See Biological Sciences 451.

**453 Cell Biology**

See Biological Sciences 453.

**483 (or MTC 483) Introductory Diagnostic**

**Microbiology (I, 3)** Diagnosis of infectious diseases by use of microbiology, immunology, and hemotologic and clinical chemical methods; organisms covered include viruses, bacteria, fungi, and parasites. (Lec. 2, Lab 2) *Pre: 201 or 211. Open only to clinical laboratory science or microbiology majors or permission of instructor. Paquette*

**491, 492 Research in Microbiology (I and II, 1–6 each)**

Special problems in microbiology. Student required to outline a problem, carry on experimental work, and present conclusions in a report. (Independent Study) *Open only to seniors in microbiology. A maximum of 6 credits can be taken for major credit. Staff*

**495 Seminar in Microbiology (I and II, 1)**

Preparation and presentation of papers on selected subject in microbiology. (Seminar) *S/U credit. Staff*

**501 Advanced Clinical Microbiology I**

See Medical Technology 501.

**502 (or BCH 502) Techniques in Microbial**

**and Molecular Genetics (II, 2)** Techniques for the study of molecular genetics in bacteria and bacteriophages including mutant isolation, phage growth, transformation, transduction, conjugation, DNA isolation and analysis, and gene cloning. (Lab. 6) *Pre: 413 and 415 or BIO 437 or 454 or 522 or permission of instructor. Nelson or Cohen*

**503 (or BCH 503) Electron Microscopy (I, 2)**

Biological specimen preparation techniques for transmission and scanning electron microscopy. Includes thin sectioning, negative staining, shadow-casting, freeze-etching, cytochemistry, principles of electron microscope operation. Final written and oral reports. (Lec. 2) *Pre: graduate standing or permission of instructor. Not open to students with credit in 403. Hufnagel*

**505 (or BCH 505) Laboratory in Electron**

**Microscopy (I, 3)** Introduction to biological sample preparation for transmission and scanning electron microscopy. Tissue preparation, ultramicrotomy, operation of the electron microscope, darkroom procedures, particulate

and molecular sample preparation, critical point drying, sputtercoating. Not open to students who have taken 405. (Lab. 6) *Pre: graduate standing or permission of instructor. Hufnagel*

**513 Advanced Clinical Immunology**

See Medical Technology 513.

**514 The Electron Microscope in Molecular**

**and Cellular Biology (II, 2)** Use of the electron microscope to analyze structure and function of biological molecules. Applications in food science, pathology, pharmacology, ecology, gene engineering, and basic research. (Lec. 2) *Pre: BCH 311 and BIO 352 or permission of instructor. In alternate years. Next offered spring 2000. Hufnagel*

**521 (or BIO 521) Recent Advances in Cell**

**Biology (I, 2)** Reading of current papers in the area of cell biology and preparation of written and oral reports. Emphasis on animal cells. (Lec. 2) *Pre: at least one of the following courses or an equivalent course emphasizing cell structure and function—BIO 327, 432, 445, 453, and MIC 421; graduate standing or permission of instructor. May be repeated for a maximum of 4 credits. Hufnagel*

**523 (or FSN 523 or NRS 523) Water Pollution**

**Microbiology (I, 3)** The microbiological aspects of water pollution, including the potential for infectious diseases, pollution effects on microbial ecosystems, and the microbial degradation of pollutants. (Lec. 3) *Pre: 201 or 211, BCH 311, or permission of instructor. Credit or concurrent enrollment in 525. Traxler*

**525 (or FSN 525) Water Pollution Microbiology Laboratory (I, 1)**

Experimental method for pollution analysis, microbial indicator assay methods, microbial assays, sample collection and statistical treatment of data. (Lab. 3) *Pre: concurrent enrollment in 523 or permission of instructor. Staff*

**533 Immunology (II, 3)** Introduction to the cellular, molecular, and genetic basis of the immune system, and the role of the immune system in immunity to infection, tumor and transplantation immunobiology, and immunopathology. (Lec. 3) *Pre: 201 or 211. Laux*

**534 Animal Virology**

See Aquacultural Science and Pathology 534.

**536 Virology Laboratory**

See Aquacultural Science and Pathology 536.

**538 Epidemiology of Viral and Rickettsial Diseases**

See Aquacultural Science and Pathology 538.

**552 (or BCH 552) Microbial Genetics (II, 3)** Recent research on the mechanism of mutation, genetic recombination, the genetic code, transposons, regulations, genetic engineering and regulation of DNA, RNA, and protein synthesis in microbial systems. (Lec. 3) Pre: 201, BIO 352, and BCH 311. Cohen

**561 Recent Advances in Molecular Cloning (I or II, 1)** Reports of readings concerning the latest developments in techniques of molecular cloning and their applications in the study of various biological systems. (Lec. 1) Pre: 552 or permission of instructor. May be repeated. Nelson

**571 Insect Microbiology**  
See Entomology 571.

**576 Marine Microbiology**  
See Oceanography 576.

**593, 594 The Literature of Bacteriology (I and II, 1 each)** Thorough study of original literature of some phase of bacteriology. Written abstracts or papers on assigned topics are discussed in weekly conferences with instructor. (*Independent Study*) Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

**641 Physiology of Bacteria (II, 3)** Bacterial structure and function, including growth, nutrition, environmental factors, metabolism, biosynthesis, and energy-yielding reactions. (Lec. 3) Pre: 413 and 415. In alternate years. Next offered 1999–00. Staff

**654 Advances in Immunology (I, 2)** Reports on assigned readings concerning latest developments in the field of cellular and humoral immunity presented and discussed by students. Research paper and critical review of a scientific paper required. (Lec. 2) Pre: 533, BCH 311, or permission of instructor. May be repeated for a maximum of 4 credits. In alternate years. Next offered 1998. Laux

**656 Mechanisms of Bacterial Pathogenesis (I, 3)** Study of recent research on the molecular mechanisms of pathogenesis. Students expected to participate in roundtable discussions of recent pertinent literature. (Lec. 3) Pre: 432, 552, and BCH 311. In alternate years. Next offered 1999–00. Staff

**691, 692 Special Problems in Microbiology (I and II, 3 each)** Assigned research on an advanced level. Student required to outline problem, conduct the necessary literature and experimental work, and present observations

and conclusions in a report. (*Independent Study*) Pre: graduate standing. Staff

**695, 696 (or BCH 695, 696) Graduate Research Seminar (I and II, 1 each)** Reports of research in progress or completed. (*Seminar*) Required of all graduate students in microbiology. S/U credit. Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

**930 Workshop in Microbiology Topics for Teachers (I and II, 0–3 each)** Especially designed for teachers of biology. Basic topics of microbiology from an advanced or pedagogical perspective. (*Workshop*) Staff

Note: For Virology, see *Aquacultural Science and Pathology and Plant Sciences*. For Mycology, see *Biological Sciences*.

## Military Science (MSC) (Army ROTC)

Chairperson: Professor Smith

**000 Leadership Laboratory (I and II, 0)** Hands-on, performance-oriented training such as rappelling, land navigation, and drill and ceremony. (Lab.) Required every semester for all ROTC students. Staff

**101 Introduction to ROTC and the U.S. Army I (I, 1)** Organization and role of ROTC and the U.S. Army. Customs and traditions, leadership dimensions, officer traits, and basic military skills. (Lec. 1) Concurrent enrollment in 000 required of all ROTC students. Staff

**102 Introduction to ROTC and the U.S. Army II (II, 1)** Branches of the Army, leadership, the U.S. Constitution, first aid, and general military skills. Expanding upon skills acquired in 101. (Lec. 1) Pre: 101. Concurrent enrollment in 000 required of all ROTC cadets. Staff

**105 Beginner Weight Training and Conditioning (I, 1)** See Physical Education and Exercise Science 105. (*Practicum*) Required of all cadets enrolled in 301. Concurrent enrollment in 000 required of all ROTC cadets. Staff

**201 History of Modern Warfare (I, 3)** Study of warfare with emphasis on the period since the introduction of gunpowder. Influence of leaders, economics, and social systems on the outcomes of selected major battles. (Lec. 3) Concurrent enrollment in 000 required of all ROTC students. Staff

**202 Land Navigation and Military Skills (II, 3)** Map reading, land navigation, terrain association, communications, first aid, and tactics. (Lec. 3) Concurrent enrollment in 000 required of all ROTC cadets. Staff

**205 Intermediate Weight Training and Conditioning (II, 1)** See Physical Education and Exercise Science 205. (*Practicum*) Required of all cadets enrolled in 302. Concurrent enrollment in 000 required of all ROTC cadets. Staff

**301, 302 Leadership and Management I, II (I and II, 3 each)** Advanced courses: application of the principles of war, small unit tactics, leadership development, planning and execution of tactical problems. (Lec. 3) Pre: concurrent enrollment in 105 for 301; 205 for 302. Concurrent enrollment in 000 required of all ROTC cadets. Staff

**401, 402 Organizational Management and Law I, II (I and II, 3 each)** Advanced courses: military law, the profession of arms, obligations and responsibilities of an officer, Army readiness program, administrative management, world change and military implications, logistics, the military team, internal defense and development. (Lec. 3) Pre: 302 for 401; 401 for 402. Concurrent enrollment in 000 required of all ROTC cadets. Not for graduate credit. LTC Smith

**403 Directed Study (I and II, 3)** Experiential learning through field work in a military-type unit on an individual basis. Written analysis required on a topic selected by the chairperson. (*Independent Study*) Pre: 301, 302, and permission of chairperson. Not for graduate credit. LTC Smith

## Music (MUS)

Chairperson: Professor R. Lee

Note: Applied music courses with an asterisk—MUS 110, 210, 310, 410, and 510 (except Composition)—require a supplementary fee: \$95 for 1 credit; \$190 for 2, 3, 4, or 6 credits.

**101 Introduction to Music (I and II, 3)** Fosters a better understanding and appreciation of the world's great music. Consideration of musical styles, techniques, and forms from the listener's standpoint. (Lec. 3) Staff (A)

**106 History of Jazz (I and II, 3)** The nature and origin of jazz and its development as an American folk idiom: European and African heritages, blues, ragtime, dixieland, boogie-woogie, swing, bop, cool, funky, gospel, jazz-rock, free-form, and progressive. (Lec. 3) Parillo and Pollart (A)

**\*110 Applied Music (I and II, 1–3)** Private instruction in performance at the freshman level. One credit equals a half-hour lesson per week. Two or three credits equal an hour lesson per week and require additional preparation time, higher levels of performance, and recital performances. (Studio) Pre: audition and permission of chairperson. May be repeated for credit. Staff

A Voice	I Flute	Q Euphonium/ Baritone
B Piano	J Oboe	
C Organ	K Clarinet	R Tuba
D Harpsichord	L Bassoon	S Percussion
E Violin	M Saxophone	T Guitar
F Viola	N Trumpet	U Harp
G Violoncello	O French Horn	V Composition
H Contra Bass	P Trombone	

**111 Basic Musicianship (I and II, 3)** Use of folk, classical, and popular music to learn essentials of music reading and music theory. (Lec. 3) Staff (A)

**112 Intermediate Musicianship (II, 3)** Continued use of folk, classical, and popular music to learn essentials of music reading and music theory, with emphasis on musical analysis, ear training, sightsinging, and part writing. (Lec. 3) Pre: 111 or permission of instructor. Not for major credit in music. Dempsey

**121 Music Theory I (II, 2)** Rhythmic, melodic, and harmonic elements of music. Scales, modes, intervals, rhythmic notation, and triads. Part writing, analysis, and keyboard work involving primary triads. (Lec. 1.5, Lab. 1) Pre: concurrent or previous keyboard experience. Dempsey and Rankin

**122 Ear Training and Sightsinging I (II, 2)** Sightsinging in major and minor keys, including outlines of tonic and dominant harmonies. Rhythmic reading, aural recognition, with notation of material of 121. (Lec. 1.5, Lab. 1) Pre: 121. May be taken concurrently. Conley

**131 Introduction to the Music Profession (I, 3)** Overview of the music profession. Development of an individualized plan for music study including articulation of learning and career goals. Introduction to skill areas including research and writing about music, basic musicianship, and appreciation of music literature. (Lec. 2, Lab. 2) Danis and Dempsey

**169 Percussion Class (I and II, 1–2)** Basic principles in performance and pedagogy of percussion instruments. (Lab. 2) Open to music majors and other students who demonstrate ability to read music. Offered every third semester. Next offered fall 1999. Pollart

**170 Guitar Class (I and II, 1–2)** Basic principles in performance and pedagogy of the guitar. (Lab. 2) Open to music majors and other students who demonstrate ability to read music. Offered every third semester. Next offered fall 1999. Salazar

**171, 172 Piano Class I, II (I and II, 1 each)** Development of basic techniques and musicianship for effective use of the piano in music classrooms. (Lab. 2) Pre: credit or concurrent enrollment in 121, 122 for 171; 171 for 172. 171 is offered in the spring; 172 is offered in the fall. Fuchs, Rankin, and/or Livingston

**173 Voice Class (I and II, 1–2)** Basic principles and pedagogy of singing, physiology, breathing, tone production, diction. (Lab. 2) Open to music majors and other students who demonstrate ability to read music. Offered every third semester. Next offered spring 2000. Swanson

**175 String Class (I and II, 1–2)** Basic principles in performance and pedagogy of string instruments. (Lab. 2) Open to music majors and other students who demonstrate ability to read music. Offered every third semester. Offered spring 1999. Danis

**177 Woodwind Class (I and II, 1–2)** Basic principles in performance and pedagogy of woodwind instruments. (Lab. 2) Open to music majors and other students who demonstrate ability to read music. Offered spring 1999. Murray and Sparks

**179 Brass Class (I and II, 1–2)** Basic principles in performance and pedagogy of brass instruments. (Lab. 2) Open to music majors and other students who demonstrate ability to read music. Offered every third semester. Next offered spring 2000. Smith

**\*210 Applied Music (I and II, 1–3)** Private instruction in performance at the sophomore level. One credit equals a half-hour lesson per week. Two or three credits equal an hour lesson per week and require additional preparation time, higher levels of performance, and recital performances. (Studio) Pre: 110 or equivalent. See 110 for areas of study. May be repeated for credit. Staff

**221 History of Music I (I, 1–3)** Historical development of classical and popular music in European and non-European cultures: world music, Medieval, and Renaissance eras. (Lec. 1–3) Pre: 121 or equivalent competency. May be taken for 1 or 2 credits only with permission of instructor prior to registration. Ladewig

**222 History of Music II (II, 1–3)** Continuation of 221: Baroque, Classical, and Romantic eras. (Lec. 1–3) Pre: 121 or equivalent competency and 221 or consent of instructor. May be taken for 1 or 2 credits only with permission of instructor prior to registration. Ladewig

**225 Music Theory II (I, 2)** Continuation of 121, covering all diatonic triads, dominant and supertonic seventh chords, and modulation to closely related keys. (Lec. 1.5, Lab. 1) Pre: 121 and 122. Gibbs

**226 Ear Training and Sightsinging II (I, 2)** Continuation of 122. Covering all diatonic triads, dominant and supertonic seventh chords, and modulation to closely related keys. (Lec. 1.5, Lab. 1) Pre: 122 and 225; 225 may be taken concurrently. Conley

**227 Music Theory III (II, 2)** Advanced rhythmic, melodic, and harmonic practice approached through analysis, keyboard, and part writing, including original work. Covers seventh, ninth, eleventh, and thirteenth chords, chromatic alteration, chromatic progression, and foreign modulation. (Lec. 1.5, Lab. 1) Pre: 225 or equivalent. Gibbs

**228 Ear Training and Sightsinging III (II, 2)** Advanced rhythmic, melodic, and harmonic practice approached through sightsinging and dictation including computer-aided instruction. (Lec. 1.5, Lab. 1) Pre: 226 or equivalent. Gibbs

**235 Introduction to Music Teaching (II, 3)** Overview of music teaching in schools and studios. History, philosophy, curriculum, learning theory, and current topics in music teaching as they relate to the broader field of education. (Lec. 3) Pre: sophomore standing in music. Lee or Livingston

**238 General Music Methods and Materials (II, 3)** Teaching methods, instructional materials, and evaluation procedures for general music, grades K–12. Learner characteristics and development of children and adolescents. (Lec. 3) Pre: sophomore standing in music. Livingston

**250 Music Convocation (I and II, 0)** Study of repertory and techniques of concert presentation through attendance of student recitals and presentations by faculty and visiting artists. (Lab.) Attendance at 75 percent of events required. May be repeated. S/U credit. Staff

**271 Piano Class III (I or II, 1)** Further development of basic keyboard performance. Improved accompaniments to folk songs. Sight transposition. Some score reading. Further development of reading skills using materials on

the level of Bartok's *Mikrokosmos*, Books 2 and 3, and Clementi's *Sonatinas*, Op. 36. Registrants must also take any part of the piano proficiency examination not previously passed. (*Lab. 2*) *Pre: 172 or equivalent. Open only to music majors. Fuchs and/or Rankin*

**280 Mid-Program Portfolio in Music (I and II, 0)** Individual accomplishment of activities and experiences, demonstrating interest and competency in music at the midpoint in the student's program of studies as a music major. (*Portfolio*) *Pre: sophomore standing in music. Staff*

**283 Vocal Diction (II, 3)** Basic phonetics (International Phonetic Alphabet). Enunciation in the foreign languages most frequently encountered in vocal and choral literature (Italian, French, German, and Latin). English diction in singing. *In alternate years. Next offered spring 1999. Conley*

**291 University Marching Band (I, 0–2)** Rehearsal and performance of music, drill, and shows for URI football games. (*Rehearsal 8*) *May be repeated for credit. S/U only for 0 credit. Smith*

**292 Concert Band (II, 0–1)** Study and performance of concert band music. Open to all students. (*Rehearsal 3*) *May be repeated for credit. S/U only for 0 credit. Smith*

**293 University Chorus (I and II, 0–1)** (*Rehearsal 3*) *May be repeated for credit. S/U only for 0 credit. Conley*

**294 Symphonic Wind Ensemble (I and II, 0–1)** (*Rehearsal 3*) *Pre: audition. May be repeated for credit. S/U only for 0 credit. Pollart*

**295 Concert Chorus (I and II, 0–1)** (*Rehearsal 3*) *Pre: audition. May be repeated for credit. S/U only for 0 credit. Conley*

**296 Jazz Studio Ensemble (I and II, 0–1)** Performance and study of jazz and studio music as related to professional experience. (*Rehearsal 3*) *Pre: audition. S/U only for 0 credit. Parillo*

**297 University Symphony Orchestra (I and II, 0–1)** Study and performance of standard and modern repertoire for the orchestra. (*Rehearsal 3*) *Pre: audition. May be repeated for credit. S/U only for 0 credit. Danis*

**\*310 Applied Music (I and II, 2–4)** Private instruction in performance at junior level. Two, three, or four credits equal an hour lesson per week. More credit requires additional preparation time, higher levels of performance, and recital performances. (*Studio*) *Pre: 210 or equivalent. See 110 for areas of study. May be repeated for credit. Staff*

**311 Basic Conducting (I, 2)** A course in elementary conducting techniques including baton techniques and score study as well as the organization of instrumental and choral rehearsals. *Pre: credit or concurrent enrollment in 225 and 226. Pollart*

**312 Advanced Conducting (II, 3)** A study of problems and approaches to instrumental and choral conducting based on advanced baton techniques. Principles of interpretation and the art of communication through practical experience with departmental organizations. *Pre: 311. Pollart*

**322 History of Music III (I, 1–3)** Continuation of 221 and 222: European, African-American, Hispanic, and other contributions to the classical and popular music of the twentieth century. (*Lec. 1–3*) *Pre: 121 or equivalent competency and 221 or consent of instructor. May be taken for 1 or 2 credits only with permission of instructor prior to registration. Ladewig*

**323 Jazz Theory and Improvisation (I, 3)** An intensive study and practice of the formal elements of jazz improvisation. (*Lec. 1, Lab. 4*) *Pre: 225, 226 and acceptance into 210. In alternate years. Next offered spring 2000. Parillo*

**329 (or EDC 329) Music for the Elementary School Teacher (II, 3)** Fundamentals of music and methods employed in teaching music and making it a more meaningful and integral part of the curriculum in the elementary school. (*Lec. 3*) *Open only to elementary and early childhood education majors. Livingston*

**339 Choral Methods and Materials (I, 3)** Organization and administration of choral music programs in elementary and secondary schools, focusing on materials, procedures, policies, and teaching methods. (*Lec. 3*) *Pre: EDC 250 and piano proficiency examination. Livingston*

**340 Instrumental Methods and Materials (II, 3)** Organization and administration of the instrumental music program in elementary and secondary schools, focusing on materials, procedures, policies, and teaching methods. (*Lec. 3*) *Pre: EDC 250. Smith*

**350 Junior Recital (I and II, 0)** Performance of a public program at least 20 minutes in duration after faculty examination. (*Studio*) *Pre: concurrent enrollment in 310. Staff*

**371 Piano Accompanying (I and II, 1)** Development of sight-reading skills. Preparation and performance of accompaniments. (*Lec. 1*) *Pre: permission of piano faculty. May be repeated. Fuchs and/or Rankin*

**399 Chamber Music Ensembles (I and II, 0–1)** Chamber music ensembles are designated as K Keyboard Ensemble, S String Ensemble, W Woodwind Ensemble, B Brass Ensemble, P Percussion Ensemble, V Vocal Ensemble, G Guitar Ensemble, J Jazz Ensemble, M Mixed Ensemble, O Opera Workshop. Small instrumental ensembles are normally restricted to one performer per part. (*Rehearsal 2*) *Pre: audition. May be repeated for credit. Staff*

**407 The Symphony (I and II, 3)** Study of the development of orchestration and of formal procedures such as the sonata, rondo, and variations. Includes works by composers such as Haydn, Beethoven, Brahms, and Tchaikovsky. (*Lec. 3*) *Pre: 222. Offered every seventh semester. Next offered spring 2000. Ladewig*

**408 The Opera (I and II, 3)** History of opera from its beginnings in Italy in the seventeenth century to the present, including works by composers such as Monteverdi, Purcell, Mozart, Wagner, Verdi, and Puccini. *Pre: credit or concurrent enrollment in 222 or the ability to read music. Offered every seventh semester. Next offered spring 2002. Ladewig*

**\*410 Applied Music (I and II, 2–4)** Private instruction in performance at the senior level. Two, three, or four credits equal an hour lesson per week. More credit requires additional preparation time, higher levels of performance, and recital performances. (*Studio*) *Pre: 310 or equivalent. See 110 for areas of study. May be repeated for credit. Not for graduate credit, except 410V (Composition). Staff*

**416 Form and Analysis (I, 3)** Critical study of the structure of tonal music. Works of various composers are analyzed with reference to motive and phrase as generative elements in design. (*Lec. 3*) *Pre: 227 or equivalent. In alternate years. Next offered fall 2000. Gibbs*

**417 Instrumentation and Choral Arranging (I, 3)** Range, timbre, transpositions, and other characteristics of instruments, singly and in combination. Elements of choral arranging. Exercises with attention to part writing, harmony, and form. Setting of a small piece of music for orchestra, band, or chorus required. *Pre: credit or concurrent enrollment in 227 or equivalent. In alternate years. Next offered fall 1999. Gibbs*

**420 Eighteenth-Century Counterpoint (II, 3)** Tonal polyphony in the style of J.S. Bach. Includes creative exercises in writing counterpoint in Baroque style and the study of representative compositions such as the inventions and fugues of Bach. (*Lec. 3*) *Pre: 227 and 228. In alternate years. Next offered spring 2000. Rankin*

**421 Electronic and Computer Music Research** (I, 3) Study and application of technology for music research in music education, theory/composition, music history, and performance, culminating in a major project in the student's area of specialization. (Lec. 2, Lab. 2) *Pre: 235 or equivalent. In alternate years. Next offered spring 1999.* Gibbs

**430 The Renaissance Era** (I and II, 3) Music at European courts and cathedrals (1400–1600), including vocal Masses, motets, madrigals, and chansons, and instrumental canzonas, ricercars, toccatas, and variations of Dufay, Josquin, Palestrina, Gabrieli et al. (Lec. 3) *Pre: 221 or the ability to read music. Offered every seventh semester. Next offered fall 1999.* Ladewig

**431 The Baroque Era** (I and II, 3) Music of 1600–1750, from the rise in Italy of opera, oratorio, idiomatic instrumental music, the sonata, and the concerto, through the works of German masters Bach and Handel. (Lec. 3) *Pre: 222 or the ability to read music. Offered every seventh semester. Next offered fall 2000.* Ladewig

**432 The Classic Era** (I and II, 3) Music of 1750–1825, beginning with the founders of the Classical style, including D. Scarlatti, Gluck, and the sons of Bach, and culminating in the works of Haydn, Mozart, and Beethoven. (Lec. 3) *Pre: 222. Offered every seventh semester. Next offered spring 2001.* Ladewig

**433 The Romantic Era** (I and II, 3) Music of 1825–1900, with emphasis on topics central to the era, including program music, nationalism, piano virtuosity, opera, lieder, the cyclic symphony, and turn-of-the-century Viennese post-Romanticism. (Lec. 3) *Pre: 222 or the ability to read music. Offered every seventh semester. Next offered spring 1999.* Ladewig

**434 The Modern Era** (I and II, 3) Music of the modern era, with emphasis on changing aesthetics as revealed through the analysis of selected compositions. (Lec. 3) *Pre: 227 or the ability to read music. Offered every seventh semester. Next offered fall 1998.* Gibbs

**442 Directed Study in Applied Music Pedagogy** (I and II, 2) Research in materials and approaches for studio teaching. *Pre: 4 credits in 210. In alternate years. Next offered fall 1998.* Rankin

**450 Senior Recital** (I or II, 0) Performance of a public program at least 20 minutes in duration after faculty examination. *Pre: concurrent enrollment in 410. Not for graduate credit.* Rankin

**470 Special Topics in Music** (I and II, 1–3) Exploration of advanced topics not covered by the standard curriculum but of interest to faculty and students in a particular semester. Topics in performance, music history, music theory or composition, music education. *May be repeated for credit with a different topic.* Staff

**480 Graduation Portfolio in Music** (I and II, 0–2) Individual accomplishment of activities and experiences demonstrating competence as a music professional. Achievement of entry-level professional behaviors indicating potential success as a music major graduate. (Portfolio) *Pre: senior standing in music. Not for graduate credit. S/U only.* Lee or Livingston

**490 Independent Study** (I and II, 1–3) Preparation of a project under the guidance of a member of the appropriate faculty. (Independent Study) *Pre: acceptance by faculty member who will be the project advisor and approval of chairperson. May be repeated for credit.* Staff

**\*510 Applied Music** (I and II, 2, 3, 4, or 6) Private instruction. One 60-minute lesson each week. Levels, master classes, and recital performance as prescribed in the applied music syllabi. (Studio 60 minutes) *Pre: audition demonstrating proficiency appropriate to the selected M.M. degree. See 110 for areas of study. May be repeated.* Staff

**511 Advanced Choral Conducting** (I, 3) Critical study of choral music scores with reference to interpretation and performance. Development of technical command and expressive skills includes supervised rehearsal and conducting of University ensembles. (Lec. 3) *Pre: knowledge of conducting technique as evidenced in audition or 311.* Conley

**512 Advanced Instrumental Conducting** (II, 3) Critical study of orchestral and chamber music scores with reference to interpretation and performance. Development of technical command and expressive skill includes supervised rehearsal and conducting of University ensembles. (Lec. 3) *Pre: knowledge of basic baton as evidenced in audition or credit in 312.* Danis

**513 Graduate Conducting Project** (I and II, 3) Preparation and conducting of a program of chamber music and/or a major ensemble with documentation. (Studio 3) *Pre: 511, 512, and 548 and permission of chairperson.* Staff

**540 Foundations of Music Education** (I and II, 3) Examination of the broad influences upon music education. Historical, philosophical, sociological, psychological, and curricular founda-

tions. (Lec. 3) *Pre: graduate standing in music. Offered every third semester. Next offered fall 1998.* Pollart

**545 Musical Learning, Evaluation, and Assessment** (I and II, 3) A study of cognitive, psychomotor, and affective learning in music. The ways in which musical learning may be evaluated and assessed. The needs of special populations will be included. (Lec. 3) *Pre: graduate standing in music. Offered every third semester. Next offered spring 1999.* Lee or Livingston

**548 Research in Music** (I and II, 3) Study of research techniques as applied to the art of music. Major project procedures and data collection and examination in the following research categories: historical, philosophical, and empirical. (Lec. 3) *Pre: graduate standing in music. Offered every third semester. Next offered fall 1999.* Livingston

**550 Graduate Performance Recital** (I and II, 0) Performance of advanced repertoire of various styles in a public program at least 55 minutes in duration for the M.M. in performance and 45 minutes in duration for the M.M. in music education after faculty acceptance. (Studio) *Pre: concurrent enrollment in 510 and 6 or more credits in 510 for the M.M. in performance or 4 or more credits in 510 for the M.M. in music education.* Staff

**552 Graduate Composition Recital** (I and II, 0) A juried recital of at least 40 minutes of original compositions prepared by the composer. (Studio) *Pre: concurrent enrollment in 510V and 3 or more credits in 510V.* Gibbs

**567 Seminar in Performance and Pedagogy** (I, 2) Study of performance literature, practice, and pedagogy. Research projects and supervised teaching experience appropriate to the major performance area. (Lec. 2) *Pre: concurrent enrollment in 550. In alternate years. Next offered fall 1998.* Rankin

**570 Graduate Project** (I and II, 3) Independent study resulting in a major essay, composition, or orchestration. (Independent Study) *Pre: 548 and permission of chairperson.* Staff

**571 Special Topics in Music** (I and II, 1–3) Exploration of advanced topics not covered by the standard curriculum but of interest to faculty and students in a particular semester. Topics in performance, music history, music theory and composition, and music education. (Lec. 1–3) *May be repeated for credit with a different topic.* Staff

**579 Experiential Learning in Music (I or II, 2)** Developing competence through an individual and/or collaborative experiential activity involving music research, performance, service, and/or teaching in university and community settings. May include professional music studio or computer lab work. Student will work with his or her major professor or with the director of graduate studies. (*Practicum*) Pre: graduate standing and previous or concurrent enrollment in 580. Livingston

**580 Master of Music Portfolio I (I or II, 0)** Planning individual activities and experiences demonstrating competence at the graduate level in music. Should be taken in the first semester of matriculation. Student will work with his or her major professor or with the director of graduate studies. (3 common Seminars) Pre: graduate standing in music. S/U only. Livingston

**581 Master of Music Portfolio II (I or II, 1)** Individual accomplishment of activities and experiences demonstrating competence at the graduate level of music. Achievement of professional behaviors indicating significant growth in areas of specialization. Oral presentation required. Should be taken in final semester of study. Student will work with his or her major professor or with the director of graduate studies. (3 common Seminars) Pre: graduate standing in music. S/U only. Livingston

**583 Vocal Diction (II, 3)** Phonetics (International Phonetic Alphabet). Enunciation in the foreign languages most encountered in vocal literature (French, Italian, and German). English diction in singing. (Lec. 3) In alternate years. Next offered spring 1999. Conley

**590 Piano Accompanying (I and II, 1)** Development of sightreading skills. Preparation and performance of accompaniments of major works. (*Studio 1*) Pre: permission of piano faculty. May be repeated for a maximum of 3 credits. Rankin and/or Fuchs

**593 University Chorus (I and II, 0-1) (Rehearsal 3)** Pre: audition at graduate level of performance. May be repeated. Conley

**594 Symphonic Wind Ensemble (I and II, 0-1) (Rehearsal 3)** Pre: audition at graduate level of performance. Pollart

**595 Concert Choir (I and II, 0-1) (Rehearsal 3)** Pre: audition at graduate level of performance. Conley

**596 Jazz and Studio Ensemble (I and II, 0-1)** Study and performance of jazz and studio music, with leadership roles in improvisation and performance. (*Rehearsal 3*) Pre: audition at graduate level of performance. Parillo

**597 University Symphony (I and II, 0-1) (Rehearsal 3)** Pre: audition at graduate level of performance. May be repeated. Danis

**598 Chamber Music Ensemble (I and II, 0-1)** Chamber music ensembles are designated as K Keyboard Ensemble, S String Ensemble, W Woodwind Ensemble, B Brass Ensemble, P Percussion Ensemble, V Vocal Ensemble, G Guitar Ensemble, J Jazz Ensemble, M Mixed Ensemble, O Opera Workshop. Select appropriate letter and small ensemble from the list and add to course number, as 598S String Ensemble. Other ensemble combinations may be added. Small instrumental ensembles are normally restricted to one performer per part. (*Rehearsal 2*) Pre: graduate standing in music and evidence by audition of graduate-level performance. May be repeated. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) Pre: 548. May be repeated. S/U credit. Staff

## Natural Resources Science (NRS)

Chairperson: Professor Husband

**100 Natural Resource Conservation (II, 3)** Introduction to man's use and management of natural resources: land, food, forest, wildlife, water, minerals, and air, with a survey of contemporary resource-use problems in environmental pollution. (Lec. 3) Husband (S)

**212 Introduction to Soil Science (I, 3)** Physical, biological, and chemical properties of soils and their practical application to environmental science. Introduction to soil genesis, classification, and land-use and conservation issues. (Lec. 3) Amador (N)

**286 Analysis and Presentation of Environmental Data (II, 3)** The scientific method, summarizing and reporting of numerical data, unique properties of environmental data, method of unit conversion, graphic visualization of environmental data. (Lec. 1, Lab. 2) Pre: 100 and 212, or permission of instructor. Open to natural resources science majors only. August

**300 Seminar in Natural Resources (I, 1)** Review and discussion of research and current topics in natural resources. (*Seminar*) Pre: 100 and 212. S/U credit. Husband

**301 Introduction to Forest Science (I, 3)** Development and importance of forestry; forest regions; tree characteristics and identification with emphasis on Northeastern species; forest environment; tree growth and site productivity. (Lec. 2, Lab. 2) Pre: BIO 112. Staff

**302 Fundamentals of Forest Management (II, 3)** Wood properties, timber harvesting, measurement and utilization of forest products; establishment, tending, and protection of forest stands; silvicultural systems; forest inventory procedures and management plans. (Lec. 2, Lab. 2) Pre: 301. Staff

**304 Field Ornithology (I, 3)** Identification, field study techniques, habitats, and basic biology of birds. Emphasis on field identification of local species. (Lec. 1, Lab. 4) Pre: BIO 113. Paton

**305 Principles of Wildlife Management (I, 3)** Introduction to wildlife management. Typical forest and farm game species. Forest and farm habitats analyzed, management principles emphasized. (Lec. 3) Pre: BIO 112, 113, and 262. McWilliams

**309 Wildlife Management Techniques Laboratory (I, 2)** Application of practical field techniques for quantification and evaluation of wildlife and habitats. Methods of field identification, sampling, and data analysis. (Lab. 4) Pre: 100 and concurrent enrollment in 305, or permission of instructor. McWilliams

**312 Methods in Soil and Water Analysis (I, 3)** Principles and exercises in the collection, analysis, and interpretation of soil and water data. Sampling and experimental design, chemical analysis techniques, data processing, and spatial analysis. (Lec. 1, Lab. 4) Pre: 212 and CHM 101 or 103 or permission of instructor. In alternate years. Next offered fall 1998. Compton

**324 Biology of Mammals (I, 3)** Classification, distribution, field study techniques, and basic biology of mammals. Emphasis on New England species. (Lec. 2, Lab. 3) Pre: BIO 113. In alternate years. Next offered in fall 1998. Husband

**351 Soil Morphology Practicum (I, 1)** Six weeks of practical experience in the description of soil profiles under field conditions. Field trips to observe, describe, and interpret morphological properties as utilized in soil judging. (*Practicum*) Pre: 212 or permission of instructor. May be repeated for credit with permission of chairperson. Stolt

**395 Research Apprenticeship in Natural Resources Science (I, II, and SS, 1–3)** Supervised experience for qualified undergraduates who assist NRS faculty and graduate students in departmental research projects. Tasks may include literature review, research design, installation of sampling plots and equipment, laboratory analyses, data collection, and data analysis. (Practicum) Pre: sophomore to senior standing and permission of instructor. Limited to NRS majors. May be repeated for a maximum of 6 credits. S/U credit. Staff

**399 Natural Resources Internship (I, II, and SS, 1–6)** Supervised work experience in forestry, wildlife management, soil science, water resources, environmental education, or related areas of natural resources management. (Practicum) Pre: 100, 212, and approval of chairperson. Open only to NRS majors. May be repeated for a maximum of 6 credits. S/U credit. Staff

**402 Wildlife Biometrics (I, 3)** Presentation of statistical design and analysis of ecological field measurements. Emphasis on quantitative measurements and data analyses used in wildlife population research. (Lec. 2, Lab. 3) Pre: BIO 262 and STA 308 or 409 or permission of instructor. In alternate years. Next offered in fall 1999. Husband

**406 Wetland Wildlife (II, 3)** Introduction to management of wetland wildlife. Emphasis on management techniques used for major wetland types, waterfowl, furbearers, and nongame wildlife. (Lec. 2, Lab. 2) Pre: BIO 262 or permission of instructor. Paton

**407 Nongame and Endangered Species Management (II, 3)** Management programs for nonhunted species, basic conservation biology, and techniques used for management of endangered species. (Lec. 3) Pre: 305 or concurrent enrollment in 305. In alternate years. Staff

**409 Concepts in GIS (I, 3)** Discussion of the unique properties of spatial data, GIS data structures, accessing existing spatial data, and applications of GIS in the environmental sciences. (Lec. 3) Pre: BIO 262 or permission of instructor. Not for graduate credit. August

**410 Fundamentals of GIS (I, 3)** Emphasis on using a geographic information system (GIS) to create a geographically referenced spatial database, spatial topology, data visualization, computer-assisted map making, and spatial data query and analysis. (Lab. 6) Pre: past or simultaneous enrollment in 409 or 509. August

**412 Soil-Water Chemistry (I, 3)** Biogeochemistry of soil-water interactions. Soil composition, the exchange and sorption of elements, trace element behavior, redox reactions and control of these factors on availability and loss. (Lec. 3) Pre: 212 and CHM 124 and 126 or permission of instructor. In alternate years. Next offered fall 1999. Compton

**423 Wetland Ecology (I, 4)** Formation, development, and distinguishing features of inland and coastal wetlands. Topics include classification, geology, hydrology, soils, plant ecology, vegetation dynamics. Primary emphasis on wetlands of the glaciated Northeast. (Lec. 2, Lab. 4) Pre: BIO 262, GEL 103, and concurrent enrollment in NRS 425 or 525. Golet

**424 Wetlands and Land Use (II, 4)** Survey of wetland values, exploitation, current status, and legal protection. Emphasis on critical issues including wetland evaluation, impact assessment, mitigation procedures. Field trips provide examples of wetland use conflicts. (Lec. 2, Lab. 4) Pre: 423 or permission of instructor. Golet

**425 Wetland Field Investigations (I, 1)** Independent field study of a diverse freshwater wetland ecosystem, with emphasis on aerial photo-interpretation, wetland classification, and in-depth examination of glacial geology, hydrology, plant ecology, and soils. (Practicum) Pre: concurrent enrollment in 423. Not for graduate credit. Golet

**426 Soil Microbiology (II, 3)** Occurrence, metabolism and ecology of soil microorganisms, with emphasis on nutrient cycling, soil pathogens, transformation of organic and inorganic pollutants, and soil biotechnology. (Lec. 3) Pre: 212 or permission of instructor. Amador

**440 Ecosystem Processes in Land and Water Management (II, 3)** Processes affecting the flows of energy, water, mass, and nutrients in terrestrial and aquatic ecosystems, with emphasis on linkages between ecosystems and management implications. (Lec. 3) Pre: BIO 262 and NRS 212 and CHM 101 or 103 or permission of instructor. Compton

**441 Methods in Ecosystem Analysis (II, 2)** Measurement of processes affecting the flow of energy, water, mass, and nutrients in terrestrial ecosystems of southern New England. Comparison of ecosystems and assessment of management impacts. (Lab. 4) Pre: 212 and BIO 262 and CHM 101 or 103 or permission of instructor. Compton

**450 Soil Conservation and Land Use (II, 3)** Application of soil survey interpretation as a tool in soil and water conservation and land use planning. Implications of soil properties and problems for land use considered with emphasis on urbanizing situations. (Lec. 3) Pre: 212 or permission of instructor. Stolt

**451 Soil and Water Conservation Technology (I, 3)** Principles and practices involved in mechanical protection, improvement, and development of soil and water resources. Design of conservation features and structures. (Lec. 2, Lab. 3) Pre: MTH 111 or equivalent. Staff

**461 Watershed Hydrology and Management (I, 4)** Study of the processes that govern the hydrology and quality of surface runoff and groundwater. Emphasis on watershed management and the impact of land use on water quality. (Lec. 3, Lab. 2) Pre: 212 or permission of instructor. Gold

**471 Soil Morphology and Mapping (I, 3)** A detailed study of the morphological properties of soils and their distribution on the landscape. Practical experience in describing soil profiles and preparing soil maps. (Lec. 1, Lab. 4) Pre: 212 or permission of instructor. Stolt

**475 Plant Nutrition and Soil Fertility**  
See Plant Sciences 475.

**491, 492 Special Projects (I, II, and SS, 1–3 each)** Special work to meet the needs of individual students in natural resources. (Independent Study) Pre: permission of chairperson. Staff

**498 Teaching Practicum in Natural Resources Science (I and II, 1–3)** Teaching experience for qualified undergraduates through actual involvement in planning and assisting in NRS courses. May include supervised participation in a discussion group, assisting in a laboratory or field course, or tutoring. (Practicum) Pre: senior standing, previous enrollment in the course to be taught, and permission of instructor. Limited to NRS majors. May be repeated for a maximum of 3 credits. Not for graduate credit. S/U only. Staff

**500 Graduate Seminar in Natural Resources (II, 1)** Presentation of research reports and discussion of current topics in natural resources. Critique of research methodology and scientific literature. (Seminar) Pre: graduate standing in NRS. Enrollment is required of all graduate students in residence, but no more than 2 credits may be taken for program credit. S/U credit. Golet

**505 Biology and Management of Migratory Birds (II, 2)** Current programs, problems, and techniques for managing migratory game and

nongame birds. Emphasis on basic biology of the species, habitat management, and harvest management. (Seminar) Pre: 305 or permission of instructor. In alternate years. Next offered spring 1999. Paton

**509 Concepts of GIS and Applications in Environmental Science (I, 3)** Unique properties of spatial data, geographic information system (GIS) data structures, accessing existing spatial data, and applications of GIS in the environmental sciences. Uses in ecology, conservation, soil science, geohydrology, and wildlife management. (Lec. 3) Pre: BIO 262 or permission of instructor. August

**510 Soil-Water Relations (II, 3)** Processes governing water flow and availability in unsaturated and saturated soil. Emphasis on soil-water-plant relationships with applications to watershed management and hydrology. (Lec. 2, Lab. 3) Pre: 212, 461, or permission of instructor. Gold

**522 Advanced GIS Analysis of Environmental Data (II, 3)** Discussion and application of terrain modeling, spatial statistics, proximity analysis, remote sensing/GIS linkages, and environmental data integration. Emphasis on ecological data at watershed/landscape scales. (Lec. 1, Lab. 6) Pre: 410 or permission of instructor. August

**523 Water Pollution Microbiology**  
See Microbiology 523.

**525 Wetland Field Investigations (I, 1)** Independent field study of a diverse freshwater wetland ecosystem, with emphasis on aerial photo-interpretation, wetland classification, and in-depth examination of glacial geology, hydrology, plant ecology and soils. (Practicum) Pre: concurrent enrollment in 423. Golet

**526 Microbial Ecology of Soils and Sediments (I, 3)** Occurrence and activity of microorganisms in soils and sediments, including wetlands. Environmental physiology of microbes; habitat interactions; methods of study; importance of microbial processes to ecosystem productivity, pollutant degradation, and atmospheric chemistry. (Lec. 3) Pre: 212, MIC 211, or permission of instructor. Amador

**532 Conservation Biology (II, 2)** Examination of the different components of conservation of biological diversity. Topics include genetics of small populations, minimum viable population sizes, captive propagation reintroduction ecology, and causes of extinction. (Lec. 2) Pre: BIO 262. In alternate years. Next offered spring 2000. Paton

**534 Ecology of Fragmented Landscapes (II, 2)** Presentation of the concepts of landscape ecology with emphasis on populations of plants and animals in fragmented habitats. Topics discussed include: habitat corridors, fluxes of energy and species along habitat edges, shape analysis, and stability of populations in habitat patches. (Lec. 2) Pre: BIO 262 or permission of instructor. In alternate years. Next offered spring 1999. August

**555 Applied Coastal Ecology (I, 2)** Resource management problems in coastal national parks. Topics include air and water pollution, barrier island erosion, deer overpopulation, Lyme disease, and ecosystem restoration. Examples of conflicting land-management mandates and research needs discussed. Optional field trips. (Lec. 2) Pre: advanced course work or experience in topical fields or permission of instructor. Offered in even-numbered years. Buckley, Ginsberg, and Roman

**567 Soil Genesis and Classification (II, 3)** Development of soils as influenced by physical, chemical, biological, and climatic factors. Processes of soil formation presented relative to soil taxonomy and geographic distribution. (Lec. 3) Pre: 471 or permission of instructor. Stolt

**568 Recent Advances in Natural Resources Science (I, 3)** Critical analysis and presentation of technical reports on recent advances in natural resources science. Topics will vary according to instructor and background of students. (Lec. 3) Pre: graduate standing or permission of instructor. Staff

**582 Seminar in Soil Ecology and Biochemistry (II, 1)** Discussion of current topics in special areas of soil ecology and biochemistry based on primary scientific literature. (Lec. 1) Pre: senior or graduate standing, 212, and permission of instructor. Amador

**591, 592 Special Problems (I and II, 1–3 each)** Advanced independent research projects supervised by members of the research staff and unrelated to thesis research. Projects developed to meet individual needs. (Independent Study) Pre: permission of chairperson. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## New England Studies (NES)

Coordinator: Associate Professor Schoonover

**200 New England (I or II, 3)** Introduction to the study and interpretation of New England culture through the social and natural sciences, humanities, and arts. Field work. (Lec. 3) Staff (L)

**300 The New England Experience (I or II, 3)** Life in New England, past and present, through varying disciplines focusing on a new topic each semester. (Lec. 3) May be repeated for credit with different emphasis. Staff

**400 Special Topics in New England Studies (I or II, 1–3)** Specialized topics in the study of New England offered by specialists in the field. (Seminar) May be repeated for credit with different topics. Staff

## Nursing (NUR)

Interim Dean: Associate Professor Joseph

**103 Professional Practice in Health and Illness (I and II, 3)** Introduction to the concept of professional helping including problem management, communication, the teaching process, and critical decision making. Analysis of ecosystem influences and cultural variability in health, illness, and health care. (Lec. 2, Lab. 3) Staff

**150 Human Sexuality (I and II, 3)** Interdisciplinary approach to the study of individual and societal determinants in the development, integration, and expression of human sexuality and a code of sexual behavior. (Lec. 3) Hirsch and Staff (S)

**203 Comprehensive Health Assessment (I and II, 3)** Introduces the techniques of history taking and systematic health assessment of individuals across the life span. Recognition of normal findings is emphasized. (Lec. 2, Lab. 3) Pre: BIO 242 and 244; NUR 103. Staff

**213 Pathophysiology (I, II, and SS, 3)** System approach to the examination of etiology, pathogenesis, and clinical manifestations underlying disease across the life span. Related research and diagnostics tests will be examined. (Lec. 3) Pre: BIO 242 and 244; MIC 201. Staff

**223 Health Promotion: Nursing Strategies and Interventions (I and II, 3)** Examination of health promotion in a nursing context. Emphasis on macro- and micro-level health promotion strategies applicable to nursing practice with individuals, families, and communities. (Lec. 3) Pre: 203; BIO 242 and 244; MIC 201; FSN 207 and PSY 232. Staff



**224 Practicum in Health Promotion Nursing (I and II, 3)** Application of health promotion principles and nursing strategies to clients of all ages, to families, and to communities. Emphasis on utilization of the nursing process in selected clinical situations. (Practicum) Pre: credit or concurrent enrollment in 223. Staff

**246 Conceptual Bases of Professional Nursing (I or II, 3)** Overview and synthesis of concepts essential to development of the professional nursing role. Primary emphasis on expanding and refining the theoretical bases for decision making and nursing strategies in client care. (Lec. 3) For R.N. students only. Staff

**273 Critical Thinking and Research in Nursing (I and II, 3)** Introduction to the principles of scientific inquiry and the research process, including identification of forms of analytical thinking common to problem solving in nursing. Opportunity for evaluating and applying research findings. (Lec. 3) Pre: PSY 300 or STA 220 or equivalent statistics course per instructor and concurrent or previous enrollment in 224. Staff

**323 Health Restoration: Nursing Strategies and Interventions (I and II, 6)** Focuses on strategies and interventions to restore health to individuals across the life span who have acute health problems. Emphasis on the nursing process and theoretical foundation. (Lec. 6) Pre: 224, 213, and 273; credit or concurrent enrollment in BMS 225 or 226. Staff.

**324 Practicum in Health Restoration Nursing (I and II, 6)** Application of health restoration strategies and interventions to adult clients with acute health problems. Application of the nursing process and scientific basis of nursing care. (Lab. 18) Pre: credit or concurrent enrollment in 323. Staff

**333 Psychiatric Mental Health Nursing (I and II, 3)** Nursing strategies to support and care for persons with limitations in psychosocial functioning in the context of family and community; psychiatric and/or mental health. (Lec. 3) Pre: 324; credit or concurrent enrollment in BMS 225 and 226. Staff

**334 Practicum in Psychiatric Mental Health Nursing (I and II, 3)** Application of the nursing process and the use of self as the therapeutic agent with individuals and groups of clients. Emphasis on developing nursing strategies for psychiatric and/or mental health care. (Lab. 9) Pre: credit or concurrent enrollment in 333. Staff

**343 Nursing in Childbearing and Reproductive Health (I and II, 3)** Emphasis on the nursing management of childbearing families and repro-

ductive health issues across the life span. (Lec. 3) Pre: credit or concurrent enrollment in BMS 225, 226 and NUR 334. Staff

**344 Practicum in Childbearing and Reproductive Health Nursing (I and II, 3)** Application of the nursing process in the care of individuals and families with childbearing and reproductive experiences. (Lab. 9) Pre: credit or concurrent enrollment in 343. Staff

**346 Practicum in Care of Clients and Families (I or II, 3)** Application of health promotion and restoration principles and corresponding nursing strategies for clients and families in a variety of clinical settings. (Practicum) Pre: 246 and 273. For R.N. students only. Staff

**349 Aging and Health (II, 3)** Examines normal age changes, effects on health, health problems, and interventions to achieve optimal wellness. Utilizes a systems perspective emphasizing healthy, positive aging and incorporates an interdisciplinary approach to care. (Lec. 3) Burbank

**360 Impact of Death on Behavior (I and II, 3)** Seminar to explore the human experience of dying and the issue of quality of life. Group discussion focuses on the effect that individual and social values and medical and social structures have on one's grief response and bereavement process. (Lec. 3) Staff (L)

**390 Directed Study (I and II, 1–3)** Research study or individual scholarly project relating to the nursing major. Faculty guidance in problem delineation and in development, implementation, and evaluation of the project. (Independent Study) Pre: admission to the College of Nursing. S/U credit. Staff

**423 Chronic Health Alterations: Strategies and Interventions (I and II, 3)** Examination of client and/or family problems associated with chronic illness and nursing management in various settings. Emphasis on theoretical analysis of strategies applicable to management of chronicity across the life span. (Lec. 3) Pre: 344 and BMS 225, 226. Not for graduate credit. Staff

**424 Practicum in Nursing of Older Adults with Health Alterations (I and II, 3)** Syntheses of gerontological knowledge and the application of the nursing process in the complex health care of older adults and their families. (Lab. 9) Pre: credit or concurrent enrollment in 423. Not for graduate credit. Staff

**434 Practicum in Nursing of Children with Health Alterations (I and II, 3)** Synthesis of pediatric knowledge and the application of the

nursing process in the care of ill children and their families. (Lab. 9) Pre: credit or concurrent enrollment in 423. Not for graduate credit. Staff

**443 Nursing of Vulnerable Populations in the Home and Community (I and II, 3)** Analysis of concepts related to the nursing care of clients in the home and community, with emphasis on vulnerable populations. (Lec. 3) Pre: 434, 424. For R.N. students; 246, 273. Not for graduate credit. Staff

**444 Practicum in Nursing of Vulnerable Populations (I and II, 3)** Application of the nursing process in the home care setting and with vulnerable populations in the community. In-depth analysis of a selected community, including utilization of the epidemiological process. (Lab. 9) Pre: credit or concurrent enrollment in 443. Not for graduate credit. Staff

**446 Clinical Directed Study for Registered Nurse Students (I and II, 1–4)** Clinical study or individual scholarly project related to the nursing major. Faculty guidance in problem delineation and in development, implementation, and evaluation of the project. (Independent Study) Pre: 346 and permission of instructor. Not for graduate credit. Staff

**454 Theories, Issues, and Practice in Professional Nursing (I and II, 3)** Examination of theories, issues, and concepts related to professional nursing. Emphasis on the application of principles of leadership and professionalism in a clinical experience. (Lec. 1.5, Lab. 4.5) Pre: credit or concurrent enrollment in 444. Not for graduate credit. Staff

**459 Perspectives on Male and Female Sexuality (I or II, 3)** Examination of the multifaceted perspectives (somatic, emotional, ethical, cultural) on male and female sexuality. Topics include history and recent developments in sexuality research, therapy, role and gender issues. (Lec. 3) Pre: 150 or permission of instructor. Hirsch and Dannenfelser

**467 Independent Study in Human Sexuality (I, II or SS, 2–6)** A specifically designed learning experience for the theoretical study of human sexuality and related practice strategies. (Independent Study) Pre: 150 or equivalent; permission of instructor. Hirsch or Dannenfelser

**468 Practicum in Theories of Human Sexuality (I, II or SS, 2–6)** A specifically designed practicum involving the application of theory and development of practice strategies in specific areas within the field of human sexuality. (Practicum) Pre: 150 and 467 or equivalent; permission of instructor. Hirsch or Dannenfelser

**500 General Study of Nursing Knowledge for Nursing Practice (I and II, 4)** Introduction to the essential features of nursing knowledge and its development in relation to nursing practice. Study of approaches to nursing knowledge development, and major conceptual/theoretical knowledge in nursing. (Lec. 3, Lab 2) *Pre: graduate standing.* Staff

**503 Expanded Nursing Assessment Skills (I and II, 3)** Expansion of nursing assessment skills including health history taking and physical, psychological, and social assessment skills. Specific physical assessment skills included are inspection, auscultation, percussion, and palpation. (Lec. 2, Lab. 1) *Pre: enrollment in the M.S. program in nursing.* Coppa, Carley, and Gerzevitz

**504 Expanded Nursing Assessment Skills: Pediatrics (I, 1)** Application of expanded nursing assessment skills to children. Includes assessment of growth and development, psychosocial, cognitive, and physical well-being of children of all age groups. (Lec. 1) *Pre: credit or concurrent enrollment in 503 or permission of instructor.* Coppa or McGrath

**505 Nursing Research (I or II, 3)** An overview and analysis of current research in nursing with special focus on patient care. Students will design a research project. (Seminar) *Pre: a course in statistics, credit or concurrent enrollment in 500, or permission of instructor.* Fortin, Kim, Miller, or Yeaw

**506 Independent Study in Nursing (I and II, 2–6)** Intensive study of a specific area of interest, a problem or issue in nursing under guidance of the faculty. (Independent Study) *Pre: permission of graduate faculty.* Staff

**507 Theories of Practice for Nursing (II, 3)** Analysis of general theories of practice for nursing and their applicability to various areas of clinical practice. (Seminar) *Pre: 500 or permission of instructor.* Hirsch or Burbank

**510 Nursing Leadership in the Health Policy Process (II, 3)** Study of nurses' participation in the health policy process. Focus on theories for the development of nursing leaders. Analysis and application of creative nursing strategies for the enhancement of health care. (Seminar) *Pre: enrollment in the M.S. program in nursing.* Hirsch or Schmieding

**511 Advanced Mental Health Nursing I (II, 3)** Investigation of theories of healthy and psychopathological patterns of individual behavior from a mental health perspective. (Seminar) *Pre:*

*500 and credit or concurrent enrollment in 512.* Ferszt

**512 Practicum in Advanced Mental Health Nursing I (II, 3)** Field experience to develop competence in the practice of advanced mental health nursing. Emphasis on application of relevant theories in solving individuals' mental health problems. (Practicum) *Pre: 500 and concurrent enrollment in 511.* Ferszt

**513 Advanced Mental Health Nursing II (I, 3)** Theoretical analysis of current modes of advanced mental health intervention in order to explain strategies for solution of family, group, and community problems. (Seminar) *Pre: 511, 512, and concurrent enrollment in 514.* Ferszt

**514 Practicum in Advanced Mental Health Nursing II (I, 3)** Field experience to develop increased competence in the practice of mental health nursing intervention. (Practicum) *Pre: 511, 512, and concurrent enrollment in 513.* Ferszt

**520 Graduate Study Seminar (I or II, 1)** A seminar designed to facilitate the synthesis and examination of information learned in the master's program about nursing knowledge development, advancement of nursing practice, and leadership role development. (Seminar) *Pre: completion of 30 graduate program credits and concurrent enrollment in the final sequence of concentration courses.* Staff

**521 Theoretical Study of Major Problems in Nursing Practice (II, 3)** Major theories and concepts for developing strategies in nursing practice. Emphasis on developing nursing strategies through theoretical analysis of problems viewed in the context of organizational and societal systems. (Seminar) *Pre: 500 and concurrent enrollment in 522.* Dufault

**522 Practicum in the Study of Major Problems in Nursing Practice (II, 3)** Field study of major nursing problems with emphasis on examination, evaluation, and revision of nursing strategies for problems in the context of organizational and societal systems. (Practicum) *Pre: 500 and concurrent enrollment in 521.* Dufault

**531 Primary Health Care Nursing I (II, 3)** Theoretical knowledge and skills for the development of nursing strategies in analyzing, managing, and preventing health-related problems common to primary health care clients. (Seminar) *Pre: 500; 503 and 504.* Coppa, Carley, and Gerzevitz

**532 Practicum in Primary Health Care Nursing I (II, 3)** Clinical application of theoretical

knowledge and skills as presented in 531. (Practicum) *Pre: concurrent enrollment in 531.* Coppa, Carley, and Gerzevitz

**533 Primary Health Care Nursing II (I, 3)** Theoretical study for the development of increased nursing competency in primary care practice. Emphasis on health care strategies to assist individuals and families in coping with health-related problems. (Seminar) *Pre: 531, 532, and concurrent enrollment in 534.* Coppa, Carley, and Gerzevitz

**534 Practicum in Primary Health Care Nursing II (I, 6)** Application of theoretical knowledge and skills for the development of nursing strategies for health promotion and management of health-related problems common to families. (Practicum) *Pre: 531, 532, and concurrent enrollment in 533.* Coppa, Carley, and Gerzevitz

**535 Pathophysiology for Advanced Practice Nurses (I, 3)** An in-depth study of pathophysiological phenomena across the life span from the biological life processes perspective. Clinical decision making based on the synthesis of this knowledge and current research findings will be explored. (Lec. 3) *Pre: admission to graduate program in nursing or permission of instructor.* Gerzevitz

**538 Learning Theories and Strategies for Health Professionals (II, 3)** The study of selected learning theories and strategies and their application in health professions. Emphasis will be on expanding the scope of teaching as professionals. (Lec 3) *Pre: 500 or permission of instructor.* Hirsch

**539 Application of Learning Theories in Professional Practice (II, 3)** Field project in the application of learning theories and strategies in professional practice. Emphasis on gaining knowledge of the application of strategies and outcome evaluation in practice and educational settings. (Practicum) *Pre: Previous or concurrent enrollment in 538 or permission of instructor.* Hirsch

**541 Advanced Study of Teaching in Nursing Education and Practice (I, 3)** Advanced study of educational theories and strategies having application in nursing education and practice. Emphasis will be on role development, instructional design, methods, and evaluation. (Lec. 3) *Pre: 507, 539, or permission of instructor. In alternate years. Next offered 1999–00.* Hirsch

**542 Practicum in Nursing Education and Practice (I, 6)** A field experience designed to develop competence in teaching. Emphasis is

placed on the instructional design component and the utilization of strategies based on theoretical knowledge. *(Practicum) Pre: permission of instructor or previous or concurrent enrollment in 541. In alternate years. Next offered 1999–00.* Hirsch

**551 Theoretical Study of Nursing Administration (I, 3)** Study of relation of nursing philosophy, organizational theories, and practice environment to nursing administration. Emphasis on theories, concepts, and issues that explain and advance strategies in nursing administration. *(Seminar) Pre: 505, 507, two restricted electives, or permission of instructor. In alternate years. Next offered 1999–00.* Schmieding

**552 Practicum in Nursing Administration (I, 6)** Field experience in nursing administration. Emphasis on role development and the examination, development, and implementation of strategies in nursing administration. *(Practicum) Pre: Previous or concurrent enrollment in 551. In alternate years. Next offered 1999–00.* Schmieding

**555 Advanced Gerontological Nursing I (II, 3)** Study of the theories of aging, age-related changes, and health needs of healthy older adults and those with minimal functional limitations using problem-strategy-theory approaches to nursing knowledge. *(Seminar) Pre: 500 or permission of instructor. In alternate years. Next offered 1999–00.* Burbank

**556 Practicum in Advanced Gerontological Nursing I (II, 3)** Study of major problems and issues in advanced gerontological nursing through provision of nursing care to healthy older adults and those with minimal functional limitations. *(Practicum) Pre: Concurrent or previous enrollment in 555. In alternate years. Next offered 1999–00.* Burbank

**557 Advanced Gerontological Nursing II (I, 3)** Analysis of theoretical and empirical knowledge necessary for care of frail older adults and those with complex health problems and functional limitations within acute and long-term care settings. *(Seminar) Pre: 505, 507, 556. In alternate years. Next offered 1998–99.* Burbank

**558 Practicum in Advanced Gerontological Nursing II (I, 6)** Development, evaluation, and revision of theory-based strategies for selected nursing problems through provision of nursing care to older adults with multiple chronic and acute illnesses and functional limitations. *(Practicum) Pre: Previous or concurrent enrollment in 557. In alternate years. Next offered 1998–99.* Burbank

**560 Ethical Theories, Nursing Practice, and Health Care (I or II, 3)** Analysis of philosophic positions, ethical theories, and moral principles important to professional nurses in their clinical, educative, and administrative practice. *(Seminar) Pre: B.S. or B.A. in a health-related field, one course in philosophy and ethics, or permission of instructor. Staff*

**562 Advanced Clinical Study of Nursing Practice in Critical Care (I, 6)** Study and application of the theories of practice and of biopsychosocial interaction in advanced critical care nursing. Analysis of patient problems and nursing strategies relevant to critical care patients. *(Practicum) Pre: 500 and concurrent enrollment in 569. In alternate years. Next offered 1998–99.* Fortin

**564 Advanced Clinical Study of Nursing Practice in Parent-Child Health (I, 6)** Study and application of normal developmental and biopsychosocial stress theories in advanced clinical parent-child health nursing. Analysis of problems and nursing strategies relevant to parents and children. *(Practicum) Pre: 500 and concurrent enrollment in 569. In alternate years. Next offered 1998–99.* Hirsch and McGrath

**569 Theoretical Study of Advanced Nursing (I, 3)** Theoretical foundations of advanced nursing practice. Emphasis is on the reciprocal nature of the relationship between theories, client problems, and nursing strategies in the areas of advanced practice. *(Seminar) Pre: 507, 521, 522, and concurrent enrollment in 562 or 564, or permission of instructor. Next offered fall 1998.* Hirsh

**571 Theoretical Study of Well Women's Health Care (I, 3)** A study of major theories, client issues, and nurse-midwifery strategies used in the care of well women seeking gynecological health care. *(Seminar) Pre: 500. Mercer and Pringle*

**572 Practicum: Theoretical Study of Well Women's Health Care (II, 3)** Clinical application of the theoretical knowledge and interventions in the care of well women in ambulatory health care settings. *(Practicum) Pre: prior or concurrent enrollment in 571.* Kennedy

**573 Theoretical Study of the Childbearing Woman and Her Family (II, 3)** Within a systems perspective, theories are utilized to examine client issues related to the normal childbirth experience. Knowledge and skills relevant to nurse-midwifery strategies of normal childbirth are emphasized. *(Seminar) Pre: credit or concurrent enrollment in 571, 572; concurrent enrollment in 574.* Erickson-Owens

**574 Practicum: Theoretical Study of the Childbearing Woman and Her Family (II, 3)** Theoretical application of nurse-midwifery strategies during the normal childbirth experience. Knowledge and skills relevant to patient care are emphasized. *(Practicum) Pre: concurrent enrollment in 573.* Kennedy

**575 Advanced Practice: Collaborative Nurse-Midwifery (I, 3)** Within a systems perspective, theories are utilized to examine client issues of the at-risk childbirth experience. Expanded nurse-midwifery strategies related to collaborative practice within the community are emphasized. *(Seminar) Pre: concurrent enrollment in 576.* Staff

**576 Advanced Practice: Collaborative Nurse-Midwifery Practicum (I, 6)** Field study of the clinical application of theoretical knowledge and skills in the at-risk childbirth experience. Use of collaborative practice and the management process within communities is emphasized. *(Practicum) Pre: concurrent enrollment in 575.* Staff

**577 Practice and Integration of Nurse-Midwifery (I or II, 5)** Comprehensive and practical application of clinical skills and theoretical knowledge in nurse-midwifery. Complete integration of the nurse-midwifery role with the client, family, and community. *(Practicum) Pre: 575 and 576.* Staff

**582 Pharmacotherapeutics in Advanced Practice Nursing (II, 3)** Integration of pharmacotherapeutic and decision-making theories with human pathophysiology. Case management approach to the prescription of medications in primary health care across the life span. *(Lec. 3) Pre: matriculation into master's program in nursing or permission of instructor.* Coppa

**590 Directed Study and Practice in Advanced Clinical Nursing (I or II, 3)** In-depth study and supervised clinical practice in a specialized area of nursing. *(Independent Study) Pre: graduate standing and permission of graduate faculty.* Staff

**601 Foundations of Nursing Science (II, 3)** Analysis of the nature of nursing knowledge from the historical and epistemological perspectives. Focus on examination of theoretical, ethical, and methodological foundations of the development of nursing science. *(Seminar) Pre: enrollment in the Ph.D. program in nursing.* Kim

**602 Construction of Nursing Theory I: Inductive Process (II, 4)** Study of inductive approaches to generating theory relevant to nursing science. Examination of multidisciplinary strategies for generation of theory from

field data. (Seminar) Pre: enrollment in the Ph.D. program in nursing, 601, or permission of instructor. Schwartz-Barcott

### 603 Construction of Nursing Theory II:

**Deductive Process** (I, 3) Study of deductive theory-building as applied to nursing science. Focus on the nature of deductive theories and the application of deductive process to nursing theory construction. (Seminar) Pre: enrollment in the Ph.D. program in nursing, 601, or permission of instructor. Kim

### 621 Nursing Theory and Research in the Client Domain

(I, 3) In-depth, comparative analysis of existing nursing theories and research relevant to the client domain. Development of a research proposal for validation of a selected nursing theory. (Seminar) Pre: doctoral standing in nursing and completion of core courses in nursing. Schwartz-Barcott

### 631 Nursing Theory and Research in the Client-Nurse Domain

(I or II, 3) Study of theoretical and research work in the client-nurse domain. Formulation and testing of hypotheses dealing with client-nurse phenomena. (Seminar) Pre: doctoral standing in nursing and completion of core courses in nursing. Kim and Miller

### 641 Nursing Theory and Research in the Practice Domain

(I, 3) In-depth analysis of theoretical and research work in the nursing domain of practice. The expansion and refinement of knowledge for nurse-system phenomena of the practice domain. (Seminar) Pre: doctoral standing in nursing and completion of core courses in nursing. Kim

### 651 Advanced Methods in Nursing Research I

(I, 3) In-depth study of theories and methods in sampling, research design, data collection, and data analysis, and their application to qualitative research in nursing. Emphasis on qualitative data collection methods. (Seminar) Pre: enrollment in the Ph.D. program in nursing, advanced statistics course, or permission of instructor. Fortin

### 652 Advanced Methods in Nursing Research II

(II, 3) In-depth study of application of theories and methods in sampling, research design, data collection, data analysis for quantitative and evaluative research in nursing. (Seminar) Pre: enrollment in the Ph.D. program in nursing, 651, or permission of instructor. Fortin

### 653 Measurement and Instrument Development in Nursing Research

(II, 3) In-depth study of theories and methods relevant to measurement and instrument development for nursing and health sciences. Emphasis on measure-

ment as an ongoing process of successive approximation, refinement, and validation. (Seminar) Pre: completion of 652 or permission of instructor. Fortin

### 660 Philosophical Foundations for Health Care Research

(I, 3) Presentation of the historical and philosophical basis of contemporary health care research. (Seminar) Pre: enrollment in the Ph.D. program in nursing. Burbank

### 671 Role Development in Nursing Research

(II, 3) In-depth examination of the role of the nurse researcher as a member of a multidisciplinary team and in academia. Emphasis on theories and issues related to researcher role development. (Seminar) Pre: doctoral standing in nursing, 601, 602 or 603, and 660. McGrath

### 699 Doctoral Dissertation Research

(I or II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**995 Reading and Research in Nursing** (I or II, 1–6) Advanced work by individual student on a selected issue in nursing under the direction of a faculty member. (Independent Study) Pre: graduate standing. S/U credit. Staff

## Ocean Engineering (OCE)

Chairperson: Professor Spaulding

### 101 Introduction to Ocean Engineering

(II, 1) Overview of ocean engineering topics pointing out the common areas with other engineering branches but emphasizing specific ocean applications. (Seminar) S/U only. Staff

### 215 Ocean Engineering Seminar I

(I and II, 1) Topics in ocean engineering will be covered in a seminar form. New directions and established areas of ocean engineering will be presented. Speakers will be alternated between invited industry representatives, faculty, and students. (Seminar) S/U only. Staff

### 216 Introduction to Ocean Engineering Design

(II, 1) Introduction to the design of systems in ocean engineering featuring team-based, hands-on projects. Stress-integrated approach includes socioeconomic, environmental, and operational aspects. (Lec. 1) Staff

### 307 Introduction to Engineering Wave Mechanics and Littoral Processes

(II, 3) Description of coastal area and the study of beach dynamics and coastal protection methods. Linearized water waves, velocity, pressure, and wave group sound energy. Wave refraction: diffraction, shoaling, and breaking. Waves and

water-level prediction. Nearshore waves and current. Littoral transport. (Lec. 3) Pre: MCE 354 or permission of instructor. Grilli

### 310 Basic Ocean Measurement

(I, 3) Basic ocean measurement and instrumentation exercises using boats and laboratories. Includes cruise design, navigation and mapping systems, sonar systems, water quality sensors, wave spectra, computer data acquisition, and signal processing. (Lec. 1, Lab. 2) Pre: ELE 220 or permission of instructor. Tyce

### 311 Coastal Measurements and Applications

(I, 4) Exercises in basic coastal measurement from vessels, in situ, and in the laboratory. Experiments in measuring currents, surface elevation, wave and wave forces, geotechnical properties and applications, and acoustic propagation. (Lec. 2, Lab. 4) Spaulding

### 395 Ocean Systems Design Proposal

(II, 1) Development of detailed proposal for students' individual ocean systems design project. (Independent Study) Pre: junior standing in ocean engineering. S/U only. Spaulding

### 416 Ocean Engineering Seminar II

(I and II, 1) Topics in ocean engineering will be covered in a seminar form. New directions, established areas, and professional ethics in ocean engineering will be presented. Speakers will be alternated between invited industry representatives, faculty, and students. (Seminar) Not for graduate credit. S/U only. Spaulding

### 421 Marine Structure Design

(II, 3) Statistical properties and spectra of sea waves; design of vertical breakwaters; design of sea walls; harbor tranquility, design concept for offshore structures. (Lec. 3) Pre: 307. Hu

### 425 Coastal Experiments

(II, 4) Basic coastal measurement techniques for coastal management. Experimental (field and laboratory) measurements of physical and geological parameters. Major student designed, operated, and reported experiment addressing a practical problem. (Lec. 2, Lab. 4) Not for credit in ocean engineering. Pre: MTH 107 or 108 or equivalent. Spaulding

### 471 Underwater Acoustics

(II, 3) Vibrations, the acoustic wave equation, duct acoustics, and sound pressure levels and spectra. Underwater acoustics including transducers, arrays, surface and bottom scattering, and ray propagation. (Lec. 3) Pre: MCE 372. Not for graduate credit. Stepanishen

### 483 Foundation Engineering

See Civil and Environmental Engineering 483.

**491, 492 Special Problems I, II (I and II, 1–6 each)** Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) *Pre: permission of chairperson. Not for graduate credit. Staff*

**495 Ocean Systems Design Project (I, 4)** Design project of an ocean-related system under the supervision of a faculty advisor. The project is to combine a number of different engineering and scientific disciplines. (*Lec. 4*) *Pre: 395. Not for graduate credit. Staff*

**510 Engineering Ocean Mechanics (II, 3)** Fundamental equations of estuarine and coastal hydrodynamics. Scaling of governing equations. Long period waves including seiches, tides, storm surges, and tsunamis. Wind- and estuarine-induced circulation. Pollutant and sediment transport. (*Lec. 3*) *Pre: MCE 354 or equivalent. Spaulding*

**514 Engineering Wave Mechanics and Nearshore Processes (I, 3)** Linear water wave boundary value problem. Engineering wave properties. Nonlinear waves (long waves, Stokes waves, stream function waves). Nearshore hydrodynamics and wave breaking. Fully nonlinear transient waves. (*Lec. 3*) *Pre: MCE 455 or equivalent. Grilli*

**515 Marine and Vehicle Hydrodynamics (I, 3)** Hydrodynamics of fixed and floating ocean structures (vehicles). Viscous, inviscid, and ideal fluid flows; and linear water waves involving bodies in unbounded fluid, floating bodies (in still water and in waves); ship waves; lifting surfaces. (*Lec. 3*) *Pre: MCE 354 or equivalent or OCE 510 or 514; 307, 514 or equivalent. Grilli*

**522 Dynamics of Waves and Structures (I, 3)** Deterministic analysis for SADO structures; MDOF dynamic analysis; distributed-parameter systems; linear and second-order Stokes wave theories; wave forces on cylinders; chaotic vibration of marine structures. (*Lec. 3*) *Pre: MCE 464 or permission of instructor. Hu*

**534 Corrosion and Corrosion Control**  
See Chemical Engineering 534.

**535 Advanced Course in Corrosion**  
See Chemical Engineering 535.

**537 Advanced Materials Engineering**  
See Chemical Engineering 537.

**560 Introduction to Data Collection Systems (I, 3)** Practical problems of data collection. Probes and sensors, interfaces, signal conditioning, and storage. Examples found among the

current research areas within ocean engineering will be emphasized. (*Lec. 3*) *Pre: graduate standing in engineering or permission of instructor. In alternate years. Next offered fall 1999. Tyce*

**561 Introduction to the Analysis of Oceanographic Data (I, 3)** Design of oceanic experiments to determine spatial and temporal sampling rate, precision, accuracy, signal-to-noise ratio, etc. Description of typical ocean data collection and analysis systems. Development of relevant techniques. (*Lec. 3*) *Pre: IME 411, MTH 451, or equivalent. Miller*

**565 Ocean Laboratory I (I or II, 3)** Measurements, experiments, operation of apparatus in the ocean and in the laboratory. Statistical theory, planning multivariable experiments, checking of data, etc. (*Lec. 1, Lab. 6*) *Pre: graduate standing in engineering or oceanography, or permission of instructor. Tyce*

**571 (or ELE 571) Underwater Acoustics I (I, 3)** Introduction to sound generation, transmission, and reception, including vibration of mechanical systems, acoustic waves in fluids, acoustic transducers and arrays, acoustic propagation in the ocean, and sonar systems. (*Lec. 3*)  
Stepanishen

**572 Underwater Acoustic Transducers (I or II, 3)** Theory, design, and calibration of electroacoustical transducers including: dynamical analogies and equivalent circuits, piezoelectric and magnetostrictive materials, transmitting and receiving responses, reciprocity and acoustic measurements. (*Lec. 3*) *Pre: 471 or equivalent. Stepanishen*

**575 Marine Bioacoustics (II, 3)** Introduction to marine mammal hearing, sound production, and the uses of sound for communication and echolocation; dolphin sonars; analysis and processing of marine mammal signals including passive tracking; the effects of noise on marine mammals. (*Lec. 3*) *Pre: 471 or permission of instructor. Miller*

**581 Experimental Geomechanics**  
See Civil and Environmental Engineering 581.

**582 (or CVE 582) Seabed Geotechnics (I or II, 3)** Geotechnical engineering principles as applied to submarine slope stability, bearing capacity, anchoring; emphasis on effective stress principle, compressibility, and shear strength of marine sediments. (*Lec. 3*) *Pre: CVE 381 or equivalent or OCE 311, or permission of instructor. Silva*

**583 Advanced Foundation Engineering**  
See Civil and Environmental Engineering 583.

**591, 592 Special Problems (I and II, 1–6 each)** Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) *Pre: permission of chairperson. Staff*

**599 Master's Thesis Research (I and II, 1–9)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) *S/U credit.*

**605, 606 Ocean Engineering Seminar (I and II, 1 each)** Seminar discussions including presentation of papers based on research or literature survey. (*Seminar*) *Required of all resident graduate students. May be repeated for a maximum of 2 nonprogram credits. S/U credit. Staff*

**611 Coastal and Estuarine Environmental Modeling (I, 3)** Numerical modeling techniques to solve problems in coastal and estuarine circulation and pollutant transport. Application of models to predict tidal, wind, and density-forced circulation, constituent and sediment transport, oil and chemical spill transport. (*Lec. 3*) *Pre: 510 or permission of instructor. Spaulding*

**614 Coastal Modeling (II, 3)** Mild slope equation. Parabolic wave equation. Harbor oscillations and wave field modeling (refraction—diffraction). Nearshore hydrodynamic models. Fully nonlinear wave model (boundary elements) and applications. (*Lec. 3*) *Pre: 514. Grilli*

**623 Random Waves and Vibrations (II, 3)** Random ocean waves; random wave kinematics and forces; wave kinematics near ocean surface; linear and second-order random wave theories; wave simulations; linear random vibration; nonlinear stochastic dynamic analysis. (*Lec. 3*) *Pre: 522. Hu*

**661 Analysis of Oceanographic Data Systems (I, 3)** Design of systems for deep-ocean and estuarine data collection and processing. Space-time sampling, multivariate analysis, and convergence of moments as applied to ocean data estimation and system design. Current topics in ocean data systems. (*Lec. 3*) *Pre: 560 or ELE 506 or equivalent. Miller*

**666 Ocean Laboratory II (I, 3)** Advanced design/laboratory course in ocean mapping and instrumentation. Students work as a team designing and deploying ocean instrumentation, including sonars, navigation systems, vessels, buoys, underwater sensors, at locations of opportunity. (*Lec. 1, Lab. 6*) *Pre: 565 or permission of instructor. Tyce*

**672 (or ELE 672) Underwater Acoustics II (II, 3)** Sound transmission in ocean, transducers, active signal design for range and Doppler reso-

lution, ambient and platform noise, classical and wave vector-frequency methods of beamforming, adaptive beamforming, characteristics of targets, and active/passive sonar systems. (Lec. 3) Pre: 571. Stepanishen

**673 Advanced Course in Underwater Acoustic Propagation (I, 3)** Analysis of propagation from a concentrated acoustic source in the ocean by methods such as advanced normal mode theory, numerical integration, and Fast Fourier Transforms. Applications to ocean features such as surface ducts, shadow zones, deep-sound channel, etc. (Lec. 3) Pre: 571 or equivalent. Stepanishen

**674 Nonlinear Acoustics (I or II, 3)** Topics in the nonlinear acoustics of fluids, propagation and interactions of finite-amplitude sound waves, parametric sonar, sound generation by turbulence, cavitation noise, shock waves, underwater explosions, radiation pressure and acoustic streaming. (Lec. 3) Pre: 571 or permission of instructor. Stepanishen

**675 Processing of Underwater Acoustic Data (II, 3)** Description of the underwater acoustic environment. Methods of measuring underwater acoustic signals. Data analysis of passive and active signals. Applications of underwater acoustics to oceanographic survey. (Lec. 3) Pre: ELE 506 or equivalent. Stepanishen

**676 Acoustic Radiation from Underwater Vibrators (I or II, 3)** Fundamentals of acoustic radiation from submerged structures. Radiation from planar, cylindrical, and spherical surfaces. In-vacuo and in-fluid vibration of elastic bodies. Acoustic coincidence and fluid-loading effects on radiation from elastic bodies. (Lec. 3) Pre: 571 or permission of instructor. Stepanishen

**677 Statistical Sonar Signal Processing**  
See Electrical Engineering 677.

**688 (or CVE 688) Marine Geomechanics (I or II, 3)** Integrated study of marine geotechnics and marine geology. Topics include sedimentary processes, acoustic characteristics, slope stability, consolidation and stress history, engineering properties and other subjects related to seabed utilization. (Lec. 3) Pre: CVE 381 or permission of instructor. Silva

**691, 692 Special Problems (I and II, 1–6 each)** Advanced work under supervision of a staff member arranged to suit the individual requirements of the student. (Independent Study) Pre: permission of chairperson. Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester

in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Oceanography (OCG)

Dean: Professor Leinen

**110 (or GEL 110) The Ocean Planet (I, 3)** Formation of the universe, solar system, and solid Earth. Evolution of Earth's oceans, atmosphere, and biosphere. Natural resources and present environment on Earth. (Lec. 3) Larson and Kincaid (N)

**123 Oceans, Atmospheres, and Global Change (II, 4)** The impact of human activities on the oceans, atmospheric composition, and climate set against a background of natural processes in and history of global changes in climate and ecosystems. (Lec. 3, Lab. 3) Merrill (N)

**131 Volcanoes and the Environment (I, 3)** General introduction to volcanic eruptions and their impact on the global environment and on human activity. Basic principles of the generation of magmas and their eruption at the earth's surface. (Lec. 3) Carey and Sigurdsson (N)

**401 General Oceanography (I, 3)** General survey in the major disciplines including geological, physical, chemical, and biological ocean sciences integrated into a conceptual approach to the coastal ocean. (Lec. 3) Pre: at least one laboratory course in a physical or biological science and junior standing or above. Staff (N)

**451 Oceanographic Science (II, 3)** Oceanography for undergraduate science majors. The approach used is to present and apply basic physical, chemical, geological, and biological principles to the integrated study of the world ocean system. (Lec. 3) Pre: two semesters of MTH 131 and 132 or 141 and 142, one semester of CHM 101 and 102 or 191, one semester of PHY 111 and 185 or 203 and 273 or 213 and 285. A second semester of CHM 112 and 114 or 192 is recommended. Not for graduate credit for GSO students. D'Hondt and Heikes

**480 Introduction to Marine Pollution (II, 3)** An introductory course in marine pollution emphasizing geochemical aspects of the sources, transport, and fate of pollutants in the coastal marine environment. (Lec. 3) Pre: one semester of general chemistry (CHM 101 or 103); one semester of general biology (BIO 100, 103 or 104) and general geology (GEL 100 or 103) are recommended. Not for graduate credit. Quinn or King

**483, 484 Laboratory and Research Problems in Physics**  
See Physics 483, 484.

**491 Ocean Studies (I and II, 15)** Full-time intensive work experience with Graduate School of Oceanography research staff at Narragansett Bay Campus. Student expected to participate in research program, seminars, and other activities of Bay Campus. (Independent Study) Pre: junior standing in natural sciences, natural resources, or engineering, and permission of staff. Not for graduate credit in oceanography. S/U only. Staff

**493, 494 Special Problems and Independent Study in Oceanography (I and II, 1–6 each)** Research in oceanography conducted as supervised individual study. (Independent Study) Pre: junior or senior standing in natural science, natural resources, or engineering, and permission of staff. S/U only. Staff

**501 Physical Oceanography (I, 3)** Basic course covering physical properties of seawater, heat budget, distribution of variables, dynamics, water masses and general circulation, waves and tides. (Lec. 3) Pre: PHY 213 and MTH 141. Hebert

**505 Marine Analytical Chemistry (I, 3)** Application of analytical methods to marine problems with emphasis on understanding basic methods and instruments. Combines general principles with practical experience. Students conduct analytical projects in the laboratory. (Lec. 1, Lab. 2) Offered every fall. Kester and Heikes

**510 Descriptive Physical Oceanography (II, 3)** Observed distributions of temperature, salinity, currents; methods of deducing deep flow; physical properties of seawater; flow in estuaries; practical work in the analysis of oceanographic data; study of recent literature. (Lec. 3) Pre: 501. Rossby

**521 Chemical Oceanography (II, 3)** Processes regulating the composition of seawater and the distribution of chemical species. The interaction of marine chemistry with the ocean floor, atmosphere, and marine organisms. (Lec. 2, Lab. 2) Pre: CHM 101 and 112 and PHY 213. Pilson

**523 Organic Geochemistry of Natural Waters (I, 3)** Chemistry of organic matter in natural waters with emphasis on the marine environment. Topics include a consideration of the origin, nature, and biogeochemical reactions of organic matter in aquatic environments. (Lec. 3) Pre: CHM 228 or permission of instructor. Offered in odd-numbered years. Quinn

**524 Chemistry of the Marine Atmosphere (II, 3)** Chemistry and physics of marine aerosols, trace gases, and precipitation; cycles and budgets of atmospheric nitrogen, sulfur, halogen, and carbon compounds; effects of man on the

marine atmosphere. (Lec. 3) *Pre: 521 and CHM 432 or permission of instructor. Offered in odd-numbered years. Staff*

**531 Synoptic and Dynamic Meteorology (I, 3)** Observed structure of atmosphere; principles of balanced flows, waves, and disturbances. Observations and models of storm formation, semi-permanent features, and general circulation. Relationship between weather and climate. (Lec. 3) *Pre: PHY 203 or permission of instructor. Merrill*

**533 Graduate Writing in Marine and Environmental Sciences (I, 3)** Graduate writing in marine and environmental sciences; writing and editing journal articles and abstracts; principles and practice in scientific writing. *Pre: Graduate standing and WRT 101, or permission of instructor. Rahn*

**540 Geological Oceanography (II, 3)** Origin and evolution of the ocean basin and its margin: morphology, structure, plate tectonics, volcanism, geochemistry, stratigraphy, sedimentation, and paleoceanography. (Lec. 2, Lab. 2) *Pre: GEL 103 or permission of instructor. Staff*

**561 Biological Oceanography (I, 4)** Dynamics of marine ecosystems; patterns of production and distribution of plankton, benthos, and nekton in relationship to their environment. (Lec. 3, Lab. 2) *Pre: general ecology. Oviatt*

**574 Biology of Marine Mammals (II, 3)** Migration, reproduction, social organization, classification, anatomy, populations, physiology, and communications of cetaceans and pinnipeds. (Lec. 2, Lab. 2) *Pre: permission of instructor. In alternate years. Next offered spring 2000. Staff*

**576 (or MIC 576) Marine Microbiology (I, 4)** The role of bacteria, fungi, apochlorotic algae, flagellates, sarcodines, and ciliates in the cycling of organic matter is discussed in the context of their structure, habitats, trophic modes, ecology, processes, and taxonomy. (Lec. 3, Lab. 3) *Pre: CHM 112 and MIC 201 or 211 or permission of instructor. Offered in odd-numbered years. Staff*

**580 Introduction to Marine Pollution (II, 3)** An introductory course in marine pollution emphasizing geochemical aspects of the sources, transport and fate of pollutants in the coastal marine environment. *Review papers or research proposals will be required. (Lec. 3) Pre: one semester of general chemistry (CHM 101 or 103); one semester of general biology (BIO 100, 103 or 104) and general geology (GEL 100 or 103) is recommended. Quinn and King*

**591, 592 Individual Study (I and II, 1–6)** Individual study of assigned topics or special problems involving literature search and/or original investigation under one or more members of the staff. (*Independent Study*) *Staff*

**593, 594 Special Studies (I and II, 1–4 each)** Studies of specialized topics in the marine sciences. (*Independent Study*) *Staff*

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) *S/U credit. Staff*

**605 Dynamical Oceanography (II, 3)** Simple steady-state theories applied to ocean motion. Review of well-known force balances in oceanography, wind-driven circulation, thermohaline circulation, the thermocline, oceanic boundary layers, nearshore circulation, diffusion. (Lec. 3) *Pre: 501. Watts*

**606 Aquatic Community Ecology (II, 3)** Lectures and discussion of controversial topics contrasting marine and freshwater communities. Current topics of interest will vary on a yearly basis. (Lec. 3) *Pre: permission of instructor. E. Durbin and Twombly*

**610 Geophysical Fluid Dynamics I (I, 3)** Natural world fluid dynamics emphasizing ocean circulation. Classical fluid dynamics; GFD fundamentals (rotation and stratification); Taylor-Proudman theorem; potential vorticity; planetary waves; geostrophic contours; shallow water quasi-geostrophic theory; frictional layers. (Lec. 3) *Pre: 606 or permission of instructor. Hara*

**611 Geophysical Fluid Dynamics II (II, 3)** Continuously stratified quasi-geostrophic theory; classical and modern theories of the wind-driven ocean circulation; stability theory; oceanic convection; wave-mean flow interactions; ageostrophic dynamics; topographical effects. (Lec. 3) *Pre: 610 or permission of instructor. Rothstein*

**613 Waves (II, 3)** Generation, propagation, and decay of surface waves, internal waves, and Rossby waves in the ocean. (Lec. 3) *Pre: MCE 550 or permission of instructor. Wimbush*

**614 Tides (I, 2)** Generation, propagation, and dissipation of ocean tides. Earth tides. Relation between theory and observation. Tidal analysis. (Lec. 2) *Pre: 501. Wimbush*

**620 Chemical Distributions (II, 3)** Interdisciplinary study of the processes responsible for oceanic chemical distributions with emphasis on conservative properties, biologically active con-

stituents, and radionuclides. Includes projects involving data-processing analysis. (Lec. 3) *Pre: 501, 521, 540, and 561 or permission of instructor. Kester*

**623 Physical Chemistry of Seawater (I, 3)** Characterization of dissociation, solubility, and redox equilibria in seawater. Partial molar volumes, conductivity, and diffusion of ions in seawater. Kinetic studies in seawater; effect of temperature, salinity, and pressure on physicochemical properties in seawater. (Lec. 3) *Pre: 521 and CHM 432 or permission of instructor. Offered in odd-numbered years. Kester*

**625 Organic Geochemistry of Sediments (I, 3)** Chemistry of organic matter in recent to ancient sediments. Topics include the source, characterization, significance, and fate of sedimentary organic compounds with emphasis on the marine environment. (Lec. 3) *Pre: 523 or permission of instructor. Offered in even-numbered years. Quinn*

**628 High-Temperature Geochemistry (I, 3)** Principles and factors governing the distribution of trace elements in volcanic processes. Applications to the study of rock genesis, mantle dynamics, oceanic crust formation, and hotspots. (Lec. 3) *Pre: CHM 431 or equivalent, or permission of instructor. Offered in even-numbered years. Schilling*

**631 Seminar in Marine and Atmospheric Chemistry (I and II, 1)** Discussion of problems of current interest in marine chemistry. (*Seminar*) *Pre: 521 or permission of instructor. S/U credit. Staff*

**640 Marine Particles (II, 3)** Discussion of the chemical, biological, and physical processes that control particle formation, transformation, and sedimentation in the oceans. *Offered in alternate years. Pre: permission of instructor. Moran*

**643 Subduction Zones (II, 3)** Structure, petrology, and geochemistry of subduction zones, island arcs, and other magmatic arcs at convergent plate margins. Petrogenesis of andesites and related magmas. (Lec. 3) *Pre: 540 or permission of instructor. Sigurdsson*

**644 Global Paleoclimatology (I, 3)** Principles of modern climatology, climate dynamics, modeling, and climate indicators with application to the geologic record; Phanerozoic climates and relationships to tectonics, paleogeography, and ocean-atmosphere composition. (Lec. 2, Lab. 2) *Pre: 510 and 540. Offered in odd-numbered years. Staff*

**645 Petrology of the Oceanic Crust (I, 3)**

Nature and origin of igneous and metamorphic rocks of the oceanic crust of the earth; mineralogy, petrology, and petrogenesis of seafloor rocks; metamorphism of the ocean crust. (Lec. 3) *Pre: graduate standing or permission of instructor.* Sigurdsson

**646 Deep-Sea Sediments and Processes (II, 3)**

Deep-sea sediments and their relation to oceanic processes such as solution, productivity, and dilution. Sedimentary distributions in time and space as related to tectonic models. Paleoclimatology, and past water mass distributions and conditions. Term paper. (Lec. 3) *Pre: graduate standing or permission of instructor. Offered in odd-numbered years.* Leinen

**649 Plankton Paleoecology (I, 3)** Concepts of paleoecology. Interaction between planktonic marine organisms and their environment over evolutionary time scales. The use of fossil plankton in reconstructing paleoenvironmental conditions and paleoecological systems. Patterns, causal hypotheses, and geological consequences of temporal and geographic variation in Cretaceous and Cenozoic plankton assemblages. (Lec. 2, Lab. 2) *Pre: permission of instructor. Offered in even-numbered years.* D'Hondt

**651 Marine Stratigraphy (I, 3)** Concepts and methods of biostratigraphy, lithostratigraphy, and chronostratigraphy. Stratigraphic nomenclature. Stratigraphic correlation and completeness. Special focus will be placed on the integration of multiple stratigraphic techniques and their application to the Cretaceous and Cenozoic marine record. Class discussion of advances and problems in recent research articles. (Seminar) *Pre: permission of instructor. Offered in odd-numbered years.* D'Hondt

**652 Marine Geophysics (II, 3)** Survey of basic subdisciplines of marine geophysics including plate tectonics, gravity, magnetism, heat flow, reflection and refraction seismology. Basic theory and methods of data collection and interpretation emphasized. (Lec. 3) *Pre: 540 or permission of instructor. Offered in odd-numbered years.* Kincaid and Larson

**655 Paleomagnetism and Geomagnetism (II, 3)** Earth's magnetic field, origin and dynamo theory, rock magnetism and paleomagnetism, field directions in rocks and sediments, and temporal variation. Magnetic recording by ridges and seamounts; forward/inverse modeling, skewness analysis. (Lec. 3) *Pre: 540 or permission of instructor. Offered in even-numbered years.* King and Larson

**661 (or BIO 661) Phytoplankton Taxonomy (I, 3)** Classical and modern systems and techniques for the identification, nomenclature, and classification of planktonic algae, with emphasis on marine forms. Phylogeny will be briefly considered. (Lec. 1, Lab. 4) *Pre: permission of instructor. Offered in even-numbered years.* Hargraves

**663 (or BIO 663) Phytoplankton Physiology (I, 3)** Metabolic processes and methods of their investigation in phytoplankton with primary emphasis on functions pertinent to their ecology. Includes adaptation, uptake of nutrients, excretion, rhythms, pigments, and photosynthesis. (Lec. 3) *Pre: graduate standing or permission of instructor.* Swift

**664 (or BIO 664) Phytoplankton Ecology (II, 3)** Biology and ecology of the pelagic marine microscopic algae with emphasis on their adaptations, physiological ecology, distribution, succession, production, and regional and seasonal dynamics. (Lec. 3) *Pre: permission of instructor.* Swift

**665 Marine Bio-Optics and Remote Sensing (II, 3)** Bio-optical properties of ocean waters. Major focus is on basic principles of visible-band ocean remote sensing and its application to determining phytoplankton pigment and production at regional to global scales. (Lec. 2, Lab. 2) *Pre: 561. Offered in odd-numbered years.* Swift and Yoder

**666 Zooplankton (II, 3)** Biology of marine zooplankton, dealing with morphology, adaptation, distribution, physiology, production, and interrelationships with other members of the marine biota. (Lec. 1, Lab. 4) *Pre: permission of instructor.* Staff

**667 (or BIO 667) Advanced Phytoplankton Seminar (II, 1)** Specialized and advanced areas of phytoplankton biology and research, including systematics, physiology, and ecology. (Seminar) *Pre: graduate standing or permission of instructor. May be repeated. S/U credit.* Hargraves, Smayda, and Swift

**668 Productivity of Ocean Margins (II, 3)** Processes affecting biological productivity of ocean margin waters. Major focus on dynamics of production in mid to outer shelf waters and adjacent boundary currents. (Lec. 3) *Pre: 501, 561. Offered in even-numbered years.* Yoder

**669 Marine Fish Ecology and Production (II, 3)** Functioning of fishes in major world ecosystems is explored through comparison of feeding ecology, bioenergetics, and production rates. (Lec. 2, Lab. 2) *Pre: 561 or permission of instructor.* E. Durbin

**670 Fish Population Dynamics (II, 3)** Methods for estimating vital statistics of fish populations, stock assessment theory and methods, analytical and empirical model development, and fisheries forecasting. (Lec. 3) *Pre: graduate standing or permission of instructor.* Collie

**671 Marine Zooplankton Ecology (II, 3)** Marine zooplankton community structure and function including the relation of spatial and temporal distribution patterns to the oceanic environment, organism interactions, secondary production, feeding, and reproduction. Emphasis on open-ocean communities. (Lec. 3) *Pre: 561 or permission of instructor.* Wishner

**673 Fisheries Oceanography (I, 3)** Physical and biological processes acting at the egg, larval, juvenile, and adult stages of commercially important fish and shellfish. Topics include: growth, survival, and recruitment dynamics; larval dispersal and fish distributions; changes in long-term abundance in relation to climate. (Lec. 3) *Pre: graduate standing or permission of instructor. 501, 561 recommended. Offered in odd-numbered years. Next offered fall 1999.* Buckley and Collie

**678 Low-Temperature Geochemistry and Isotope Geology (II, 3)** A study of processes important in determining the chemical and isotopic mass balance of the oceans and the geochemistry of deep-sea sediments. (Lec. 3) *Pre: 521. Staff*

**679 (or BIO 679) Animal Communication (I, 2)** Visual, chemical, and auditory communication in animals, including receptor systems, feedback, and redundancy. Functional aspects and organization of communication. Discussion of readings. Research problem can be taken under 691 or BIO 691. (Lec. 2) *Pre: BIO 467 or equivalent and permission of instructor. In alternate years. Next offered fall 1999.* Specker

**681 Marine Pollution (II, 3)** The chemical and biological processes governing the fate and effects of pollutants in the marine environment are introduced. Approaches used in the analyses and modeling of marine pollution will be introduced. (Lec. 3) *Pre: 521, 561, or permission of instructor.* Staff

**689 Coastal Marine Ecosystems (II, 3)** Comparative analysis of community structure in estuaries and shelf waters. Biological characterization of specific habitats with respect to general properties of the physical-chemical-geological environment. Class-developed databases for comparisons of Narragansett Bay with estuaries of the world. (Lec. 2, Lab. 1) *Pre: 561. Staff*



**691, 692 Individual Study** (*I and II, 1–6 each*) Individual study of assigned topics or special problems involving literature search and/or original investigation under one or more members of the staff. (*Independent Study*) Staff

**693, 694 Special Studies** (*I and II, 1–4 each*) Studies of specialized topics in the marine sciences. (*Independent Study*) Staff

**695 Seminar in Oceanography** (*I and II, 1 each*) Students give seminar reports on problems and current research in various areas of oceanography. (*Seminar*) Attendance and registration are required of all graduate students in residence, but no more than 2 credits are allowed for a program of study. S/U credit. Yoder

**699 Doctoral Dissertation Research** (*I and II*) Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

**930 Workshop in Oceanography Topics for Teachers** (*I and II, 0–3*) Especially designed for teachers of physical sciences. Basic topics in oceanography from an advanced or pedagogical perspective. (*Workshop*) Pre: teacher certification. Staff

*Note: Graduate students in oceanography choose from supporting courses in other departments.*

## Pharmacy (PHC)

Dean: Professor Luzzi

**317 Interactive Learning Session I** (*I, 1*) Small group active learning sessions designed to reinforce progressively the basic science curriculum, promote communication and problem-solving skills, and enhance patient assessment and the delivery of pharmaceutical care. (*Seminar 1*) Pre: third-year standing or permission of instructor. Staff

**327 Interactive Learning Session II** (*II, 1*) Small group active learning designed to reinforce progressively the basic science curriculum, promote communication and problem-solving skills, and enhance patient assessment and the delivery of pharmaceutical care. (*Seminar 1*) Pre: third-year standing permission of instructor. Staff

**417 Interactive Learning Session III** (*I, 1*) Small group active learning designed to reinforce progressively the basic science curriculum, promote communication and problem-solving skills, and enhance patient assessment and the delivery of pharmaceutical care. (*Seminar 1*) Pre: fourth-year standing or permission of instructor. Staff

**427 Interactive Learning Session IV** (*II, 1*) Small group active learning designed to reinforce progressively the basic science curriculum, promote communication and problem-solving skills, enhance patient assessment and the delivery of pharmaceutical care. (*Seminar 1*) Pre: fourth-year standing or permission of instructor. Staff

**517 Interactive Learning Session V** (*I, 1*) Small group active learning designed to reinforce progressively the basic science curriculum, promote problem-solving skills, and enhance patient assessment and the delivery of pharmaceutical care. (*Seminar 1*) Pre: fifth-year standing or permission of instructor. Staff

**527 Interactive Learning Session VI** (*II, 1*) Small group active learning designed to reinforce progressively the basic science curriculum, promote communication and problem-solving skills, and enhance patient assessment and the delivery of pharmaceutical care. (*Seminar 1*) Pre: fifth-year standing or permission of instructor. Staff

**594 Experiential Tracking Practicum** (*I and II, 7*) Through direct hands-on work, students will learn how to acquire, interpret, and apply information to extend their knowledge in a specific field. This will be accomplished by collaborative work with a faculty sponsor. (*Practicum 7.5 wks*) Pre: sixth-year standing. Staff

## Pharmacy Practice (PHP)

Chairperson: Professor Hume

**311 Foundations of Human Disease I: Immunoinflammatory Disease**  
See Biomedical Sciences 311.

**312 Foundations of Human Disease II: Central Nervous System Disease**  
See Biomedical Sciences 312.

**324 Pharmacotherapy of CNS and Musculoskeletal Disorders—Therapeutics I** (*II, 2*) The appropriate use of medications in the treatment of human disease. Interpretation of data to design, monitor, and modify drug therapy in psychiatric, neurologic, and musculo-skeletal diseases. (*Lec. 2*) Pre: third-year standing or permission of instructor. Dufresne

**360 Hospital Pharmacy** (*II, 3*) Introduction to practice of pharmacy in hospitals, including both professional and administrative activities. Field trips to representative hospital pharmacies. (*Lec. 3*) Pre: third-year standing. Cyganowski and Staff

**404 Pharmacokinetics II**  
See Applied Pharmaceutical Sciences 404.

**409 Foundations of Human Disease III: Infectious and Pulmonary Processes**  
See Biomedical Sciences 409.

**410 Foundations of Human Disease IV: Endocrinology, Oncology, Medicinal Genetics, GI**  
See Biomedical Sciences 410.

**411 Biostatistics II**  
See Statistics 411.

**413 Pharmacotherapy of Infectious Diseases—Therapeutics II** (*I, 2*) The appropriate use of medications in the treatment of human disease. Interpretation of clinical data to design, monitor, and modify drug therapy in infection and pulmonary disease. (*Lec. 2*) Pre: fourth-year standing or permission of instructor. Rana

**414 Pharmacotherapy of Endocrine and GI Disorders—Therapeutics III** (*II, 2*) The appropriate use of medications in the treatment of human disease. Interpretation of clinical data to design, monitor, and modify drug therapy in endocrine and gastrointestinal disease. (*Lec. 2*) Pre: fourth-year standing or permission of instructor. Luisi

**420 Biotechnology Products in Pharmacy**  
See Biomedical Sciences 420.

**455, 456 Pharmacotherapeutics I, II** (*I and II, 4 each*) The use of drugs in the treatment of human disease. Application of scientific, social and economic principles to the development and assessment of drug therapy plans. (*Lec. 4*) Pre: successful completion of all required courses in first 6 semesters of the curriculum. Last offered 2000–01. Luisi, Owens, and Staff

**471 Contemporary Pharmacy Practice Laboratory** (*I and II, 2*) Issues associated with the dispensing of medication, use of patient profiles, and effective interaction with patients and health professionals in simulated practice sessions. (*Lec. 1, Lab. 3*) Pre: APS 459, FSN 444, BMS 443, 446, and 455; concurrent enrollment in APS 461 and 462. Not for graduate credit. Last offered fall 2001. Cyganowski

**484 Institutional Pharmacy Externship** (*I and II, 5*) Structured practical experience in selected institutional pharmacies. Participation in drug distribution, inventory control, drug utilization review, and other aspects of contemporary pharmacy practice. (*Practicum 40 hours per week*) Pre: 455, 456, 471; APS 461, 462; BMS 444, 455, and 456. Not for graduate credit. Last offered spring 2002. Pedro, Spink, and Lattari

**485 Community Pharmacy Externship** (*I and II, 5*) Structured practical experience in selected community pharmacies. Participation in patient counseling, drug distribution, and other aspects of contemporary pharmacy practice. (*Practicum 40 hours per week*) *Pre: 455, 456, 471; APS 461, 462; BMS 444, 455, and 456. Not for graduate credit. Last offered spring 2002.* Pedro, Spink, and Lattari

**486 Specialty Externship** (*I and II, 3-6*) Structured practical experience in institutional, community, and nontraditional pharmacy settings. (*Practicum*) *Pre: permission of chairperson. May not be taken concurrently with 484, 485, or 490. May be repeated for a maximum of 12 credits. Not for graduate credit.* Pedro, Spink, and Lattari

**490 Clinical Pharmacy Clerkship** (*I and II, 5*) Faculty-supervised clinical pharmacy experience in affiliated practice settings. Development of general clinical problem-solving and communications skills. (*Practicum 40 hours per week*) *Pre: 455, 456, 471; APS 461, 462, BMS 444, 455, and 456. Not for graduate credit. Last offered spring 2002.* Geletko and Staff

**497, 498 Special Problems** (*I and II, 1-3 each*) Methods of carrying out a specific research project. Literature search, planning, laboratory work, writing an acceptable report. (*Independent Study*) *Pre: permission of chairperson. Staff*

**499 Specialty Clerkship** (*I and II, 3-6*) Faculty-supervised clinical pharmacy experience in affiliated institutional and ambulatory health care settings. Development of pharmaceutical care skills in various specialty areas. (*Practicum*) *Pre: permission of chairperson. May not be taken concurrently with 485 or 490. May be repeated for a maximum of 12 credits. Not for graduate credit.* Staff

**510 Foundations of Human Disease V: Renal and Cardiovascular Diseases**  
See Biomedical Sciences 510.

**511, 512 Advanced Pharmacotherapeutics** (*I and II, 3 each*) The clinical use of medications in a disease-oriented approach. The basic concepts of pharmacology, pharmacy, pathophysiology, and biochemistry will be correlated to the treatment of disease. (*Lec. 3*) *Pre: fifth-year standing in the Doctor of Pharmacy program or permission of instructor. Must be taken concurrently with 561, 562.* Glen and Staff

**513 Pharmacotherapy of Oncology and Toxicology—Therapeutics IV** (*I, 2*) The appropriate use of medications in the treatment of human disease. Interpretation of clinical data to design, monitor, and modify drug therapy in cancer,

blood disorders, and overdose conditions. (*Lec. 2*) *Pre: fifth-year standing or permission of instructor.* Glen

**514 Pharmacotherapy of Renal and Cardiovascular Disorders—Therapeutics V** (*II, 2*) The appropriate use of medications in the treatment of human disease. Interpretation of clinical data to design, monitor, and modify drug therapy in renal and cardiovascular disease. (*Lec. 2*) *Pre: fifth-year standing or permission of instructor.* Hume

**515 Pharmacy Practice Laboratory I**  
See Applied Pharmaceutical Sciences 515.

**516 Pharmacy Practice Laboratory II**  
See Applied Pharmaceutical Sciences 516.

**518 Self-Care I**  
See Biomedical Sciences 518.

**542 Drug-Induced Diseases** (*I, 2*) An overview of diseases induced or aggravated by drug therapy. The course is organized using an organ system/disease-state approach. (*Lec. 2*) *Pre: enrollment in Doctor of Pharmacy program or 455 and 456.* Dufresne, Hume, and Owens

**544 Physical Assessment** (*II, I*) Organ system approach to components of physical examination and evaluation. Emphasis is placed on understanding those physical signs and symptoms which may be drug-induced. Practice skills are introduced. (*Lec. 3*) *Pre: enrollment in the Doctor of Pharmacy program or permission of instructor.* Rogowski and Staff

**561, 562 Advanced Human Pathophysiology** (*I and II, 4 each*) The etiology, epidemiology, pathology, and clinical laboratory manifestation of diseases occurring in humans. This intensive course will be taught in a biomedical format. (*Lec. 4*) *Pre: fifth-year standing in the Doctor of Pharmacy program or permission of instructor.* Barbour and Staff

**581, 582 Clinical Pharmacy Seminar** (*I and II, 1 each*) Presentations made by students on appropriate advanced clinical pharmacy topics. (*Seminar*) *Pre: fifth- or sixth- year standing in the Doctor of Pharmacy program or permission of instructor.* Rana

**590 Advanced Clinical Pharmacy Clerkship** (*I, II or SS, 5*) Clinical practice in providing optimal pharmaceutical care for patients through designing, recommending, implementing and modifying patient-specific pharmacotherapy in collaboration with other health professionals. (*Five credits taken five times for a total of 25 credits.*) (*Practicum*) *Pre: sixth-year standing in the Doctor of Pharmacy program.* Geletko

**591 Clinical Clerkship** (*I and II, 7*) Through direct clinical contact, students will learn how to provide optimal pharmaceutical care for patients. Students will collect and interpret data to design, recommend, implement, and modify patient-specific pharmacotherapy in collaboration with other health care professionals. (*Practicum 7.5 wks*) *Pre: sixth-year standing.* Geletko and Staff

**592 Clinical Clerkship** (*I and II, 7*) Through direct clinical contact, students will learn how to provide optimal pharmaceutical care for patients. Students will collect and interpret data to design, recommend, implement, and modify patient-specific pharmacotherapy in collaboration with other health care professionals. (*Practicum 7.5 wks*) *Pre: sixth-year standing.* Geletko and Staff

**593 Clinical Clerkship** (*I and II, 7*) Through direct clinical contact, students will learn how to provide optimal pharmaceutical care for patients. Students will collect and interpret data to design, recommend, implement, and modify patient-specific pharmacotherapy in collaboration with other health care professionals. (*Practicum 7.5 wks*) *Pre: sixth-year standing.* Geletko and Staff

## Philosophy (PHL)

*Chairperson:* Professor Pasquerella

**101 Logic: The Principles of Reasoning** (*I or II, 3*) Introduction to logic, presentation of evidence in basic valid argument forms. Emphasis on effective communication by considering such topics as definitions and avoidance of fallacies. (*Lec. 3*) Staff (C)

**103 Introduction to Philosophy** (*I or II, 3*) Pursues such basic questions as: What is a person? What is knowledge? Are we free? What is moral right and wrong? Does God exist? What is the meaning of death? (*Lec. 3*) *Not open to students with 9 or more credits in philosophy.* Staff (L)

**204 Theories of Human Nature** (*I or II, 3*) An introduction to philosophical inquiry by critical examination of some major traditional and contemporary views of human nature as expressed in a variety of religious, literary, scientific, and philosophical writings. (*Lec. 3*) Johnson (L)

**210 Women and Moral Rights** (*I or II, 3*) An introduction to the philosophical problems raised by reproduction, affirmative action, pornography, gender roles, and sexism in language through a critical examination of these issues. (*Lec. 3*) Pasquerella (L)

**212 Ethics (I or II, 3)** Evaluation of major ethical theories. Application of moral reasoning to topics such as virtue and vices, human dignity, conscience, responsibility, moral dilemmas, and reasons to be moral. (Lec. 3) Schwarz, Pasquerella, or Staff (L)

**217 Social Philosophy (I or II, 3)** A systematic introduction to the philosophical problems of contemporary social relations: models of community, sources of alienation, property and ownership, the meaning of work and technology, human rights and freedom. (Lec. 3) Johnson or Staff (L)

### **235 Modern Thought: Philosophy and Literature**

See Comparative Literature Studies 235.

**314 Ethical Problems in Society and Medicine (I or II, 3)** Ethical analysis of topics such as war, capital punishment, sexual morality, suicide, animal rights, honesty and deception, world hunger, discrimination, abortion. (Lec. 3) Pre: 101 or 103 or one 200-level course or permission of instructor. Schwarz, Pasquerella, or Staff (L)

**318 Power/Justice: Contemporary Critical Philosophies (I or II, 3)** Study of contemporary critical philosophies in the traditions of Marxism, existentialism, post-modernism, and feminism, with emphasis on philosophers such as Habermas and Foucault. (Lec. 3) Pre: 101 or 103 or one 200-level course or permission of instructor. Johnson (L)

**321 Ancient Philosophy (I and II, 3)** Survey of major thinkers and schools of thought in Ancient Greece, including selected pre-Socratics, Plato, and Aristotle. (Lec. 3) Zeyl (F) (L)

**322 Medieval Philosophy (I, 3)** Survey of major thinkers and schools of thought in the Middle Ages, including Augustine, Anselm, Aquinas, and Ockham. (Lec. 3) Peterson or Staff (F) (L)

**323 Modern Philosophy: Descartes to Kant (I or II, 3)** Survey of seventeenth- and eighteenth-century European philosophy. Includes, but is not limited to, empiricism, rationalism, and Kant's critical philosophy. (Lec. 3) Peterson or Staff (F) (L)

**324 Recent European Philosophy (I or II, 3)** Nineteenth- and twentieth-century British and European continental developments. Discussion of movements such as idealism, utilitarianism, existentialism, and phenomenology and of philosophers such as Hegel, Kierkegaard, Mill, Husserl, Sartre, and Heidegger. (Lec. 3) Pre: 101 or 103 or one 200-level course or permission of instructor. Johnson, Wenisch, or Staff (L)

**325 American Philosophy (I or II, 3)** A study of American philosophy including such movements as puritanism, transcendentalism, pragmatism, naturalism, process-philosophy, realism, and philosophical analysis. (Lec. 3) Pre: 101 or 103 or one 200-level course or permission of instructor. Johnson (L)

**328 The Philosophy of Religion (I and II, 3)** A systematic and critical consideration of such topics as the existence and nature of God, the problem of evil, the relation of faith to reason, religious language, miracles, and immortality. (Lec. 3) Pre: 101 or 103 or one 200-level course or permission of instructor. Zeyl or Staff (L)

**331 East Asian Thought (I or II, 3)** A study of the important philosophical and religious systems of China, Korea, and Japan; emphasis on Chinese traditions. (Lec. 3) Kim (F) (L)

**341 Introduction to Metaphysics (I or II, 3)** Analyzes topics such as person, mind-body, human action, freedom and determinism, causation, time, space, essence and existence, universals, and types of beings. (Lec. 3) Pre: 101 or 103 or one 200-level course or permission of instructor. Pasquerella, Peterson, or Schwarz

**342 Knowledge, Belief, and Truth (I or II, 3)** Analysis of topics such as knowledge, belief, certainty, doubt, skepticism, faith, the ethics of belief, truth, error, perception, *a priori* knowledge, subjectivity and objectivity, and memory. (Lec. 3) Pre: 101 or 103 or one 200-level course or permission of instructor. Wenisch, Schwarz, or Staff

**346 Existential Problems in Human Life (I or II, 3)** Discussion of ultimate questions of human existence such as meaning in life, personal commitment, human relations, suffering, despair, hope, freedom, authenticity, self-deception, death, God, and immortality. (Lec. 3) Pre: 101 or 103 or one 200-level course or permission of instructor. Foster (L)

**355 Philosophy of Art (I or II, 3)** Systematic problems arising from reflection on the creation and perception of works of art. (Lec. 3) Pre: 101 or 103 or one 200-level course or permission of instructor. Foster (L)

**401, 402 Special Problems (I and II, 3 each)** Course may vary from year to year, allowing one or more advanced students to pursue problems of special interest with guidance of instructor in conferences. One or more written papers. (Independent Study) Pre: 3 credits in philosophy and permission of instructor. May be repeated for credit. Staff

**414 Advanced Studies in Ethics (I or II, 3)** Intensive studies of various issues, theories, and aspects in the field of ethics. Texts of leading moralists will be carefully analyzed. Specific subject may change from year to year. (Seminar) Pre: 212 and one 300-level course. In alternate years. Staff

**430 Philosophy of Law (I or II, 3)** Critical evaluation of the basis of legal authority and legal decision making, covering topics in the areas of analytic and ethical jurisprudence as well as professional ethics for lawyers. (Lec. 3) Pre: 101 or 103 or one 200-level PHL course, and one 300-level PHL course, or permission of instructor. Pasquerella

**440 Philosophy of Language (I or II, 3)** Language in its relation to the world, cognitive and noncognitive functions of language, and philosophical issues in the area of communication. Works of Wittgenstein, the logical positivists, linguistic analysts, and other contemporary thinkers. (Lec. 3) Pre: 101 or 103, and one 300-level PHL course. Staff

**451 Symbolic Logic (I or II, 3)** Selected topics in modern symbolic logic including calculus of propositions, predicate calculus, and modal logics. Philosophical and mathematical aspects of the subject. (Lec. 3) Pre: 101 or MTH 131 or higher or permission of instructor. Kowalski

**452 Philosophy of Science (I or II, 3)** Analysis of the nature and structure of scientific thought. Consideration of issues such as structure and types of scientific explanation, verification and falsification, and unity of the sciences. (Seminar) Pre: 101 or 451, one 300-level PHL course, and 6 credits of natural science; or permission of instructor. Kowalski or Arieu

**453 Philosophy of the Social Sciences (II, 3)** Examination of philosophical problems raised by contemporary social sciences: the meaning of scientific knowledge, the nature of understanding of other persons and cultures, the relation of theory and practice. (Seminar) Pre: 101 or 103 or 204 or permission of instructor. Johnson

**454 Philosophy of the Natural Environment (I or II, 3)** An exploration of our problematic relationship to the natural environment: nature's ontological status, the epistemological encounter with nature through science and art, and the ethical obligations emerging from these considerations. (Seminar) Pre: 101 or 103 or one 200-level course and one 300-level course in philosophy, or permission of instructor. Foster

**490 Senior Seminar in Philosophy (I or II, 3)** In-depth study of the major works of a significant Western philosopher or of a major philosophical topic. (Seminar) Pre: senior standing in philosophy or permission of instructor. May be repeated for credit. Staff

**499 Senior Thesis (I and II, 3)** Independent research. Student works in close conjunction with a faculty member on a mutually agreeable topic. Written thesis required. (Independent Study) Pre: senior standing and permission of instructor. Not for graduate credit. Staff

**502, 503 Tutorial in Philosophy (I and II, 3 each)** Discussion by the staff and advanced students of research problems in philosophy. Presentation and criticism of original papers. (Independent Study) Pre: graduate standing or permission of instructor. May be repeated for a maximum of 9 credits. Staff

**513 General Axiology (I or II, 3)** Intensive historical and systematic study of issues such as the nature and kinds of values, their ontological status, their relation to culture, their relation to emotions, relation of axiology to other disciplines. (Seminar) Pre: graduate standing or permission of instructor. In alternate years. Wenisch or Staff

**530 Philosophy of Plato (I or II, 3)** Selected dialogues from the later period. Particular attention will be given to the areas of metaphysics, epistemology, cosmology, and ethics. (Seminar) Pre: graduate standing or permission of instructor. In alternate years. Zeyl

**531 Philosophy of Aristotle (I or II, 3)** Selected texts with emphasis on the major concepts of Aristotle's metaphysics, theory of knowledge, and ethics. (Seminar) Pre: graduate standing or permission of instructor. In alternate years. Zeyl

**542 Advanced Studies in Patristic and Scholastic Philosophy (I or II, 3)** Intensive studies of one or more thinkers belonging to the patristic or scholastic tradition. The specific subject may change from year to year. (Seminar) Pre: graduate standing or permission of instructor. In alternate years. Peterson

**551 Philosophical Logic (I or II, 3)** Intensive consideration of such issues as the nature, structure, and function of propositions, predication, analysis of the "is" relation. Relation between proposition and facts. Nature of logic and criterion of the logical, relation of logic to language, psychology, and ontology. (Seminar) Pre: graduate standing or permission of instructor. In alternate years. Kowalski or Staff

**555 Philosophy of the Arts and of Literature (I or II, 3)** An intensive study of one or more thinkers concerned with philosophical problems arising from our experience of the arts and of literature. The phenomenological tradition will be stressed. (Seminar) Pre: graduate standing or permission of instructor. In alternate years. Foster or Staff

**570 Philosophy of Immanuel Kant (I or II, 3)** Intensive analysis of major texts. Special attention will be given to *The Critique of Pure Reason*. (Seminar) Pre: graduate standing or permission of instructor. In alternate years. Peterson or Staff

**580 Nineteenth-Century Philosophy (I or II, 3)** Intensive analysis of the work of a major philosopher or philosophical movement. Attention will be given to such major figures as Hegel, Kierkegaard, C.S. Peirce, or James. The specific subject changes from year to year. (Seminar) Pre: graduate standing or permission of instructor. In alternate years. Foster, Johnson, or Staff

**582 Advanced Studies in Contemporary Philosophy (I or II, 3)** Intensive studies of one or more thinkers of philosophical movements of the twentieth century. The specific subject may change from year to year. (Seminar) Pre: graduate standing or permission of instructor. In alternate years. Johnson or Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Physical Education and Exercise Science (PEX)

Co-Chairpersons: Associate Professor O'Leary and Associate Professor Seleen

**105 (PED) Beginner Elective Activity I: Individual and Dual Sports (I or II, 1)** Beginning level of instruction for students with little or no previous experience in the activities offered. Select appropriate letter for activity desired; e.g., 105A Beginning Archery. (Studio 3) Staff

A Archery	M Tennis
B Badminton	N Track and Field
C Biking and Hiking	P Marksmanship
D Bowling	S Activities for Children
E Canoeing	T Handball
F Fencing	W (or MSC) Weight Training and Conditioning
G Golf	Y Modern Gymnastics
H Gymnastics	Z Paddleball
I Sailing	
K Skiing	
L Aerobics	

**106 (PED) Activity II: Team Sports and Group Activities (I or II, 1)** Beginning level of instruction for students with little or no previous experience in the activities offered. Select appropriate letter for activity desired. (Studio 3) Staff

A Folk and Square Dance	L Soccer
H Basketball	M Softball
I Flag Football	N Volleyball
J Field Hockey	P Campcraft
K Lacrosse	

The above activities may be offered in combination or as a single activity for the entire semester.

**115 (PED) Team Sports (I or II, 0.5)** Emphasis on analysis of skills, strategies, class organization, and teaching techniques. Select appropriate letter for activity desired. (Studio 3) Open to physical education majors only. Staff

A Basketball	E Lacrosse
B Field Hockey	F Soccer
C Flag Football	G Softball
D Recreational Sports	H Volleyball

**120 (PED) Weight Training and Physical Conditioning (I and II, 1)** Principles of weight training and conditioning with emphasis on constructing individual and group exercise programs. (Studio 3) Open to physical education majors only. Staff

**130 (PED) Beginning Swimming (I or II, 1)** Beginning level of instruction for students with little or no previous experience. (Studio 3) Staff

**205 (PED) Intermediate Elective, Activity I (I and II, 1)** Intermediate level of instruction for those students who have acquired the basic skills and have performing experience in the activity. All activities listed under 105. (Studio 3) Staff

**206 (PED) Intermediate Elective, Activity II (I and II, 1)** Intermediate level of instruction for those students who have acquired the basic skills and have performing experience in the activity. All activities listed under 106. (Studio 3) Staff

**215 (PED) Individual Sports (I or II, 0.5)** Emphasis on analysis of skills, strategies, class organization, and teaching techniques. Select appropriate letter for activity desired. (Studio 3) Open to physical education majors only. Staff

A Archery	E Golf
B Badminton	F Tennis
C Bowling	G Wrestling
D Fencing	

**217 (PED) Field Experience in Physical Education, Health, and Recreation (I and II, 1)** Students assist in one of the following: community agency, public or private school program, summer camp or recreation program, special education program. (Practicum) Pre: permission of chairperson. May be repeated but with different agency. S/U credit. Staff

**222 (PED) Basic Movements and Gymnastics (I or II, 1)** Techniques and acquisition of basic skills. Includes theory and analysis of basic through advanced skills of apparatus and tumbling with special emphasis on teaching and safety procedures. (Studio 3) Open to physical education majors only. Staff

**230 (PED) Intermediate Swimming (I or II, 1)** Intermediate level of instruction for those students who have acquired the basic skills and have performing experience in swimming. (Studio 3) Staff

**243 (PED) Prevention and Care of Athletic Injuries and First Aid (I, 3)** Conditioning, use of physiotherapy equipment, massaging, taping and bandaging technique. Latest American Red Cross procedures with the opportunity to receive standard certification. (Lec. 3) Open to physical education majors only. Bissonnette

**250 (PED) Supervised Pre-Professional Field Experience (I and II, 1)** Supervised early field experience for students wishing to explore choices in teaching physical education. (Practicum) Pre: permission of the coordinator of student teaching. S/U only. O'Leary

**251 (PED) Folk and Square Dance (I, 1)** Techniques and acquisition of basic skills. Includes theory and analysis of basic through advanced skills. (Studio 3) Open to physical education majors only. Staff

**263 (PED) Principles of Athletic Coaching (I or II, 3)** Principles of exercise physiology, leadership, and psychology applied to athletic coaching. Includes materials on administration of athletics. (Lec. 3) Norris and Staff

**270 (PED) Introduction to the History and Philosophy of Physical Education (I and II, 3)** Historical development of physical education as an integral part of education and as a profession from ancient times to the present. Emphasis on development of educational philosophies within physical education and basic to current interpretations of the theory and practice of physical education. (Lec. 3) Cohen and Polidoro

**275 (PED) Introduction to Fitness and Wellness (I and II, 3)** Principles of exercise,

components of cardiorespiratory fitness, weight and tension control. Exercise testing, assessment of individual interests and needs. Development of exercise program to achieve individual goals with subsequent re-evaluation. (Lec. 2, Lab. 2) Riebe

**280 (PED) Introduction to Recreation and Leisure Studies (I and II, 3)** Development of recreation from a historical and cross-cultural perspective. Emphasis on the role of leisure in a community setting through study of the relationships of play, recreation, and leisure. (Lec. 3) O'Leary

**295 (PED) Physical Education in Elementary Schools (II, 3)** Techniques, including the use of audiovisual materials, used in conducting a program of physical education for elementary school children. Types of activities found in the basic program and progressions in planning for various age groups will be stressed. (Lec. 2, Lab. 2) Staff

**310 (PED) Principles of Human Motor Development (I or II, 3)** Overview of the principles of motor development for the physical education teacher. Examines human motor development across the life span with emphasis on assessment and program development. Includes basic principles of motor learning. (Lec. 3) Pre: admission to the teacher education program and PSY 232 or HDF 200; or permission of chairperson. O'Donnell and Staff

**314 (PED) Methods of Teaching Health and Physical Education (I, 3)** Comprehensive review of the methods and materials essential in teaching health and physical education with emphasis on the application of interdisciplinary approaches and learning theories. (Lec. 3) Pre: 295. Staff

**315 (PED) Assisting in Physical Education (I and II, 1)** Each student must include one unit of assisting in the department activity program (105, 106, 205, 206). (Practicum) Pre: 314 or permission of chairperson. May be repeated for credit in different activity or level. O'Leary

**321 (PED) Track and Field (I or II, 1)** Techniques and acquisition of basic skills. Includes theory and analysis of basic through advanced skills, strategies, and officiating. (Studio 3) Open to physical education majors only. Copeland

**324 (PED) Rhythmic Analysis and Accompaniment (I, 2)** Special emphasis on rhythmic and kinesthetic factors in movement. Use of various types of instruments for dance accompaniment with practical experience in the accompaniment of dance. (Studio 3) Cohen

**325 (PED) Physical Fitness Appraisal and Guidance (I, 3)** Theory and application of physical fitness and wellness assessments with focus on appropriate test selection and performance. Emphasis on practical skills of test administration. (Lec. 3) Pre: 275. Lamont and Staff

**330 (PED) Life Saving (I and II, 1) (Studio 3)** Staff

**340 (PED) Water Safety Instructor (I and II, 2)** (Lec. 1, Lab. 2) Staff

**341 (PED) Techniques of Officiating I (I, 3)** Presentation of current methods and techniques of officiating selected fall team sports. Provides necessary training and practical experience for students. (Lec. 2, Lab. 2) Norris and Staff

**342 (PED) Techniques of Officiating II (II, 3)** Presentation of current methods and techniques of officiating selected spring team sports. Provides necessary training and practical experience for students. (Lec. 2, Lab. 2) Norris and Staff

**343 (PED) Advanced Athletic Training: Recognition of Athletic Injuries (II, 3)** Development of advanced diagnostic techniques for recognizing and evaluating athletic injuries. Development of advanced techniques for protection of athletic injuries. (Lec. 3) Pre: 243. Bissonnette

**344, 345 (PED) Field Experience in Athletic Training I, II (I and II, 3 each)** Laboratory participation under training room conditions involving specific techniques in the prevention, protection, and emergency care of athletes participating in intercollegiate and intramural athletics. Supervised field practicum, 150 hours. (Practicum) Pre: 243 or permission of chairperson for 344; 343 and 344 or permission of chairperson for 345. Bissonnette

**346 (PED) Skin and Scuba Diving, Beginners (I and II, 2)** Emphasis on basic physical principles, hazards, selection of equipment, and techniques. (Note: This course requires a physical examination at the student's expense administered by a physician with special expertise in this area. Please contact Health Services for a reference to an approved physician prior to July 1 for enrollment in the fall semester and November 1 for enrollment in the spring semester.) (Lec. 1, Lab. 2) Pre: permission of instructor. McAniff

**347 (PED) Skin and Scuba Diving, Advanced (I and II, 2)** Emphasis on the skill needed for advanced scuba activities as related to deep dives, salvage. (Note: This course requires a physical

examination at the student's expense administered by a physician with special expertise in this area. Please contact Health Services for a reference to an approved physician prior to July 1 for enrollment in the fall semester and November 1 for enrollment in the spring semester.) (Lec. 1, Lab. 2) Pre: 346. McAniff

**355 (PED) Coaching of Soccer (I or II, 2)** Techniques and acquisition of fundamental skills. Includes advanced tactics and strategy, analysis of individual and team play, officiating, and planning of training schedules. (Lec. 1, Lab. 2) Pre: 263 or permission of instructor. Staff

**362 (PED) Coaching of Track and Field (II, 2)** Theory, techniques, and practice in coaching of track and field. (Lec. 2, Lab. 2) Pre: 263 or permission of instructor. Staff

**364 (PED) Coaching of Baseball (I, 2)** Theory, techniques, and practice in coaching baseball. (Lec. 2, Lab. 2) Pre: 263 or permission of instructor. Norris

**369 (PED) Tests and Measurements (I and II, 3)** The place of testing in the physical education curriculum. Includes analysis of data, marking systems, and overview of existing tests and measures. (Lec. 3) Staff

**370 (PED) Kinesiology (I and II, 3)** Human motion based on anatomical, physiological, and mechanical principles. Emphasis on application of these principles to fundamental movements and physical education activities. Includes electromyographic analysis of physical skills. (Lec. 3) Pre: BIO 121. Riebe

**375 (PED) Women in Sport: Contemporary Perspectives (II, 3)** Survey of issues relating to gender, herstory, governance, physiology, psychology, economics, diversity, and the institutionalization of women involved in sport. (Lec. 3) Cohen

**380 (PED) Organization and Administration of Physical Education (I and II, 3)** Techniques, methods, and systems used in organizing and administering physical education programs in public and private institutions. (Lec. 3) Polidoro and Nedwidek

**382 (PED) Sport Psychology (I or II, 3)** Survey of major topics in sport psychology including attention in sport, anxiety and arousal, aggression, self-esteem, team cohesiveness, leadership, youth participation, and gender in sport. (Lec. 3) Pre: admission to the teacher education program and PSY 113, or permission of chairperson. Polidoro

**384 Coaching of Football (I, 2)** Theory, techniques, and practice in coaching football. (Lec. 2) Pre: 263 or permission of instructor. Nedwidek

**386 Coaching of Basketball (I, 2)** Theory, techniques, and practice in coaching basketball. (Lec. 2, Lab. 2) Pre: 263 or permission of instructor. Staff

**391 (PED) (or HLT 391) Directed Study (I and II, 1–3)** Development of an approved project supervised by a member of the department faculty. (Independent Study) Pre: junior standing and permission of chairperson and instructor. Staff

**410 (PED) Corrective and Adapted Physical Education (I, 3)** Evaluation and planning of programs in physical education adapted to the needs of atypical individuals. Application of anatomical and mechanical principles in detection and correction of faulty development and body mechanics. Emphasis on technological assessment and relationship to the medical field. (Lec. 2, Lab. 2) Pre: 370 or permission of chairperson. Riebe

**416 (PED) Aging and Leisure (I or II, 3)** The aging process and its impact on leisure pursuits and recreation programming for older adults. Assessments of researching needs; program adaptation; fitness benefits; and retirement planning. (Lec. 3) Pre: junior or senior standing. In alternate years. Seleen

**425 (PED) Fitness and Wellness Program Development (II, 3)** Practice and principles in the development of fitness and wellness programs. Includes interpretation of fitness and wellness screening, application of exercise and wellness prescriptions, program leadership, development, and administration. (Lec. 3) Pre: 325 and BIO 343. Not for graduate credit. Riebe

**430 (PED) Adapted Aquatics (I, 3)** Planning, administering, and teaching adapted aquatics. Application of kinesiological concepts, characteristics, and methods of teaching aquatics to people with disabilities. (Lec. 2, Lab. 2) Pre: 410, intermediate level swimming ability, or permission of instructor. Staff

**443 (PED) Advanced Athletic Training: Rehabilitation of Athletic Injuries (I, 3)** Advanced learning in reconditioning of athletic injuries. Includes learning the use of mechanical, electrical, cryo-, hydro-, and drug therapy. Athletic training administration included. (Lec. 3) Pre: 343 or permission of chairperson. Not for graduate credit in physical education. Staff

**484 (PED) (or HLT 484) Supervised Field Work (I and II, 6–12)** Supervised field work in health, physical education, or recreation in community and/or commercial agencies. (Practicum) Not for teacher certification or graduate credit. Seleen

**486 (PED) (or HLT 486) Field Experience Seminar (I and II, 3)** Seminar for students completing field work in health, physical education, or recreation. Topics include identification of problems, resource materials, and discussions of future career concerns. (Seminar) Pre: concurrent enrollment in 484. Not for graduate credit in physical education. Seleen

Note: Student teaching includes practicum in both elementary and secondary schools under the supervision of the departmental staff. See EDC 485, 486, 487, 488, and 489.

**510 (PED) Current Issues in Physical Education, Health, and Recreation (I or II, 3)** Designed to develop student awareness of contemporary situations that are of concern to the above professions. Extensive review of contemporary literature. Critical analysis of selected issues, their components and effects. (Lec. 3) Pre: permission of instructor. Polidoro

**520 (PED) Curriculum Construction in Physical Education (I or II, 3)** Analysis of criteria and procedures for curriculum construction in physical education. Standards for the evaluation and revision of elementary and secondary school physical education courses. (Lec. 3) Pre: permission of instructor. Staff

**525 (PED) Comparative Physical Education and Sport (I or II, 3)** Examination of the status and practice of sport and physical education in selected countries. Emphasis on comparative analyses in developed and third world countries. (Lec. 3) Pre: graduate standing or permission of instructor. Polidoro

**526 (PED) Sport and International Relations (I or II, 3)** An examination of the role that sport plays in promoting international relations. Special lectures, readings, library research on topics relating to sport and international relations. (Lec. 3) Pre: graduate standing or permission of instructor. Polidoro

**530 (PED) (or EXS 530) Research Methods and Design in Physical Education and Exercise Science (I or II, 3)** Introduction to methodology in experimental, laboratory, curriculum, action, and historical research. (Lec. 3) Pre: competence in basic statistics and permission of instructor. O'Donnell or Staff

**540 (PED) Planning and Supervision of Recreational and Athletic Facilities (I, 3)** Examination of the factors involved in the construction and/or renovation of facilities for most efficient multipurpose use and maintenance. Course includes field trips. (Lec. 3) *Pre: junior standing and permission of chairperson.* O'Leary

**550 (PED) Administration of Physical Education (I or II, 3)** Problems and procedures for administering a physical education program studied from the viewpoint of the physical education administrator, the school administrator, and the faculty. Emphasis is placed on the study of administrative cases. (Lec. 3) *Pre: 380 or permission of instructor.* Nedwitek or Polidoro

**551 (PED) Sport and Recreation Operations (I or II, 3)** Analysis of operational problems and policies associated with interscholastic, intercollegiate, professional, community, and commercial sports enterprises. (Lec. 3) *Pre: 380 or graduate standing.* Nedwitek

**552 (PED) Supervision of Physical Education and Health Instruction (I or II, 3)** Principles, techniques, and procedures involved in effective supervision of physical education and health instruction, with emphasis on the leadership role of the supervisor in the improvement of instruction. *Pre: graduate standing or permission of instructor.* (Lec. 3) Nedwitek

**555 (PED) Women in Sport: Issues and Controversies (I, 3)** Critical analysis of women's sports using contemporary feminist perspectives. Emphasis on psychosocial and political-economic constructs that regulate women's emergence into sport. (Lec. 3) Cohen

**560 (PED) (or HLT 560) Seminar in Health, Physical Education, and Recreation (I or II, 3)** Selected topics within the three areas, depending on availability of specialized instruction including visiting professorship. (Seminar) *Pre: permission of instructor.* Staff

**578 (PED) Sport in American Culture (I or II, 3)** A survey of contemporary themes relating to the study of human behavior in sports contexts in American culture. (Lec. 3) *Pre: graduate standing or permission of instructor.* Cohen

**580 (PED) Physical Education: Mentally Retarded and Learning Disabled (I or II, 3)** Contributions of physical education to the growth and development of the mentally retarded and learning disabled. Theoretical and practical aspects of programs to best serve their individual needs. (Lec. 3) *Pre: permission of instructor.* Staff

**582 (PED) (or EXS 582) Sport Psychology (I or II, 3)** Counseling and psychotherapeutic techniques to improve athletic performance. Considers needs of the athlete arising from competitive stress, staleness, failure, team structure, and interactions. (Lec. 3) *Pre: graduate standing, PSY 113 and 232, or permission of instructor.* Staff

**585 (PED) Adapted Physical Activities for Special Populations (I, 3)** Characteristics and needs for special populations: retarded, emotionally disturbed, learning disabled, sensory impaired, and obese. Adapted activities based on individual needs. Effects of federal legislation on programs discussed. (Lec. 3) *Pre: permission of instructor.* Staff

**591 (PED) (or EXS 591 or HLT 591) Special Problems (I or II, 3)** Written paper reporting an in-depth investigation of a pertinent problem in the field, including a review of relevant literature, analysis, and solution of the problem based on scientific methodology, with recommendations for improved practices. (*Independent Study*) *Limited to and required of all graduate students in physical education who elect the non-thesis option.* Staff

**592 (PED) (or EXS 592 or HLT 592) Internship in Physical Education and Exercise Science (I, II, or SS, 3)** Directed field experience under the supervision of a faculty member and a professional staff member of the cooperating institution. Application of knowledge, synthesis of practical experiences. Paper required. (*Practicum*) *Pre: a minimum of 12 graduate credits in physical education and permission of major professor and chairperson.* Staff

**595 (PED) (or EXS 595 or HLT 595) Independent Study (I or II, 3)** Development of an approved project supervised by a member of the graduate faculty. (*Independent Study*) *Pre: permission of chairperson and instructor. May not be substituted for 591 or 599.* Staff

**599 (PED) (or EXS or HLT 599) Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) *S/U credit.* Staff

## Physical Therapy (PHT)

*Director: Professor Rowinski*

*Note: Following are upper-level undergraduate courses that are required for students admitted to the master's degree program in physical therapy. Physical therapy is not offered at the undergraduate level; students must have a bachelor's degree to gain admission to this program.*

**410 Human Anatomy (I, 4)** Structure and function of human anatomy as related to physical therapy. Emphasis on musculoskeletal, visceral, nervous and vascular systems and tissue histology. (Lec. 4) *Pre: BIO 121, 242, admission to physical therapy program, or permission of instructor. Concurrent enrollment in 411 required.* Agostinucci

**411 Applied Human Anatomy Laboratory (I, 2)** Dissection of a cadaver to demonstrate structure and function of human anatomy. Accurate palpation of anatomic structures in parallel with dissection. (Lab. 4) *Pre: admission to physical therapy program or permission of instructor. Concurrent enrollment in 410 required.* Agostinucci

**412 Basic Physical Evaluation, Therapeutic Exercise, and Care (I, 3)** Surface anatomy, range of motion, reflex, and manual muscle testing methods of the physical examination are presented. Soft tissue evaluation and introduction to therapeutic exercise prescription are provided to initiate the student's experience of therapeutic care provision. (Lec. 2, Lab. 3) *Pre: admission to physical therapy program or permission of instructor.* Staff

**417 Psychosocial Needs of the Disabled (I, 2)** The physical therapist's role in addressing the psychosocial needs of the patient and family resulting from movement disorders. Reaction to illness and disability and the need to consider particular religious, cultural, social, and economic differences. (Lec. 2) *Pre: admission to physical therapy program or permission of instructor.* Roush

**418 Professional and Community Practices in Physical Therapy (I and II, 1)** Introduction to relation of physical therapy practice to the community health care delivery systems. Organization of hospital departments, private practices, and other specific clinical settings is elucidated to initiate student's professional socialization. (*Practicum*) *Pre: admission to physical therapy program or permission of instructor.* Roush

**420 Physiological Basis of Physical Therapy (I, 3)** A comprehensive study of the physiological mechanisms, adaptations, and measurement principles which guide therapeutic evaluation and treatment. Laboratory demonstrations and experiences introduce the student to quantification of physiological change in humans. (Lec. 2, Lab. 3) *Pre: 410 or permission of instructor.* Rowinski

**422 Pathophysiology and Medical Management of Movement Disorders (II, 3)** Exploration of physiological regulation in disease states, with an emphasis on total medical management of disorders affecting human movement. Role of the therapist in interacting with various other medical and paramedical professionals is presented. (Lec. 3) *Pre: BIO 242, admission to physical therapy program, or permission of instructor.* Roush

**430 Human Neurosciences and Neurology (II, 4)** Anatomy, physiology, dysfunction, and evaluation of the human nervous system as a basis of therapeutic intervention. Gross and microscopic structure of the nervous system and the neurological examination. (Lec. 3, Lab. 3) *Pre: BIO 121, 242, admission to physical therapy program, or permission of instructor.* Agostinucci

**440 Advanced Head and Neck Anatomy**  
See Dental Hygiene 440.

**510 Biomechanics and Pathokinesiology (II, 3)** Principles, theories, and recent investigations of the biomechanics of human motion and posture are presented to develop analytical skills for normal and abnormal movement evaluation. (Lec. 2, Lab. 3) *Pre: 410, 412, 420, or permission of instructor.* Blanpied

**513 Directed Study in Physical Therapy (I, II, and SS, 1–3)** Subject matter arranged to meet the individual needs of graduate students in physical therapy under the supervision of staff. (*Independent Study*) *Pre: permission of instructor.* Staff

**515 Research Methods in Physical Therapy (I, 3)** Research design and methods in current physical therapy theory development and scientific literature. Preparation of a research proposal through review of literature and pilot study of selected research methods are required. (Lec. 3) *Pre: credit or concurrent enrollment in STA 307 or equivalent and second-year standing in physical therapy or permission of instructor.* Roush and Blanpied

**518 Ethical, Legal, and Interdisciplinary Issues of Clinical Practice (I, 2)** Standards, ethical considerations, and legal implications of physical therapy practice. Communication with other health care disciplines and governmental agencies for the provision, progression, and implementation of physical therapy services. (Lec. 2) *Pre: second-year standing in physical therapy or permission of instructor.* Roush

**525 Research Projects in Physical Therapy I (I, 3)** Development of an investigation into some problem of basic or applied physical therapy science. Case studies, preliminary data, or survey

instruments are compiled, and a review of related literature is accomplished under guidance of faculty. (*Independent Study*) *Pre: 515, third-year standing in physical therapy, or permission of instructor.* Staff

**528 Professional Practice and Administration (II, 3)** Responsibilities of the physical therapist in supervising personnel and establishing therapeutic practice in hospital, out-patient, and private settings. Department planning, personnel development, cost accounting and billing, standards of practice, and quality assurance are discussed. (Lec. 3) *Pre: second-year standing in physical therapy or permission of instructor.* Roush

**532 Physical Agents and Instrumentation in Physical Therapy (II, 4)** Theory, clinical investigations, and current research regarding the application of physical therapeutic energies and agents. Direct treatment techniques and supervision of support personnel in the administration of mechano-, electro-, thermo-, hydro-, ionto-, and phototherapy. (Lec. 3, Lab. 3) *Pre: 420, second-semester standing in physical therapy, or permission of instructor.* Rowinski

**535 Research Project in Physical Therapy II (II, 3)** Completion of investigation into some problem of basic or applied physical therapy science. Data gathering is completed, results are summarized, and conclusions relating findings to previous studies are formulated. (*Independent Study*) *Pre: 525 or permission of instructor.* Staff

**538 Professional Problems and Public Relations (I, 2)** Current problems in professional practice including legislative, educational, and interdisciplinary topics. Issues relating to consumers of physical therapy services and methods of marketing the services of physical therapists are elaborated. (Lec. 2) *Pre: third-year standing in physical therapy or permission of instructor.* Romeo

**540 Human Motor Development and Learning (I, 3)** Development and maturation of the human nervous system forms the basis for clinical considerations of developmental disabilities and motor learning. Theories of motor skill acquisition and therapeutic interventions for neuromuscular problems of the infant, child, adolescent, and adult. (Lec. 2, Lab. 3) *Pre: 410, 430, second-year standing in physical therapy, or permission of instructor.* Robinson

**542 Clinical Diagnosis (I, 2)** Modern medical and therapeutic diagnostic methods are presented to develop competencies in referral and evaluation of disorders. Medical and pharmacological science topics pertaining to physical therapy diagnoses are presented by invited lec-

turers. (Lec. 2) *Pre: second-year standing in physical therapy or permission of instructor.* Rowinski

**550 Orthopaedic Physical Therapy (I, 3)** Physical evaluation and treatment techniques of the human muscular, articular, and skeletal systems related to orthopaedic conditions. Rehabilitation of injured, congenitally dysfunctioning, surgically intervened patients, and patients with conditions at risk for dysfunction. (Lec. 2, Lab. 3) *Pre: 410, 412, 420, 510; second-year standing in physical therapy or permission of instructor.* Blanpied

**552 Functional Rehabilitation and Advanced Therapeutic Exercise (II, 3)** Patient care techniques and programs related to the restoration of functional motor activities are provided through specification of treatment protocols, assistive devices, therapeutic apparatus, and therapeutic exercise programs. Competency is developed by simulating actual clinical conditions. (Lec. 2, Lab. 3) *Pre: 550 or permission of instructor.* Blanpied and Agostinucci

**555 Seminar in Physical Therapy (I, II, or SS, 1–3)** Group exploration of advanced topics in physical therapy through study of recent literature and investigations. Detailed research reviews, clinical cases, and reports are brought to discussion. (*Seminar*) *Pre: graduate standing and permission of instructor or director. May be repeated with different topic for a maximum of 6 credits.* Staff

**560 Neurological Physical Therapy (II, 3)** Physical therapy for the neurologically disabled patient. Proprioceptive neuromuscular facilitation, neurodevelopmental, sensory-motor integration, other patterned stimulation and evaluation techniques with emphasis on stroke, spinal cord injury, and other disabling conditions of the nervous system. (Lec. 2, Lab. 3) *Pre: 430, BIO 242, second-year standing in physical therapy, or permission of instructor.* Robinson

**570 Cardiopulmonary Physical Therapy (II, 3)** Physiological basis, testing and evaluation, treatment, and administration of programs for cardiac and pulmonary-diseased patients requiring physical therapy. (Lec. 2, Lab. 3) *Pre: 420, 422, second-year standing in physical therapy, or permission of instructor.* Robinson

**574 Sports Physical Therapy (II, 2)** Advanced knowledge and competency in sports injury evaluation and treatment are developed. Additional coverage of sports injury prevention, athletic screening, medical intervention, interdisciplinary coordination, and patient or public education is provided. (Lec. 1, Lab. 3) *Pre: 550 or permission of instructor.* Blanpied and Perkins



**575 Physical Therapy Internship I** (*I, II or SS, 5*) Assignment to various clinical settings which provide supervised experiences with practicing physical therapists and support personnel. Specific setting and rotational time schedule is determined by the academic clinical coordinator and clinical staff. (*Practicum*) *Pre: permission of instructor.* Staff, ACCE

**580 Pediatric and Geriatric Physical Therapy** (*I, 3*) Specific problems of the maturing and aging patient population in physical therapy practice. Developmental disability programs and treatment programs in nursing facilities, treatment centers, and home programs for the aged patient population. (*Lec. 2, Lab. 3*) *Pre: 430, 540, third-year standing in physical therapy.* Robinson

**585 Physical Therapy Internship II** (*I, II, and SS, 5*) Assignment to various clinical settings which provide supervised experiences with practicing physical therapists and support personnel. Specific setting and rotational time schedule is determined by the academic clinical coordinator and clinical staff. (*Practicum*) *Pre: permission of instructor.* Staff, ACCE

**590 General Practice Physical Therapy** (*I, 3*) Problems and benefits associated with the business and conduct of different types of physical therapy private practice. Integration of the art and science of physical therapy with the delivery of services. (*Lec. 3*) *Pre: 418, 528, third-year standing in physical therapy.* Roush

**595 Physical Therapy Internship III** (*I, II, and SS, 5*) Assignment to various clinical settings which provide supervised experiences with practicing physical therapists and support personnel. Selection of clinical specialty area of student's interest is considered in determination of the setting. (*Practicum*) *Pre: permission of instructor.* Staff, ACCE

## Physics (PHY)

*Chairperson:* Professor Malik

**101 Physics and Physicists** (*I, 1*) Survey course spotlighting current developments in physics and examining the way scientific research is carried out. (*Lec. 1*) Letcher

**109 Introduction to Physics** (*I and II, 3*) Appreciation of the physical environment and an introduction to the principles and theories of contemporary physics. (*Lec. 3*) *Pre: concurrent enrollment in 110. Not open to students with credit in 111, 112, 203, 204, 205, 213, or 214.* Staff (N)

**110 Laboratory for Introduction to Physics** (*I and II, 1*) Demonstrations and laboratory exercises related to 109. (*Lab. 2*) *Pre: concurrent enrollment in 109.* Staff (N)

**111, 112 General Physics I, II** (*I and II, 3 each*) 111: Mechanics, heat, and sound. 112: Optics, electricity, magnetism, and modern physics. Noncalculus presentation of fundamental physics. Suitable for prospective teachers. (*Lec. 3*) *Pre: concurrent enrollment in 185 and 186.* Malik (N)

**130 Physics and Climatic Change** (*I and II, 3*) A qualitative presentation of physical principles used to describe atmospheric climate on global and smaller scales. Examination of the physical basis for climatic change. (*Lec. 3*) Hart (N)

**140 The Ideas of Physics** (*I and II, 3*) A non-mathematical presentation of classical and modern physics illustrated by lecture demonstrations. (*Lec. 3*) *Of particular interest to liberal arts students.* Staff (N)

**185, 186 Laboratory for General Physics I, II** (*I and II, 1 each*) Selected laboratory exercises applicable to materials in 111, 112. (*Lab. 2*) *Pre: concurrent enrollment in 111 and 112.* Staff (N)

**203 Elementary Physics I** (*I and II, 3*) Introduction to Newtonian mechanics. Kinematics and dynamics of particles and systems of particles. Motion of rigid bodies and oscillatory motion. Conservation principles. (*Lec. 3*) *Pre: credit or concurrent enrollment in MTH 141 and concurrent enrollment in 273. Intended for science or engineering majors. Not open to students with credit in 213.* Staff (N)

**204 Elementary Physics II** (*I and II, 3*) Introduction to electricity and magnetism, leading to Maxwell's equations. Electric fields and Gauss' law; magnetic fields and Ampere's law. Capacitance and inductance, DC and AC circuits. Electromagnetic waves. (*Lec. 3*) *Pre: 203, credit or concurrent enrollment in MTH 142, and concurrent enrollment in 274. Intended for science or engineering majors. Not open to students with credit in 214.* Staff (N)

**205 Elementary Physics III** (*I and II, 3*) Introduction to topics of thermodynamics, kinetic theory, wave motion, acoustics, and optics. (*Lec. 3*) *Pre: 203, credit or concurrent enrollment in MTH 243, and concurrent enrollment in 275. Intended for science or engineering majors. Not open to students with credit in 213, 214.* Staff (N)

**213, 214 Elementary Physics I, II** (*I and II, 3 each*) 213: Mechanics and elements of thermodynamics. (*Lec. 3*) *Pre: MTH 141 and 142.* 142

*may be taken concurrently. For students planning to major in one of the sciences.* 214: Electricity, magnetism, and elements of wave phenomena. (*Lec. 3*) *Pre: concurrent enrollment in 285 and 286, MTH 142, and credit or concurrent enrollment in MTH 243. Intended for science or engineering majors.* Staff (N)

**273, 274, 275 Elementary Physics Laboratory I, II, III** (*I and II, 1 each*) Laboratory exercises and recitation sessions related to topics in 203, 204, and 205. (*Lab. 3*) *Pre: concurrent enrollment in 203, 204, and 205.* Staff (N)

**285, 286 Physics Laboratory I, II** (*I and II, 1 each*) Laboratory exercises and recitation sessions related to topics in 213 and 214. (*Lab. 3*) *Pre: concurrent enrollment in 213 and 214.* Staff (N)

**306 Elementary Modern Physics** (*I and II, 3*) Introduction to relativistic and quantum physics. Special relativity theory, structure of atoms, molecules, and nuclei; wave and particle properties of matter, Schrodinger equation in one dimension. (*Lec. 3*) *Pre: 204, 205, or ELE 210. Not open to students with credit in 341.* Staff

**322 Mechanics** (*I, 3*) Introduction to Newtonian statics and dynamics using vector analysis; particle motion, Lagrange's equations; rigid body motion. Application to various topics in physical mechanics. (*Lec. 3*) *Pre: 204 and MTH 244.* Staff

**331 Electricity and Magnetism** (*II, 3*) Electrostatic fields and dielectric materials; magnetic fields, magnetic induction and magnetic materials; introduction to Maxwell's equations. (*Lec. 3*) *Pre: 204 and MTH 243.* Staff

**334 (or AST 334) Optics** (*II, 3*) Geometrical and physical optics; thick lens optics, interference, diffraction, polarization. (*Lec. 3*) *Pre: 112, 214, or 205.* Staff

**341 Introductory Modern Physics** (*I and II, 3*) The development and current status of major advances in twentieth-century physics, such as special relativity, kinetic theory, structure of atoms, molecules and nuclei, wave and particle properties of matter, thermionic and photoelectric effects. (*Lec. 3*) *Pre: 213, 214, and MTH 142. MTH 243 and ELE 210 can be substituted for 214. Not open to students with credit in 306.* Staff

**381, 382 Advanced Laboratory Physics** (*I and II, 3 each*) Key experiments covering a wide range of disciplines including nuclear physics, properties of the electron, magnetism thermodynamics, and optics. Quantitative analysis is stressed, including statistics and curve fitting. Technical skills are developed. (*Lab. 6*) *Pre: 204 and 205.* Nunes and Staff

**401, 402 Seminar in Physics (I and II, 1 each)** Preparation and presentation of papers on selected topics in physics. (*Seminar*) Required of all undergraduate and graduate students in physics; one semester required for all senior physics majors. Staff

**410 Computational Physics (II, 3)** Development and application of computer techniques to classical and quantum physics problems. Emphasis will be on approximation techniques and numerical methods for solving matrix, integral, and differential equations arising in physics. (Lec. 2, Lab. 3) Pre: MTH 215, 244, CSC 211, and PHY 306. Staff

**420 Introduction to Thermodynamics and Statistical Mechanics (II, 3)** Emphasis on laws of thermodynamics and properties of thermodynamic systems, kinetic theory of gases, molecular velocity distributions, transport phenomena, Maxwell-Boltzmann statistics. (Lec. 3) Pre: 205 and MTH 243. Northby

**425 Acoustics (I, 3)** Mathematical theory of vibrating systems; harmonic wave motion. Topics include: transmission and absorption of sound waves, microphones, psychoacoustics, underwater acoustics, and ultrasonics. (Lec. 3) Pre: permission of chairperson. Staff

**451 Introduction to Quantum Mechanics (I, 3)** Photoelectric, Compton effects; spectra, atomic structure, matter waves, duality, uncertainty, Schrodinger equation; 1-D, hydrogen. Postulates: wave functions, dynamical variables, Hermiticity, eigenvalues, commutators, generalized uncertainty. Angular momentum: spherical harmonics, Pauli matrices. Spin-orbit, Zeeman effects; angular momenta addition. (Lec. 3) Pre: 306, 322, MTH 215 and 244. Staff

**452 Quantum Mechanics: Techniques and Applications (II, 3)** Perturbation theory, atomic polarizability, Stark effect, periodic potentials. Variational principles. Sudden approximation: nuclear decay. Time-dependent perturbations: radiation, selection rules. Ehrenfest theorem. Scattering: Born approximation, partial waves. Fermions, bosons, helium atom: Hartree (Fock) and Monte Carlo optimization. (Lec. 3) Pre: 451 and MTH 461. Staff

**455 Introduction to Solid-State Physics (I, 3)** Crystal structure, thermal, electrical, and magnetic properties of solids. Electron gas theory of metals, band theory of solids. Semiconductors. (Lec. 3) Pre: 451 and MTH 243. Staff

**483, 484 (or AST 483, 484 or OCG 483, 484) Laboratory and Research Problems in Physics (I and II, 3 each)** Research in current areas of

physics. Students perform research projects with individual faculty members. Students in physics and physical oceanography may coordinate their research project with a faculty member of the Graduate School of Oceanography. (Lec. 1, Lab. 6) Pre: 381 and 382. Staff

**491, 492 (or AST 491, 492) Special Problems (I and II, 1–6 each)** Advanced work under the supervision of a staff member arranged to suit the individual requirements of the student. (*Independent Study*) Staff

**510 Mathematical Methods of Physics I (I, 3)** Topics designed to include applications in physics. Vector and tensor analysis; linear algebra; coordinate systems. Determinants, matrices; introductory group theory. Infinite series, complex analysis, analytic properties, conformal mapping, calculus of residues. Fourier analysis and Laplace transforms. (Lec. 3) Pre: permission of chairperson. Staff

**520 Classical Dynamics (I, 3)** Newton's laws. Conservation theorems and symmetry properties. Lagrangian mechanics. Central force motion. Dynamics of rigid bodies. Hamiltonian mechanics. Canonical transformations. Action-angle coordinates. Hamilton-Jacobi theory. Deterministic chaos. Relativistic mechanics. (Lec. 3) Pre: credit or concurrent enrollment in 510. Staff

**525 Statistical Physics I (I, 3)** Equilibrium thermodynamics (laws of thermodynamics, thermodynamic potentials). Phase transitions (phase coexistence, Clausius-Clapeyron equation, metastable states, critical point). Kinetic theory. Equilibrium statistical mechanics (microcanonical, canonical, grandcanonical ensembles, bosons, fermions). Critical phenomena. (Lec. 3) Pre: 420 or equivalent, 510. Staff

**530 Electromagnetism I (II, 3)** Electrostatics, including boundary value problem. Multipoles, electrostatics of macroscopic media, dielectrics. Magnetostatics. Time-varying fields, Maxwell equations, conservation laws. Plane electromagnetic waves, wave propagation. Wave guides, resonant cavities. Magnetic materials. (Lec. 3) Pre: credit or concurrent enrollment in 510 and 520. Staff

**560 Experimental Methods in Condensed Matter Science (I or II, 3)** Fundamental experiments on topics related to departmental research. Experimental methodology. (Lec. 2, Lab. 3) Pre: 484 or equivalent. Staff

**570 Quantum Mechanics I (II, 3)** Dirac notation. Matrix representations, observables, uncertainty relations. Time evolution; Schrodinger and Heisenberg pictures. Schrodinger equation

applications. Propagators and Feynman path integrals. Aharonov-Bohm effect. Angular momentum; Wigner-Eckart theorem. (Lec. 3) Pre: credit or concurrent enrollment in 510 and 520. Staff

**577, 578 Seminar in Sensors and Surface Technology (I and II, 1)** Students, faculty, and invited outside speakers present and discuss selected topics related to research interests of the Sensors and Surface Technology Partnership. (*Seminar*) Pre: permission of instructor. May be repeated. S/U credit. Staff

**580 Condensed Matter Physics I (I, 3)** Introductory theories. Crystal lattices (classification, reciprocal lattice, diffraction). Electron energy levels (periodic structures, tight-binding, APW, OPW approximations, pseudopotentials; Fermi surfaces). Phonons (harmonic and anharmonic effects). Dispersion. Electron-phonon interaction. (Lec. 3) Pre: 530 or permission of chairperson. Staff

**590 Faculty Project (I or II, 1–6)** A special project directly related to the research program of an individual faculty member. (*Independent Study*). Pre: permission of chairperson. Not to exceed 6 credits. Staff

**591 Special Problems (I or II, 1–6)** Advanced study under the supervision of a faculty member arranged to suit the individual needs of the student. (*Independent Study*) Pre: permission of chairperson. Not to exceed 6 credits. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

**610 Mathematical Methods of Physics II (II, 3)** Topics designed to include applications in physics. Ordinary and partial differential equations; Sturm-Liouville theory. Numerical methods and computational techniques. Probability and statistics. Integral transforms. Integral equations; Green's functions. Special functions of mathematical physics. (Lec. 3) Pre: 510. Staff

**625 Statistical Physics II (II, 3)** Equilibrium critical phenomena (critical exponents, scaling relations, multicritical phenomena). Exact solutions. Renormalization group theory and other approximate methods. Critical behavior of magnets, fluids, and surfaces. (Lec. 3) Pre: 525 and 670. Staff

**626 Statistical Physics III (II, 3)** Stochastic processes. Markov condition. Master equation. Fokker-Planck equation. Brownian motion. Langevin equation. Transport phenomena.

Onsager theory of irreversible processes near equilibrium. Boltzmann equation. Linear response theory, fluctuation dissipation theorem. (Lec. 3) Pre: 525. Muller

**630 Electromagnetism II** (I, 3) 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 by moving charges. Multipole fields. (Lec. 3) Pre: 530. Staff

**660 Nuclear and Particle Physics** (II, 3) Weak, strong, and electromagnetic interactions. Nucleon-nucleon potential, shell model, optical model. Isospin, unitary symmetry, quark model of hadrons. Scattering and reaction theory of few-body systems. Deuteron. Relativistic nuclear and particle phenomena. (Lec. 3) Pre: 570 and 670. Staff

**670 Quantum Mechanics II** (I, 3) Symmetry (parity, translation, time-reversal). Time-independent (dependent) perturbation theory, variational methods. Identical particles. Scattering theory (Lippman-Schwinger equation, Born series, partial waves, resonances, optical theorem, inelastic scattering). Applications. Relativistic quantum mechanics. (Lec. 3) Pre: 570 or permission of chairperson. Staff

**672 Quantum Mechanics III** (II, 3) Atomic systems (structure, semiclassical radiation theory, collisions). Quantum fields (scalar, spin-1/2, electromagnetic). Applications: quantum field theory (Feynman diagrams in QED and weak interactions, renormalization). Fock space. Many-body theory. (Lec. 3) Pre: 670. In alternate years. Next offered spring 1999. Staff

**680 Condensed Matter Physics II** (II, 3) Interacting systems. Green's functions. Second quantization. Landau theory of quasi-particles. Schroedinger and Heisenberg pictures. Many-body Green's functions. Perturbation series, diagrammatic analysis. Dielectric response. Thermal properties. Phonons in metals. (Lec. 3) Pre: 580. Staff

**690 Topics in Physics** (I or II, 3) Advanced topics in areas of research specializations: a) neutron physics; b) quantum fluids; c) magnetism; d) surface physics; e) nonlinear phenomena; f) advanced quantum physics; g) nuclear physics; h) low-temperature physics. (Lec. 3) Pre: permission of chairperson. Staff

**691 Advanced Special Topics** (I or II, 1–6) Special topics related to current developments by visiting or permanent faculty. (Lec. 1–6) Pre: permission of instructor. Staff

**699 Doctoral Dissertation Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**930 Workshop in Physics Topics for Teachers** (I, II, and SS, 0–3 each) Especially designed for teachers of physical sciences. Basic topics in physics from an advanced or pedagogical perspective. (Workshop) Pre: teacher certification. Staff

## Plant Sciences (PLS)

Chairperson: Associate Professor Sullivan

**107 (or BIO 107) Plant Biology Seminar** (I, 1) A seminar series offered by faculty, graduate students, and visiting professionals for the purpose of acquainting students with career opportunities provided by the plant biology program. (Seminar) Krul

**150 Plant Biology for Gardeners** (SS, 3) Fundamentals of plant biology, emphasizing the structure, physiology, and ecology of vascular plants common to gardens and landscaped environments. (Lec. 3) Hull (N)

**200 Introduction to Plant Protection** (I, 4) Basic study of weeds, insects, and disease agents, and the problems they cause. Recognition of important plant pests and application of integrated cultural, chemical, and biological pest management procedures. (Lec. 4) Pre: BIO 104A or 112, or permission of instructor. Englander

**205 Population, Environment, and Plant Biology I** (II, 4) Solving problems related to the interaction of population growth, environment, cell behavior, and plant productivity, as seen from the perspective of competitive evolution. (Lec. 3, Lab. 2) Next offered spring 2000. Krul

**210 Plant Protection Practicum** (I, 1) Introduction to practical aspects of plant protection, concentrating on field diagnostic techniques and development of analytical and observation skills. Diagnostics are primarily an interactive field activity, supplemented by microscopy, report writing, and oral presentations. (Practicum) Pre: prior or concurrent enrollment in 200 or permission of instructor. Englander

**222 Ecology of the Home Landscape** (II, 3) Basics of home gardening with minimal environmental impact including maintenance of the trees, shrubs, lawns, flowers, vegetables, native and invasive plants, composting, water quality, and wildlife and pest management. (Lec. 2, Lab. 2) Casagrande and Maynard

**233 Floral Art** (I, II, and SS, 3) Theory and practice in the art of flower and plant arrangement for the home, show, and special occasions. History, elements, and principles of design and color. (Lec. 1, Lab. 4) Siligato (A)

**250 Plant Breeding and Genetics** (II, 4) Introduction to the general principles of plant breeding, with emphasis on the application of genetic principles in plant improvement strategies. (Lec. 3, Lab. 2) Pre: BIO 112. Chandlee and Ruummele

**255 Fundamentals of Plant Physiology** (II, 2) Fundamental concepts underlying life functions in plants. Emphasis on energy relations and material transport. Special consideration of photosynthesis, water use, nitrogen utilization, dormancy, and photomorphogenesis. (Lec. 2) Pre: BIO 112, CHM 101; PLS 205 recommended. Hull

**305 Population, Environment, and Plant Biology II** (I, 4) Solving problems related to the interaction of population growth, environment, cell behavior, and plant productivity, as seen from the perspective of competitive evolution. (Lec. 3, Lab. 2) Pre: 205 or permission of instructor. Next offered fall 1999. Krul

**306 Landscape Management and Arboriculture** (I, 3) Culture of new and established trees, shrubs, and vines in the landscape. Practical exposure to planting, pruning, fertilization, and plant protection. Prepares the student for Arborist's Certification Examination. (Lec. 2, Lab. 2) Pre: BIO 112 or permission of instructor. Maynard

**311 Fruit Culture** (I, 3) Principles of fruit production with emphasis on home gardens. Topics include propagation, planting, soils, fertilization, cultural practices, pruning and storage of tree and small fruits and dwarfs or semi-dwarf stocks. (Lec. 2, Lab. 2) Pre: 205. In alternate years. Next offered fall 1999. Alm

**315 Introduction to Horticulture Therapy** (I, 3) Objectives and techniques of applying horticulture and horticulture-related skills to therapeutic and rehabilitative programs. (Lec. 3) Pre: 205 or permission of instructor. Shaw

**316 Gardens and Therapy** (I, 3) Identification, culture, and use of garden flowers and herbs. Garden planning and design with emphasis on those appropriate for special populations. (Lec. 2, Lab. 2) Pre: 205 or permission of instructor. In alternate years. Next offered fall 1998. Shaw

**320 Landscape Design** (I, 3) Examination of landscape design principles and practices including introduction to landscape graphics,

preliminary design, and planting design. (Lec. 3) Pre: LAR 201 or permission of instructor. Not open to landscape architecture majors. Simeoni

**322 Power Units (II, 3)** Principles of operation, maintenance, and adjustment of power units including gasoline and diesel engines and electric motors. Emphasis on tractors and other power units important in farm, nursery, greenhouse, and grounds maintenance operations. (Lec. 2, Lab. 2) In alternate years. Next offered spring 2000. Wing

**324 Vegetable Science (II, 3)** The origins, culture, cultivars, soil, and fertility management of vegetables for commercial growers and home gardeners. Practical experience in growing vegetables from seed to harvest under greenhouse conditions. (Lec. 2, Lab. 2) Pre: 205. In alternate years. Next offered spring 1999. Wallace

**331 Floriculture and Greenhouse Management (I, 3)** The greenhouse environment and its relation to the culture of specific plants. Principles governing the production and culture of plants under controlled temperature, humidity, light, and modified atmospheres. Greenhouse construction and environmental control. (Lec. 3) Pre: 205 or permission of instructor. Shaw

**332 Plant Pathology: Introduction to Plant Diseases**  
See Biological Sciences 332.

**335 Commercial Floral Design and Flower Shop Practices (I, 3)** Advanced floral design including wedding, funeral, church, and holiday arrangements. Flower shop practices, buying, selling, and handling cut flowers and potted plants. (Lec. 1, Lab. 4) Pre: 233 or permission of instructor. Siligato

**341 Introduction to Turf Management (I, 3)** Fundamental aspects of turfgrass science including identification, propagation, fertilization, pest control, and other soil-plant relationships. (Lec. 2, Lab. 2) Pre: 205 and NRS 212. Ruemmele

**350 Interior Landscaping (II, 3)** Identification, growth characteristics, culture, use, maintenance, and management of plants suitable for interior landscape situations. (Lec. 2, Lab. 2) Pre: 205 or permission of instructor. Shaw

**352 (or ASP 352) General Genetics (I, 3)** Introduction to basic genetic principles and concepts leading to an understanding of genes. Heredity and the expression of inherited variation. Applications and implications of these concepts to animals, plants, fungi, and bacteria are discussed. (Lec. 3) Pre: BIO 104A or 104B, or 112 or 113. Not open to students with credit in BIO 352. Chandlee

**353 Landscape Plants I**  
See Landscape Architecture 353.

**354 Landscape Plants II**  
See Landscape Architecture 354.

**355 (or ASP 355) Genetics Laboratory (I, 2)** Basic principles and concepts of genetics demonstrated with microorganisms, plants, and animals. (Lab. 4) Pre: credit or concurrent enrollment in 352 or BIO 352. Not open to students with credit in BIO 454. Chandlee

**361 (461) Weed Science (I, 3)** Ecological and cultural aspects of weed problems, physiology of herbicide action, selected problem areas in weed control and plant identification. (Lec. 2, Lab. 2) Pre: NRS 212, organic chemistry recommended. In alternate years. Next offered fall 1999. Sullivan

**390 Irrigation Technology (II, 3)** A study of the science and technology of obtaining, applying, and managing water as it relates to the culture of field, forage, vegetable, turf, and ornamental crops. (Lec. 2, Lab. 2) Pre: NRS 212 and MTH 111. In alternate years. Next offered spring 2000. Sullivan

**393, 394 Plant Protection Clinic (I and II, 3 each)** Practical experience in plant pest detection and identification, pest management techniques and equipment. (Lec. 1, Lab. 4) Pre: ENT 385, PLS 332 or 440, and permission of instructor. Wallace

**399 (or LAR 399) Plant Sciences Internship (I, II, and SS, 1–6)** Directed work experience programs at nurseries, turf farms, greenhouses, plant breeding farms, arboreta, research farms, or laboratories. (Practicum) Pre: 205 and permission of instructor. May be repeated for a maximum of 6 credits. S/U credit. Staff

**401, 402 Plant Sciences Seminar (I and II, 1 each)** Presentations and discussions of current topics of concern to producers and consumers of plants and plant products, including plant protection. (Seminar) Maynard

**405 Propagation of Plant Materials (II, 3)** Theoretical and practical study of propagation including grafting, budding, cuttage, and seedage. (Lec. 2, Lab. 2) Pre: 205. Maynard

**406 Senior Thesis Research (I and II, 3–6)** Seniors conduct research approved by a faculty mentor. Research results are written and orally presented to a group of faculty for a grade. (Independent Study) Pre: permission of instructor. May be repeated for up to 6 credits. Not for graduate credit. Staff

**407 Environmental Education: Theory and Experiential Learning (II, 3)** Exploration of environmental education from a theoretical and experiential perspective. Seven weeks of lecture/discussion and seven weeks of training and teaching in an on-campus environmental education program. (Lec. and Practicum) Pre: NRS 100, 212, and PLS 200 or permission of instructor. Kinigstein

**415 Theories and Practices in Therapeutic Horticulture (II, 3)** Concepts and methods of using plant and gardening activities in horticulture therapy programs for exceptional individuals in most types of therapeutic situations. (Lec. 1, Lab. 4) Pre: 315 and 316. Not for graduate credit in plant science. Shaw

**436 Floriculture and Greenhouse Crop Production (II, 4)** Status of floriculture industry and commercial production of greenhouse crops including scheduling, marketing, and postharvest handling. Student project required. (Lec. 3, Lab. 2) Pre: 331. In alternate years. Next offered spring 2000. Shaw

**440 Diseases of Turfgrasses, Trees, Shrubs, and Ornamental Shrubs (I, 3)** Disease diagnosis, epidemiology, and control measures pertinent to these categories of plants. (Lec. 3) Pre: 332 or equivalent or permission of instructor. Jackson

**441 Plant Disease Laboratory (I, 1)** Laboratory and field diagnosis of turf diseases and diseases of trees and ornamental shrubs. (Lab. 2) Pre: concurrent enrollment in 440. Jackson

**442 Advanced Turf Management (II, 3)** Establishment and maintenance practices for specialty turfgrass areas such as golf courses, lawn tennis courts, bowling greens, athletic fields, public parks, industrial and institutional grounds, airports, and roadsides. Design and construction specifications, and construction and maintenance budgets. (Lec. 3) Pre: 341 or equivalent. Jackson

**463 Principles of Plant Disease Control (II, 3)** The extent and impact of plant disease loss. Disease-causing agents, the nature of disease epidemics, disease forecasting, and strategies for plant disease control. (Lec. 3) Pre: 332 or permission of instructor. In alternate years. Next offered spring 1999. Jackson and Wallace

**471 Plant Improvement I (I, 3)** Plant cell and tissue culture methodologies particularly as they relate to the development and selection of improved plant varieties through the modern approaches of plant biotechnology. (Lec. 3) Pre:

205 and 352 or BIO 352. In alternate years. Next offered fall 1999. Krul

**472 Plant Improvement II (II, 3)** Traditional breeding and contemporary approaches to the improvement of economic crops with a focus on emerging strategies and opportunities utilizing the tools of molecular biology for gene transfer. (Lec. 3) Pre: 205 and 352 or BIO 352. In alternate years. Next offered spring 2000. Chandlee

**475 (or NRS 475) Plant Nutrition and Soil Fertility (I, 4)** The plant-soil system. Availability and mobility of mineral nutrients in soil and their uptake, distribution, and function in plants. Plant energy relations and organic nutrition. Laboratory: hydroponic plant culture, ion interactions, radioisotopes, and deficiency symptoms. (Lec. 3, Lab. 2) Pre: 205, NRS 212, BIO 112, and organic chemistry. Next offered fall 1999. Hull

**476 Environmental Plant Physiology (II, 3)** Physiological interactions of plants with their physical and biological environment, emphasizing energy dynamics, signal transduction reactions, physiological responses to stress, and allelopathic associations. (Lec. 3) Pre: 205, BIO 262, or permission of instructor. In alternate years. Not for graduate credit. Next offered spring 1999. Hull

**484 Structures (II, 3)** Principles of design and construction of structures related to agricultural production. Emphasis on woodframe buildings. Planning, materials, construction components, environmental control, and waste disposal. (Lec. 3) Pre: MTH 111 or equivalent, or permission of instructor. In alternate years. Next offered spring 1999. Wing

**491, 492 (or LAR 491, 492) Special Projects and Independent Study (I and II, 1–3 each)** Special work to meet individual needs of students in various fields of plant nutrition, propagation, growth and development, garden design, site planning, plant pathology, entomology, and related subjects. (Independent Study) Pre: permission of chairperson. Staff

**501, 502 Graduate Seminar in Plant Sciences (I and II, 1 each)** Presentation of technical reports and discussion of current research papers in crop science, landscape ecology, growth and development of economic plants, and production, protection, and management of economic crops. (Seminar) Sullivan

**511 The Nature of Plant Disease (I, 3)** Analysis of the nature of plant disease, the processes of infection and pathogenesis, and the structural

and physiological responses that determine resistance to disease. (Lec. 3) Pre: BIO 332 or equivalent. In alternate years. Next offered spring 2000. Staff

**512 Plant Growth and Development (II, 4)** Environmental, chemical, and genetic regulation of plant development, from seed formation to senescence. (Lec. 3, Lab. 3) Pre: BIO 447. In alternate years. Next offered 1999–00. Krul

**513 Laboratory Plant Tissue Culture (II, 1)** Techniques for initiation and continuous culture of plant cells; protoplast isolation, fusion, and selection; micropropagation, somatic embryogenesis, and production of haploid plants via pollen and anther culture. (Lab. 3) Pre: BIO 447, concurrent enrollment in 472, and permission of instructor. In alternate years. Next offered spring 2000. Krul

**572 (or BCH 572) Plant Biochemistry (II, 3)** Physiological chemistry unique to plants. Emphasis on energy acquiring, transferring, and storing reactions including the metabolism of carbohydrates, amino acids, lipids, phenolics, and phytohormones. (Lec. 3) Pre: BCH 311 or 581 or permission of instructor. In alternate years. Next offered spring 2000. Hull

**576 Environmental Plant Physiology (II, 3)** Physiological interactions of plants with their physical and biological environment, emphasizing energy dynamics, signal transduction reactions, physiological responses to stress, and allelopathic associations. Supervised report on appropriate topic required. (Lec. 3) Pre: 205, BIO 262 or permission of instructor. In alternate years. Next offered spring 1999. Hull

**591, 592 Nonthesis Research in Plant Sciences (I and II, 1–3 each)** Advanced work under the supervision of research staff to expand research experience into areas other than those related to thesis research. Arranged to suit individual requirements. (Independent Study) Pre: permission of instructor. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

Note: For other related courses, see BIO 311, 321, 323, 432, 437, 447, 453, 515, 521, 522, 524, 534, 536, 554, 571, 572 and MIC 521, 552.

## Political Science (PSC)

Chairperson: Professor Tyler

**113 American Politics (I or II, 3)** Basic principles of the government of the United States: constitutionalism, separation of powers, federalism, civil liberties; politics; legislative, executive, and judicial organization; functions of government. (Lec. 2, Rec. 1) Moakley (S)

**116 International Politics (II, 3)** Nature of the state system, foundations of national power, means of exercising power in the interaction of states. Current international problems. (Lec. 2, Rec. 1) Genest (S)

**201 Introduction to Comparative Politics (I, 3)** An examination of different governmental systems and political institutions. Illustrations and comparisons from the Americas, Europe, and the developing nations. (Lec. 3) Pre: 116. Petro (S)

**221 State and Local Government (I, 3)** Survey of institutional framework of American state and local governments. Consideration of current events and controversies at state and local levels. (Lec. 3) Pre: 113. Leduc (S)

**240 Major Political Ideologies (I or II, 3)** Introduction to and analysis of fascism, communism, socialism, and capitalism. An examination of the contemporary meaning of liberalism, radicalism, and conservatism. (Lec. 3) Killilea (L)

**261 The President and Public Policy (II, 3)** Examines the role of the President within the American political process. (Lec. 3) Pre: 113 and freshman or sophomore standing. Students may not take both 261 and 461 for credit. Moakley

**288 The American Legal System (II, 3)** Political and social analysis of the American legal system, particularly at trial court and street levels, and roles of participants in that system with observation of local courts. (Lec. 3) Pre: 113. Rothstein (S)

**300 Challenge of Nuclear Arms (II, 3)** Nuclear weapons addressed from a range of perspectives. Emphasis on the strategic, political, social, and moral issues and controversies raised by the potential for nuclear war. (Lec. 3) Pre: 3 credits in the social sciences recommended or permission of instructor. Tyler

**301 Comparative Politics (I, 3)** An exploration of the theoretical concepts underlying the study of different political systems; in particular, issues of modernization, political culture, and relative economic and political performance. (Lec. 3) Pre: 201 or permission of instructor. Petro

**304 Introduction to Public Administration (II, 3)** An overview of the field of public administration. Consideration will be given to the relationship of public organizations with society. Examination of major administrative theories and their influence upon contemporary organizational environment. (Lec. 3) *Pre: 113 or permission of instructor.* Staff

**305 Politics in Rhode Island (II, 3)** Exploration of politics and policy process in an age of New Federalism in Rhode Island. Examination of the political development of the state and the contemporary character of state politics. *Pre: six credits in social sciences.* (Lec. 3) Moakley and Sundlun

**309 Polimetrics (II, 3)** Examination of practical problems of data preparation and analysis in political science using mainframe, mini- and microcomputers. Examples from recent research in politics. (Lec. 3) *Pre: STA 308 or equivalent.* Leduc

**321 Politics and Problems of Israel (II, 3)** Analysis of the evolution of political institutions and the dynamics of public policy in Israel. Emphasis on contemporary political problems. (Lec. 3) *Pre: 113 or 116 or permission of instructor.* Zucker (F)

**341 Political Theory: Plato to Machiavelli (I, 3)** Major political philosophies from Plato to Machiavelli and their influence on such key concepts as justice, equality, and political obligation. (Lec. 3) Killilea (L)

**342 Political Theory: Modern and Contemporary (II, 3)** Continuation of 341. Machiavelli to Marx and Freud. (Lec. 3) Killilea (L)

**343 Revolutionary Thought (II, 3)** Analysis of revolutionary thought from Jewish millennialism to Latin American and Asian communism. (Lec. 3) *Pre: 113. Offered every third year.* Rothstein

**344 International Financial Economics**  
See Economics 344.

**365 Political Parties and Practical Politics (I, 3)** Analysis of the American party process with some attention to comparative party systems. History, organization, functions, methods, problems, and prospects for reform. (Lec. 3) *Pre: 113.* Zucker

**368 Public Opinion (I, 3)** Examination of public opinion and formative influences upon it. Role and implications of public opinion in governmental process. (Lec. 3) *Pre: 113.* Tyler

**369 Legislative Process and Public Policy (II, 3)** Analysis of American legislative bodies, particularly Congress, some attention to comparative legislatures. Structure, organization, functions of Congress analyzed in relation to its role in determining public policy. (Lec. 3) *Pre: 113.* Zucker

**370 Politics and Media (I, 3)** Analysis of the relationship between the mass media in the United States and the political process. Emphasis on the impact of the media on both domestic and foreign policy processes. *Pre: 113 or 116, or permission of instructor.* Genest

**375, 376 Field Experience in Practical Politics (I or II, 1–3 each)** Supervised experience in local, state, and national units of government, political organizations, private and public community agencies. Students must have placement description, faculty supervisor, and outline of academic component of experience prior to registration. (Practicum) *Pre: 12 credits in the social sciences including 6 credits in political science and permission of instructor.* S/U credit. May be repeated for a maximum of 6 credits. Staff

**377 Politics of China (I, 3)** Institutions of the Chinese system including the Communist Party, the state system, the bureaucracy, and the army. Emphasis on China's economic and social progress and relations with other nations. (Lec. 3) *Pre: 116 or equivalent recommended.* Tyler

**401 Comparative European Politics (I or II, 3)** Concepts and methodologies relative to the study of comparative politics. Structural-functional approach to survey of the formal and informal features of the political systems of Great Britain, France, Germany, Soviet Union, and one other country. (Lec. 3) Petro (F)

**402 Environmental Policy and Politics (I, 3)** Seminar in the politics and public policy associated with environmental pollution. (Lec. 3) *Pre: 113 and junior or senior standing.* Hennessey

**403 Global Ecopolitics (II, 3)** Seminar focuses on the international politics of global pollution, marine pollution, atmospheric pollution, tropical deforestation, and conservation. (Lec. 3) *Pre: 116 or 402.* Hennessey or Stein

**405 The Indian Political System: Tradition and Modernity (II, 3)** Analysis of the Indian political system; emphasis on social and cultural influences, Gandhi and Nehru, human rights, rural and urban development, regional and international relations. (Lec. 3) *Pre: 116 or permission of instructor.* Stein

**406 Russian Foreign Policy (II, 3)** An upper-level introduction to the issues of Russian foreign policy, including relations with newly formed states of the CIS. (Lec. 3) *Pre: six credits in the social sciences recommended or permission of instructor.* Offered in alternate years. Petro

**407 Politics of the Russian Commonwealth (II, 3)** An upper-level introduction to the politics and society of Russia and the newly created states of the CIS. (Lec. 3) *Pre: six credits in the social sciences recommended or permission of instructor.* Offered in alternate years. Petro (F)

**408 African Governments and Politics (I, 3)** Political developments in the new nations of sub-Saharan Africa. Main stress is functional: role of parties as integrative forces, democratic centralism, one-party states, African political thought, and common developmental problems. (Lec. 3) *Pre: 113 and 116.* Hamilton (F)

**410 Issues in African Development**  
See African and Afro-American Studies 410.

**420 Nonviolence and Change in the Nuclear Age (I, 3)** Focuses on the philosophies and political participation of individuals and movements working nonviolently for social change and conflict resolution from M. Gandhi and M.L. King to the present within America and globally. (Lec. 3) *Pre: 113 or 116.* Stein

**422 Comparative American State Politics (II, 3)** Comparative study of American state politics and government, focusing on public policy formation and execution. Emphasis on contemporary issues. (Lec. 3) *Pre: 221 and STA 308 or equivalents, or permission of instructor.* Leduc

**431 International Relations (I, 3)** Analysis of the various theories of international relations and study of the major forces and events shaping the politics of the Great Powers. (Lec. 3) *Pre: 116.* Genest

**432 International Government (II, 3)** General development of international government, with particular attention to structure, methods, and operations of the League of Nations, the United Nations, and related agencies. Problems of security, conflict resolution, and social and economic issues. (Lec. 3) *Pre: 116.* Staff

**434 American Foreign Policy (II, 3)** Analysis of the institutions, techniques, and instruments of policy making and the execution of foreign policy. (Lec. 3) *Pre: 116.* Genest

**440 The Politics of Being Mortal (I or II, 3)** Seminar on how attitudes toward death affect political values and priorities, especially in re-

gard to capitalism and the threat of nuclear war. (Lec. 3) Pre: 341, 342, or permission of instructor. Killilea

**441 Women and Politics (II, 3)** Explores the role of women in the American political system, as voters, campaign activists, and office holders, and as members of organized groups in the policy-making process. (Lec. 3) Pre: 113 or permission of instructor. Not for graduate credit. Moakley

**443 Twentieth-Century Political Theory (I, 3)** Important political theorists of this century, particularly as they interpret the basis of political obligation and weigh the question of violent political change. (Lec. 3) Pre: permission of instructor. Offered every third year. Rothstein

**455, 456 Directed Study or Research (I or II, 3 each)** Special work arranged to meet the needs of individual students who desire advanced work in political science. (Independent Study) Pre: permission of chairperson. Staff

**461 The American Presidency (I, 3)** Presidential leadership and decision making, with emphasis on growth in power and prestige of the presidency, exercise of presidential influence in conduct of government, and presidential initiative in formulating and developing national policies and priorities. (Lec. 3) Pre: 113. Moakley

**466 (or AAF 466) Urban Problems (II, 3)** Contemporary and emerging problems of urban affairs. Discussion, reading, and assignments on the interaction among urban change, development of social institutions, and formation of public policy. (Lec. 3) Pre: 113. Hamilton

**471 Constitutional Law (I, 3)** The Supreme Court as a political institution in American democracy. Analysis of leading constitutional decisions exploring: adaptation of governmental powers to changed conditions of society, development and function of judicial review, and dynamics of decision making in the Supreme Court. (Lec. 3) Pre: 113. Rothstein

**472 Civil Liberties (II, 3)** The problem of human freedom examined in the context of the fundamental rights guaranteed to individuals by the American Constitution. Emphasis on religious liberty, freedom of expression, racial equality, fair criminal procedures, and the protection of personality and privacy. (Lec. 3) Pre: 113. Rothstein

**474 (or SOC 474) Criminal Justice System (II, 3)** The American system of criminal justice, general processing of cases, principal actors, study of theories of criminal law, and pretrial detention and sentencing. (Lec. 3) Pre: 113. Staff

**475 Behavior Systems in Crime**  
See Sociology 475.

**481, 482 Political Science Seminar (I or II, 3 each)** Intensive studies in various important fields in political science. Class discussion of assigned readings and student reports. Emphasis on independent research. (Seminar) Pre: 6 credits in political science beyond 113 and 116. Staff

**483 Political Process: Policy Formulation and Execution (I or II, 3)** Interrelationships of policy development and administration with particular attention devoted to participants in the process. Specific activities of the executive branch and government policies that affect the structure, composition, and function of the bureaucracy. (Lec. 3) Pre: 113 or permission of instructor. Staff

**485 The Politics of Children's Rights (I, 3)** Explores the political aspects and their relationship to socioeconomic and cultural factors of major issues that affect children's lives. Focuses on individual and societal rights and responsibilities in America and internationally. (Seminar) Pre: six credits in social sciences recommended or permission of instructor. Stein

**486 Cooperative Communities (II, 3)** Alternative ways in which people live, work, and share together in their quest for personal growth and sense of community. Emphasis on smaller units of society. (Lec. 3) Pre: 113, 116, or permission of chairperson. Stein

**487 Rebuilding Our Communities: Theory and Practice (I, 3)** Seminar examines theories and practices of participatory citizenship in contemporary America. Explores individual and communitarian rights and responsibilities within a democratic civic culture. Includes a 40-hour community service experience. (Seminar) Pre: senior and graduate level or juniors by permission. Stein

**491 Principles of Public Administration (I, 3)** Principles of public administration, structure and organization, financial management, administrative responsibility, and the relation between the administration and other branches of government. (Lec. 3) Pre: 113. Staff

**498 Public Administration and Policy Formulation (II, 3)** Identification and analysis of factors which affect formulation of public policy, including roles of the executive, the bureaucracy, the legislature, and special interest groups. Evolution of the policy process, particularly at the state and local levels of government. (Lec. 3) Pre: 491 or permission of chairperson. Hennessey

**501 Administrative Theory (I or II, 3)** Theoretical constructs and models in fields of public administration; theories of Weber, Riggs, Dorsey, Simon, Presthus. Lower-level models in subfields of organization, communications, and decision making. Task-oriented subject matter such as personnel, budget, and program administration related to theoretical formulations which seek to explain them. (Lec. 3) Pre: 491 or permission of instructor. Staff

**502 Techniques of Public Management (I or II, 3)** Principles and techniques employed in the administration of staff activities of the public service, such as administrative planning, project scheduling, and budgeting. (Lec. 3) Pre: 491 or permission of instructor. Staff

**503 Problems in Public Personnel Administration (I or II, 3)** Development of personnel administration, including problems of recruitment, examination, promotion, and staffing within public service. Emphasis on evaluation of employee performance and collective bargaining in public service. (Lec. 3) Pre: graduate standing or permission of instructor. Staff

**504 Ethics in Public Administration (I, 3)** This course explores through case studies, class discussion, films, and readings how ethical deliberation in the public sector is an essential commitment and skill for public administrators. (Seminar) Pre: graduate standing or permission of instructor. Killilea or Vocino

**505 (or SOC 505) Public Program Evaluation (I or II, 3)** Research design and methodologies associated with the evaluation of governmental programs and activities. (Lec. 3) Pre: STA 308 or equivalent or permission of instructor. Staff

**506 Seminar in Budgetary Politics (I, 3)** Examination of federal, state, and local fiscal and budgetary processes, focusing on the politics of the budgetary process and models of budgeting, with emphasis on contemporary issues. (Seminar) Staff

**512 Marine Science and Policy Analysis**  
See Marine Affairs 512.

**521 International and Comparative Trade Unions and Labor Relations**  
See Labor and Industrial Relations 521.

**522 Issues in Corrections**  
See Sociology 522.

**523 Seminar in Comparative Public Administration (I or II, 3)** Theory, practice, and organization of selected European and developing nations' administrative systems. Analysis of selected policies. Influence of English and French

systems on developing systems. Structure-function and ecological analysis. (Seminar) Pre: 491, 501, or permission of instructor. Staff

**524 Seminar in Public Policy Problems (I or II, 3)** In-depth exploration of selected problems of policy formulation: intergovernmental relations, regionalization, citizen participation and control, priority setting for public sector programs. (Seminar) Pre: 491, 501, or permission of instructor. Staff

**544 Democracy and Its Critics (I or II, 3)** Seminar examining the roots of modern democracy in the social contract theories and analyzing the quality and limits of self-determination in these theories in the light of contemporary politics. (Lec. 3) Pre: 341, 342, or permission of instructor. Killilea

**546 Peace and World Order Studies (II, 3)** This seminar explores various approaches globally to peacebuilding, world order, and community. Emphasizes conflict resolution, from local to transnational levels, and the search for social justice and human unity. (Seminar) Pre: 420 or permission of instructor. Stein

**553 Scope and Methods of Political Science (I, 3)** Study of political science as a discipline, its development in relation to other social sciences, and survey of political theories, concepts, and analytic models. (Seminar) Pre: graduate standing. Leduc

**555, 556 Directed Study or Research (I or II, 3 each)** Special work arranged to meet the individual needs of graduate students in political science. (Independent Study) Pre: permission of chairperson. Staff

**568 Jurisprudence (II, 3)** Introduction to the philosophy of law, treating the sources, the nature, and the consequences of major systems of legal thought. Emphasis on the relationship between legal reasoning and judicial decision making in the United States. (Lec. 3) Pre: 471, 472, or permission of instructor. Staff

**573 Administrative Law (I or II, 3)** Legal aspects of interaction between government agencies, individuals, and public interest groups. Systematic analysis of leading cases, evaluating the courts as an instrument for protecting the individual's rights in administrative action. (Lec. 3) Pre: 113. Rothstein

**577 International Ocean Law**  
See Marine Affairs 577.

**580 Seminar in International Relations Theory (I or II, 3)** A critical treatment of major

international relations theories beginning with an analysis of core theoretical concepts. (Seminar) Pre: honors seniors with permission of instructor or graduate standing. Genest or Petro

**581, 582 Special Topics Seminar (I, II, or SS, 3 each)** Master's-level seminar on special topics in political science not regularly covered in other courses. (Seminar) Pre: graduate or senior standing in political science or permission of instructor. May be repeated up to five times for a total of 15 credits with different topic. Staff

**583 Seminar in American Politics (I or II, 3)** Critical consideration of central issues in American political institutions, behavior, and policy making. (Seminar) Pre: honors seniors with permission of instructor or graduate standing. Zucker or Moakley

**584 Seminar in Advanced Comparative Theory (I or II, 3)** A critical treatment of the major methodological approaches used in comparative politics beginning with an analysis of core theoretical concepts. (Seminar) Pre: graduate standing; undergraduates only with permission of instructor. Petro

**590 Internship in Public Administration (I or II, 3–6)** Participation at an administrative agency under supervision of agency head and a faculty member. Planning, personnel management, research organization, budgeting, interdepartmental relations, informal liaisons that are the hallmark of effective administration. (Practicum) Pre: permission of M.P.A. director. May be taken as one 6-credit unit or two 3-credit units. Staff

**595 Problems of Modernization in Developing Nations**  
See Resource Economics 595.

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Portuguese (POR)

Section Head: Professor McNab

**101 Beginning Portuguese I (I and II, 3)** Fundamentals of modern European Portuguese. Emphasis on standard pronunciation, development of familiarity with most common grammar structures, and acquisition of working vocabulary. (Lec. 3) Pre: no prior Portuguese is required. Staff (F)

**102 Beginning Portuguese II (I and II, 3)** Continuation of 101. (Lec. 3) Pre: 101 or equivalent or permission of instructor. Staff (F)

**103 Intermediate Portuguese I (I and II, 3)** Intensive and extensive reading of moderately difficult Portuguese prose, review of grammar structures, idiomatic expressions, conversation practice based on readings. (Lec. 3) Pre: 102 or equivalent or permission of instructor. Staff (F)

**104 Intermediate Portuguese II (I and II, 3)** Continuation of 103. Readings of more difficult texts. Class discussion and reports on supplementary readings. (Lec. 3) Pre: 103 or equivalent or permission of instructor. Staff (F)

**205, 206 Advanced Portuguese (I and II, 3 each)** Practice in speaking and writing standard Portuguese. Understanding varieties of Portuguese. Materials of cultural, intellectual, and professional interest. (Lec. 3) Pre: 104 or equivalent or permission of instructor. Staff

**335, 336 Topics in the Literature of the Portuguese-Speaking World (I and II, 3 each)** Selected topics in the literatures of continental Portugal and the adjacent islands, Brazil, Cape Verde, Angola, Mozambique. (Lec. 3) Pre: 206 or equivalent or permission of instructor. 205 or 206 may be taken concurrently with permission of instructor. May be repeated for credit as often as topic changes. Staff

**497, 498 Directed Study (I and II, 3 each)** For the advanced student. Individual study and reports on problems of special interest. (Independent Study) Pre: one 300-level course in Portuguese, acceptance of project by staff member, and approval of chair. Not for graduate credit. Staff

## Prior Learning Assessment (PLA)

**100 Prior Learning Assessment Portfolio Development (I, II, or SS, 1)** Identification through self-assessment of student prior learning and appropriate methods for seeking credit. Analysis and application of the process for developing a prior learning portfolio. (Seminar) Pre: matriculated status and permission of the student's academic dean. Offered through the Alan Shawn Feinstein College of Continuing Education. S/U only. Staff

## Psychology (PSY)

Chairperson: Professor Collyer

**103 Towards Self-Understanding (I and II, 3)** Individual and social problems of normal persons. Personality development, social behavior, and adaptive reactions with emphasis on increasing awareness of personal and interpersonal functioning. (Lec. 3) Grebstein, Prochaska, and Staff (S)



**113 General Psychology** (*I and II, 3*) Introductory survey course of the major facts and principles of human behavior. Prerequisite for students interested in professional work in psychology or academic fields in which an extended knowledge of psychology is basic. (*Lec. 2, Rec. 1*) Staff (S)

**232 Developmental Psychology** (*I and II, 3*) Comprehensive understanding of human development and growth from birth to senescence. (*Lec. 3*) Pre: 113. Brady, Gross, Kulberg, and Staff (S)

**235 Theories of Personality** (*I and II, 3*) Critical survey of the major theories of personality. Emphasis will be placed on the "normal" personality. (*Lec. 3*) Pre: 113. Stevenson and Staff (S)

**254 Behavior Problems and Personality Disorders** (*I and II, 3*) Evaluation of the more serious behavioral disorders as found in the major forms of character disorders, psychoneuroses, and psychoses. Theories of causation, development and effects of anxiety and defense mechanisms, and interpretation of symptoms and methods of treatment. (*Lec. 3*) Pre: 113. Florin, Vosburgh, and Staff (S)

**261 The Alcohol-Troubled Person: Introductory Concepts** (*I and II, 3*) Introductory and basic concepts in alcohol trouble: prevention, identification, early intervention, treatment, education. (*Lec. 3*) Staff

**300 Quantitative Methods in Psychology** (*I and II, 3*) Basic concepts and techniques of quantification in psychology. Emphasis on application of certain statistical tools in the analysis of psychological measurements of behavior. (*Lec. 3*) Pre: 113, at least one college-level mathematics course, and sophomore standing. Harlow and Cohen

**301 Introduction to Experimental Psychology** (*I and II, 3*) Lectures, demonstrations, and laboratory experiments introduce the student to fundamental principles of experimental techniques applied in psychological research. (*Lec. 2, Lab. 2*) Pre: 300. Collyer, Silverstein, Smith, and Staff

**305 Field Experience in Psychology** (*I and II, 3*) Direct contact with settings and populations served by psychologists. Emphasis on understanding models and theories in relation to practical problems. Topical sections may include: a) preclinical, b) community, c) laboratory, and d) organizational applications. (*Practicum*) Pre: 113 and permission of instructor. May be repeated for a maximum of 6 credits. Stevenson, Biller, and Staff

**310 History and Systems of Psychology** (*I or II, 3*) Origins of psychological inquiry and theories of psychology. Transformations of theories and methods of inquiry through the history of our culture including contemporary systems and models of psychological functioning. (*Lec. 3*) Pre: 113. Silverstein (L)

**334 Introduction to Clinical Psychology** (*I, 3*) Emphasis on scope of the field, functions of the clinical psychologist, methods used, and problems encountered, both scientific and professional. (*Lec. 3*) Pre: 254, junior standing. Staff

**335 The Psychology of Social Behavior** (*I and II, 3*) Conceptual and empirical analyses of individual behavior in social contexts; attention to social motivation, attitude development and change, liking, conformity, aggression, altruism. (*Lec. 3*) Pre: 113 and junior standing or permission of instructor. Cohen

**361 Learning** (*II, 3*) Learning process in humans and subhumans, including principles and methods. Course features operant learning and behavior modification principles. (*Lec. 3*) Pre: 301 or permission of instructor. Smith

**371 Laboratory in Learning** (*II, 1*) Laboratory experiments in learning (primarily animal) designed to parallel course materials in 361. (*Lab. 2*) Pre: 301, credit or concurrent enrollment in 361, or permission of instructor. Smith and Staff

**381 Physiological Psychology** (*I, 3*) Physiological mechanisms operative in human behavior. Sensory, neural, endocrine, and response systems as related to sensation, perception, attention, emotions, motivations, and learning. (*Lec. 3*) Pre: junior standing. Valentino

**382 Research Methods in Physiological Psychology** (*II, 3*) A thorough introduction to the principles and techniques of experimentation in physiological psychology, including brain stimulation and lesions, electrophysiology, and pharmacology. (*Lab. 6*) Pre: credit or concurrent enrollment in 381 and permission of instructor. Valentino

**384 Cognitive Psychology** (*I, 3*) An examination of contemporary research and theories on mental activities. Topics will include: perception, pattern recognition, attention, memory, problem solving, language, consciousness, and artificial intelligence. (*Lec. 3*) Pre: 113 and 301 or equivalent. In alternate years. Brady

**385 Perception** (*I or II, 3*) Sensory function, development of perception, perception of space,

color, sound, and complex events. (*Lec. 3*) Pre: 113 and 300, or equivalent. In alternate years. Collyer

**388 The Psychology of Language** (*I or II, 3*) Study of language processes in light of contemporary theories and research. Topics include speech production, perception, memory, comprehension, language and the brain, language acquisition, reading, language, and thought. (*Lec. 3*) Pre: junior standing. In alternate years. Brady

**391 Theories of Learning** (*I or II, 3*) Psychological theories developed for explanation of experimental data in the area of learning, including evaluation of learning theories, their basic concepts, and analysis of various behaviors in terms of the theoretical frameworks. (*Lec. 3*) Pre: 301 and junior standing. In alternate years. Silverstein

**405 Psychological Anthropology**  
See Anthropology 405.

**430 Intimate Relationships**  
See Sociology 430.

**432 Advanced Developmental Psychology** (*II, 3*) Major issues in developmental psychology. Emphasis on research in Piaget, Erikson, Bruner, Kagan, and Moss. Includes effects of infant care, sex typing, parental discipline, and developmental aspects of intellectual and perceptual growth. (*Lec. 3*) Pre: 232. Biller

**434 Psychological Testing** (*I and II, 3*) Measurement procedures employed in the measurement of intelligence, aptitudes, abilities, attitudes, interests, and personality. Principles of validity and reliability developed and applied to the various tests. (*Lec. 3*) Pre: 300 or equivalent. Harlow, Velicer, and Staff

**436 Psychotropic Drugs and Therapy**  
See Biomedical Sciences 436.

**442 The Exceptional Individual** (*I and II, 3*) Issues underlying the classification, institutionalization, and treatment of the physically, psychologically, and mentally disabled. Social psychology of attitudes toward the disabled, current legislation, and needs of the exceptional for integration into community life. (*Lec. 3*) Pre: junior or senior standing. Gross

**456 Research Methods in Social Psychology** (*II, 4*) Lecture and laboratory experience will introduce students to current research methods used in social psychology. (*Lec. 2, Lab. 4*) Pre: 300, 301, and 335 or permission of instructor. Cohen

**460 The Substance-Troubled Person (I, II, and SS, 3)** Presents theoretical and applied material on alcohol and other mood-altering substances of abuse. Relevant for alcohol and substance abuse counselors, personnel administrators, and other social service workers. (Lec. 3) *Offered through the Alan Shawn Feinstein College of Continuing Education.* Staff

**464 Humanistic Psychology (II, 3)** Discussion of humanistic approaches to the understanding and direction of behavior. Emphasis on contemporary writers such as Rogers, Maslow, May, Moustakas. Discussions of phenomenology and existentialism. (Lec. 3) *Pre: 235 and junior standing. In alternate years. Next offered 1999–00.* Berman

**465 Introduction to Crisis Intervention (I or II, 3)** Interventions for various types of emergencies including substance abuse and functional or organic disorders. (Lec. 3) *Pre: 254 and permission of instructor.* Quina and Staff

**466 Child Sexual Abuse (I, 3)** Current theorizing regarding the causes of sexual abuse of children will be presented, as well as the short- and long-term effects of such abuse. Management of problems will be followed, from disclosure through current state-of-the-art practices in treatment. Issues in prevention, court cases, and investigation will be reviewed. (Lec. 3) *Pre: senior status and permission of instructor. Not for graduate credit.* Gross

**470 Topics in Social Psychology (I, 3)** Empirical and conceptual approaches to a major topic in contemporary social psychology. Topics will vary from semester to semester. (Seminar) *Pre: 113 and 335.* Cohen and Stevenson

**471 Applied Behavioral Analysis and Remediation (II, 3)** Study and application of behavioral approaches used to analyze and remediate behavioral problems of children and adults in educational and human service settings and everyday life. (Lec. 3) *Pre: 361 or permission of instructor. Offered through the Alan Shawn Feinstein College of Continuing Education only.* Smith or Groden

**473 Practicum in Behavioral Psychology (I or II, 3)** Supervised, on-site field experience in applications of behavioral approaches in an educational or human service setting. (Practicum) *Pre: 471 or permission of instructor.* Smith, Quina, or Groden

**479 Contemporary Problems for Modern Psychology (I and II, 3–12)** Central issues and recent developments in the field. Topics limited each semester to one of the following: a) per-

sonality, b) learning, c) methods and design, d) developmental, e) motivation, f) perception, g) clinical, h) general, and i) humanistic psychology. (Seminar) *Pre: permission of chairperson. May be repeated for a maximum of 12 credits.* Staff

**480 The Female Experience (II, 3)** Topics ranging from the biological distinctiveness of women to social supports for sexism as they relate to attitudes, motives, and behavior of women. (Lec. 3) *Pre: 113 and at least one 200-level psychology course.* Staff

**489 Problems in Psychology (I and II, 3)** Advanced work in psychology. Course will be conducted as seminar or as supervised individual project. Students must obtain written approval from proposed faculty supervisor prior to registration. (Independent Study) *Pre: senior or graduate standing or permission of instructor. May be repeated once.* Staff

**499 Psychology Practicum (I and II, 1–6)** Individual and group projects applying psychology in clinical or laboratory settings. (Practicum) *Pre: senior standing or permission of instructor. May be repeated for a maximum of 6 credits. Not for major credit in psychology. S/U only.* Staff

**505 Community Psychology (I, 3)** Introduction to community psychology; study and change of individual's interaction with community systems; theoretical and empirical models, intervention strategies, and research methods relevant to community psychology. (Lec. 3) Florin

**517 (or STA 517) Small N Designs (II, 3)** A survey of Small N experimental methodology, including hypothesis of quasi-experimental designs and the application of interrupted time series. Applications in applied research, particularly behavioral intervention. (Seminar) *Pre: 532 and 533. In alternate years.* Velicer

**532 Experimental Design**  
See Statistics 532.

**533 Advanced Quantitative Methods in Psychology (II, 3)** Advanced quantitative methods applied to psychology. Survey of methods such as multiple regression, multivariate analysis of variance, discriminate analysis, canonical correlation, principal component analysis, and factor analysis. Applications involve BMDP, SAS, or SSPS computer programs. (Lec. 2, Lab. 2) *Pre: 532.* Velicer or Harlow

**540 (or EDC 540) Learning Disabilities: Assessment and Intervention (SS, 3)** Applications of early screening batteries; remedial programs for various disabilities, developing treatment ex-

ercises, behavioral programs, and programs for older children and adolescents. Emphasis on pragmatic application of skills for detection and treatment. (Lec. 3) *Pre: permission of instructor. May be repeated as A and B for a maximum of 6 credits.* Berman

**544 The Psychological Bases for Reading Disorders (I or II, 3)** An in-depth review of research on factors related to reading ability. Topics include linguistic requirements, perceptual and neurological factors, implications for screening and instruction. (Lec. 3) *Pre: graduate standing or permission of instructor.* Brady

**550 Operant Analysis of Behavior (I or II, 3)** Introduction to the principles of operant conditioning with emphasis on the use of these principles in the analysis of behavior. (Lec. 3) Smith

**554 Alternate Therapies (I or II, 3)** Theory and practice of those individual and group techniques which can be integrated into one's present style of helping: a) existential, b) body therapies, c) cognitive therapies, and d) other contemporary approaches. Students may participate in a maximum of five distinct workshops. (Lec. 2, Lab. 2) *Pre: professional and/or graduate standing and permission of the coordinator.* Staff

**581 Psychological Aspects of a Healthy Lifestyle**  
See Exercise Science 581.

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) *S/U credit.*

**600 Multicultural Issues in Psychology: Theory, Research, and Practice (I or II, 3)** Focus is on general issues and concepts relevant to a psychology that is concerned with multicultural populations as sources of enrichment for theory, research, and practice. (Seminar) *Pre: graduate standing.* Staff

**601 Physiological Psychology (II, 3)** An advanced consideration of physiological research on neural, endocrine, and response systems as they relate to attention, motivation, emotion, memory, and psychological disorders. (Lec. 2, Lab. 2) Valentino

**602 Learning and Motivation (II, 3)** Empirical and theoretical analysis of the basic principles of acquisition and loss of habits. Topically organized to deal with respondent and operant conditioning, and their relationship to reinforcement and motivation. (Lec. 3) *Pre: undergraduate learning course.* Silverstein and Staff

**603 Development** (*II, 3*) Theoretical, methodological, and applied issues in life span development, including cognitive, perceptual, psychomotor, affective, and social development. Topically organized. (*Lec. 3*) Kulberg, Biller, and Staff

**604 Cognitive Psychology** (*I, 3*) A survey of the theoretical and methodological issues in human cognition. Topics include pattern recognition, attention, memory, language, problem solving. (*Lec. 3*) Brady and Staff

**605 Personality** (*I or II, 3*) Reading of primary source materials from major personality theorists relevant to a particular topical emphasis. Application and comparative evaluation of the theories studied. (*Lec. 3*) Stevenson and Staff

**606 Social Psychology** (*I, 3*) Intensive exploration of the methods, theory, and database of contemporary social psychology focusing on salient issues that clarify significant topics in this area. (*Lec. 3*) Staff

**607 Advanced Psychopathology** (*I or II, 3*) Empirical literature with regard to etiological factors involved in the formation of pathological character trends and deviations. Evaluation of clinical theory and classification systems as related to the psychotherapeutic process. (*Lec. 3*) Harris, Grebstein, and Staff

**608 Theories and Systems** (*I, 3*) An in-depth analysis of the origin and logical structure of major systematic approaches to psychology. Emphasis on significant recurrent controversies. (*Lec. 3*) *Pre: graduate standing.* Collyer or Silverstein

**609 Perception** (*I or II, 3*) A survey of topics in the psychology of perception, including sensory function; psychophysical models, measurement, and scaling; visual perception; and methods for analyzing perceptually guided behavior. (*Lec. 3*) Collyer

**610 (or STA 610) Parsimony Methods** (*I, 3*) Multivariate procedures designed to reduce the dimensionality and help in the interpretation of complex data sets. Methods include principal components analysis, common factor analysis, and image analysis. Related methods: cluster analysis and multidimensional scaling. Applications involve the use of existing computer programs. (*Lec. 3*) *Pre: 533 or STA 541 or equivalent.* In alternate years. Next offered 1998–99. Velicer

**611 Methods of Psychological Research and Experimental Design** (*I, 3*) Provides the student of psychology with a knowledge of research methodology and the techniques of experimen-

tal designs. It prepares for the development of thesis problems of graduate students in psychology and related disciplines. (*Lec. 3*) *Pre: 532 and 533.* Staff

**612 (or STA 612) Structural Modeling** (*II, 3*) Theory and methodology of path analysis with latent variables. Discussion of "causation" and correlation, Confirmatory Factor Analysis, Measurement and Structural Equation models. Practical applications utilizing LISREL, EQS, and PLS computer programs. (*Lec. 3*) *Pre: 533 or 610.* Harlow and Velicer

**615 Collaborative Research in Psychology** (*I or II, 0–3*) Collaborative approaches to psychological research. Special emphasis on topics that can involve students at varying levels of research skill. Format includes weekly topical seminar and biweekly colloquium combining all topical interest groups. (*Seminar*) *May be repeated for a maximum of 6 credits. S/U credit.* Kulberg and Staff

**625 Seminar: Social Psychology** (*II, 3*) Emphasis on a major area in contemporary social psychology. Empirical studies analyzed for their relevance to theoretical and applied issues; students will design an original investigation. (*Seminar*) *Pre: graduate standing or permission of instructor. May be repeated for a maximum of 6 credits with different topic.* Cohen and Stevenson

**641 Introduction to Psychotherapy** (*I, 3*) A transtheoretical analysis of the major systems of psychotherapy. Developing an integrative, eclectic model through identifying the processes of change that are the core of effective therapy. (*Lec. 3*) Grebstein or Morokoff

**642 Introduction to Psychotherapy Practice** (*II, 3*) Instruction and practice in the basic interviewing skills and clinical techniques necessary for practicum courses in psychotherapy. Seminar format with some lecture material, role playing, structured experiential exercises, case presentation, and discussion and videotape illustration. (*Seminar*) *Pre: 641 and permission of instructor. S/U credit.* Biller

**644 Family Therapy** (*I, 3*) Introduction to theories and techniques of family assessment and family therapy. Seminar format with videotape illustrations, case presentation and discussion, role playing, lecture, and selected experiential exercises. (*Lec. 3*) *Pre: permission of instructor.* Grebstein

**645 Marital and Sexual Therapy** (*I, 3*) Behavioral, psychodynamic, and systems perspective on marital and sexual problems and treatments.

Theory and research applied in supervised practice with troubled couples. (*Lec. 3*) Staff

**646 Group Therapy** (*I, 3*) Theory, research, and change strategies developed in working with small groups. Current research, models, and techniques will be discussed in the context of actual clinical work with groups. (*Lec. 3*) *Pre: permission of instructor. In alternate years.* Staff

**647 Child Therapy** (*I, 3*) Seminar discusses issues, techniques, and research related to behavior changes in children and their families. Aspects of therapy, the role of behavioral approaches, and the participation of parents will be explored. Direct, supervised experience is included in this course. (*Lec. 3*) *Pre: participation in the Psychological Consultation Center.* Staff

**661 Psychological Services I: Administration and Interpretation of Cognitive Tests** (*I, 3*) Instruction and practice in administration and interpretation of cognitive tests; individual intelligence tests of both general and specific abilities. Rationale, research evidence, clinical application of Stanford-Binet, Wechsler, McCarty scales. (*Lec. 2, Lab. 2*) Berman and Willis

**662 Psychological Services II: Administration and Interpretation of Personality Tests** (*II, 3*) Instruction and practice in the administration and interpretation of instruments used in the assessment of personality. Emphasis on projective tests such as Rorschach, TAT. Rationale, research evidence, and clinical application. (*Lec. 2, Lab. 2*) Berman and Staff

**664 Advanced Diagnostic Problems** (*II, 3*) Use and interpretation of cognitive, projective, and neural psychological tests. Focus on integrating data into meaningful description of total personality functioning. Use of the diagnostic interview. (*Lec. 3*) *Pre: 661, 662, and permission of instructor. In alternate years.* Berman

**665 Child Psychopathology** (*II, 3*) Issues in the classification of disordered behavior will be related to diagnostic and treatment considerations from early childhood through adolescence. Emphasis will be placed upon synthesizing knowledge about the psychological, developmental, and educational factors that affect disordered child behavior. (*Lec. 3*) *Pre: 607. In alternate years. Next offered 1999–00.* Berman

**666 Seminar: Ethical and Legal Issues in Psychology** (*I or II, 3*) Ethical, legal, and professional issues as they relate to the provision of psychological services and psychological research. Emphasis is on the study of ethical issues and the examination of the development

of professional standards as they relate to the areas of clinical psychology practice, school psychology practice, and applied research practice. (Seminar) Staff

**668 School Psychological Consultation (II, 3)** Historical and contemporary perspectives on consultation are discussed in terms of mental health and psychoeducational services. The focus is on the content and process of consultation in various clinical and educational settings. (Lec. 3) Pre: 666 or equivalent. Staff

**670 Field Experience in Psychological Services (I and II, 1–12)** Training placements and internships are available in a variety of institutional agencies and school settings under supervision which must be acceptable to the department: (a) school, (b) experimental areas, (c) clinical. (Practicum) S/U credit. Staff

**672 Individual Clinical Practicum (I or II, 3–9)** Introductory experience in dealing with clinical problems in a variety of clinical settings. Individual supervision to be arranged. (Practicum) Pre: 661, 662. May be repeated for a maximum of 9 credits. S/U credit. Staff

**674 Clinical Practices: Therapy (I or II, 1–12)** Specialized techniques of clinical interviewing, counseling, and psychotherapy. Critical discussions of student's own supervised therapy sessions: a) individual, b) behavior, c) sensitivity, d) specialized techniques. (Practicum) Pre: 607 and 641. May be repeated for a maximum of 12 credits. Staff

**676 Neurological Correlates of Psychopathology (II, 3)** Functioning and physiology of the central nervous system with particular attention to determining how neurological disruption and injury are manifested in behavioral disorder. Techniques used to evaluate and interpret neuropsychological functioning. (Lec. 2, Lab. 2) Pre: permission of instructor. In alternate years. Next offered 1999–00. Berman or Faust

**680 School Practices I: Diagnostic (I and II, 3–9)** Testing procedures and devices in the diagnosis of organicity, personality problems, special learning problems, visual, auditory, and memory problems; includes administration, interpretation, and special adaptation of tests in the school situation. (Practicum) Pre: 434, 661. May be repeated for a maximum of 9 credits. Staff

**681 Special Problems in School Psychology (I or II, 3–9)** Role of the psychologist in the school setting. Several theoretical and practical issues concerned with the value of psychological theory, administrative philosophy, and school

organization are explored. (Seminar) May be repeated for a maximum of 9 credits. Vosburgh and Staff

**683 Psychology of the Exceptional Child (I, 3)** Social, psychological, and educational factors that constitute the matrix of concerns with the exceptional individual in the school and community. Recent innovations in public and private education and habilitation. Research issues and legislation discussed evolve into student studies. (Lec. 3) Gross

**687 Seminar: Topics in the Psychology of the Exceptional Individual (I or II, 3)** Survey of topics and current issues in the treatment, needs, and understanding of the psychology of specific exceptionalities. (Seminar) May be repeated for a maximum of 9 credits with different topics. Staff

**688 Developmental Neuropsychology Seminar (II, 3)** Conceptual overview emphasizing changing relationships between human central nervous system and behavior from conception through adolescence. Normal and abnormal neurodevelopment, theoretical principles, assessment and intervention issues, and selected research methodologies. (Seminar) Pre: 601 or equivalent. Willis

**690 Seminar: Contemporary Issues in Psychology (I and II, 3–12)** Recent developments and current issues. Rigorous exploration of experimental and theoretical literature. Study limited each semester to one of the following areas: developmental, clinical, motivation, perception, psychophysics, and scaling problem solving and thinking. (Seminar) May be repeated for a maximum of 12 credits. Staff

**692, 693 Directed Readings and Research Problems (I or II, 3–6 each)** Directed readings and advanced research work under the supervision of a staff member arranged to suit the individual requirements of the students. (Independent Study) Staff

**695 Seminar: Teaching Psychology (II, 3)** Primarily a seminar in the teaching of psychology at the undergraduate level. Includes a consideration of general issues in college teaching, preparation of a course proposal, and sample presentation. (Seminar) Quina, Stevenson, and Staff

**696 Practicum: Teaching Psychology (I or II, 3)** Practicum for students teaching a college-level psychology course. Supervision of course preparation, presentation, and evaluation. Individual supervision to be arranged. (Practicum) S/U credit. Staff

**699 Doctoral Dissertation Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit. Staff

## Public Health (MPH)

Coordinator: Interim Dean Joseph (College of Nursing)

NOTE: The following courses are not part of an existing degree. They may be offered if there is sufficient interest. For further information, contact the Coordinator.

**520 Introduction to Environmental Health (I or II, 3)** Introduction to basic principles of toxicology; carcinogenesis; and risk perception, assessment, and management. Unique aspects of environmental health as a public health discipline are explored for several topics. (Lec. 3) Staff

**590 Public Health Internship (I, II or SS, 1–6)** Experiential, field-based learning experience in public health. Requires agency/program supervisor, faculty advisor, and MPH committee approval. May be taken either semester or during summer. May be repeated for up to 6 credits. (Practicum) Pre: completion of core public health courses and one-half credits in MPH track. Staff

**597 Public Health Project (I, II, SS, 3 or 6)** Research or program/development/evaluation project in public health. Requires topic/focus in MPH program track, faculty sponsorship, and MPH committee approval. May be taken either semester or during summer. May be repeated for up to 6 credits. (Independent Study) Pre: completion of core public health courses and one-half of credits in MPH track. Staff

## Public Relations (PRS)

Coordinators: Stephen Wood, Communication Studies and Antone Silva, Journalism

**340 (or JOR 340) Public Relations (I, 3)** Principles and procedures in public relations: emphasis on role of the public relations practitioner as a specialist in communication; analysis of publications produced as a part of public relations. (Lec. 2, Lab. 2) Pre: junior standing and JOR 220 with a grade of C or better. Staff

**441 (or JOR 441) Public Relations Practices (II, 3)** Practical application of traditional PR methods in solving problems in a variety of markets. Explores fundamental agency operations, client-

agency relationships. Combines practical experience with individual projects, programs, and campaigns. (Practicum) Pre: 340. Not for graduate credit. Staff

**491 Public Relations Internship** (I and II, 3 or 6) Supervised experience in public relations. Requires a minimum of 120 hours (3 credits) or 240 hours (6 credits). Weekly class meeting. May be repeated; maximum of 6 credits allowed toward graduation. Pre: *public relations majors only*; 340, 441, COM 306 and JOR 341. Permission of instructor and application required. Not for graduate credit. Staff

## Religious Studies (RLS)

Chairperson: Professor Pasquerella (Philosophy)

**111 Judaism, Christianity, and Islam** (I and II, 3) Comparative study of the teachings, the histories, and the practices of the three religions of Abraham; emphasis on their teachings. (Lec. 3) Wenisch (L)

**125 Biblical Thought** (I, 3) Selected portions of the Old and New Testaments with emphasis on their positive contribution to the philosophy of the Jewish and Christian religions. (Lec. 3) Kim (L)

**126 The Development of Christian Thought** (II, 3) History of religious and philosophical ideas, development of the teachings of Christianity. Emphasis to meet needs and interests of students. Historical nature of material suitable for liberal education without regard to student's religious affiliation. (Lec. 3) Wenisch (L)

**131 Introduction to Oriental Philosophies and Religions** (I and II, 3) Introductory study of the main philosophical and religious ideas in the Orient, with emphasis on Hinduism, Buddhism, Confucianism, and Taoism. (Lec. 3) Kim (F) (L)

## Resource Development (RDV)

Coordinator: D. Abedon

**300 Introduction to Global Issues in Resource Development** (I and II, 3) Role of the United States in development assistance to foreign nations. Topics include: foreign aid, resource development, transfer of technology, international career opportunities and requirements. (Lec. 3) McCreight or Abedon

**487 International Development Internship** (I and II, 1–6) Supervised participation in programs related to international development. Minimum of 35 hours of internship per credit.

(Practicum) Pre: 300 and permission of instructor. Not for graduate credit. S/U only. McCreight or Abedon

**495 International Development Seminar** (II, 3) Seminar in international development for advanced-level students in the international development minor. (Seminar) Pre: 300 and permission of instructor. Not for graduate credit. McCreight or Abedon

## Resource Development Education (RDE)

Coordinator: Associate Professor Mallilo

**244 Introduction to Agricultural and Extension Education** (II, 3) Overview of the field covering various types of educational programs and activities for prospective teachers and Cooperative Extension personnel, including FFA, 4-H, and occupational experience. (Lec. 3) Offered in spring of even-numbered years. Mallilo

**444 Teaching of Agribusiness and Natural Resources**  
See Education 444.

**486 Internship in Agricultural and Extension Education** (I, II, or SS, 1–6) Provides experiential learning opportunities related to agricultural education and/or Cooperative Extension education. (Practicum) May be repeated for a maximum of 6 credits. Not for graduate credit. Mallilo

## Resource Economics (REN)

Chairperson: Associate Professor Wessells  
(Environmental and Natural Resource Economics)

**105 Introduction to Resource Economics** (I and II, 3) Application of microeconomic principles to selected resource problem areas. The market mechanism and its alternatives are examined as methods of resolving contemporary resource use problems. (Lec. 3) Staff (S)

**110 Multimedia Presentation of Environmental Issues** (II, 3) Research of pressing environmental issues and creation of multimedia presentations using computer technologies to combine slides, video, audio, and computer graphics. No technical knowledge or computer skills are necessary. (Lec. 2, Lab. 2) Opaluch

**310 Economics for Environmental Resource Management and Policy** (I, 3) Economic approaches to natural resource use and environmental policies. Exploring measures of the "economic value of environment." How scientists,

managers, and markets can affect the environmental quality of life. (Lec. 3) Pre: 105 or ECN 201. Swallow

**325 Planning and Managing a Small Natural Resources Firm** (II, 3) Directed toward students with an interest in managing a small marine, agricultural, or other natural resources firm. (Lec. 3) Pre: 105 or ECN 100 or 201 or permission of instructor. Staff

**336 Fisheries Economics** (I, 3) Supply and demand of fisheries products. Cost and returns in harvesting and processing. Market power and price determination, finance, insurance, fisheries policy and management. (Lec. 3) Pre: 105 or permission of instructor. Staff

**341 Economics of Food and Natural Resource Markets** (I, 3) The function, structure, and operation of food, fisheries, and natural resource markets; price analysis; costs and margins; international trade; channels of distribution; futures markets; marketing information; regulations and controls; cooperative marketing. (Lec. 3) Pre: 105 or ECN 201 or permission of instructor. Anderson

**345 International Trade in Natural Resource Products** (II, 3) Economics of national and international policies regarding international trade in exhaustible and renewable natural resource products. Impacts of these policies on resource management and producer and consumer welfare. (Lec. 3) Pre: 105 or ECN 201 or permission of instructor. Wessells

**410 Fisheries Economics** (I, 3) Institutional, biological, and economic factors affecting the use of marine fishery resources. Bioeconomic analysis is applied to problems of marine fisheries management and development in both high- and low-income countries. Evaluation of public policy alternatives. (Lec. 3) Pre: 310 or ECN 328 or 323 or permission of instructor. Sutinen

**415 Environmental Harms and Sanctions**  
See Economics 415.

**432 Environmental Economics and Policy** (II, 3) Economic analysis of policies that address environmental and natural resource problems. Topics include pollution-control policies, economic incentives, and the optimal use of renewable and nonrenewable natural resources. (Lec. 3) Pre: 105 or ECN 201. Wichelns

**435 Aquacultural Economics** (I, 3) Economics of international and domestic development of aquaculture, environmental and resource regulations on aquaculture, and management of and

decision making in aquacultural enterprises. Analysis of public and private aquaculture production and marketing. (Lec. 3) Pre: 105 or ECN 201 or permission of instructor. Anderson

**440 Benefit-Cost Analysis (II, 3)** Basic concepts in benefit-cost analysis. Measurement, comparison of benefits and costs over time, and criteria for evaluation of projects and public policies. Problems and case studies in evaluation of current natural resources issues. (Lec. 3) Pre: 105 or permission of instructor. Grigalunas

**456 Tourism Economics (II, 3)** Application of economic principles and research methods to tourist and tourism industry behavior. A framework for assessing economic, social, and environmental benefits and costs of tourism development is compared to practical research methods. (Lec. 3) Pre: 105 or ECN 201. Tyrrell

**460 Economics of Ocean Management (I, 3)** The role of marine resources use in the economy. Oceans policy arising from multiple-use conflicts. Current marine resource issues examined such as fisheries, offshore oil, marine mining, and shipping. (Lec. 3) Pre: 410 or permission of instructor. Sutinen

**470 Natural Resource Allocation and the Leadership Process (I, 3)** Application of leadership skills to natural resource policy, especially coastal issues. Group dynamics, conflict management, and communication techniques applied to allocation issues. Identification of alternative solutions from case studies. (Workshop 3) Pre: junior or senior standing. Staff

**491, 492 Special Projects (I and II, 1–3 each)** Workshop for advanced students where individuals or small groups are assigned projects requiring the analysis of natural resource and allocation problems with particular emphasis on marine resources. (Independent Study) Pre: permission of chairperson. Staff

**501 Graduate Seminar in Natural Resource Economics (I or II, 1)** Presentation of research and discussion of current issues and methodologies in environmental and natural resource economics. (Seminar) Attendance is required of all full-time graduate students in residence; exceptions made with permission from chairperson. No more than one credit may be taken for program credit. S/U credit. Staff

**514 Economics of Marine Resources (I, 3)** Role of economics in management of estuarine and marine resources. Particular attention to resource valuation, environmental issues, and management of renewable and non-renewable

resources. (Lec. 3) Not for graduate credit in resource economics. Grigalunas

**518 Mathematics for Economists (I, 2 or 4)** Introduction to mathematical methods in economics and business. Economic applications of constrained and unconstrained optimization, matrix algebra, primal and dual functions, eigen roots, with illustrations from economics, finance, and environmental and natural resource economics. (Lec 2 or 4) Pre: ECN 328 and MTH 131 or equivalent or permission of instructor. Gates

**520 Production Economics (II, 2)** Production in natural resource economics. The formulation and estimation of production functions. Technological change in economic growth and its measures. New directions in production theory and applications. (Lec. 2) Pre: at least two credits of 518, or MTH 131. Gates

**522 Mathematical Programming for Natural Resource Management (II, 2)** Application of mathematical (linear) programming to typical natural resource management issues. Emphasis is placed on problem formulation and solution using existing computer software programs. (Lec. 2) Pre: Pre: at least two credits of 518, or MTH 131. Gates

**524 Dynamic Economic Models (II, 3)** Fundamentals of dynamic economic theory. Dynamic optimization techniques applied to environmental and natural resource economics. (Lec. 3) Pre: 528 or permission of instructor. In alternate years. Next offered spring 1999. Tyrrell

**527 (or ECN 527) Macroeconomic Theory (II, 3)** Static and dynamic models of aggregate economic behavior developed and analyzed. (Lec. 3) Pre: ECN 327 and 375 or equivalent, or permission of instructor. Staff

**528 (or ECN 528) Microeconomic Theory (I, 3)** Analytic tools of optimization. Neoclassical price and production theory. Neoclassical theory of consumer and producer behavior, price and distribution, partial and general equilibrium and welfare economics. (Lec. 3) Pre: ECN 328 and 375 or equivalent, or permission of instructor. Swallow

**532 Land Resource Economics** See Community Planning 537.

**534 Economics of Natural Resources (II, 4)** Microeconomic theory applied to problems of natural resource allocation. The rationale for government intervention in the market's provision of natural resources and alternative techniques for optimally allocated natural resources

are investigated. (Lec. 4) Pre: 528 or permission of instructor. Wichelns

**540 Applied Resource Economics (II, 3)** Examines issues in agricultural and natural resource policy through applications of theoretical and empirical tools. Applications include pollution control, fisheries management, water, and agricultural policy. (Lec. 3) Pre: 528 or permission of instructor. Opaluch

**543 Economic Structure of the Fishing Industry (I, 3)** Analysis of fishing industries from the standpoint of activity and efficiency. Problems related to common property resources, government policy, labor, and legal and institutional factors. (Lec. 3) Pre: 514 or permission of instructor. In alternate years. Next offered fall 1998. Sutinen

**576 (or ECN 576 or STA 576) Econometrics (I, 4)** Application of statistics and mathematics to economic analysis. Implication of assumption required by statistical methods for testing economic hypotheses. Current econometric methods examined and discussed. (Lec. 3, Lab. 2) Pre: ECN 575 or equivalent, STA 308 or equivalent, or permission of instructor. Tyrrell

**591, 592 Special Projects (I and II, 1–3 each)** Advanced work under staff supervision arranged to suit the individual requirement of the student. (Independent Study) Pre: permission of chairperson. Staff

**595 (or MAF 595, PSC 595, SOC 595) Problems of Modernization in Developing Nations (II, 3)** Selected regional problems in the environmental complex, agricultural systems, population dynamics, distribution systems, political integration, urbanization-industrialization, popular participation, integrated theories of modernization. (Lec. 3) Pre: permission of instructors. Hennessey, Krausse, and Poggie

**598 Master's Nonthesis Research (I and II, 1–3)** Credit for completion of major paper. (Independent Study) Pre: enrollment in nonthesis master's program in resource economics. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit. Staff

**602 Research Methodology (I, 3)** Evaluation of alternative research methods and techniques. Development of specific research projects. (Lec. 2, Lab. 2) In alternate years. Next offered fall 1999. Gates

**610 Advanced Studies** (*I and II, 1–3*) Advanced topics in resource economics. Mathematical models in resource management. (*Independent Study*) May be repeated with different topics. Staff

**628 (or ECN 628) Advanced Microeconomic Theory** (*II, 3*) Neoclassical value and distribution theory. Theories of imperfect competition, general equilibrium theory, and dynamic analysis. (*Lec. 3*) *Pre: 528 or permission of instructor. In alternate years. Next offered fall 1998.* Opaluch

**630 Resource Analysis** (*II, 3*) Development and application of welfare theory to natural resource use. Welfare concepts such as consumer surplus, producer surplus, and marginal cost pricing in policy decisions for agriculture and natural resources. (*Lec. 3*) *Pre: 628 or permission of instructor. In alternate years. Next offered spring 1999.* Swallow

**634 Advanced Economics of Natural and Environmental Resources** (*II, 4*) Concepts of economic efficiency applied to natural resources with emphasis on intertemporal allocation of nonrenewable and renewable resources. Application of welfare and institutional economics to resource management and development; analysis of optimum allocation among users. (*Lec. 4*) *Pre: 534 and 524 or permission of instructor. In alternate years. Next offered fall 1999.* Sutinen

**635 Marine Resources Policy** (*I, 3*) Analysis of public policy problems relating to estuarine and marine resources, including natural resource damage assessment, environmental issues, coastal zone concerns, and other selected topics. (*Lec. 3*) *Pre: 534. In alternate years. Next offered spring 2000.* Grigalunas

**676 (or ECN 676) Advanced Econometrics** (*II, 4*) A course covering the tools necessary for professional research in resource economics. Reviews the general linear model, but emphasis is on simultaneous equation models. Assumes a knowledge of introductory econometrics, statistical theory, and matrix algebra. (*Lec. 4*) *Pre: 576 or its equivalent.* Wessells

**677 Econometric Applications in Resource Economics** (*I, 3*) Special topics in econometrics as applied to agriculture and natural resources. Topics include time series models. Bayesian analysis and dichotomous dependent variables. (*Lec. 3*) *Pre: 676. In alternate years. Next offered fall 1998.* Tyrrell

**699 Doctoral Dissertation Research** (*I and II*) Number of credits is determined each semester in consultation with the major professor or program committee. (*Independent Study*) S/U credit.

## Russian (RUS)

*Section Head:* Professor Aronian

**101 Beginning Russian I** (*I and II, 3*) Introduction to fundamentals of grammar; exercises in speaking, reading, and writing. Emphasis on pronunciation, intonation, and aural comprehension of contemporary spoken Russian. Language laboratory required. (*Lec. 3*) *Pre: no prior Russian is required.* Staff (F)

**102 Beginning Russian II** (*I and II, 3*) Continuation of 101. (*Lec. 3*) *Pre: 101 or equivalent.* Staff (F)

**103 Intermediate Russian I** (*I and II, 3*) Completion of fundamentals of grammar; exercises in speaking and writing, reading of contemporary texts; emphasis on distinction between spoken and written language. Language laboratory required. (*Lec. 3*) *Pre: 102 or equivalent.* Staff (F)

**104 Intermediate Russian II** (*I and II, 3*) Continuation of 103. (*Lec. 3*) *Pre: 103 or equivalent.* Staff (F)

**205, 206 Advanced Russian** (*I and II, 3 each*) Oral reports, written compositions, and classroom discussion based on readings in Russian history and culture, literature, and current Soviet affairs. Listening projects in laboratory. (*Lec. 3*) *Pre: 104 or equivalent.* Aronian

**325, 326 Introduction to Literary Studies in Russian** (*I and II, 3 each*) Techniques of literary criticism applied to Russian literary works in various genres. Listening projects in laboratory emphasizing poetry and drama. (*Lec. 3*) *Pre: credit or concurrent enrollment in 205 and 206. In alternate years. Next offered 1998–99.* Aronian (A)

**391, 392 Masterpieces of Russian Literature** (*I and II, 3 each*) Prose, poetry, and drama from late eighteenth through twentieth century in translation. Emphasis on literary movements through textual analysis. Authors range from Pushkin to Pasternak, including Dostoevsky and Tolstoy. (*Lec. 3*) Aronian (A) (F)

**460, 461 The Russian Novel** (*I and II, 3 each*) Major developments in themes and techniques, significant shifts of mode. Influences on the emergence of the novel in Russia. Laboratory required. (*Lec. 3*) *Pre: credit or concurrent enrollment in 205 and 206. In alternate years. Next offered 1998–99.* Aronian

**497, 498 Directed Study** (*I and II, 3 each*) For the advanced student. Individual research and reports on problems of special interest. (*Independent Study*) *Pre: acceptance of project by staff member and approval of section head.* Staff

## Sociology (SOC)

*Chairperson:* Professor Carroll (Sociology and Anthropology)

**100 General Sociology** (*I and II, 3*) Introductory description and analysis of the structure and dynamics of human society. Social norms, groups, intergroup relations, social change, stratification, and institutions. (*Lec. 3*) Staff (S)

**102 Issues and Problems in Contemporary American Society** (*I or II, 3*) Theoretical analysis of contemporary issues and societal trends and their impact on social organization. Social developments occurring after World War II analyzed and assessed according to their import and implications for social change. Emphasis on a sociological understanding of current issues. (*Lec. 3*) *Not for major credit in sociology.* Staff (S)

**204 Social Psychology** (*I and II, 3*) Examination of the social basis of self and behavior; emphasis on identity, motivation, attitude, social role, and the symbolic in social life. (*Lec. 3*) Travisano (S)

**206 Development of Human Societies** (*I or II, 3*) Sociological perspective in which whole societies are the unit of analysis. Succession of hunting and gathering, horticultural, agrarian, industrial societies. Social change is central to approach; focus is on the place of technology in the changing sociocultural pattern. (*Lec. 3*) Staff (S)

**212 The Family** (*I or II, 3*) The family as a social institution, its uniformity and variability in historical time and social space. Emphasis on contemporary American family. Variation in institutional patterns by rural-urban residence, region, race, social class. Issues and conflicts in the contemporary family scene. (*Lec. 3*) Albert and Mederer (S)

**214 Urban Sociology** (*I or II, 3*) Patterns of urban development, taking into account sociological characteristics of urban life. Problems of urban redevelopment and planning. (*Lec. 3*) Staff (S)

**216 Deviant Behavior** (*I or II, 3*) Examination and analysis of major theories of deviant behavior. Application of these theories to particular types of deviant behavior. (*Lec. 3*) Danesh (S)

**224 Health, Illness, and Medical Care** (*I or II, 3*) Introduction to social factors in the occurrence, distribution, and treatment of illness in society; critical analysis of the social organization of medicine in contemporary American society. (*Lec. 3*) Staff (S)

**238 Population Problems** (I or II, 3) Problems in the growth, decline, and composition of populations. Effects of fertility, mortality, migration. Special attention to American society. (Lec. 3) Staff (S)

**240 Minority and Majority Relations** (I or II, 3) Relations among the various ethnic, religious, racial, and political minorities and majorities, with special reference to the United States. (Lec. 3) Cunnigen (S)

**241 Work and Society** (I or II, 3) Work and the organizations of industry, work roles, work groups, and authority structures; labor-management relations; some aspects of industrialization. (Lec. 3) Staff (S)

**242 Sex and Gender** (I or II, 3) Current research exploring issues of sex and gender. Socialization, gender role playing, and personal relationships. Institutional costs of sexism. Prospects for human liberation. (Lec. 3) Reilly (S)

**300 Topics in Sociology** (I or II, 1-3) Critical study of selected topics. Subject will vary according to the expertise and availability of instructors. (Lec. 1-3) Pre: one 100- or 200-level sociology course. May be repeated for credit with different topic. Staff

**301 Sociological Research Methods** (I and II, 3) Scientific method in sociological research. Research design, data collection techniques, sampling measurement, table construction, and interpretation. Emphasis on critical reasoning and evaluation of sociological research. (Lec. 3) Pre: 9 credits in sociology including 100. Staff

**314 Juvenile Delinquency** (I or II, 3) Causes of delinquency; juvenile courts and probation; correctional institutions; programs of prevention. (Lec. 3) Pre: one 100- or 200-level sociology course. Staff

**316 Social Welfare Institutions** (I or II, 3) Development of British and American welfare. Influence of ideology on welfare and poverty. Contemporary American welfare. Social Security, poverty, welfare revolt of the 1960s. Evaluation of present and proposed welfare structure. (Lec. 3) Pre: one 100- or 200-level sociology course. Reilly (S)

**318 Social Movements and Social Change** (I or II, 3) Analysis of theoretical perspectives, directions, patterns, and consequences of social change in relationship to social movements. Case studies of social movements with special emphasis on the civil rights movement. (Lec. 3) Pre: 6 credits in sociology. Cunnigen

**320 Formal Organizations** (I or II, 3) Development, description, and analysis of types of formal organizations, from small-scale systems to modern large bureaucratic organizations, post-bureaucratic forms such as open, egalitarian systems, and adhocracies. (Lec. 3) Pre: one 100- or 200-level sociology course. Staff

**322 The Arts and Social Order** (I or II, 3) Consideration of the relationship between the arts and socially established meanings, social structure, and societal myths, with special attention to consonant and dissonant functions of the arts for social cohesion. (Lec. 3) Pre: 6 credits in sociology or permission of instructor. Travisano

**326 Madness and Society** (I or II, 3) Phenomenon of mental disorder considered in light of recent research findings and developments in sociological theory. Mental disorder discussed as an outgrowth of societal processes. (Lec. 3) Pre: 6 credits in sociology or permission of instructor. Travisano

**330 Criminology** (I or II, 3) Nature and extent of crime; past and present theories of crime causation; criminal behavior in American society and its relation to personal and cultural conditions. (Lec. 3) Pre: one 100- or 200-level sociology course. Carroll (S)

**331 Punishment and Corrections** (I or II, 3) An overview and analysis of societal reactions to crime with emphasis on American society. Purposes of criminal sanctions, probation and parole, jails and prisons, capital punishment and its effect. (Lec. 3) Pre: one 100- or 200-level sociology course. Carroll

**336 Social Inequality** (I or II, 3) Dimensions and dynamics of inequality in society; concepts of class and status; processes of social mobility. (Lec. 3) Pre: one 100- or 200-level sociology course. Cunnigen (S)

**344 The Sociology of Religion** (I or II, 3) Sociological theory and research in the analysis of interrelationships among religious culture, secular culture, the social structure of religious groups, and general social structure. (Lec. 3) Pre: one 100- or 200-level sociology course. Peters

**346 Sociology of Knowledge** (I or II, 3) Theories and research on the social bases of ideas. Emphasis on the works of Durkheim, Mannheim, and Marx and their influences on "common sense" interpretations of social life. (Seminar) Pre: one 100- or 200-level sociology course. Peters and Staff

**350 Work and Family Life** (I, 3) Linkages between economic and family institutions. Effects of work on family and of family on work. Historical development of the linkages. Contemporary effects due to men's decreasing and women's increasing labor force participation. (Lec. 3) Pre: 100 or 212 or HDF 230. Mederer

**360 Introduction to Demographic Techniques** (I or II, 3) Examination of demographic data sources; construction and analysis of techniques for examining the demographic variables of size, composition, and distribution and the demographic processes of fertility, mortality, and migration; consideration of methods for making estimates and projections. (Lec. 3) Pre: 238 or permission of instructor. Staff

**401 History of Sociological Thought** (I and II, 3) Development of sociology as reflected in writings of American and European scholars: Plato, Aristotle, Rousseau, Vico, Spencer, Durkheim, Marx, Weber, Veblen, R. Merton, Parson, and others. (Seminar) Pre: 100 and 6 credits in sociology. Danesh and Peters

**402 Sociology in Applied and Community Settings** (I and II, 3) Field experience and research in applying sociological concepts and methods to problems of community agencies and settings. Formulating and developing approaches to ongoing social systems; introduction to program analysis and evaluation. (Practicum) Pre: 301. Open only to sociology majors. May be repeated for a maximum of 6 credits. Not for graduate credit. Staff

**408 Individual Life and Social Order** (I or II, 3) Sociology of the individual as a creative participant in social order. Emphasis on cultural symbolism in the development of personal idiom, social structure, and social change. (Lec. 3) Pre: 9 credits in sociology or permission of instructor. Travisano

**413 Sexual Inequality** (I or II, 3) Development of sexual inequality. Critique of various theories explaining inequality. Sociological interpretation of theories of sexuality. Some effects of inequality: American women; minority women; women's work. Discussion of liberation and androgyny. (Seminar) Pre: 242 or permission of instructor. In alternate years. Mederer and Reilly

**416 Fertility: A Demographic Analysis** (I or II, 3) Examination of theories of fertility: fertility levels, trends, and differentials; fertility control; policy and research issues; emphasis on the U.S. population. (Seminar) Pre: 238 or permission of instructor. Staff



**420 Family Violence (I or II, 3)** Examination and analysis of the incidence, types, and causes of violence between family members, including child abuse, wife abuse, and abuse of the elderly. (Seminar) Pre: 100 or 102 or permission of instructor. Staff

**424 Health Care Delivery Systems (I or II, 3)** Contemporary issues in health care delivery; dynamics and problems in health care rationing; incentives to demedicalize, and promotion of competition. (Lec. 3) Pre: one 300-level sociology or anthropology course or permission of instructor. Staff

**428 Institutional Racism (I, 3)** Consideration of varying models of race and ethnic relations; examination of recent research on issues such as residential segregation, school desegregation, affirmative action, and racial disorders; comparisons of United States with other societies. (Seminar) Pre: one 300-level sociology course or permission of instructor. In alternate years. Cunningham

**430 (or PSY 430) Intimate Relationships (I or II, 3)** Examination of the effects of cultural, social, and psychological processes in the development, maintenance, and dissolution of intimate relationships. Emphasis on friendship patterns, dating and marital relationships, intimacy in nontraditional relationships. Emphasis on research. (Lec. 3) Pre: any 100- or 200-level course in sociology or PSY 113 and permission of instructor. Not for graduate credit. Albert

**432 (or LRS 432) Industrial Sociology (I or II, 3)** The social structure of industrial organizations; institutional patterns of conflict and co-operation; the impact of the political process; current issues in industry. (Lec. 3) Pre: 100 or permission of instructor. Staff

**437 Law and Families in the United States**  
See Human Development and Family Studies 437.

**438 Aging in Society (II, 3)** Social theories of growing old in a changing society. Organizational and sociohistorical factors are examined in terms of their consequences for the present status of the aged. (Lec. 3) Pre: one 300-level course in sociology or permission of instructor. Mederer

**452 Class and Power (II, 3)** Class structures and patterns of power in advanced societies; comparisons of inequality in capitalist and socialist societies; theories of the relation between class and power; class consciousness, conflict, and accommodation. (Lec. 3) Pre: 336 or permission of instructor. In alternate years. Danesh

**470, 471 Independent Study (I and II, 3 each)** Areas of special research not covered in other courses. May be taken as honors courses. (Independent Study) Pre: one 300-level sociology course and permission of instructor. Staff

**473 Topics in Sociological Research (I and II, 3)** Original sociology research conducted on a topic selected by the student in conjunction with a faculty member. Students will be evaluated on the basis of work submitted to the instructor. (Independent Study) Pre: permission of instructor. May be repeated once on the same topic. Staff

**474 Criminal Justice System**  
See Political Science 474.

**475 (or PSC 475) Behavior Systems in Crime (I, 3)** Criminal behavior studied in categories useful for sociological analysis. Linkages of criminal behavior systems to the larger society; behavior systems in causal theorizing, justice, prevention, and corrections. (Seminar) Pre: 330 or equivalent. In alternate years. Carroll

**495 Senior Seminar in Sociology (I and II, 3)** Critical examination of selected topics in sociology. Particular topics for examination will be selected by the course instructor. Required for students in the B.A. program in sociology. (Seminar) Pre: senior standing; open only to sociology majors. Not for graduate credit. Staff

**505 Public Program Evaluation**  
See Political Science 505.

**522 (or PSC 522) Issues in Corrections (II, 3)** Justifications for punishment and corrections; historical development; intensive survey of current research on deterrence, effectiveness of treatment, prison, violence, and other issues. (Seminar) Pre: 330, 475, STA 308, or permission of instructor. In alternate years. Carroll

**595 Problems of Modernization in Developing Nations**  
See Resource Economics 595.

## Spanish (SPA)

Section Head: Professor Gitlitz

**101 Beginning Spanish I (I and II, 3)** Introduction to Spanish for beginners. (Lec. 3) Pre: no prior Spanish is required. Staff (F)

**102 Beginning Spanish II (I and II, 3)** Continuation of 101. (Lec. 3) Pre: 101 or equivalent. Staff (F)

**103 Intermediate Spanish I (I and II, 3)** Reading and discussion of representative authors, grammar review, and continued practice in language skills to broaden understanding of Hispanic culture. (Lec. 3) Pre: 102 or equivalent. Staff (F)

**104 Intermediate Spanish II (I and II, 3)** Continuation of 103. (Lec. 3) Pre: 103 or equivalent. Staff (F)

**131 Refresher Course in Spanish (I and II, 3)** Rapid one-semester review of beginning Spanish structures and vocabulary. For students with one or two years of high school Spanish who are not ready for 103 or higher level, and who have taken the placement examination. (Lec. 3) Pre: one or two years of precollege Spanish or permission of section head. Not open to students with credit in 101 or 102. Staff (F)

**201 Oral Expression in Spanish (I or II, 3)** Development of oral skills in Spanish through discussion, interpreting, and reports on topics of personal, practical, or cultural interest. (Lec. 3) Pre: 104. Staff

**205 Spanish Language and Style I (I and II, 3)** Development and refinement of all Spanish language skills, with emphasis on writing, through structured practice using Hispanic cultural and literary materials. (Lec. 3) Pre: 104 or equivalent. Staff

**206 Spanish Language and Style II (I and II, 3)** Continuation of 205. (Lec. 3) Pre: 205 or equivalent. Staff

**305 Early Spanish-American Literature and Culture (II, 3)** Study of the early development of Spanish-American culture through its literature, from Conquest to Independence. (Lec. 3) Pre: 206 or permission of instructor. Staff

**306 Modern Spanish-American Literature and Culture (I or II, 3)** Significant figures and developments in literature, the arts, and society, from Independence to the present. (Lec. 3) Pre: 206 or permission of instructor. Staff (A)

**307 Hispanic Culture Through the Seventeenth Century (II, 3)** Significant contributions in literature and the arts, from the unique period of coexistence of Christians, Jews, and Muslims through the Golden Age of the sixteenth and seventeenth centuries. (Lec. 3) Pre: 206. In alternate years. Staff

**308 Literature and Culture of Modern Spain (II, 3)** Major figures and developments in Spanish literature, the arts, and society from the eighteenth century to the present. (Lec. 3)

*Pre: 206 or permission of instructor. In alternate years. Staff*

**310 Field Workshop (SS, 1–6)** Cultural visit to Spain or Hispanic America. Significant monuments and places of interest to the student of literature and civilization will be studied. Lectures supplemented by assigned readings. (*Workshop*) *Pre: 104 or permission of instructor. Staff*

**312 Advanced Spanish (I and II, 3)** Problematic aspects of Spanish grammar; proper syntax and word usage in speaking, translation, and writing at sophisticated levels; correct reproduction of sounds and intonation patterns. (*Lec. 3*) *Pre: 206 or permission of instructor. Staff*

**315 Practicum in Community Work (I and II, 3)** Practical application of Spanish in a community agency, school, or business. Individual project developed by student under guidance of a Spanish faculty member. Requires a minimum of 120 hours. (*Practicum*) *Pre: 206 and permission of instructor. Staff*

**325 Introduction to Literary Genres (I, 3)** Presentation of the novel, poetry, drama, and essay as literary genres. Textual commentary and methods of criticism. (*Lec. 3*) *Pre: 206 or permission of instructor. Trubiano and Staff*

**391, 392 Spanish Literature in Translation (I and II, 3 each)** Reading and analysis in English of Spain's most significant contributions to world literature: poetry, novel, drama, essay. Works through the seventeenth century in the first semester; those of the nineteenth and twentieth in the second. (*Lec. 3*) *Not for major credit in Spanish. Staff (A) (F) for 391; (A) for 392.*

**393 Modern Hispanic-American Literature in Translation (I or II, 3)** Introduction to the development of Latin-American literature in the twentieth century and an examination of how the literary artifact has reflected the major social and political changes of the region. (*Lec. 3*) *Not for major credit in Spanish. Staff (A) (F)*

**401 Oral and Dramatic Presentation of Hispanic Literature (I, 3)** Practice in effective oral communication in Spanish and appreciation of Hispanic literature through analysis and class presentation of drama, poetry, and prose. (*Lec. 3*) *Pre: 325 or permission of instructor. Staff*

**421 Business Spanish (I or II, 3)** Study of concepts and terminology in the Spanish-speaking business world. (*Lec. 3*) *Pre: credit or concurrent enrollment in a 300-level Spanish course. Not for graduate credit in Spanish. Staff*

**430 Castilian Prose of the Sixteenth and Seventeenth Centuries (II, 3)** Literary significance of the Renaissance and Baroque periods and an analysis and critical examination of the prose works of the principal writers of this Golden Age of Castilian Literature. (*Lec. 3*) *Pre: 325 or permission of instructor. Gitlitz or Trubiano*

**431 Drama and Poetry of the Sixteenth and Seventeenth Centuries (II, 3)** Spanish poetry and drama from the early Renaissance through the Baroque. (*Lec. 3*) *Pre: 325 or permission of instructor. Trubiano or Gitlitz*

**450 Romanticism and Realism (II, 3)** Nineteenth-century Spanish literature of the romantic and realist movements. Examples of drama, poetry, and prose as they reflect evolving concerns of the modern writer and society. (*Lec. 3*) *Pre: 325 or permission of instructor. Staff*

**470 Topics in Hispanic Literature (I and II, 3)** Special topics or authors not emphasized in other courses. (*Seminar*) *Pre: 325 or permission of instructor. Staff*

**481 Don Quijote (I, 3)** Life and times of Miguel de Cervantes Saavedra and the reading and critical interpretation of his work. *El ingenioso hidalgo Don Quijote de la Mancha*. (*Lec. 3*) *Pre: 325 or permission of instructor. Required for Spanish majors. In alternate years. Staff*

**485 Modern Spanish Narrative (II, 3)** Representative narrative works by Spain's major authors from the Generation of 1898 to the present. (*Lec. 3*) *Pre: 325 or permission of instructor. Manteiga*

**486 Modern Spanish Poetry and Drama (II, 3)** Selected poetry and plays from the nineteenth century through the present. (*Lec. 3*) *Pre: 325 or permission of instructor. Manteiga*

**488 Spanish-American Poetry and Drama (I or II, 3)** Traces the development of poetic expression and drama from the seventeenth century to modern times as a reflection of the evolution of Spanish-American identity. (*Lec. 3*) *Pre: 325 or permission of instructor. Morín*

**489 The Spanish-American Narrative (I or II, 3)** Traces the development of fictional prose in Spanish America from the colonial period to modern times as a reflection of cultural and societal changes. (*Lec. 3*) *Pre: 325 or permission of instructor. Morín or White*

**497, 498 Directed Study (I and II, 1–3 each)** For the advanced student. Individual research and reports on problems of special interest. (*Independent Study*) *Pre: 325, acceptance of*

*project by staff member, and approval of section head. Staff*

**510 Contemporary Spanish Workshop (SS, 3–6)** New developments in all areas of Hispanic studies including pedagogical matters and classroom techniques. (*Workshop*) *Pre: graduate standing or permission of instructor. Staff*

**561 Seminar in Medieval Poetry and Prose (I, 3)** Examination and analysis of the epic, lyrical, and narrative medieval literature of Spain and its impact on subsequent literature. (*Seminar*) *Pre: graduate standing or permission of instructor. Staff*

**570 Topics in Hispanic Literature and Culture (I, II, or SS, 3)** Special topics or authors not emphasized in other courses. (*Seminar*) *Pre: graduate standing or permission of instructor. Staff*

**572 Evolution of Spanish-American Culture and Thought (II, 3)** Development of Spanish-American thought and cultural trends, as portrayed in major works of artists and thinkers. (*Lec. 3*) *Pre: graduate standing or permission of instructor. Next offered spring 2000. Morín or White*

**574 Interpretations of Modern Spanish-American Thought (I or II, 3)** Topics of interest in the development of modern Spanish-American thought as represented in the essay from the period of independence to the present. (*Seminar*) *Pre: graduate standing or permission of instructor. Morín or White*

**580 Seminar in Nineteenth-Century Spanish Literature (I or II, 3)** Selected authors and topics from the Spanish Romantic movement through realism and naturalism. (*Seminar*) *Pre: graduate standing or permission of instructor. May be repeated with different topic and permission of instructor. Staff*

**584 Interpretations of Modern Spain (I, 3)** Development of Spanish thought particularly with respect to sociological and cultural problems from the eighteenth century to the contemporary period as seen through the writings of significant essayists. (*Lec. 3*) *Pre: graduate standing or permission of instructor. In alternate years. Manteiga*

**585 Seminar in Twentieth-Century Spanish Literature (I, 3)** Topics of aesthetic, cultural, and linguistic concern in twentieth-century peninsular literature. (*Seminar*) *Pre: graduate standing or permission of instructor. May be repeated with different topic and permission of instructor. Manteiga*

**587 Seminar in Renaissance and Baroque Literature** (II, 3) Aesthetic analysis of works representative of the period and their influence on subsequent literatures. (Seminar) Pre: *graduate standing or permission of instructor. May be repeated with different topic and permission of instructor.* Trubiano or Gitlitz

**588 Seminar in Colonial Spanish-American Literature and Culture** (I or II, 3) Topics of interest dealing with the development of Spanish-American cultural identity and literature from the period of discovery and colonization to independence. (Seminar) Pre: *graduate standing or permission of instructor.* Morin or White

**589 Seminar in Modern Spanish-American Literature and Culture** (I or II, 3) Topics of interest dealing with the development of Spanish-American literature and culture from the period of independence to the present. (Seminar) Pre: *graduate standing or permission of instructor. May be repeated with different topic.* Morin or White

**590 The Hispanic Presence in the United States** (II, 3) A study of the establishment of the Hispanic presence and its heritage in the art, folklore, and language of the United States, and an analysis of the literature of the Spanish-speaking peoples. (Lec. 3) Pre: *graduate standing or permission of instructor. In alternate years.* Staff

**597, 598 Directed Study** (I and II, 3 each) Individual research and reports on problems of special interest. (Independent Study) Pre: *graduate standing and approval of the director of graduate studies. May be repeated with different topic.* Staff

**599 Master's Thesis Research** (I and II) Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

## Statistics (STA)

Section Head: Professor Hanumara

**220 Statistics in Modern Society** (I and II, 3) Elementary concepts in sampling, polls, surveys, random samples. Foundations of statistical inference; estimation, comparison prediction. Statistics for the consumer, quality of data, credibility of statistical evidence. Environmental measurements and experiments. (Lec. 2, Rec. 1) Staff (M)

**307 Introductory Biostatistics** (II, 3) Statistical methods applicable to health sciences. Data presentation. Vital statistics and life tables. Fitting models to health data. Testing, estimation, analysis of cross-classifications, regression, correlation. (Lec. 2, Rec. 1) Pre: MTH 107 or 108. Not open to students with credit in 308 or 409. Staff

**308 Introductory Statistics** (I and II, 3) Descriptive statistics, presentation of data, averages, measures of variation, skewness, kurtosis. Elementary probability, binomial and normal distributions. Sampling distributions. Statistical inference, estimation, confidence intervals, testing hypotheses, linear regression, and correlation. (Lec. 2, Rec. 1) Pre: MTH 107 or 108. Not open to students with credit in 307 or 409. Staff

**409 Statistical Methods in Research I** (I and II, 3) Same as 308, but is for students who have better mathematical preparation. (Lec. 3) Pre: MTH 132 or 142. Not open to students with credit in 307 or 308. Staff

**411 (or PHP 411 or APS 411) Biostatistics II** (II, 3) An overview of statistical methods used in performing research in pharmacotherapeutics and pharmacoepidemiology. Emphasis will be on understanding both common study designs and the output from statistical analysis of data obtained from these studies. (Lec. 3) Pre: *an introductory statistics course (i.e., 307) or permission of instructor.* Staff

**412 Statistical Methods in Research II** (I and II, 3) Multiple linear regression and correlation analysis, curvilinear regression. Analysis of variance and covariance. Analysis of enumerative data. Some nonparametric methods. (Lec. 3) Pre: 307 or 308 or 409. Staff

**413 Data Analysis** (I, 3) Exploring data from experimental trials, sample surveys, multivariate studies; weighing chances, detecting patterns, identifying outliers, finding models; elementary computational procedures. (Lec. 3) Pre: 307 or 308 or 409 and CSC 201. Staff

**415 Introduction to Experimental Design** (I, 3) Experimental units and replication. Nesting. Reduction of variance: blocking, concomitant variables. Commonly used designs: completely randomized, randomized blocks, split plots. Factorial arrangement of treatments, confounding. Incomplete block designs. (Lec. 3) Pre: 412. Not for graduate credit. Staff

**416 Survey of Advanced Statistical Methods** (II, 3) Selected topics for multivariate, nonparametric and sampling methodology. Multivariate normal, Hotelling's  $T^2$ , discriminant function; rank tests; simple random sampling, stratified sampling, cluster sampling, and systematic sampling. (Lec. 3) Pre: 412. Not for graduate credit. Staff

**491 Directed Study in Statistics** (I and II, 1–3) Advanced work in statistics. Conducted as supervised individual projects. (Independent Study) Pre: *permission of chairperson. S/U credit.* Staff

**492 Special Topics in Statistics** (I or II, 3) Advanced topics of current interest in statistics. (Lec. 3) Pre: *permission of chairperson.* Staff

**500 Nonparametric Statistical Methods** (I or II, 3) Rank and sign tests, permutation tests and randomization, run test, tests of goodness of fit, order statistics, estimation, and comparison with parametric procedures. Examples illustrating the applications of nonparametric techniques. (Lec. 3) Pre: 409. Staff

**501 Analysis of Variance and Variance Components** (I or II, 3) Analysis of variance and covariance, experimental design models, factorial experiments, random and mixed models, estimation of variance components, unbalanced data. (Lec. 3) Pre: 412. Staff

**502 Applied Regression Analysis** (I or II, 3) Topics in regression analysis including subset selection, biased estimation, ridge regression, and nonlinear estimation. (Lec. 3) Pre: 412. Staff

**513 Statistical Quality Assurance**  
See Industrial and Manufacturing Engineering 513.

**517 Small N Designs**  
See Psychology 517.

**520 Fundamentals of Sampling and Applications** (I or II, 3) Simple random sampling; properties of estimates, confidence limits. Sample size. Stratified random sampling; optimum allocation, effects of errors, and quota sampling. Regression and ratio estimates; systematic and multistage sampling. (Lec. 3) Pre: 308 or 409. Staff

**532 (or ASP 532 or PSY 532) Experimental Design** (I, 3) Application of statistical methods to biological and psychological research and experimentation. Experimental situations for which various ANOVA and ANCOVA designs are most suitable. (Lec. 3) Pre: 409 or equivalent. Staff

**535 Statistical Methodology in Clinical Trials** (II, 3) Bioavailability, dose response models, crossover and parallel designs, group sequential designs, survival analysis, meta analysis. (Lec. 3) Pre: 409, 411, or 412 or permission of instructor. Staff

**541 Multivariate Statistical Methods** (I or II, 3) Review of matrix analysis. Multivariate normal distribution. Tests of hypotheses on means, Hotelling's  $T^2$ , discriminate functions. Multivariate regression analysis. Canonical correlations. Principal components. Factor analysis. (Lec. 3) Pre: 412. Staff

**542 Categorical Data Analysis Methods (I or II, 3)** Analysis of multidimensional categorical data by use of log-linear and logit models. Discussion of methods to estimate and select models followed by examples from several areas. (Lec. 3) Pre: 412. Staff

**550 Ecological Statistics (I, 3)** Application of statistical methodology to the following topics: population growth, interactions of populations, sampling and modeling of ecological populations, spatial patterns, species abundance relations, and ecological diversity and measurement. (Lec. 3) Pre: 409 or permission of instructor. Staff

**576 Econometrics**  
See Resource Economics 576.

**584 Pattern Recognition**  
See Electrical Engineering 584.

**591 Directed Study in Statistics (I and II, 1-3)** Advanced work in experimental statistics conducted as supervised individual projects. (Independent Study) Pre: permission of chairperson. S/U credit. Staff

**592 Special Topics in Statistics (I or II, 3)** Advanced topics of current interest in experimental statistics. (Lec. 3) Pre: permission of chairperson. Staff

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) S/U credit.

**610 Parsimony Methods**  
See Psychology 610.

**611 Linear Statistical Models (I or II, 3)** Review of mathematical and statistical concepts. Multivariate normal distribution. Distribution of quadratic forms. Power of the F-test. Basic linear models: general linear hypothesis, regression models, experimental design models, variance component models, mixed models. (Lec. 3) Pre: 501 or 502. Staff

**612 Structural Modeling**  
See Psychology 612.

*In addition to statistics courses offered by the Department of Computer Science and Statistics under the STA code, there are a number of statistics courses offered by other departments:*

**Applied Pharmaceutical Sciences**  
411 Biostatistics II

**Business Analysis and Computing**  
201, 202 Managerial Statistics I and II  
530 Statistical Methods for Management

## Industrial and Manufacturing Engineering

411 Probability and Statistics for Engineers  
412 Statistical Methods for Engineers  
513 Statistical Quality Assurance  
533 Advanced Statistical Methods for Research and Industry  
634 Design and Analysis of Industrial Experiments

## Management Science and Information Systems

450 Forecasting  
455 Analysis of Managerial Data  
470 Advanced Managerial Decision Support Systems  
480 Managerial Application of Simulation  
601 Business Research Methods: Linear Models  
602 Business Research Methods: Multivariate Analysis  
630 Management Statistics with SAS and Personal Computer Software  
675 Applied Time Series Methods and Business Forecasting

## Mathematics

451 Introduction to Probability and Statistics  
452 Mathematical Statistics  
550 Probability and Stochastic Processes  
551 Mathematical Statistics

## Psychology

300 Quantitative Methods in Psychology  
533 Advanced Quantitative Methods in Psychology

## Textiles, Fashion Merchandising, and Design (TMD)

Chairperson: Professor Welters

**103 Consumer Issues in Textiles and Clothing (I and II, 3)** Effect of fibers, yarns, fabrics, and finishes on appearance, performance, and cost. Impact of environmental and consumer safety, labeling, energy conservation, and fashion on the development of textiles, laundry equipment, and detergents. (Lec. 3) Proficiency test available. Helms

**113 Color Science (II, 3)** The science of color: light and its interaction with objects and color vision. Color explained, mixed, measured, described, and reproduced (paints, dyes, photography, TV). Color in the natural world. (Lec. 3) Bide (N)

**216 Interior Design I (I and II, 3)** Discussions and problems to develop discrimination and creative ability in selection of adequate and well-designed home furnishings. (Lec. 3) Loewenstein

**222 Apparel Production (I and II, 3)** Analysis of apparel construction and production; current industrial and technological developments. Discussion of sizing and quality standards with emphasis on identification of fabrics, garment styles, findings, and trims. (Lec. 3) Pre: 103. Moreno

**224 Clothing and Human Behavior (I and II, 3)** Clothing and appearance as a form of human behavior. Analysis of social, psychological, and cultural factors in personal appearance and as a system of communication. Focus on cross-cultural and international perspectives. (Lec. 3) Moreno (S)

**232 Fashion Retailing (I and II, 3)** A comprehensive study of fashion retailing as an operating system. Examination of the strategies and the organizational structure which support the fashion retail system. (Lec. 3) Harps-Logan

**238 Surface Design (SS, 3)** History, classification, and traditional processes for surface-designed textiles. Introduction to screen printing and block printing. Emphasis on resist dyeing and painting. (Lec. 2, Lab. 2) Staff

**240 Development of Contemporary Fashion (I, 3)** History of contemporary fashion from the beginning of the twentieth century to the present. Influence of designers, buyers, consumers, and technology on fashion in the marketplace. (Lec. 3) Pre: 103 and sophomore standing. Welters

**303 Textile Science (I and II, 3)** Current textiles and textile products. Scientific aspects of fibers, yarns, fabrication, and finishes for apparel and home furnishings. Study of existing regulatory controls and policies as they affect the consumer. (Lec. 3) Pre: 103 and CHM 124 or permission of instructor. Bide

**313 Textile Science Laboratory (I and II, 1)** Laboratory exercises include fiber identification, fabric analysis, and fabric performance testing. A written project and oral presentation on fabric performance are required. Students furnish their own fabric for performance testing. (Lab. 2) Pre: 103, CHM 124, 126, and concurrent enrollment in 303. Bide or Ordoñez

**316 Housing Space and Function (II, 3)** Fundamental principles of house planning concerning orientation, space relationships, function, flexibility, aesthetic and economic factors. (Lec. 2, Lab. 2) Pre: 216. Loewenstein

**325 Apparel I (I, 4)** Principles of garment production as related to construction, fit, performance, quality, and cost. Construction tech-

niques, sizing, material evaluation and assembly management. Quality analysis and introduction to computer-aided design. (Lec. 2, Lab. 4) Rubens

**327 Apparel Design (I and II, 3)** Design principles as applied to contemporary clothing with emphasis on various age groups and special populations. Laboratory experiences concentrate on the creative process and development of illustrative techniques. (Lec. 2, Lab. 2) Aspelund

**332 Fashion Merchandise Buying (I and II, 3)** The theory of fashion merchandising and its application to basic retailing procedures, the responsibility of the buyer, and procedures used to determine consumer demand, merchandise selection, and pricing. (Lec. 3) Pre: 103, 224, and 232. Harps-Logan

**335 Apparel II (II, 4)** Application of flat pattern design and draping techniques. Special emphasis on computer-aided design application as related to sizing, sloper development, and pattern drafting. Creative laboratory processes from design to finished product. (Lec. 2, Lab. 4) Pre: 325 or permission of instructor. Rubens

**336 Fabrics for Interiors (II, 3)** The design, manufacturing, selection, installation, and performance of interior fabrics. Labeling, warranty programs, testing and safety requirements for both residential and commercial uses. (Lec. 3) Pre: 216, 303, 313, or equivalent course work. Helms

**340 Historic Costume (I, 3)** Sociological, economic, religious, and political factors affecting the history of costume and resulting fashion changes from antiquity to the early twentieth century. Use of department's historic costume collection. (Lec. 3) Ordoñez

**342 Fashion Study Tour (II, 1)** Students spend two weeks overseas during intersession studying the apparel and/or interior furnishings market in London and Paris. Lectures and tours by designers, manufacturers, and retailers. Students may register once in apparel and once in interior furnishings. Travel costs are extra. (Practicum) Pre: junior standing or permission of instructor. Ordoñez

**358 Weaving (II, 3)** Introduction to hand weaving including on-loom and off-loom techniques. Designing, drafting, warping, and finishing of various types of weaves. Students complete samplers and projects. (Lec. 1, Lab. 4) Staff

**361, 362 Special Problems (I and II, 1–4 each)** Open to qualified juniors and seniors who wish to do advanced work. (Independent Study) Pre: approval of application by instructor and chairperson. May be repeated for a maximum of 6 credits. Staff

**402 Seminar in Textiles and Clothing (II, 1–2)** Recent developments in manufacturing, marketing, and retailing of textile products. Discussion of fashion issues and impact on consumer. Lectures by speakers from business, industry, and government. (Lec. 1–2) Pre: junior or senior standing or permission of instructor. May be repeated once. Spring 1999: *Luxury Markets*. Ordoñez

**403 Textile Performance (I, 3)** Analysis of textiles using test methods and standards adopted by government, industry, and buyers to insure consumer satisfaction. Interpretation of test data in relation to consumer expectations and performance claims. (Lec. 2, Lab. 2) Pre: 103 and 303 or permission of instructor. Bide

**406 Historic Furniture (I, 3)** Chronological study of the development of furniture, factors that influence style and production, characteristics of style, and influence of historic furniture on later periods. (Lec. 3) Staff

**413 Dyeing and Finishing of Textiles (II, 3)** Study of chemical and physical interactions of dyes and finishes with textile fiber/fabric systems. Evaluation of application techniques. Detection and evaluation of problems resulting from dyeing and finishing. (Lec. 2, Lab. 2) Pre: 303 or permission of instructor. Next offered spring 2000. Bide

**416 Interior Design II (I, 3)** Observation and experience in professional interior design with emphasis on meeting living needs of individuals and groups. Field trips, laboratory applications, and guest lecturers. (Lec. 2, Lab. 2) Pre: 316 or permission of instructor. Loewenstein

**422 Fashion Retailing Seminar (I, 1)** Seminar concerning the retailing of textile, apparel, and other fashion products. Concurrent registration in 461 or 462 required. (Seminar) Pre: 303, 332 and permission of instructor. Not for graduate credit. Harps-Logan

**424 Fashion Theory and Analysis (II, 3)** Principles, theories, and recent investigations of the fashion process are presented to develop analytical skills for evaluating consumer behavior, as related to clothing and adornment. Application to contemporary trends. (Lec. 3) Pre: senior or graduate standing. Moreno

**432 Fashion Merchandising Operations Control (II, 3)** Analysis of determinants of fashion merchandising profitability below gross margin; expense analysis, classification, allocating expense center accounting, and key operating ratios. Emphasis upon modification and control of selling cost ratios. (Lec. 3) Pre: 232 and 332. Harps-Logan

**433 Textile Markets (I and II, 3)** Study of social, economic, and political issues that affect the development, production, and marketing of textile products. Study of the textile needs of the apparel, home furnishings, industrial, and medical industries. (Lec. 3) Pre: 303 and ECN 201 and 202. Helms

**440 Historic Textiles (II, 3)** Chronological study of textiles, emphasizing socioeconomic, religious, and political influences. Contribution of designers, inventors, trade groups, and industrialists. (Lec. 3) Pre: 103 or permission of chairperson. Ordoñez

**453 Textiles: A Global Perspective (II, 3)** An international perspective on the manufacturing and marketing of textile products, which will develop a global overview of trade and trade policy. (Lec. 3) Pre: senior standing or permission of instructor. Helms

**461, 462 Internship (I and II, 1–6)** Structured internship in textiles, apparel, or interior design supervised by a faculty advisor. Juniors and seniors work in business, industry, or other agencies under supervision of qualified personnel. (Minimum of 45 hours per semester per credit) May be repeated for a maximum of 12 credits. Pre: completion of 60 credit hours, minimum GPA of 2.00, and permission of instructor and chairperson. Not for graduate credit. Staff

**500 Ethnic Costume and Textiles (II, 3)** Survey of regional styles of costume and textiles from all areas of the world, excluding fashionable dress. Influence of social, economic, technological, and aesthetic factors. (Lec. 3) Pre: 224 or equivalent, 340, 440, or permission of instructor. In alternate years. Next offered fall 1999. Moreno

**503 Topics in Textile Science (I, II, or SS, 3)** Advanced study in a particular area of textile science. One topic will be studied from a list that includes dyeing, finishing, printing, polymer and fiber chemistry, dyestuff chemistry, and color science. (Lec. 2, Lab. 2) Pre: graduate standing, 303 or equivalent, or permission of instructor. May be repeated up to three times with different topics. Staff

**510 Research Methods in Textiles (I or II, 3)**

Application of research methodology to the study of textiles and clothing. Approach is multidisciplinary in that experimental, social science, and historic methods are covered. (Lec. 3) *Pre: graduate standing or permission of instructor. Next offered spring 1999.* Welters

**513 Detergency (I, 3)** Study of chemical and mechanical interactions of textile fibers, fabrics, laundering products, equipment, and soils. Laboratory experience in evaluation of laundry products and fabric durability during laundering. (Lec. 2, Lab. 2) *Pre: graduate standing, 303 or equivalent, or permission of instructor. Next offered spring 2000.* Ordoñez

**520 Introduction to Textile Conservation (I, II, or SS, 3)** Survey of methods used to clean, repair, store, and display historic textiles and costumes. Laboratory experience in conservation practices. (Lec. 2, Lab. 2) *Pre: a textile science course and historic textiles or costume course, or permission of instructor.* Ordoñez

**521 Topics in Textile Conservation (II, 1–3)** Investigation of textile conservation theory and methodology. Some topics will include laboratory assignments. (Lec. 1–3) *Pre: 520 or experience in textile conservation, and permission of instructor. May be repeated with different topic.* Staff

**522 Special Problems in Textile Conservation (I or II, 1–3)** Supervised independent studies on specific textile conservation projects or research. (Independent Study) *Pre: 520 or experience in textile conservation, and permission of instructor. May be repeated for a maximum of 6 credits.* Ordoñez

**524 Social and Psychological Aspects of Textiles and Clothing (II, 3)** Seminar in social and psychological aspects of textiles and clothing. Theories and assumptions concerning relevance of clothing to individuals and groups. (Lec. 3) *Pre: 224 or permission of instructor. Next offered spring 2000.* Moreno

**530 Historic Textile Internship (I and II, 2–4)** Supervised internship designed to introduce the student to management of textile and costume collections in a museum or historical society setting. Individually designed to suit student needs: conservation, education, and research. (Practicum) *Pre: 510, 520, graduate standing in textiles, fashion merchandising, and design, or permission of chairperson.* Welters or Ordoñez

**532 Consumer Behavior in Fashion Retailing (I or II, 3)** Use by fashion retailing management of explanatory and predictive models of consumer behavior relating to fashion merchandising in establishing retail policy and strategy. (Lec. 3) *Pre: graduate standing or permission of instructor.* Harps-Logan

**540 Special Problems in Textiles and Clothing (I and II, 3)** Supervised independent study in specific areas of textiles and clothing. (Independent Study) *Pre: permission of chairperson.* Staff

**542 Fashion Promotion (I, 3)** Emphasis on understanding and applying the principles of fashion retailing communication. Evaluation and application of effective promotional activities such as visual merchandising and fashion shows to trade and retail levels of fashion merchandising. (Lec. 3) *Pre: graduate standing or permission of instructor.* Harps-Logan

**552 Retail Price Strategy (I or II, 3)** Economic, financial, legal, and fashion retailing principles are examined and integrated into a functional model in order to analyze management's pricing decisions and strategies for fashion merchandise. (Lec. 3) *Pre: graduate standing or permission of instructor.* Harps-Logan

**570 Topics in Historic Textiles or Costume (I or II, 3)** Advanced study in a particular area of historic textiles or costume using artifactual and documentary primary sources. Use of historic textile and costume collection. (Lec. 3) *Pre: 340, 440 or equivalent. May be repeated for a maximum of six credits. Fall 1998: Recent Developments in Dress History.* Welters

**599 Master's Thesis Research (I and II)** Number of credits is determined each semester in consultation with the major professor or program committee. (Independent Study) *S/U credit.*

## Theatre (THE)

*Acting Chairperson:* John F. Stevenson

*Courses in theatre offer theory, production, design, and performance training in various areas of dramatic arts, and many are open to nonmajors. The Department of Theatre conducts open auditions and makes performance and production work available to all members of the University community.*

**100 Introduction to Theatre (I and II, 3)** Designed to provide students with a theoretical and practical understanding of the theatrical process as well as to develop critical standards

and increase the enjoyment of theatre as an art. (Lec. 2, Lab. 4) *Not open to theatre majors.* Staff (A)

**111 Introduction to Acting (I and II, 3)** Designed to initiate students to theatre as a collaborative art through systematic exposure to the principles and techniques of acting, directing, stage design, stagecraft, and playwriting. Participation in productions required. (Studio 6) Staff

**117 Introduction to Voice and Movement (II, 3)** An exploration of the body and voice as instruments with emphasis on the development of physical and vocal awareness, concentration, maintenance, and endurance. (Studio 6) Guest Artist

**161 Introduction to Stagecraft (I and II, 3)** Stage carpentry, rigging, properties, scene painting, and lighting mechanics with practical experience working on productions. (Lec. 2, Lab. 2) Galgoczy

**181 Script Analysis (I and II, 3)** Analysis of plays from varying perspectives of the actor, director, and designer. Course emphasizes theatre terminology and develops a working vocabulary. (Lec. 3) Armstrong (A)

**211, 212 Basic Acting I, II (I and II, 2 each)** Introduction to the theory and basic techniques of acting. Includes moment-to-moment improvisation, the reality of doing, fantasy work, and voice and movement. (Studio 4) *Pre for 211: 111, 117, or permission of instructor; concurrent enrollment in 213. 212: Continuation of 211. Pre: 211 and permission of instructor; concurrent enrollment in 214.* Guest Artist

**213 Acting Workshop (I, 1)** A voice-movement workshop to be taken concurrently with 211. (Studio 2) *Pre: concurrent enrollment in 211.* Guest Artist

**214 Acting Workshop (II, 1)** A voice-movement workshop to be taken concurrently with 212. (Studio 2) *Pre: concurrent enrollment in 212.* Guest Artist

**217 The Role of Music in Theatre (II, 3)** Perspectives on music and its relationship and application to the theatre for theatre students. Musical vocabulary, performance techniques, and conventions related to the theatre. Emphasis on relationship of music and musical performance to all aspects of theatrical production. (Studio 6) *Pre: permission of instructor. May be repeated for a maximum of 6 credits with permission of instructor.* Guest Artist

**221 Stage Management (I, 3)** Theoretical and practical study of the basic methods and procedures of the production staff with emphasis on the director-stage manager relationship and the role of each. Participation in productions required. (Lec. 2, Lab. 2) McGlasson

**227 Dance for Musical Theatre (I, 3)** Orientation and instruction in beginning dance for the musical stage. Dance vocabulary in jazz, ballet, tap; performance techniques and conventions related to the American musical. (Studio 6) *Pre: theatre major or permission of instructor. May be repeated once with permission of instructor.* McGlasson

**250 Costume Laboratory (I and II, 3)** Practical experience in the principles of costuming including drafting theatrical patterns, construction and finishing techniques, and experience working on a theatrical production. (Lec. 1, Lab. 4) Emery

**261 Introduction to Theatre Design (I, 3)** Introduction to theatre production design with emphasis on development of capabilities for expression in conceptual and graphic terms. Projects in stage scenery, costumes, and lighting. (Lec. 2, Lab. 2) Wittwer

**291 Production Laboratory (I and II, 1)** Orientation and instruction in theatre through tutored participation in crews and production assignments or projects for departmental productions. (Independent Study) *May be repeated for credit.* Staff

**300 Individual Problems in Theatre Studies (I and II, 1–3)** Individual theatre work on an approved project under supervision of a staff member. (Independent Study) *Pre: permission of staff. May be repeated for a maximum of 6 credits.* Staff

**301 Special Group Studies (I and II, 1–3)** Group theatre work in approved production projects under supervision of a staff member. (Independent Study) *Pre: permission of staff. May be repeated for a maximum of 6 credits.* Staff

**311, 312 Intermediate Acting I, II (I and II, 3 each)** 311: Continuation of Basic Acting with emphasis on approaches to characterization through improvisation and through the analysis and performance of assigned scenes. (Studio 6) *Pre: 211, 212, and permission of instructor; concurrent enrollment in 313.* 312: Continuation of 311. (Studio 6) *Pre: 311 and permission of instructor; concurrent enrollment in 314.* Guest Artist

**313 Acting Workshop (I, 1)** A voice-movement workshop to be taken concurrently with 311. (Studio 2) *Pre: concurrent enrollment in 311.* Guest Artist

**314 Acting Workshop (II, 1)** A voice-movement workshop to be taken concurrently with 312. (Studio 2) *Pre: concurrent enrollment in 312.* Guest Artist

**321 Orientation to Play Direction (I, 3)** Director's role in the process of theatre production. Emphasis on development of production concepts and rehearsal techniques. (Lec. 2, Lab. 2) Swift

**322 Play Direction (II, 3)** Practical course in play direction. Class functions as a production unit and mounts a season of one-act plays. (Practicum: minimum of 6 hours per week) *Pre: 321 and permission of instructor.* Swift

**331 Playwriting (I or II, 3)** Analysis and evaluation of written material supplemented by play readings and workshop tryouts of students' plays. (Lec. 2, Lab. 2) Guest Artist

**341 Theatre Management (II, 3)** Principles, terminology, and practical technique of theatre administration. Emphasis on stage management. Assignments will be made to departmental productions. (Lec. 2, Lab. 2) McGlasson

**350 Makeup (I, 1)** Principles and techniques of stage makeup. Practical experience in application through a number of projects in developing character makeups with chiaroscuro, prosthetics, and facial hair. (Studio 2) Emery

**351, 352 Principles and Theories of Theatrical Costuming I, II (I and II, 3 each)** 351: Analytical study of fashions, modes, and manners in Western civilization as required for modern theatrical production; Greek through the Renaissance. (Lec. 3) 352: Continuation of 351; the Renaissance to the present. (Lec. 3) Emery (A)

**355 Stage Costume Design (II, 3)** Costume design theories and techniques for modern and period plays in a wide variety of styles. (Studio 6) *Pre: 351 or 352; 261 or permission of instructor.* Emery

**362 Scene Painting (II, 3)** Problems in scene painting, including use of color, basic techniques in scenic art such as texturing, trompe l'oeil, work from design elevations, carving, and some work in plastics. (Studio 3) Wittwer

**365 Scene Design (II, 3)** Theories and techniques of scenic design, emphasizing conceptualization and development of stage setting through project designs for various stage forms,

production styles, and periods. (Studio 6) *Pre: 261 or permission of instructor.* Wittwer

**371 Stage Lighting (I, 3)** Theories and techniques of lighting for the stage. A series of design projects introduces students to script analysis and conceptualization for lighting, instrumentation, and the use of color in stage lighting. (Lec. 2, Lab. 2) Wittwer

**381 History of Theatre to 1642 (I, 3)** General history of the theatre from its origins through the Renaissance. Introduction to non-Western drama of the period. Course focuses on the actor, staging, and the audience as they have influenced the development of the theatre and dramatic literature. (Lec. 3) Armstrong (A)

**382 History of Theatre: Neoclassical Through the Nineteenth Century (II, 3)** Course includes non-Western drama of China, Japan, and Korea. Continuation of 381. (Lec. 3) Armstrong (A)

**383 History of the Modern Theatre (I, 3)** Modern theatre and drama from 1880 to the present. Course includes new European stagecraft and its influence on the development of modernist and post-modernist drama, and contemporary non-Western drama. (Lec. 3) Armstrong (A)

**384 American Theatre History (II, 3)** Origins and development of American theatre from the wilderness to the contemporary Broadway and off-Broadway stage, including the evolution of the musical play. Analysis of special contributions made by the grassroots movement, the university theatres, the Federal Theatre Project, and the regional theatre movement. (Lec. 3) Armstrong

**391 Advanced Production Laboratory (I and II, 1–2)** Advanced instruction in theatre through tutored participation in crews and production assignments or projects for departmental productions. (Lab. 2–4) *Pre: 291 or permission of staff. May be repeated for credit.* Staff

**400 Advanced Individual Problems in Theatre Studies (I and II, 1–3)** Advanced individual theatre work on an approved project under supervision of a staff member. (Independent Study) *Pre: permission of staff. May be repeated for a maximum of 6 credits. Not for graduate credit.* Staff

**401 Advanced Special Group Studies (I and II, 1–3)** Advanced group theatre work in approved production projects under supervision of a staff member. (Independent Study) *Pre: permission of staff. May be repeated for a maximum of 6 credits. Not for graduate credit.* Staff

**411, 412 Scene Study (I or II, 3 each)** Emphasis on the analysis and interpretation of assigned scenes representative of the major theatrical genres and styles. (Studio 6) Pre: for 411, 311, 312, and permission of instructor and concurrent enrollment in 417; for 412, 411 and permission of instructor and concurrent enrollment in 418. Not for graduate credit. Swift

**413 Special Workshop in Acting (I or II, 3)** Techniques related to a specific aspect or style of performance; e.g., masks, puppetry, verse-speaking, and improvisation. The study is normally related to a departmental production or special project. (Studio 4) May be repeated for a maximum of 6 credits. Not for graduate credit. Guest Artist

**415 Professional Internship (I or II, 12)** Designed for junior and first-semester senior theatre majors who desire a professional experience. This program provides instruction and practical experience in cooperation with a faculty advisor and a professional theatre. (Practicum) Pre: permission of chairperson. Not for graduate credit. Staff

**417 Acting Workshop (I, 1)** A voice-movement workshop to be taken concurrently with 411. (Studio 2) Pre: concurrent enrollment in 411. Not for graduate credit. Guest Artist

**418 Acting Workshop (II, 1)** A voice-movement workshop to be taken concurrently with 412. (Studio 2) Pre: concurrent enrollment in 412. Not for graduate credit. Guest Artist

**420 Advanced Directing Practice (I or II, 1–3)** Special projects for the advanced directing student. Student directors will assume production responsibilities for all aspects of their projects, including a critical analysis upon completion. (Independent Study) Pre: 321, 322, or equivalent and permission of instructor. Not for graduate credit. Swift

**441 Advanced Theatre Management (I or II, 3)** Individual projects of theatre management in a major departmental production or project. (Practicum) Pre: 341. Not for graduate credit. McGlasson

**451 Stage Costume Technology (I, 3)** Construction methods and techniques appropriate to stage costuming with emphasis on major theatrical periods and productions. (Studio 6) Pre: 351 or 352 or permission of instructor. May be repeated for a maximum of 6 credits. Not for graduate credit. Emery

**455 Advanced Costuming (I or II, 1–3)** Individual projects in costume design for studio or major productions. Styles and theory related to

projects; costume sketches and construction. (Independent Study) Pre: 355 and permission of instructor. Not for graduate credit. Emery

**463 Special Workshop in Design and Technical Theatre (I or II, 3)** Techniques related to a specific aspect or style of production; e.g., masks, puppetry, wig making, sound effects, projections, properties. Normally related to a departmental production or special project. (Lab. 6) May be repeated for a maximum of 6 credits. Not for graduate credit. Staff

**465 Advanced Scene Design (I or II, 1–3)** Individual projects in designing scenery for studio and major productions. (Studio 2–6) Pre: 365 and permission of instructor. Not for graduate credit. Wittwer

**475 Advanced Stage Lighting (I or II, 1–3)** Individual projects in lighting design and control for studio and major productions. (Studio 2–6) Pre: 371 and permission of instructor. Not for graduate credit. Wittwer

**481 Topics in Theatre (I or II, 3)** Selected topics in theatre. (Seminar) Pre: upper-division standing and permission of instructor. May be repeated for credit with different topic. Staff

**482 Theatre Architecture in Western and Non-Western Drama (I, 3)** Examines staging practices of Western and non-Western drama from Egyptian staging of passion plays through the theatre practice of China, Japan, and Korea. (Seminar) Pre: upper-division standing and permission of instructor. In alternate years. Armstrong

**483 Aesthetics and Criticism of the Theatre (II, 3)** Study of dramatic theory and criticism. (Seminar) Pre: upper-division standing and permission of instructor. In alternate years. Armstrong

**484 Special Research Project (I or II, 3)** An in-depth study of a single critical or historical aspect of theatre. The subject is normally related to a departmental production. (Independent Study) Pre: permission of instructor. May be repeated for a maximum of 6 credits. Not for graduate credit. Staff

## University of Rhode Island Freshman Seminar (URI)

Acting Coordinator: Associate Professor Richmond, University College

**101 Traditions and Transformations: A Freshman Seminar (I or II, 1)** Introduces first-year students to the traditions of higher education and academic culture and to significant societal and personal issues that bear on developing

goals for the undergraduate years. Required of all new freshmen and new transfer students with less than 24 credits. May not be repeated for credit. Staff

Note: The community service component of URI 101 is part of the Feinstein Enriching America Program.

## University Year for Action Internship Program (UYA)

Director: L. Gaulin

**301, 302 Field Experience I, II (I or II, 3–12 each)** Field experience gained at placement site through participation in the UYA program. The experience will be defined by a job description and learning contract arranged by the UYA director between the student intern, the intern's faculty advisor, and the relevant agency supervisor. (Practicum) Pre: junior or senior standing, a minimum quality point average of 2.50, participation in the UYA program, and permission of faculty advisor. May be repeated for a maximum of 24 credits. S/U credit. Staff

**303, 304 Colloquium I, II (I or II, 3 each)** Seminar format. Discussions of issues and problems raised by internship experiences in public service agencies. (Seminar) Pre: concurrent enrollment in 301 for 303, and in 302 for 304. Required for and open only to students enrolled in the UYA program. Staff

## Women's Studies (WMS)

Director: Associate Professor Hughes

**150 Introduction to Women's Studies (I or II, 3)** Images of women in American culture, the theories and processes of socialization, historical perspectives, and implications for social change. (Lec. 3) Staff (S)

**210 Introduction to Feminist Theories (I or II, 3)** Historical development of feminist thought, the exploration of contemporary feminist theories, including African-American, lesbian, Western and non-Western perspectives, and the future role of feminist theories. (Lec. 3) Staff

**220 Women and the Natural Sciences (II, 3)** An interdisciplinary perspective on women as practitioners and subjects of the natural sciences; history of women in science; science as a gendered discourse. (Lec. 3) Hughes, Stein (L)

**300 Field Experience in Women's Studies (I or II, 3–6)** Supervised field work allowing students to learn through direct personal experience.



rience about the background, problems, and concerns of particular populations of women. (Practicum) Pre: 150 or 210 or permission of instructor. May be taken or repeated for a maximum of 6 credits. Staff

**310 Race, Class, and Sexuality in Women's Lives** (I or II, 3) Interconnections among race, ethnicity, class, and sexuality and the impact of sexism, racism, classism, and heterosexism on women's lives are investigated. Alliance building among women is explored. (Lec. 3) Pre: 150 or 210 or permission of instructor. Shugar

**330 Feminist Methods** (I or II, 3) Distinguishing qualities of feminist methodologies are examined, including methods in the social sciences, humanities, and natural sciences. The interdisciplinary focus of feminist research and the future of feminist methods are considered. (Lec. 3) Pre: 210 or permission of instructor. Staff

**333 Women in Irish Society** (I or II, 3) Roles of Irish women will be examined through historical and contemporary writings. The decline of women's power will be investigated and their current status will be assessed, especially in the Republic. (Lec. 3) Reilly (F) (L)

**350, 351 Special Topics in Women's Studies** (I and II, 1–3) Selected areas of study pertinent to women's studies. Instruction may be offered in class seminar or tutorial environments according to specific needs and purposes. (Lec.) May be repeated with different topic. Staff

**400 Critical Issues and Feminist Scholarship** (I or II, 3) Theoretical and value questions in women's studies; impact of feminist scholarship on traditional disciplines; feminist theory and research methods in selected fields; the future of feminism. (Seminar) Pre: 210 or permission of instructor. Shugar

**450 Independent Study** (I and II, 3) Advanced work in women's studies under the direction of a faculty member affiliated with the women's studies program. (Independent Study) Pre: junior or senior standing. May be repeated for a maximum of 6 credits. Staff

**490 Advanced Topics in Women's Studies** (I and II, 1–3) Advanced study in topics of special interest in Women's Studies. This course will be conducted as a seminar for juniors, seniors and graduate students. Pre: upper-division standing, 210, 310, 330 or permission of the instructor. (Seminar) May be repeated with different topic. Staff

## Writing (WRT)

Director: Professor Shamoon

**002 Writing Lab** (I and II, 0) Intensive study of grammar, punctuation, sentence formation, and paragraph skills. Operates on individual tutorial basis. Students may be referred. (Lab.) Staff

**101 Composition** (I, II, and SS, 3) Practice in the organization of ideas and language skills. Emphasizes steps in the writing process and responses to readings to develop ability, confidence, and clarity in writing. (Lec. 3) Not open to students who have completed CMS 101. Not for major credit in English. Staff (Cw)

**103 (or ENG 103) Introduction to Literature** (I and II, 3) The experience of literature through reading and discussion of fiction, poetry, and drama. Writing of six to eight essays on literary topics. (Lec. 3) Requires writing skills beyond the elementary level. Staff (Cw)

**123 College Writing for Returning Students** (I and II, 3) College-level readings and discussions as a basis for instruction and practice in specific types of written work required in college courses. (Lec. 3) Offered through the Alan Shawn Feinstein College of Continuing Education. For students who are beginning degree study after an interruption in formal education of at least three years. Not open to students with credit in BGS 100. Staff (Cw)

**201 Intermediate Writing** (I and II, 3) An introduction to strategies of reading and writing academic research in the physical sciences, social sciences, humanities, and the arts. Emphasizes longer papers and research methods. (Lec. 3) Staff (Cw)

**227 Business Communications** (I and II, 3) Basic business communications forms, group reports and presentations, effective use of electronic mail systems, and design of graphic aids for successful visual communication. (Lec. 3) Open to business majors only. Martin and Staff (Cw)

**235 Writing with Computers** (I or II, 3) The study of writing as modified by writing with computer. Practice in a variety of professional papers, graphic enhancement of text, and desktop publishing. (Lec. 3) Staff (Cw)

**301 Writing Nonfiction** (I and II, 3) Study and practice in advanced nonfiction with an emphasis on tone, style, audience, and the range of authorial voices. Writing will be submitted for publication. (Lec. 3) Staff (Cw)

**333 Scientific and Technical Writing** (I and II, 3) Practice in specific forms of writing in the scientific and technical fields. (Lec. 3) Competence in basic skills required. Staff (Cw)

**435 (or EDC 435) The Teaching of Composition** (I and II, 3) Philosophy, materials, and methods underlying the teaching of writing with emphasis on current approaches including the application of linguistics. Offers practice in writing workshop techniques, marking, constructing assignment sequences, and individualized instruction. (Seminar) Pre: junior standing or permission of instructor. Staff

**488 Traditions of Nonfiction**  
See English 488.

**512 (or ENG 512) Modern Rhetorical Theory** (I, 3) An introduction to theories of rhetoric and their relation to literature and language. Includes D'Angelo, Kinneavy, Winterowd, Perelman, Booth, and Burke. Pertinent related literary works. (Lec. 3) Pre: graduate standing or permission of instructor. Next offered fall 1999. Staff

**520 (or ENG 520) Studies in Composition and Reading Research** (I or II, 3) Investigation of current research in composition, reading, and the construction of audiences; pedagogies; conceptions of literacy. (Lec. 3) Next offered spring 2000. Staff

**999 Methods of Teaching College Writing** (I and II, 0) Materials and multiple methods of teaching writing on the college level. Required of teaching assistants who will teach in the College Writing Program unless waived by the director of English graduate studies, the supervisor of teaching assistants, and the director of the College Writing Program. (Seminar) Staff

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Graduate Dean's appointed student member

Graduate Student Association elected members (2)

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Steve Swallow, *Resource Economics (1999)*

Peter Swaszek, *Electrical Engineering (2001)*

Mario Trubiano, *Languages (2000)*

Dominic Valentino, *Psychology (2001)*

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\*Denotes graduate faculty

\*Abell, Paul, Ph.D., *Professor of Chemistry*

Abusamra, Ward, M.A., *Professor of Music*

Albert, Luke S., Ph.D., *Professor of Botany*

\*Alexander, Lewis M., Ph.D., *Professor of  
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Batroukha, M. Dean, Ph.D., *Professor of Journalism*

Baum, Werner, Ph.D., *Past President of the  
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Sciences*

\*Bloomquist, Lorraine E., Ed.D., *Professor of  
Physical Education*

Bond, Howard W., Ph.D., *Professor of Medicinal  
Chemistry*

\*Boothroyd, Geoffrey, Ph.D., *Professor of Industrial  
and Manufacturing Engineering*

Bowman, Beverly Hosbrook, M.S., *Associate  
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Brainard, Calvin H., Ph.D., *Professor of Finance and  
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Briggs, Nathalie, B.S., *Assistant Professor in the  
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Bromley, James Donald, Ed.D., *Professor of  
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\*Brown, James Henry Jr., D.F., *Professor of Natural  
Resources Science*

Brown, Phyllis Tucker, M.S., *Associate Professor of  
Food Science and Technology, Nutrition, and  
Dietetics*

\*Bumpus, Marguerite J., Ed.D., *Professor of  
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Burns, Donald B., M.A., *Professor of Music*

\*Cabelli, Victor J., Ph.D., *Professor of Biochemistry,  
Microbiology, and Molecular Genetics*

Caddick, Jack W., M.S., *Associate Professor of Plant  
and Soil Science*

Cain, Joseph Lambert, *Professor of Art*

Cain, Matene Rachotes, *Professor of Art*

Caldwell, Winifred A., M.A., *Associate Professor of  
Speech Communication*

Cameron, Lucille W., M.L.S., *Dean of Libraries and  
Associate Professor in the Library*

Campbell, Henry, S.M., *Professor of Civil and  
Environmental Engineering*

\*Carney, Edward J., Ph.D., *Professor of Computer  
Science and Statistics*

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Microbiology*

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\*Chang, Pei Wen, Ph.D., *Professor of Fisheries,  
Animal and Veterinary Science*

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*Professor of Chemistry*

Cumberland, Arlene J., M.S., *Associate Professor of  
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Cuomo, Frank, M.S., *Professor of Physics*

\*DeLuise, Frank, M.S., *Professor of Mechanical  
Engineering and Applied Mechanics*

DelSanto, Frank, Ed.D., *Associate Professor of  
Physical Education, Health, and Recreation*

Demers, Beatrice S., M.A., *Professor of French*

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- \*Duff, Dale Thomas Ph.D., *Associate Professor of Plant Sciences*
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- Dymsza, Henry A., Ph.D., *Professor of Food Science and Nutrition*
- England, Ralph W., Ph.D., *Professor of Sociology*
- Eshleman, Ruth E., *Associate Professor of Food Science and Nutrition*
- Etchingham, John B., M.L.S., *Associate Professor in the Library*
- Feeney, Marian S., M.S., *Professor of Resource Economics*
- Felbeck, George F., Ph.D., *Professor of Natural Resources Science*
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- \*Gersuny, Carl, Ph.D., *Professor of Sociology*
- Gilbert, Roland W., M.S., *Assistant Professor of Natural Resources Science*
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- Goff, Robert H., M.S., *Associate Dean of the College of Engineering, and Professor of Mechanical Engineering and Applied Mechanics*
- Goodman, Leon, Ph.D., *Professor of Chemistry*
- Goodwin, Ernest Bartlett, M.A., *Assistant Dean of Engineering and Associate Professor of Electrical Engineering*
- \*Goos, Roger D., Ph.D., *Professor of Botany*
- Gould, Walter Philip, Ph.D., *Associate Professor of Natural Resources Science*
- Grady, Ethyl R., M.S., *Associate Research Professor of Home Economics*
- \*Greene, Helen Finch, Ph.D., *Associate Professor of Human Development, Counseling, and Family Studies*
- Griffiths, Albert E., Ph.D., *Associate Professor of Plant and Soil Science*
- Grove, James F., M.S., *Professor of Electrical Engineering*
- Gullason, Thomas Arthur, Ph.D., *Professor of English*
- Gunning, Thomas J., Ed.D., *Associate Professor of Human Development, Counseling, and Family Studies*
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- Leathers, Roger K., D.P.E., *Associate Professor of Physical Education*
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- Leete, William W., M.F.A., *Professor of Art*
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- McGuire, Marion L., Ph.D., *Professor of Education*
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 Metz, William DeWitt, Ph.D., *Professor of History*  
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 Middleton, Foster H., Dr.Eng., *Professor of Ocean Engineering*  
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 \*Miller, Robert H., Ph.D., *Professor of Natural Resources Science*  
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 Moulthrop, Kendall, M.S., *Professor of Civil Engineering*  
 \*Mueller, Walter C., Ph.D., *Professor of Plant Sciences*  
 Murphy, Claire M., Ph.D., *Professor of English*  
 Nagel, Wilma I., Ph.D., *Associate Professor of Education*  
 Nally, Thomas Pomphert, Ph.D., *Professor of Education*  
 \*Napora, Theodore, Ph.D., *Associate Professor of Oceanography*  
 Nash, Charles D., Ph.D., *Professor of Mechanical Engineering and Applied Mechanics*  
 \*Navascués, Michael, Ph.D., *Professor of Hispanic Studies*  
 \*Nelson, Richard G., Ph.D., *Associate Professor of Education*  
 Newman, Frank, Ph.D., *President of the University*  
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 O'Neill, Rae K., Ed.M., *Assistant Professor of Education*  
 Parker, Bart C., M.F.A., *Professor of Art*  
 Parker, John, M.S., *Associate Professor of Mechanical Engineering and Applied Mechanics*  
 Pascale, Alfred C., Ed.D., *Associate Professor of Human Development, Counseling, and Family Studies*  
 Patric, Earl F., Ph.D., *Associate Dean of the College of Resource Development and Professor of Natural Resources Science*  
 Peck, Austin, J.D., *Associate Professor of Business Law*  
 Penhallow, William S., M.S., *Professor of Physics*  
 Petrie, Paul J., Ph.D., *Professor of English*  
 \*Pickart, Stanley J., Ph.D., *Professor of Physics*  
 Pitterman, Marvin, Ph.D., *Professor of Finance and Insurance*  
 \*Polk, Charles, Ph.D., *Professor of Electrical Engineering*  
 Potter, Nancy A., Ph.D., *Professor of English*  
 Poulsen, Roy G., Ph.D., *Professor of Finance and Insurance*  
 Pratt, David Mariotti, Ph.D., *Professor of Oceanography*  
 Prince, Mack J., M.S., *Associate Professor of Electrical Engineering*
- \*Rayack, Elton, Ph.D., *Professor of Economics*  
 Robinson, Claire S., M.A., *Associate Professor of Physical Education*  
 Robinson, E. Arthur, Ph.D., *Professor of English*  
 Rohm, Robert, M.F.A., *Professor of Art*  
 Rorholm, Niels, Ph.D., *Professor of Resource Economics*  
 Rosengren, William R., Ph.D., *Professor of Sociology and Anthropology*  
 Rosie, Douglas M., Ph.D., *Assistant Provost and Professor of Chemistry*  
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 Ryan, Lorraine D., M.A., *Associate Professor of English*  
 Sabatino, Richard A., Ph.D., *Professor of Economics*  
 \*Saila, Saul B., Ph.D., *Professor of Oceanography and Zoology*  
 Salomon, Milton, Ph.D., *Professor of Food and Resource Chemistry*  
 Salvatore, Lucy V., M.S.L.S., *Associate Professor of Library Science*  
 Schneider, Stewart P., M.S., *Associate Professor of Library Science*  
 \*Schultz, Beatrice, Ph.D., *Professor of Communication Studies*  
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 \*Schwartzman, Solomon, Ph.D., *Professor of Mathematics*  
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 Smith, Kathleen F., Ed.D., *Associate Professor of Management*  
 Smith, Lewis T., Ph.D., *Professor of Fisheries, Aquaculture, and Pathology*  
 Soderberg, Lanny O., Ph.D., *Associate Professor of Education*
- \*Sonstroem, Robert J., Ph.D., *Professor of Physical Education*  
 Sorlien, Robert P., Ph.D., *Professor of English*  
 Spaulding, Irving A., Ph.D., *Professor of Resource Economics and Rural Sociology*  
 \*Spence, John E., Ph.D., *Professor of Electrical Engineering*  
 Stockard, Raymond H., B.S., *Director of Career Planning and Placement*  
 Stone, Leslie R., M.S., *Professor of Physics*  
 Stuckey, Irene Hawkins, Ph.D., *Professor of Plant Physiology*  
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 Thomas, Daniel Harrison, Ph.D., *Professor of History*  
 Thompson, Jack, M.S., *Associate Professor of Journalism*  
 \*Tutt, Ralph M., Jr., Ph.D., *Professor of English*  
 Velletri, Andrew, M.S., *Associate Professor of Mechanical Engineering*  
 Viets, Hermann, Ph.D., *Dean of the College of Engineering*  
 \*Vosburgh, William T., Ph.D., *Professor of Psychology*  
 Votta, Ferdinand, Jr., D.Eng., *Professor of Chemical Engineering*  
 Wakefield, Robert C., Ph.D., *Professor of Plant Science*  
 Warren, David, Ph.D., *Professor of Political Science*  
 Waters, Harold A., Ph.D., *Professor of French*  
 Weeden, Patricia J., M.S., *Associate Professor of Textiles, Fashion Merchandising, and Design*  
 Weeks, Richard R., D.B.A., *Dean of the College of Business Administration and Professor of Marketing*  
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 \*White, Frank Mangrem, Ph.D., *Professor of Mechanical and Ocean Engineering*  
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 Wilson, Mason P., Jr., Ph.D., *Professor of Mechanical Engineering*  
 Wilson, Philip Hempstead, M.S., *Associate Professor of Plant Science*  
 \*Wood, Norris P., Ph.D., *Professor of Biochemistry, Microbiology, and Molecular Genetics*  
 Wood, Porter Shelley, M.A., C.P.A., *Professor of Accounting*  
 Wood, Stephen B., Ph.D., *Professor of Political Science*  
 Worthen, Leonard R., Ph.D., *Associate Dean of Pharmacy and Professor of Pharmacognosy*  
 Yates, Vance J., Ph.D., *Professor of Animal and Veterinary Science*

\*Young, William, Th.D., *Professor of Philosophy*  
Youngken, Heber W. Jr., Ph.D., *Provost for Health  
Science Affairs, Dean of the College of  
Pharmacy, and Professor of Pharmacognosy*  
Zipkowitz, Fay, D.A., *Professor of Library and  
Information Studies*

## Faculty

### \*Denotes graduate faculty

First date after title indicates appointment to present position; the second date, when the first fails to do so, indicates first appointment in the University.

- Accetta, David A., *Assistant Professor of Military Science*, 1996. B.A., 1987, University of Rhode Island.
- \*Adams, Jerome F., *Associate Professor of Human Development and Family Studies*, 1994, 1989. B.A., 1968, M.A., 1970, University of Windsor; Ph.D., 1989, Purdue University.
- \*Ageloff, Roy, *Associate Professor of Management Science*, 1977, 1972. B.S., 1965, University of New York, Buffalo; M.B.A., 1967, University of Connecticut; Ph.D., 1975, University of Massachusetts.
- \*Agostinucci, James, *Associate Professor of Physical Therapy*, 1995, 1992. B.S., 1975, D.Sci., 1988, Boston University.
- \*Albert, Alexa, *Professor of Sociology and Anthropology*, 1997, 1982. B.A., Cedar Crest College; M.A., 1971, Lehigh University; Ph.D., 1978, Bryn Mawr College.
- Allen, Anthony J., *Associate Professor of Education*, 1978, 1969. B.S., 1960, Loyola University; M.Ed., 1967, Ph.D., 1970, Boston College.
- \*Alm, Steven R., *Associate Professor of Plant Sciences*, 1993, 1987. B.S., 1976, M.S., 1979, State University of New York College of Environmental Science and Forestry; Ph.D., 1985, Ohio State University.
- \*Amador, Jose A., *Associate Professor of Natural Resources Science*, 1998, 1992. B.S., 1982, M.S., 1986, Ph.D., 1990, Cornell University.
- \*Anderson, James L., *Professor of Resource Economics*, 1994, 1983. B.S., 1976, College of William and Mary; M.S., 1978, University of Arizona; Ph.D., 1983, University of California, Davis.
- \*Anderson, Joan Gray, *Professor of Consumer Studies and Human Development and Family Studies*, 1997, 1984. B.S., 1971, University of Massachusetts; M.S., 1975, Cornell University; Ph.D., 1984, University of California, Davis.
- \*Anderson, Judith L., *Professor of Communication Studies and Women's Studies*, 1982, 1970. B.A., 1962, M.A., 1963, University of Kansas; Ph.D., 1970, Indiana University.
- \*Andrade, Susan E., *Assistant Professor of Applied Pharmaceutical Sciences*, 1996. B.S., 1988, University of Rhode Island; D.Sc., 1994, Harvard School of Public Health.
- \*Arakelian, Paul G., *Professor of English*, 1993, 1976. B.A., 1969, California State University, Los Angeles; Ph.D., 1975, Indiana University.
- Archambault, Raoul, *Professor of Military Science*, 1995. B.S., 1979, State University of New York, Albany; M.A., 1980, Central Michigan University; M.A., 1991, Salve Regina University; M.A., 1991, Naval War College.
- \*Ariew, Andre I., *Assistant Professor of Philosophy*, 1997. B.A., 1990, M.A., 1993, Ph.D., 1997, University of Arizona.
- \*Armstrong, Charles P., *Professor of Management Science and Information Systems*, 1981, 1971. B.S., 1961, M.B.A., 1965, University of Illinois; Ph.D., 1973, University of Arizona.
- Armstrong, Gordon S., *Associate Professor of Theatre*, 1987, 1983. B.A., 1965, University of Victoria; M.A., 1970, Ph.D., 1975, University of California, Berkeley.
- \*Aronian, Sona, *Professor of Russian and Women's Studies*, 1987, 1970. A.B., 1960, Boston University; Ph.D., 1971, Yale University.
- \*Atash, Farhad, *Associate Professor of Community Planning and Area Development*, 1991, 1985. B.S., 1976, M.S., 1978, Tehran University; MRCP, 1981, Kansas State University; Ph.D., 1986, Rutgers—The State University.
- \*August, Peter V., *Professor of Natural Resources Science*, 1995, 1989. B.S., 1974, University of San Diego; M.S., 1971, Texas Tech University; Ph.D., 1981, Boston University.
- \*Babson, John R., *Associate Professor of Biomedical Sciences and of Biochemistry, Microbiology, and Molecular Genetics*, 1992, 1988. B.A., 1975, University of Massachusetts; Ph.D., 1980, Oregon State University.
- Bancroft, J. Whitney, *Assistant Professor of Resource Development Education and Director, Student Development, College of the Environment and Life Sciences*, 1973. B.S., 1962, University of New Hampshire; M.S., 1971, Michigan State University; Ph.D., 1985, North Carolina State University.
- \*Barber, Stephen M., *Assistant Professor of English*, 1997. B.A., 1988, Trent University; M.A., 1990, Carleton University, Ottawa; Ph.D., 1995, York University.
- Barbour, Marilyn McFarland, *Professor of Pharmacy*, 1997, 1983. Pharm.D., 1982, University of California, San Francisco.
- \*Barker, Walter L., *Professor of English*, 1992, 1966. B.A., 1960, M.A., 1962, University of Rhode Island; Ph.D., 1966, University of Connecticut.
- Barki, Sajeev, *Assistant Professor of Marketing*, 1998. B.Tech., 1984, Indian Institute of Technology, Kharagpur; M.B.A., 1986, Indian Institute of Management, Ahmedabad; Ph.D., 1996, Vanderbilt University.
- \*Barnett, Harold, *Professor of Economics*, 1986, 1970. B.A., 1965, Miami University, Ohio; Ph.D., 1973, Massachusetts Institute of Technology.
- Barnett, Judith B., *Professor, Library*, 1992, 1971. A.B., 1959, Barnard College; M.L.S., 1962, Drexel University.
- \*Barnett, Stanley M., *Professor of Chemical Engineering, Food Science and Technology, and Pharmaceuticals*, 1980, 1969. B.A., 1957, Columbia College; B.S., 1958, Columbia University; M.S., 1959, Lehigh University; Ph.D., 1963, University of Pennsylvania.
- \*Barton, James F., *Associate Professor of Education*, 1996, 1990. B.S., 1976, University of Vermont; M.A., 1980, Boston University; Ph.D., 1990, Stanford University.
- \*Baudet, Gerard M., *Associate Professor of Computer Science*, 1987. Eng. Deg., 1970, Ecole Polytechnique; Doctorat, 1973, University of Paris VI; Ph.D., 1978, Carnegie Mellon University.
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- Schoman, Lynne, *Adjunct Assistant Professor of Nursing*, 1992. M.S., 1982, Adelphi University.
- Schottland, Edward M., *Adjunct Assistant Professor of Nursing*, 1995. M.P.S., 1973, Cornell University, Sloan Institute of Hospital Administration.
- Schwartz, Stanley, *Adjunct Clinical Associate Professor of Clinical Laboratory Science*, 1986. M.D., 1974, University of Connecticut School of Medicine.
- Scott, H. Denman, *Adjunct Professor of Public Health*, 1987. M.D., 1966, Columbia University.
- \*Sebelia, Linda, *Adjunct Associate Professor of Food Science and Nutrition*, 1989. M.S., 1974, Ohio State University.
- \*Sebens, Kenneth P., *Adjunct Professor of Biological Sciences*, 1998. Ph.D., 1977, University of Washington.
- Seidler, Susan S., *Adjunct Instructor of Nursing*, 1989. M.S., 1986, University of Rhode Island.
- Seifer, Ronald, *Adjunct Assistant Professor of Psychology*, 1990. Ph.D., 1981, University of Rochester.
- Seifert, Gerald, *Adjunct Professor of Marine Affairs*, 1982. J.D., 1964, Indiana University.
- Sepe, Raymond, *Adjunct Assistant Professor of Electrical Engineering*, 1996. Ph.D., 1990, Massachusetts Institute of Technology.
- Serabian, Beverly, *Adjunct Assistant Professor of Gerontology*, 1983. Ph.D., 1981, California School of Professional Psychology.
- Serdakowski, Joseph A., *Adjunct Assistant Professor of Chemical Engineering*, 1992. Ph.D., 1990, Brown University.
- Serra, David A., *Adjunct Clinical Assistant Professor of Fisheries, Animal and Veterinary Science*, 1997. V.M.D., 1983, University of Pennsylvania.
- Sesin, Paul, *Adjunct Associate Professor of Pharmacy Practice*, 1993. Pharm.D., 1975, Duquesne University.
- Seymour, Charles, *Adjunct Associate Professor of Clinical Laboratory Science*, 1988. Ph.D., 1975, Cornell University.
- Shah, Navnit, *Adjunct Associate Professor of Pharmaceutics*, 1993. Ph.D., 1981, St. John's University.
- \*Shamoon, Samuel J., *Adjunct Associate Professor of Community Planning and Urban Affairs*, 1995. M.C.P., 1970, University of Rhode Island.
- Shankweiler, Donald P., *Adjunct Professor of Psychology*, 1984. Ph.D., 1960, University of Iowa.
- Sharma, Surendra, *Adjunct Associate Professor of Biological Sciences*, 1989. Ph.D., 1974, Indian Institute of Technology, India.
- \*Shaw, Robert B., *Adjunct Associate Professor of Community Planning and Area Development*, 1982, and *Adjunct Professor of Civil and Environmental Engineering*, 1985. M.S., 1966, Purdue University.
- Shea, Alexandra M., *Adjunct Instructor of Nursing*, 1998. M.S.N., 1990, Yale University.
- Shea, Nancy M., *Adjunct Instructor of Nursing*, 1993. M.A., 1980, University of Iowa.
- Sheehan, Judy L., *Adjunct Instructor of Nursing*, 1994. M.S., 1984, University of Rhode Island.
- \*Sheff, Michael, *Adjunct Professor of Clinical Laboratory Science*, 1988. Ph.D., 1957, University of Sheffield, England.
- Shepard, Richard, *Adjunct Assistant Professor of Applied Pharmaceutical Sciences*, 1997. M.S., 1960, George Washington University.
- Shepp, Bryan E., *Adjunct Professor of Communicative Disorders*, 1985. Ph.D., 1959, University of Maryland.
- Sheridan, Richard E., *Adjunct Assistant Professor of Landscape Architecture*, 1995. M.L.A./M.R.P., 1973, University of Massachusetts.
- Sherman, Jeanne D., *Adjunct Assistant Professor of Nursing*, 1997. M.S., 1974, University of Rhode Island.
- Sherman, Kenneth, *Adjunct Professor of Oceanography*, 1977. D.Sc., 1978, Marski Instytut Rybacki, Gdynia, Poland.
- \*Shogren, Jason F., *Adjunct Professor of Environmental and Natural Resource Economics*, 1995. Ph.D., 1986, University of Wyoming.
- \*Shonting, David H., *Adjunct Professor of Ocean Engineering*, 1987. Sc.D., 1966, Massachusetts Institute of Technology.
- Silva, Barbara, *Adjunct Instructor of Nursing*, 1992. M.S., 1990, University of Rhode Island.
- Simeone, Michael L., *Adjunct Assistant Professor of Pharmacy Practice*, 1990. M.B.A., 1987, Bryant College.
- Singer, Don, *Adjunct Professor of Clinical Laboratory Science*, 1997. M.D., 1959, Baylor College of Medicine.
- Singer, Roberta N., *Adjunct Assistant Professor of Communicative Disorders*, 1986. M.S., 1978, University of Rhode Island.
- Sitkin, Ann Girona, *Adjunct Instructor of Library Science and Information Studies*, 1991. M.L.S., 1970, Columbia University.
- Smeal, Steven, *Adjunct Clinical Instructor of Clinical Laboratory Science*, 1980. B.S., 1978, University of Rhode Island.
- Smith, Carol J., *Adjunct Instructor of Nursing*, 1991. M.S., 1987, University of Rhode Island.
- \*Smith, Peter John Shand, *Adjunct Professor of Biological Sciences*, 1997. Ph.D., 1979, Aberdeen University.
- Smith, Richard D., *Adjunct Assistant Professor of Nursing*, 1991. M.D., 1971, Georgetown University School of Medicine.
- \*Smith, Tim D., *Adjunct Professor of Oceanography*, 1991. Ph.D., 1973, University of Washington, Seattle.
- Smokler, Herbert J., *Adjunct Assistant Professor of Nursing*, 1997. M.D., 1959, State University of New York, College of Medicine, New York City.
- Soja, Walter D., *Adjunct Assistant Professor of Pharmacy Practice*, 1981. M.S., 1978, Northeastern University.
- Solomon, Elizabeth Anne, *Adjunct Instructor of Nursing*, 1989. M.S., 1986, University of Hawaii, Manoa.
- Sorensen, Jens C., *Adjunct Associate Professor of Marine Affairs*, 1985. Ph.D., 1978, University of California, Berkeley.
- Sosa, Mary Ellen Burke, *Adjunct Assistant Professor of Nursing*, 1997. M.S., 1983, Boston University.

- Spagnolo, John, *Adjunct Assistant Professor of Pharmacy Practice*, 1992. M.A., 1984, University of Rhode Island.
- Sparadeo, Francis R., *Adjunct Assistant Professor of Psychology*, 1984. Ph.D., 1981, University of Rhode Island.
- Spearman, Amy L., *Adjunct Instructor of Nursing*, 1995. M.S.N., 1990, University of California, San Francisco.
- Spellun, Wendy B., *Adjunct Instructor of Nursing*, 1998. M.S.N., 1982, Adelphi University.
- Spierto, Richard J., *Adjunct Assistant Professor of Pharmacy Practice*, 1995. Pharm.D., 1992, University of Rhode Island.
- Spivey, Paul, *Adjunct Assistant Professor of Clinical Laboratory Science*, 1997. M.S., 1996, St. Joseph's College.
- Stamoulis, Chrysanthé C., *Adjunct Assistant Professor of Nursing*, 1992. M.B.A., 1983, Bryant College.
- Stankus, Tony, *Adjunct Instructor of Library and Information Studies*, 1982. M.L.S., 1976, University of Rhode Island.
- Steinhoff, Margaret, *Adjunct Professor of Clinical Laboratory Science*, 1997. M.D., 1983, Washington University.
- Sterling, Harry S., *Adjunct Assistant Professor of Human Development and Family Studies*, 1986. Ph.D., 1979, Cornell University.
- \*Stern, Robert Andrew, *Adjunct Professor of Astronomy*, 1996. Ph.D., 1988, University of Rhode Island.
- Stevenson, Susan, *Adjunct Instructor of Psychology*, 1995. M.Ed., 1979, Kent State University.
- Stimson, Debra, *Adjunct Instructor of Nursing*, 1996. M.S., 1985, University of Colorado.
- Stolze, Joachim, *Adjunct Assistant Professor of Physics*, 1992. Ph.D., 1982, University of Dortmund, Germany.
- Stone-Godena, Marianne Terisa, *Adjunct Instructor of Nursing*, 1996. M.S., 1977, St. Louis University.
- Stoukides, John Aristotle, *Adjunct Associate Professor of Nursing*, 1998. M.D., 1989, Tufts University.
- \*Strauss, Charles M., *Adjunct Associate Professor of Computer Science*, 1992. Ph.D., 1969, Brown University.
- \*Streit, Roy L., *Adjunct Professor of Mathematics*, 1996. Ph.D., 1978, University of Rhode Island.
- Stringer, Sharon E., *Adjunct Clinical Instructor of Clinical Laboratory Science*, 1993. B.S., 1979, Framingham State College.
- Stulik, Anne A., *Adjunct Instructor of Nursing*, 1992. M.S.N., 1985, State University of New York, Buffalo.
- \*Sullivan, Barbara K., *Adjunct Professor of Oceanography*, 1993. Ph.D., 1977, Oregon State University.
- \*Sullivan, Edmund J., *Adjunct Professor of Ocean Engineering*, 1997. Ph.D., 1970, University of Rhode Island.
- Sullivan, Elaine D., *Adjunct Assistant Professor of Nursing*, 1997. M.S., 1986, University of Rhode Island.
- Sullivan, Maureen C., *Adjunct Assistant Professor of Pharmacy Practice*, 1995. Pharm.D., 1988, University of Rhode Island.
- Sullivan, Susan C., *Adjunct Instructor of Nursing*, 1995. M.S., 1994, Salve Regina University.
- Sullman, Stephen, *Adjunct Instructor of Pharmacy*, 1987. B.S., 1981, University of Connecticut.
- Sung, C. James, *Adjunct Professor of Clinical Laboratory Science*, 1997. M.D., 1984, Chung Shan Medical and Dental College.
- Svengalis, Kendall, *Adjunct Instructor of Library and Information Studies*, 1987. M.L.S., 1975, University of Rhode Island.
- Sweeney, Muriel, *Adjunct Instructor of English*, 1991. M.A., 1972, University of Rhode Island.
- Sylvia, J. Gerin, *Adjunct Special Lecturer in Industrial Engineering*, 1980. M.Ed., 1969, Northeastern University.
- Tapley, Ronald, *Adjunct Assistant Professor of Pharmacy Practice*, 1997. Pharm.D., 1996, Idaho State University.
- Tarlov, Elizabeth C., *Adjunct Instructor of Nursing*, 1989. M.S., 1983, Pace University, Lienhard School of Nursing.
- \*Tavtravahi, Umadevi, *Adjunct Associate Professor of Clinical Laboratory Science*, 1997. Ph.D., 1980, Columbia University.
- \*Taylor, Suzanne, *Adjunct Professor of Labor and Industrial Relations*, 1987. Ph.D., 1970, University of Connecticut.
- \*Taylorson, Raymond B., *Adjunct Professor of Plant Sciences*, 1990. Ph.D., 1960, University of Wisconsin, Madison.
- Tebbetts, Diane, *Adjunct Assistant Professor of Library and Information Studies*, 1985. D.A., 1985, Simmons College.
- \*Thomas, Carol J., *Adjunct Professor of Community Planning and Area Development*, 1971. M.S., 1948, University of Connecticut.
- Thompson, Kenneth P., *Adjunct Instructor of Journalism*, 1990. B.A., 1989, University of Rhode Island.
- Thompson, William, *Adjunct Instructor of Library and Information Studies*, 1992. M.S.L.S., 1964, Louisiana State University.
- Thorn, Deborah B., *Adjunct Instructor of Pharmacy*, 1987. B.S., 1979, University of Rhode Island.
- \*Thursby, Glen D., *Adjunct Associate Professor of Biological Sciences*, 1987. Ph.D., 1983, University of Rhode Island.
- Tierney, Timothy, *Adjunct Assistant Professor of Education*, 1981. M.A., 1976, University of Rhode Island.
- \*Tigan, Mark, *Adjunct Assistant Professor of Community Planning and Urban Affairs*, 1995. M.P.A., 1972, San Jose State University.
- \*Ting, Naitee, *Adjunct Associate Professor of Computer Science and Statistics*, 1998. Ph.D., 1987, Colorado State University.
- Titlebaum, Edward L., *Adjunct Professor of Electrical Engineering*, 1992. Ph.D., 1965, Cornell University.
- Tobias, Jerry V., *Adjunct Professor of Communicative Disorders*, 1985. Ph.D., 1950, Western Reserve University.
- Torres, Carlota, *Adjunct Instructor of Nursing*, 1996. M.S., 1975, Boston University.
- Trainee, Mark L., *Adjunct Assistant Professor of Nursing*, 1989. M.D., 1981, Baylor University.
- Trevino, Belzahet, *Adjunct Assistant Professor of Chemical Engineering*, 1994. Ph.D., 1993, University of Rhode Island.
- Tryon, Julia, *Adjunct Instructor of Library and Information Studies*, 1994. M.L.I.S., 1987, University of Rhode Island.
- \*Tucker, Wayne, *Adjunct Assistant Professor of Mechanical Engineering and Applied Mechanics*, 1991. Ph.D., 1987, University of Rhode Island.
- Turnbaugh, Sarah R. Peabody, *Adjunct Assistant Professor of Sociology and Anthropology*, 1985. M.S., 1977, University of Rhode Island.
- \*Turner, Jefferson T., *Adjunct Professor of Oceanography*, 1994. Ph.D., 1977, Texas A & M University.
- \*Turner, Ruth D., *Adjunct Professor of Biological Sciences*, 1986. Ph.D., 1954, Radcliffe College, Harvard University.
- \*Uhlman, James S., *Adjunct Associate Professor of Ocean Engineering*, 1993. Ph.D., 1983, Massachusetts Institute of Technology.
- Umrigar, Cyrus J., *Adjunct Associate Professor of Physics*, 1992. Ph.D., 1980, Northwestern University.
- Uustal, Diann B., *Adjunct Associate Professor of Nursing*, 1996. Ed.D., 1983, University of Massachusetts.
- Vallee, Glenn E., *Adjunct Assistant Professor of Mechanical Engineering and Applied Mechanics*, 1995. Ph.D., 1995, University of Rhode Island.
- Varna-Garis, Ann M., *Adjunct Associate Professor of Psychology*, 1997. Ph.D., 1977, University of Rhode Island.
- Veri, Albert R., *Adjunct Associate Professor of Community Planning and Area Development*, 1984. M.L.A., 1969, Harvard University.
- Vocino, Michael C., Jr., *Adjunct Professor of Library and Information Studies and Political Science*, 1992. M.A., 1981, University of Rhode Island.
- Vohr, Fred H., *Adjunct Associate Professor of Nursing*, 1997. M.D., 1964, Albany Medical College.
- Vouros, Paul, *Adjunct Professor of Biochemistry and Biophysics*, 1988. Ph.D., 1965, Massachusetts Institute of Technology.
- Wachtel, Tom J., *Adjunct Professor of Nursing*, 1997. M.D., 1973, Faculté de Médecine de Strasbourg, France.
- Wacker, Margaret S., *Adjunct Associate Professor of Nursing*, 1997. Ph.D., 1987, New York University.

- Wagner, Richard L., *Adjunct Professor of Pharmacy Practice*, 1985. M.D., 1975, Yale Medical School.
- Wallace, Mark C., *Adjunct Assistant Professor of Natural Resources Science*, 1993. Ph.D., 1991, University of Arizona.
- Walser, Karen, *Adjunct Instructor of Nursing*, 1996. M.S., 1988, Georgetown University.
- Walsh, Catherine D., *Adjunct Assistant Professor of Nursing*, 1997. M.A., 1982, Seton Hall University.
- Walsh, Joanna M., *Adjunct Instructor of Library and Information Studies*, 1990. M.L.S., 1972, Simmons College; M.A., 1977, Northeastern University.
- Wang, Richard Y., *Adjunct Assistant Professor of Pharmacy Practice*, 1995. O.D., 1986, New York College of Osteopathic Medicine.
- Waters, William J., *Adjunct Assistant Professor of Nursing*, 1985. Ph.D., 1974, Ohio State University.
- Watkins, William D., *Adjunct Professor of Microbiology*, 1987. Ph.D., 1979, University of Rhode Island.
- Weinberg, Henry, *Adjunct Associate Professor of Mathematics*, 1983. Ph.D., 1974, New York University.
- Weinstein-Farson, Laurie L., *Adjunct Assistant Professor of Sociology and Anthropology*, 1988. Ph.D., 1983, Southern Methodist University.
- Welch, Dennis W., R.Ph., *Adjunct Assistant Professor of Pharmacy Practice*, 1992. B.S., 1971, University of Rhode Island.
- Welch, Frankie, *Adjunct Associate Professor of Textiles, Fashion Merchandising, and Design*, 1987. B.A., 1948, Furman University.
- Welsh, Oliver L., *Adjunct Professor of Communicative Disorders*, 1979. Ed.D., 1964, Boston University.
- \*Westcott, David, *Adjunct Associate Professor of Community Planning and Area Development*, 1995. M.C.P., 1979, University of Rhode Island.
- Weygand, Robert A., *Adjunct Assistant Professor of Landscape Architecture*, 1989. B.F.A., 1971, B.S.C.E., 1976, University of Rhode Island.
- Weyhing, Mary, *Adjunct Assistant Professor of Psychology*, 1985. Ph.D., 1983, University of Rhode Island.
- Whelen-Knapp, Christine M., *Adjunct Instructor of Nursing*, 1991. M.S., 1975, Boston University.
- Whitaker, Martha C., *Adjunct Instructor of English*, 1995. P.M.A.T., 1975, Rhode Island College.
- White, Deborah L., *Adjunct Instructor of Nursing*, 1996. M.S., 1986, University of Pennsylvania.
- White, Harvey J., *Adjunct Assistant Professor of Electrical Engineering*, 1987. M.D., 1978, Wayne State University.
- White, William T., *Adjunct Assistant Professor of Nursing*, 1993. M.S., 1983, University of Rhode Island.
- Wiberg, Donna, *Adjunct Assistant Professor of Nursing*, 1988, and *Pharmacy Practice*, 1993. M.S.N., 1980, University of Rhode Island.
- Wild, Eugenia, *Adjunct Assistant Professor of Women's Studies*, 1990. M.A., 1983, University of Rhode Island.
- Wilk, Jacqueline B., *Adjunct Assistant Professor of Psychology*, 1988. Ph.D., 1983, University of Rhode Island.
- \*Williams, David O., *Adjunct Assistant Professor of Biomedical Engineering*, 1977. M.D., 1969, Hahnemann Medical College.
- Williams, Gloria K., *Adjunct Assistant Professor of Clinical Laboratory Science*, 1988. M.S., 1979, Southeastern Massachusetts University.
- Wine, Howard A., *Adjunct Clinical Instructor of Pharmacy*, 1995. B.S., 1981, University of Rhode Island.
- \*Winsor, David S., *Adjunct Assistant Professor of Community Planning and Area Development*, 1985. M.C.P., 1980, University of Rhode Island.
- Winthrop, Elizabeth F., *Adjunct Associate Professor of Food Science and Nutrition*, 1994. M.S., 1983, Tufts University.
- Wolinski, Mary E., *Adjunct Assistant Professor of Music*, 1992. Ph.D., 1988, Brandeis University.
- \*Wood, David H., *Adjunct Associate Professor of Mathematics*, 1988. Ph.D., 1972, University of Rhode Island.
- \*Wright, Thomas E., *Adjunct Professor of Civil and Environmental Engineering*, 1983. M.S.E., 1975, West Virginia University.
- Wriston, Sara, *Adjunct Instructor of Nursing*, 1993. M.S., 1980, University of Pennsylvania.
- Wyman, Cynthia M., *Adjunct Assistant Professor of Pharmacy Practice*, 1992. M.B.A., 1986, Bryant College.
- \*Yankee, Ronald, *Adjunct Professor of Clinical Laboratory Science*, 1995. M.D., 1960, Yale Medical School.
- Young, Michael A., *Adjunct Associate Professor of Psychology*, 1985. Ph.D., 1974, Adelphi University, Institute of Advanced Psychological Studies.
- Zakewicz, Helen, *Adjunct Assistant Professor of Nursing*, 1998. M.S., 1984, University of Illinois.
- Zartler, Ann S., *Adjunct Assistant Professor of Psychology*, 1986. Ph.D., 1978, University of Rhode Island.
- Zinner, Steven H., *Adjunct Professor of Pharmacy Practice*, 1990. M.D., 1965, University of Pennsylvania.
- \*Zwick, William, *Adjunct Associate Professor of Psychology*, 1998. Ph.D., 1983, University of Rhode Island.

## Clinical Appointments

\*Denotes graduate faculty

- Beetez, Kelly A., *Clinical Assistant Professor of Physical Therapy*, 1995. M.S., 1993, University of Rhode Island.
- \*Carley, Rebecca, *Assistant Professor of Nursing*, 1991, 1990. M.S., 1982, Boston University.
- Congdon, Karen S., R.N., E.M.T., *Clinical Coordinator of Cardiac Rehabilitation*, 1986. B.S., 1973, M.S., 1986, University of Rhode Island.
- Connors, Elizabeth C., *Clinical Coordinator of the Speech and Hearing Center*, 1986. M.A., 1981, Northern Michigan University.
- \*Coppa, Denise, *Clinical Assistant Professor of Nursing*, 1985. M.S., 1979, University of Colorado.
- Ernst, Cheryl M., *Clinical Instructor of Physical Therapy*, 1995. B.S., 1972, Boston University.
- Evans, Marylee, R.N., *Clinical Assistant Professor of Nursing*, 1974, 1971. M.S., 1974, University of Rhode Island.
- \*Georgevitz, Diane R., *Assistant Professor of Nursing*, 1994. M.S., 1987, University of Rhode Island.
- Guthrie, James R., *Clinical Professor of Health Sciences*, 1977. M.D., 1948, New York University College of Medicine.
- Haggerty, Margaret R., R.N., *Clinical Assistant Professor of Nursing*, 1975, 1973. M.S., 1972, Boston University; Certificate, Nurse Practitioner, 1979, University of Rhode Island.
- Katzanek, Robin J., *Clinical Assistant Professor of Physical Therapy*, 1996. M.A., 1987, University of Denver.
- \*Kennedy, Holly W., *Assistant Professor of Nursing*, 1993. M.S.N., 1978, Medical College of Georgia; C.N.M., 1985, Frontier School of Midwifery & Family Nursing (Certified Nurse Midwife).
- Leone, Marion T., *Clinical Instructor of Respiratory Therapy*, 1978. R.N., 1959, Cambridge City Hospital.
- Luisi, Andrea, *Clinical Assistant Professor of Pharmacy Practice*, 1996. B.S., 1990, Pharm.D., 1994, University of Rhode Island.
- Mallon, Treacy, *Clinical Assistant Professor of Pharmacy*, 1997. Pharm.D., 1995, University of Maryland.
- \*Marshall, Vanessa A., *Associate Professor of Nursing*, 1994. Sc.D., 1986, Harvard School of Public Health; C.N.M., 1970, Yale University (Certified Nurse Midwife).
- McKindley, David S., *Clinical Assistant Professor of Pharmacy Practice*, 1995. B.S., 1987, Ferris State University; Pharm.D., 1990, University of Kentucky.
- McLinden, John P., *Clinical Assistant Professor of Physical Therapy*, 1996. M.S., 1993, University of Rhode Island.

- Robinson, Deirdre E., *Clinical Assistant Professor of Physical Therapy*, 1995. M.S., 1975, Long Island University; M.S., 1989, Northeastern University.
- Rozendal, Nancy A., *Clinical Assistant Professor of Nursing*, 1983. Ed.D., 1977, Boston College.
- \*Whitworth, Ulysses G., Jr., *Assistant Professor of Fisheries, Animal and Veterinary Science*, 1992. D.V.M., 1976, Tuskegee Institution; M.P.H., 1983, University of North Carolina, Chapel Hill.

## Research Appointments

\*Denotes graduate faculty

- Baboiian, Robert, *Adjunct Research Professor of Chemical Engineering*, 1993. Ph.D., 1964, Rensselaer Polytechnic Institute.
- Buckley, Francine G., *Adjunct Associate Research Professor of Natural Resources Science*, 1995, 1993. M.S., 1966, Cornell University.
- \*Buckley, P.A., *Adjunct Research Professor of Natural Resources Science and National Park Service Research Professor of Ecology*, 1990. Ph.D., 1966, Cornell University.
- Cioffi, Eugene A., *Assistant Research Professor of Chemistry*, 1995. Ph.D., 1985, University of Connecticut.
- Crisman, Everett A., *Assistant Research Professor of Chemical Engineering*, 1991. Ph.D., 1984, Brown University.
- DeRagon, William R., *Adjunct Assistant Research Wildlife Biologist*, 1991. M.S., 1988, University of Rhode Island.
- Gould, Lisa Loffland, *Adjunct Research Scientist*, 1998. M.S., 1972, University of Rhode Island.
- Gow, Arthur S., *Adjunct Research Professor of Chemical Engineering*, 1997. Ph.D., 1991, Pennsylvania State University.
- Hutchinson, Mary F., *Adjunct Research Scientist*, 1995. M.S., 1990, University of Rhode Island.
- Kellogg, Dorothy Q.N., *Adjunct Assistant Research Hydrologist*, 1995. M.S., 1993, University of Rhode Island.
- \*Kim, Chong S., *Adjunct Research Professor of History*, 1998. Ph.D., 1965, University of Washington.
- \*Larrat, Paul E., *Associate Research Professor of Applied Pharmaceutical Sciences and Director of Pharmacy Continuing Education Programs*, 1996, 1992. Ph.D., 1992, Brown University.
- \*Maranda, Lucie, *Assistant Research Professor of Biomedical Sciences and Environmental Health*, 1990. Ph.D., 1987, University of Rhode Island.
- \*Oxley, Jimmie Carol, *Adjunct Professor of Chemistry*, 1995. Ph.D., 1983, University of British Columbia.

- Park, Eugene, *Assistant Research Professor of Chemical Engineering*, 1994. Ph.D., 1993, University of Rhode Island.
- Rodman, Clarke A., *Adjunct Research Professor of Mechanical Engineering and Applied Mechanics*, 1991. A.B., 1946, Harvard University.
- \*Smayda, Theodore John, *Research Professor of Oceanography and Botany*, 1970, 1959. Dr. Philos., 1967, University of Oslo, Sweden.
- \*Smith, James Lewis, *Adjunct Associate Research Professor of Chemistry*, 1995. Ph.D., 1980, University of British Columbia.
- Tefft, Brian C., *Adjunct Assistant Research Professor of Natural Resources Science*, 1996, 1995. M.S., 1981, University of Maryland/Frostburg State University.

## Visiting and Affiliated Staff

### Clinical Laboratory Science

- Rhode Island Blood Center*  
 Ronald Yankee, M.D., *Director*  
 Margaret Kenney, M.S., M.T., *Education Coordinator*
- Rhode Island Hospital*  
 Robert Kenney, M.D., *Medical Director*  
 David Mello, M.S., C.L.S., *Program Director*
- St. Joseph's Hospital*  
 Salvatore R. Allegra, M.D., *Director*  
 Suzanne Goddu, M.S., M.T., *Program Director*

### Music

- Guest Artists/Teachers*  
 Gary Buttery, M.M., *tuba, jazz ensemble*  
 Joan Ceo, B.M., *harp*  
 Rene de la Garza, M.M., *voice, chamber vocal ensembles, opera workshop*  
 Michelle Djokic, M.M., *cello*  
 Elizabeth Dean Gates, M.M., *French horn*  
 Dale Munchy, *accompanist*  
 Jane Murray, M.M., *oboe, woodwind class, Director of the Preparatory Division*  
 Rebecca Noreen, M.M., *bassoon*  
 David Norfrey, *accompanist*  
 Daniel Salazar, M.M., *guitar, guitar class, guitar ensemble*  
 Brian Sparks, M.M., *saxophone, woodwind class, jazz ensemble, saxophone ensemble*  
 Ronald Stabile, B.S., *percussion, percussion ensemble*  
 Margaret Swanson, M.M., *voice, voice class, music appreciation*  
 Susan Thomas, B.M., *flute, flute ensemble*  
 Jonathan Towne, M.M., *clarinet*  
 Dan Vinson, M.S., *trombone, euphonium, brass ensemble*

### Nursing

- Bradley Hospital*  
 William T. White, R.N., M.S., *Director of Nurses*
- Butler Hospital*  
 Virginia Eagan, R.N., M.S., C.S., *Director of Nursing*
- Cranston Headstart*  
 Mary Legacy, *Director*  
 Susan Mooney, *Education Coordinator*
- Cranston Senior Services Center*  
 Terry Murphy, *Assistant Director*  
 Catherine Saccocia, R.N.
- Fruit Hill Day-Care Center*  
 Sister Ruth Crawley, F.M.M., *Administrator*
- Genesis Center*  
 Sister Marlene Laliberte, *Director*
- Kent County Memorial Hospital*  
 Margaret Clifton, R.N., M.S.N., *Director of Nursing*  
 Elaine Barber, R.N., M.S.N., *Director, Nursing Inservice Education*  
 Virginia Bainton, R.N., *Director, Home Care Program*
- Kent County Mental Health Services*  
 Michael Lichtenstein, M.S., *Director of Clinical Services*  
 Karen Rush, R.N., B.S.N., *Program Manager*
- Kent County Visiting Nurse Association*  
 Claire S. Connor, R.N., M.P.H., *Executive Director*  
 Nancy Roberts, R.N., M.S., *Assistant Director*
- Miriam Hospital*  
 Jeanette S. Matrone, R.N., Ph.D., *Nurse-in-Chief*  
 Carol Lamoureux, R.N., M.S., *Assistant Nurse-in-Chief*
- Newport County Headstart Program*  
 Larry Pucciarelli, *Director*  
 Maureen McEvoy, R.N.
- Newport Hospital*  
 Lorraine Davol, R.N., M.S., *Vice President for Nursing*  
 Dorothy Garman, R.N., *Nursing Staff Development Instructor*  
 Valerie Martin, R.N., *Nurse Manager*
- Newport Naval Hospital*  
 Capt. D. Vertrees Holligsworth, *Commanding Officer*  
 William F. McKeon, M.D., M.P.H.  
 Denise Fahey, R.N., B.S., C.O.H.N.
- Nurse Midwifery Preceptors*  
 Kathy Delfino, C.N.M.  
 Deb Drew, C.N.M.  
 Christine Pfeiffer, C.N.M.  
 Lynette Scolpino, C.N.M.
- Providence Headstart Program*  
 Sister Barbara McMichael, *Director*  
 Donna Tatari, R.N., *Health Services Coordinator*

*Rhode Island Hospital*

Donna Donilon, R.N., M.S., *Nurse Manager, Nursing Professional Development Department*  
 Elaine Amato-Vealey, R.N., Ph.D., *Clinical Educator, Special Projects*

Margaret P. Boger, R.N., M.S., *Clinical Educator, Adult Services*

Anne Del Santo, R.N., M.S., P.N.P., *Pediatric Primary Care*

Anne L. McKinnon, R.N., M.S., *Clinical Educator, Pediatrics*

*Roger Williams Medical Center*

Christine Hickey, R.N., B.S., *Director, Organizational Education and Development*

*Scallop Shell Nursing Home*

Neil E. Mahoney, *Administrator*

Lynn McCall, R.N., *Director of Nursing Services*

*South County Hospital*

Maureen Daly, R.N., M.S., *Director, Nursing Education*

*Traveler's Aid Society of R.I.*

Linda Dziobek, R.N., *Director of Health Services*

*Veterans Administration Medical Center*

Louise McMahon, R.N., M.S., *Chief Nurse*  
 Marilyn Vincent, R.N., B.S., *Home Care Coordinator*

*Visiting Nurse Association of Rhode Island*

Karen Bowman, R.N., M.P.H., *Director, V.N.A., Inc.*  
 Barbara Stewart, R.N., M.S., *Clinical Services Manager, V.N.A., Inc.*

*Visiting Nurse Services of Newport County*

Jean Anderson, R.N., M.S., *Director*

*Visiting Nurse Services of Washington County and Jamestown*

Philomena Marshall, *Director*

Elaine Sullivan, R.N., M.S., *Clinical Specialist*

*Warwick Central Adult Day Care*

Denise Beverage, R.N.

*Warwick Child Inc. (Head Start)*

Karen Stanley, R.N.

*Warwick Senior Centers*

Carol Panos, R.N.

*Westerly Hospital*

Barbara A. Brady, R.N., M.S., *Vice President, Operations*

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Joshua Goldman, *President, AquaFuture, Inc., Turner's Falls, Mass.*  
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Robert McCabe, *President, Narragansett Electric Co., Providence*  
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# APPENDIX

## Loan Funds and Scholarships

The following are privately contributed loan and scholarship funds. For federal programs and general student aid information, see pages 21–25.

### LOAN FUNDS

Short-term loans of up to \$200 are available to full-time students who can demonstrate a means of repayment. These are interest-free loans that may be used only for education-related expenses and must be repaid within 90 days.

Short-term loan funds have been contributed by private donors. In addition to an unrestricted fund for undergraduates, loans are available to graduate and international students.

Included among the many donors to the Short Term Loan Fund are: Leroy F. Burroughs, Dean Mason Campbell Memorial, Norman M. Fain, Barney M. Goldberg, Patrons Association, Providence Engineering Society, Providence Wholesale Drug Company, University of Rhode Island Alumni Association, John H. Washburn Memorial, and Louisa White Fund. A separate short-term loan fund has been established in the name of Peter M. and Mildred J. Galanti.

Also, individual loan funds have been established in the name of the late Dr. J. Louis Jack in memory of his brother, Dr. Gabriel J. Jack, and his wife, Gladys E. Jack. These funds are available to any qualified URI students with financial need and good scholastic standing. Interest rate is one-half of prevailing rate.

Applications for short-term loans are available at the Student Financial Aid Office.

Loans to needy nursing students are available through the Louisa White Student Loan Endowment at the request of the Dean of the College of Nursing.

### SCHOLARSHIPS

★ *Denotes scholarships available to graduate students*

If not otherwise stated in the following descriptions, selection of recipient is made by the Student Financial Aid Office.

#### Any College of the University

*George and Violet Ajootian Scholarship:* Income from endowment for a scholarship awarded annually to students with financial need.

★ *American Screw Company Foundation Scholarship:* Income from endowment awarded annually to worthy undergraduate or graduate students, with preference to children of former employees of the American Screw Company.

*Anthony Athletic Association Scholarship:* Income from endowment awarded annually to a graduate of Coventry High School with financial need.

*George E. Arnold '30 Memorial Scholarship:* Income from endowment for scholarships awarded annually on the basis of financial need.

*Aurora Civic Association Scholarship:* Income from endowment to support the University's general scholarship fund.

*Pearl J. Baker Scholarship:* Grant awarded to a graduating senior from Ponagansett High School who will be attending URI. Recipient selected by the Student Financial Aid Office.

*B.A. Ballou Company Scholarship:* Scholarship awarded annually to students with financial need.

★ *John F. Bannon Scholarship:* Income from endowment awarded to deserving undergraduate or graduate students on the basis of financial need.

*Carlton and Olive Barton Scholarship:* Income from endowment awarded annually to an undergraduate student with an above-average academic record and genuine financial need.

*John M. Baxter Scholarship:* Income from endowment for a scholarship in basketball or track awarded annually to a student competing in one of these sports. Recipient selected by the Director of Athletics in consultation with basketball and track coaches. The funds were donated by the late John M. Baxter '52; Sun Life Assurance Company of Canada; and numerous others.

*Ralph S. Belmont, M.D., '31 Scholarship:* Income from endowment available to undergraduate students with financial need. First consideration given to graduates of Rogers High School in Newport.

*Artack and Elose Berberian Scholarship:* Income from endowment awarded annually to students with financial need, with preference to Armenian students.

*William Bingham Foundation Undergraduate Scholarship:* Income from endowment for scholarships awarded annually to supplement student financial aid in instances where other available scholarship support is insufficient to meet students' needs. Recipients selected by the Student Financial Aid Office.

*Hank Blay Memorial Scholarship:* Income from endowment awarded annually to a student employed by, or whose parent is employed by, the Metropolitan Life Insurance Company, on the basis of academic performance and genuine financial need.

*Allice Bliss Memorial Scholarship:* Income from endowment awarded to students with financial need.

*Boss Family Endowment:* Two-thirds of income from endowment for scholarships in athletics. Recipients selected by the Director of Athletics and by the Student Financial Aid Office.

*Brittingham/Pezzullo Scholarship:* Fund established to honor Mrs. Eva Stuebe, Tom Pezzullo Jr., and Ines Rose Longo. Income from endowment for a scholarship awarded annually to an incoming, first-year student who is a Rhode Island resident and a first-generation college attendee and has demonstrated financial need.

*Leroy F. Burroughs Memorial Scholarship:* Income from endowment awarded annually to a student with financial need.

*Ernie Calverley Scholarship:* Income from endowment for a scholarship in athletics with preference to men's basketball. If there is no men's basketball player with financial need, then the scholarship will be made available to a male or female student who is academically qualified (over a 2.00 grade point average) and who is participating in a varsity sport that is not fully funded by the Athletics Department. Recipients selected by the Athletics Department.

*E. Doris Carney Memorial Scholarship:* Income from endowment awarded annually to the member of Phi Sigma Kappa having the highest grade point average. Phi Sigma National will match the award. Recipient selected by the Student Financial Aid Office and Phi Sigma Kappa.

*Carothers Centennial Scholarship:* Income from endowment awarded annually through the Centennial Scholarship Program.

*Robert L. Carothers and Patricia Ruane Scholarship:* Income from endowment for scholarships to minority students. Recipients selected by the Student Financial Aid Office.

*Castellucci and Galli, Inc. Scholarship:* Income from endowment awarded annually to a student with financial need.

*Castrovillari Family Athletic Scholarship:* Income from endowment to support URI basketball. Recipient selected by the Athletics Department.

*Hazel Ruth Cavnor Memorial Scholarship:* Income from endowment for a scholarship awarded annually to students on the basis of financial need and the student's application in studies.

*Centreville Savings Bank Scholarship:* Income from endowment for scholarships to undergraduate students who live in the Centreville Bank service area on the basis of merit (3.00 minimum average) and financial need. Recipient selected by the Student Financial Aid Office.



*Harry C. Chandler '24 Memorial Scholarship:* Income from endowment for a scholarship awarded to students with financial need.

*Chi Omega 60's Scholarship:* Income from endowment for a scholarship awarded annually. Preference to a Chi Omega or to a son or daughter of a Chi Omega who is in good academic standing and displays leadership in the community. Recipient will be chosen by a Chi Omega Committee led by Roberta Anderson.

*Citizens Bank Women's Athletic Scholarship:* Income from endowment for a scholarship awarded annually to a deserving woman who is loyal and ethical and who shows leadership and discipline; a Rhode Island high school graduate with outstanding athletic talent who maintains a 2.50 grade point average. Recipient may qualify for the scholarship in future years if she continues to meet the criteria. Selection made by a committee comprised of the senior women's athletics administrator at URI, a Citizens Bank representative, the Director of Athletics, and the Director of Student Financial Aid.

*Philip H. Clark Scholarship:* Income from endowment awarded to deserving undergraduate students.

*Commercial Management Service, Inc., Endowment:* Income from endowment for scholarships awarded annually to students demonstrating need with satisfactory academic standing.

*Kenneth L. and Bertha T. Coombs 4-H Scholarship:* Income from endowment for a scholarship awarded annually based on a combination of genuine financial need and academic performance. First preference to an entering student currently or formerly a 4-H member who is a resident of Rhode Island. Application to include a summary of student's 4-H experience. Recipients selected by the Student Financial Aid Office.

*Corner Kick Scholarship Fund:* Scholarship awarded to a male soccer player recommended by the head coach of the URI men's soccer team and the Director of Athletics, as approved by the Student Financial Aid Office.

*Cranston Print Works Company Scholarships:* Awarded to dependent children of employees. Available to qualified applicants for a maximum of two years at up to \$1,500 annually. Applications available at Office of Director of Human Resources, Cranston Print Works, Cranston, R.I.

*Walter A. Crocker Endowment Fund:* Income from endowment to provide grants to students in the Alan Shawn Feinstein College of Continuing Education for expenses related to enrollment in the college. Recipients selected by the Crocker Scholarship Selection Committee.

*A.T. Cross Company Scholarship:* Income from endowment awarded to deserving students with financial need.

*Henry E. Davis Memorial Scholarship:* Income from endowment for scholarships to deserving students. Recipients selected by the Student Financial Aid Office.

*Frances B. DeFrance Memorial Scholarship:* Income from endowment for a scholarship awarded annually to a woman student who is a Rhode Island resident on the basis of scholastic ability and financial need. Contributed by Chapter B, P.E.O., Kingston, R.I., in memory of one of its founders.

*Anna and Gregory Demetrakas Fund:* Income from endowment for scholarships awarded annually to Rhode Island students enrolled in Alan Shawn Feinstein College of Continuing Education who are majoring in mathematics or a related area on the basis of financial need and academic merit. Recipients selected by the CCE Scholarship Committee.

*Paul DePace Scholarship Endowment:* Income from endowment, established by PARI in honor of Paul DePace, director of URI Capital Projects, for scholarships awarded to students who are permanently disabled.

*Colonel Joseph DeRita Football Scholarship:* Income from endowment for a scholarship awarded annually to a football player. Recipient selected by the Athletic Department.

*Dubee Family Scholarship Fund:* Income from endowment awarded annually to an undergraduate student, preferably African-American, with a good academic record and genuine financial need.

*Daniel R. Dye Memorial Scholarship:* Income from endowment awarded annually to a graduate of East Providence High School with financial need. Recipient selected by the Student Financial Aid Office.

*Frances R. and James W. Eastwood '37 Scholarship:* Income from endowment awarded annually to a deserving student with demonstrated academic promise. Selection made by the Admissions Office.

★ *Dr. Edward and Polly Eddy Scholarship:* Income from endowment for a scholarship awarded to an international student. Scholarship was initiated in honor of Dr. and Mrs. Eddy's retirement from URI.

*James J. Federico Sr. '35 Scholarship:* Endowment established as a permanent memorial in honor of James J. Federico and in recognition of his outstanding contributions, guidance, and example to youths at all levels of education and athletic participation. Income from endowment provides a scholarship awarded annually to a student-athlete graduating from Westerly High School.

*Lillian Feinstein Scholarships:* Income from endowment for scholarships to the Alan Shawn Feinstein College of Continuing Education undergraduate students. The Feinstein Foundation and CCE participate in selecting the recipients.

*Ferland Corporation Scholarship:* Income from endowment for a scholarship awarded annually to students with financial need. Preference given to employees or children of employees of the Ferland Corporation, citizens of Pawtucket, and graduates of St. Raphael's Academy.

*Frank and Arthur Fiorenzano Scholarship:* Income from endowment awarded annually on the basis of financial need, with consideration given to academic excellence. Preference given to Rhode Island residents, or F.A.F., Inc., employees and their children.

*William N. '17 and Anita Fritsch Memorial Scholarship:* Income from endowment awarded to a student with financial need.

*Thomas A. Gamon Memorial Scholarship:* Income from endowment for a scholarship awarded annually to students from Aquidneck Island.

*Beatrice and Tom Garrick Sr. Scholarship:* Income from endowment for a scholarship awarded annually to a minority student with financial need. Recipient to be selected by the Student Financial Aid Office. The fund was established with proceeds from the 1988 NCAA basketball tournament.

*General Dynamics Electric Boat Division Scholarship:* Income from endowment for scholarships of \$350 awarded, with preference to children of full-time employees of the Quonset Point facility. The students must have financial need and must be studying business, engineering, or the sciences.

*Olive Z. Godfrey Memorial Scholarship:* Income from endowment for a scholarship awarded annually on the basis of financial need. Recipient selected by the Student Financial Aid Office.

*Morton and Ruth Grossman Scholarship:* Income from endowment shared among the College of Nursing, College of the Environment and Life Sciences, turf research, the library, Department of Athletics, Financial Aid, and the URI President.

*George Hadfield III Scholarship:* Income from endowment awarded annually primarily to graduates of Tolman High School in Pawtucket. Recipients selected by the Student Financial Aid Office.

*Carlisle Hall '15 Scholarship:* Income from endowment awarded to students with financial need, with preference to the Kappa Rho chapter of Phi Gamma Delta fraternity members and ROTC cadets.

*Louis Raymond Hampton '42 Scholarship:* Income from endowment for a scholarship awarded annually on the basis of genuine financial need and academic performance. First preference given to engineering students who are dependent children of Providence Gas Company employees.

*Vasilios S. and Aphrodite Haseotes Scholarship:* Scholarship for an undergraduate student enrolled at URI whose home residence is any one of the

New England states. While there is no academic programmatic criteria associated with the scholarship, the awardee must have a 3.00 or above quality point average, as well as having a demonstrated financial need. Students receiving the scholarship may be entering freshmen or upperclassmen. Final scholarship decisions are made by the Financial Aid Office.

*James H. Higgins Memorial Scholarship:* Income from endowment awarded to men or women students with financial need. Gift is from the estate of Mrs. James H. (Ellen F.) Higgins.

*James H. Higgins Jr. Memorial Scholarship:* Income from endowment awarded to students with financial need.

*High School Model Legislature:* Amount of general fee awarded to an incoming freshman who has given an outstanding performance in the Model Legislature. Application must be made for this award. Recipients selected by the program director of the high school.

*Hoder Family Endowment:* Income from endowment added to the Harold Kopp Scholarship fund awarded annually to a football player. Selection made by the football coach and the Director of Athletics.

*Dr. Percy Hodgson Scholarship:* Income from endowment awarded annually to students with financial need, with preference to students from foreign countries.

*Hopkins Family Scholarship:* Income from endowment for the support of Centennial Scholars at the University. Recipients selected by the Student Financial Aid Office.

*Horizons Retirement Center Endowment:* Income from endowment added to the Harold Kopp Scholarship fund awarded annually to a football player. Selection made by the football coach and the Director of Athletics.

*Fran and Billie Horn International Scholarship:* Income from endowment for a scholarship awarded annually, with special consideration to students from foreign countries, on the basis of academic standing and financial need.

*International Grant:* A limited number of partial out-of-state tuition grants awarded by the Office of International Students and Scholars on the basis of financial need. Grants are not available to first-year students.

*Michael Jones Memorial Scholarship:* Income from endowment awarded annually to an East Greenwich high school student who will attend URI. Recipient selected by the Student Financial Aid Office.

*A. Livingston Kelley Memorial Scholarship:* Income from endowment, established by the will of A. Livingston Kelley, awarded annually to a worthy student with financial need who is a resident of Rhode Island.

*Sylvia C. and Frederick Kenner '38 Scholarship:* Income from endowment awarded annually to a URI freshman with genuine financial need who graduated from high school with an A- grade average or better. Recipient selected by the Student Financial Aid Office.

*Kenyon Piece Dyeworks, Inc., Scholarship:* Income from endowment awarded annually to students with financial need, with preference to employees or children of employees of Kenyon Piece Dyeworks.

*Paul J. Kervick Family Scholarship:* Income from endowment awarded annually to deserving students from middle-income families, with preference to children of employees of Providence Steel and Iron Company with financial need.

*Key Container Corporation Scholarship:* Scholarship of \$4,000 awarded annually to a full-time undergraduate student on the basis of financial need and academic record. First priority to children of Key Container Corporation employees. If no children of employees apply, then award goes to a Rhode Island high school graduate. Recipient must be a Rhode Island resident and U.S. citizen. Scholarship will be continued on to other years if recipient maintains a 2.50 grade point average. Recipient selected by the Student Financial Aid Office.

*Chester H. Kirk Scholarship:* Income from endowment awarded annually to children of AMTROL, Inc. employees. Students without financial need will receive \$100; for other children of AMTROL employees, financial need and the amount of award will be determined by the Student Financial Aid Office.

*Kenneth L. and Marie V. Kirk Endowment:* Income from endowment for a scholarship awarded annually to a student being served by URI's programming for the physically challenged who is in good academic and social standing. First preference to a student from Rhode Island. Recipient selected by the Student Financial Aid Office in consultation with the Office of Disability Services.

*Harry Knowles Memorial Scholarship:* Income from endowment, established by the will of Harry Knowles, awarded annually to students with financial need.

*Harold Kopp Football Scholarship:* Income from endowment for a scholarship in football awarded annually. Recipients selected by the football coach and the Director of Athletics. See also: the Hoder Family, Horizons Retirement Center, Pezzelli, John F. Quinn Fifth Quarter Club, and Rose Family endowments.

*June J. and Habib Koussa Scholarship:* Income from endowment for a scholarship awarded to a full-time undergraduate in engineering, business administration, resource development, or physical education with a minimum 2.75 average at URI,

or a 3.00 if a freshman, who is a native-born citizen of the United States and demonstrates financial need. Preference to graduates of Central Falls or South Kingstown High School. Recipient selected by the Student Financial Aid Office.

*Jack Kraft Endowment for Basketball:* Income from endowment for a scholarship in basketball established in honor of Jack Kraft, URI basketball coach and director of athletic giving, upon his retirement. Selection made by the Director of Athletics.

*Eleanor Lemaire Women's Athletic Scholarship:* Awarded to female student-athletes in any college. Selection made by the Lemaire Committee.

*Leviton Foundation, Inc., Scholarship:* Income from endowment for scholarships awarded annually to children and grandchildren of employees of American Insulated Wire, Atlas Wire & Cable, Cable Electric Products, Leviton Manufacturing, Rhode Island Insulated Wire, and other affiliated companies. Preference given to applicants who are undergraduates with financial need and high scholastic standing.

*Austin T. Levy Memorial Scholarship:* Income from endowment awarded annually to students with financial need, with preference to graduates of Burrillville High School.

*Lions Club of Westerly Scholarship:* Income from endowment awarded annually to graduates of Westerly High School with financial need, with preference given to upperclassmen.

★ *Little Family Foundation:* Junior Achievement Fellowships for full-time graduate business study. Recipients must have been Junior Achievement participants or advisors. Preference given to Rhode Island residents with two or more years of work experience, chosen by the graduate business faculty. If no Rhode Island residents are eligible, out-of-state students may be chosen.

*Thomas A. Macari Ice Hockey Scholarship:* Income from endowment for a scholarship in ice hockey awarded annually to a student who emulates the positive ideals of Tom Macari. Recipient selected by the hockey coaches and the URI Recreational Services Director.

*Henry H. Mackal Scholarship:* Income from endowment awarded to students with financial need and majoring in engineering, mathematics, natural sciences, or physical education.

★ *Edward Marth Scholarship:* \$500 annual grant to a graduate student enrolled in the labor relations and industrial management program. Selection made by the Labor and Industrial Relations Program.

*Mary Matzinger Memorial Scholarship:* Income from endowment awarded annually on the basis of academic excellence. Recipient selected by the Student Financial Aid Office.

*Minorities Scholarship Endowment:* Income from endowment awarded annually to a minority student with financial need. Recipient selected by the Student Financial Aid Office. Funds donated by the URI Alumni Association.

*Moore Company Scholarship:* Awarded annually to students with financial need, with preference to children of employees of the George C. Moore Company, in Westerly, Carr-Fulflex, Inc., in Bristol, and Darlington Fabrics, in Westerly.

*Richard B. Morrison Memorial Scholarship:* Income from endowment awarded annually to Rhode Island residents with financial need.

*Daniel J. and Blanche R. Murray Family Scholarship:* Income from endowment awarded annually to a student with financial need.

*Carl Myllymaki Memorial Scholarship:* Income from endowment for three equal scholarships to West-erly High School seniors who participate in sports, student government, or scouting. Carl Myllymaki was a URI student who was killed in action in Vietnam.

*Native American Scholarship:* Annual grant awarded to a student with financial need who is a Native American. (Tribal documentation must be provided.)

*Keith Nester Scholarship:* Income from endowment awarded annually to a member of a fraternity or a sorority in honor of Keith Nester, who retired after 23 years as director of the Fraternity Managers Association.

*Andrew J. Newman—John W. Chapman Scholarship:* Income from endowment awarded annually to a worthy male student in need of financial assistance, preferably to a member of the Lambda Chi Alpha fraternity. Recipients selected by the Student Financial Aid Office.

*Dorothy M. Noble Awards:* Income from endowment for two \$150 book awards presented each spring to members of the Kappa Rho chapter of Phi Gamma Delta. Selection made by the Kappa Rho chapter.

*North Family Trust:* Annual grant to an entering student from Newport County. Recipient selected by the Student Financial Aid Office.

*William E. O'Hara '81 Memorial Crew Scholarship:* Income from endowment for a scholarship awarded annually to a member of URI Crew who demonstrates leadership and academic excellence and who best exemplifies the spirit of URI Crew. Recipient selected by the URI Recreational Services Director.

*Michelle Ohley Endowment:* Income from endowment for a scholarship awarded annually in basketball. Recipient selected by the basketball coach. This endowment was established in the memory of Michelle Ohley, who was an avid basketball fan.

*Janice Paff Memorial Scholarship:* Income from endowment awarded to a student in the Alan Shawn Feinstein College of Continuing Education, enabling him or her to take an initial course at CCE and purchase books. Recipients selected by the Dean of CCE.

*Petroleum Trust Fund:* Scholarship awarded to a member of the senior class. Recipient selected by the Student Financial Aid Office.

*Pezzelli Endowment:* Income from endowment added to the Harold Kopp Scholarship fund awarded annually to a football player. Selection made by the football coach and the Director of Athletics.

*Edward E. and Ida Fisher Pierce Scholarship:* Income from endowment for a scholarship awarded annually on the basis of financial need.

*Brinton C. Piez Golf Endowment:* Income from endowment for a scholarship in men's golf awarded annually to a qualified student. Selection made by committee.

*Howard E. Possner, M.D., '37 and Dorothy Babcock Possner '37 Scholarship:* Income from endowment awarded annually to a premed student in good academic standing and with genuine financial need.

*Providence Journal-Bulletin Scholarship:* Scholarship awarded annually with preference given to qualified sons and daughters of employees of the Providence Journal Company and its subsidiaries.

*Col. John Joseph '35 and Mary Drew Prybyla Rhode Island National Guard Scholarship:* Income from endowment awarded annually to students with as many of the following characteristics as possible: an earned degree in engineering, nursing, or science with proven academic excellence; a varsity letter; membership in the R.I. Army or Air Force National Guard. Awards will be made by the Adjutant General of the State of Rhode Island. Applications are available at the Office of the Adjutant General, Armory of Mounted Commands, 1051 North Main St., Providence, RI 02904-5717.

*John F. Quinn Fifth Quarter Club Endowment:* Income from endowment added to the Kopp Scholarship fund awarded annually to a football player. Recipient selected by the football coach and the Director of Athletics.

*John F. Quinn Memorial Scholarship:* Income from endowment for a scholarship awarded annually on the basis of financial need.

*A. Robert Rainville Memorial Scholarship:* Income from endowment for scholarships awarded annually to current URI students who are winners of the annual A. Robert Rainville Leadership and Service Awards.

*Ram Club Scholarship:* Income from endowment for support of the general athletic scholarship program. Recipients selected by the Department of Athletics.

*Herbert D. and L. Marcella Randall Scholarship:* Income from endowment for scholarships divided equally between men's crew and men's tennis on the basis of financial need and academic ability. Recipient selected by the Student Financial Aid Office.

*Rau Fastener Company Scholarship:* Income from endowment awarded annually to students, with preference to children of Rau Fastener employees.

*Elton Rayack Scholarship:* Scholarship awarded annually to a junior demonstrating financial need and scholastic achievement.

*Louis M. Ream Memorial Scholarship:* Income from endowment awarded annually to students with financial need.

*Mary Ellen Reilly Scholarship:* \$500 awarded annually to a woman student (sophomore or above) on the basis of academic excellence and financial need.

*Richard and Linda J. Rendine Scholarship:* Income from endowment for a scholarship to a student who is a graduate of Pittsfield, Massachusetts, High School with second preference to a Classical High School of Providence graduate on the basis of a minimum of 3.00 academic average and demonstrated financial need. Recipient selected by the Student Financial Aid Office.

*Reserve Officers Training Corps (ROTC) Army Scholarship Program:* Two-, three-, and four-year scholarships are available to outstanding young students who are seeking not only a commission as an Army officer but a path of dynamic career opportunities. Selection is based on applicant's achievement, not financial status. Includes full tuition and fees, and up to \$1,200 for the school year, paid directly to the student. Contact the Department of Military Science.

*Rhode Island Women's Club of Providence Scholarship:* Income from endowment for a scholarship awarded annually to a woman (or women) who is a full-time meritorious student at URI. Scholarship restricted to worthy and needy students. Recipients selected from among nominations from the academic deans by the Office of the Provost.

*Pasquale and Rosaria Rizzi Scholarship:* Income from endowment awarded annually to two or more junior or senior students who are members of the Beta Psi Alpha chapter of Theta Delta Chi fraternity on the basis of scholarship, achievement, and with a preference for financial need.

*Mary L. Robinson Scholarship:* Income from endowment, established by the will of Anna D. Robinson in memory of her mother, awarded annually to a worthy and needy female student.

*Rose Family Endowment:* Income from endowment added to the Harold Kopp Scholarship fund awarded annually to a football player. Selection made by the football coach and the Director of Athletics.

*Samuel and Gertrude J. Rosen Scholarship:* Income from endowment for a scholarship awarded annually to students with financial need.

*N. Edward Rosenhirsch Memorial Scholarship:* Income from endowment awarded annually to students with financial need.

*Sarni Family Endowment:* Income from endowment awarded annually for up to one-half of tuition costs. First preference to needy, qualified first-generation students of at least one Italian parent. Scholarships to be distributed equally among the colleges.

*A.A. Savastano '32 Scholarship:* Income from endowment for a \$500 scholarship in athletics awarded annually to a high school athlete letter winner with financial need. The Student Financial Aid Office or URI coaches may propose the recipient.

*Joseph J. Scussell '31 Scholarship:* Income from endowment awarded annually on the basis of academic performance and financial need.

*John Shepard II Memorial Scholarship:* Income from endowment for scholarships awarded annually to students in the Alan Shawn Feinstein College of Continuing Education on the basis of both academic record and financial need, with preference given to students with an interest in retailing or a related field. Selection made by the Dean of CCE and a scholarship committee created for this purpose.

*Barbara K. Simmons Memorial Scholarship:* Income from endowment for a scholarship awarded to a student from Aquidneck Island with genuine financial need and an above-average academic record. Order of preference: a student in animal science, a student working for a B.S. degree in science in the College of Arts and Sciences, a student in the College of Nursing, or a student in the College of the Environment and Life Sciences. Recipient selected by the Student Financial Aid Office.

*Aleck Slade Scholarship:* Income from endowment for a scholarship in athletics awarded annually to an incoming freshman or fully matriculated student. Recipient selected by the Director of Athletics.

*Edwin S. Soforenko Scholarship:* Income from endowment awarded annually to deserving students, with first preference to employees of Insurance Underwriters, Inc., and their families.

*Harold B. Soloveitzik '35 Scholarship:* Income from endowment awarded annually to worthy students with financial need. First preference to students from the South County and Pawcatuck areas.

*Michael Spero '34 Scholarship:* Income from endowment awarded annually to American-born undergraduate students on the basis of normal progress toward completion of the baccalaureate degree and financial need.

*Ann Spruill Endowment:* Income from endowment for a scholarship based on academic excellence. Recipient selected by the Student Financial Aid Office.

*Student Senate Scholarship:* Income from endowment for a scholarship awarded annually to a student working with the Student Senate. Recipient selected by the Student Financial Aid Office.

*Student-to-Student Scholarship:* Income from endowment awarded annually to a student with financial need. Recipient chosen by the Student Financial Aid Office.

*Stan Stutz Memorial Scholarship:* Income from endowment for an athletic scholarship awarded annually to students with financial need, with preference given to residents of Westchester County, N.Y. Selection made by the Director of Athletics.

*Alice M. Talbot Memorial Scholarship:* Income from endowment established by a \$10,000 gift from the Salvation Army in appreciation of Miss Talbot's past philanthropy to the Salvation Army, and added to by the Ted Clarke family and the URI Century Club. Awarded annually to a student selected in accordance with guidelines of the URI Century Club for scholarship recipients and with approval of the Director of Athletics.

*Frederick C. Tanner Memorial Fund:* Several awards available annually to students with financial need, with preference given to sons and daughters of Federal Products Corporation employees.

*Frederick D. Tootell Memorial Scholarship:* Income from endowment for a scholarship awarded annually to members of the track team on the basis of athletic ability. Selection made by the scholarship committee of the track team.

*Triangle Club of Kingston Award:* Minimum of \$500 awarded annually to a female student from Rhode Island with financial need.

*Cecilia T. Trubiano Memorial Scholarship:* Awarded to incoming freshman students in the Talent Development program who graduated from the Providence public school system in recognition of Cecilia Trubiano's commitment and dedication to the children of the Providence public schools. Recipient selected by Talent Development and the Student Financial Aid Office.

*Francesco and Mariannina Ucci Family Scholarship Endowment:* Income from endowment awarded annually to students who have completed their sophomore year and are majoring in a scientific discipline including, but not limited to, chemistry, engineering, biological or physical science, pharmacy, computer science, or premedical studies. The recipient is selected by the Student Financial Aid Office, with preference given to graduates of West Warwick High School. This fund was established by Pompelio A. Ucci, Class of 1943.

*University Grant:* The Board of Regents has made available a sum of money to be used for scholarships. While it is expected that in any year the great majority of these scholarships will be awarded to residents of Rhode Island, in certain exceptional cases out-of-state students may qualify.

*URI Alumni Association Presidential Scholarship:* Income from endowment for a \$1,000 award for the senior year to a son or daughter of a URI alumnus(a) who has the highest cumulative quality point average for three consecutive years at URI. In the event of a tie, the award is to be divided. Application to be made through the Alumni Association Office.

*URI Alumni Association Scholarship:* Income from endowment for scholarships awarded annually on the basis of financial need.

*URI Alumni Association Scholarship for Children of Alumni:* Six \$500 awards given annually to two sophomores, two juniors, and two seniors who are sons or daughters of URI alumni. Awards based on highest quality point average for the previous academic year among the pool of applicants in each category. Awards will be given only to those who submit formal application. Selection made by the URI Alumni Association.

*URI Alumni Memorial Scholarship:* Income from endowment for a scholarship based on financial need. Recipient selected by the Student Financial Aid Office.

*URI Alumni Ram Club Memorial:* Offered in honor of Rhode Island alumni who sacrificed their lives in two world wars. Recipients selected on the basis of financial need, campus citizenship, scholastic ability, and leadership as evidenced by participation in sports and other extracurricular activities. Selection made by Alumni Ram Club.

*URI Alumni Rhode Island High School Scholastic Scholarships:* Ten \$1,000 awards to incoming URI freshmen based on scholastic achievement, SAT scores, and overall record in humanities, psychology and sciences, the performing and studio arts, pure and applied sciences, and professional and human services. Open to all Rhode Island high school seniors. Selection made by Alumni Association.

*URI Class of 1899 Memorial Scholarship:* Income from endowment for a scholarship awarded annually to students on the basis of financial need.

★ *URI Class of 1930 Scholarship:* Income from endowment for two scholarships awarded annually to undergraduate or graduate students on the basis of financial need and academic ability. Undergraduate recipients selected by the Student Financial Aid Office; graduate recipients selected by the Graduate School.

*URI Class of 1931 Memorial Scholarship:* Income from endowment for scholarships awarded annually to students on the basis of financial need.

★ *URI Class of 1933 Graduate Fellowship*: Income from endowment for a graduate fellowship.

*URI Class of 1935 Memorial Scholarship*: Income from endowment for scholarships awarded annually on the basis of financial need.

*URI Class of 1936 Scholarship Endowment*: Income from endowment for scholarships awarded annually to undergraduate students on the basis of financial need with preference given to lineal descendants of members of the Class of 1936. If no relatives of the Class of 1936 apply, the awards will go to any applicants the University selects based on financial need and academic performance.

*URI Class of 1937 Memorial Scholarship*: Income from endowment for scholarships awarded annually on the basis of financial need.

*URI Class of 1938 Raymond G. Bressler Memorial Scholarship*: Established by the Class of 1938 on their 50th anniversary. Income from endowment for scholarships awarded annually on the basis of financial need.

*URI Class of 1939 Memorial Scholarship*: Income from endowment for scholarships awarded annually on the basis of financial need.

*URI Class of 1940 Memorial Scholarship*: Income from endowment for scholarships awarded annually on the basis of financial need.

*URI Class of 1941 Memorial Scholarship*: Income from endowment for scholarships awarded annually on the basis of financial need.

*URI Class of 1942 Memorial Scholarship*: Income from endowment for scholarships awarded on the basis of financial need.

*URI Class of 1943 Scholarship*: Income from endowment for scholarships awarded annually on the basis of financial need. Recipients selected by the Student Financial Aid Office.

*URI Classes of 1944–46 Scholarship*: Income from endowment for scholarships awarded annually on the basis of financial need. Recipients selected by the Student Financial Aid Office.

*URI Class of 1947 Scholarship*: Income from endowment for scholarships awarded annually on the basis of financial need. Recipient selected by the Student Financial Aid Office.

*URI Foundation Academic Excellence Endowment*: Income from endowment for scholarships to undergraduate students on the basis of academic excellence. Recipient selected by the Student Financial Aid Office.

*URI Foundation Best and Brightest Scholarship*: Annual grants to incoming students who are residents of Rhode Island and have achieved academic excellence in high school. Recipients selected by the Student Financial Aid Office.

*URI Foundation Boat Program Scholarship*: Scholarship support for a marine-related major or a crew or sailing team member. Awards based on a combination of superior academic performance and demonstrated need. Selection made by the Student Financial Aid Office. Award to be presented by the Boat Committee Chair.

★ *URI Foundation Fellowship Endowment*: Income from endowment for a graduate student fellowship. Recipient selected by the Dean of the Graduate School from University-wide recommendations.

*URI Foundation Trustees Scholarships*: Income from endowment for scholarships awarded annually on the basis of financial need. Recipient selected by the Student Financial Aid Office.

*URI Parents Fund Scholarship*: Income from endowment for a scholarship awarded annually to students with financial need from a fund established by parents of URI students and the URI Patrons Association.

*Wal-Mart Competitive Edge Scholarship Fund*: Awarded to an incoming freshman student majoring in a technology-related field. Recipient must be a Rhode Island resident; have applied for financial aid; demonstrated high academic achievement, community service, and leadership in high school; and be registered for at least six credits. This award is renewable each year providing the student maintains a 3.00 grade point average, is enrolled full-time each semester, and continues in a technological area. Selected by the Student Financial Aid Office.

*Washington Trust Company Scholarship*: Income from endowment for a scholarship awarded annually to an undergraduate student from Rhode Island on the basis of merit and financial need.

*Paul L. Watelet '34 Athletic Scholarship*: Income from endowment for athletic scholarships, with first preference given to a participant in URI men's basketball. Selection made by the Director of Athletics.

*George F. Weston Memorial Scholarship*: Income from a fund established by the Providence Technical High School Athletic Field Association awarded annually to graduates of Rhode Island high schools and college preparatory schools who demonstrate financial need. Preference is given to former students and descendants of former students and teachers of Technical High School of Providence.

*Francis J. Wilcox '51 Memorial Scholarship*: Income from endowment awarded annually on the basis of financial need. Recipient selected by the Student Financial Aid Office.

*David R. Wilkes Scholarship*: Income from endowment awarded annually to a student with financial need, with preference given to a resident of Rhode Island.

*Frank and Natalie Williams '40 Scholarship*: Income from endowment for scholarships to undergraduate students in good academic standing with genuine financial need. First preference to students from Rhode Island.

★ *Woman's Seamen's Friend Society of Connecticut*: Awards to undergraduate and graduate students from Connecticut who are in marine-oriented programs and have financial need.

*Carl R. Woodward Memorial Scholarship*: Income from endowment, a gift from the Alumni Association, available annually to students with financial need.

*Lt. Charles Yaghoobian Jr. '65 Memorial Scholarship*: Income from endowment available to a student with financial need, with first preference to residents of Blackstone Valley, R.I., majoring in physical education, and second preference to residents of Blackstone Valley regardless of major.

## Arts and Sciences

★ *Ward Abusamra Scholarship in Music and Voice*: Income from endowment for a scholarship in music awarded annually to a graduate or undergraduate music major on the basis of merit. Preference given to students concentrating in voice or chorus. Recipient to be selected by the Department of Music Recruitment and Awards Committee during annual spring auditions.

*Heidi Allen Memorial Scholarship*: Income from endowment, established by parents and friends of Heidi Allen, awarded to a student with financial need who is a political science major.

*Beaupre Family Scholarship*: Income from endowment for a scholarship awarded annually to a chemistry major with junior standing. Recipient should be a married student (preference given to a married student with at least one child) with financial need and a 2.80 grade point average or higher who is a resident of Rhode Island. The student may, in addition, receive the award in the senior year as long as criteria are still being met. If a chemistry major does not meet all of the above criteria, the award may be given to a qualified student in any of the other sciences.

*Bessie D. Belmont Memorial Scholarship*: Gift of Dr. and Mrs. Ralph S. Belmont in memory of his mother. Income from endowment awarded annually to an undergraduate majoring in natural sciences on the basis of scholarship and/or diligent application and financial need.

★ *Stanley Berger Memorial Scholarship*: Income from endowment awarded annually to a graduate student in clinical psychology. Recipient selected by the Department of Psychology.

*Mary Braga Scholarship*: Income from endowment for a scholarship to a female undergraduate of the College of Arts and Sciences of Portuguese descent. Preference will be given to a Rhode Island resident

and to the older student. The dean of the College of Arts and Sciences will determine the recipient.

★ *Bertran M. Brown '36 Endowment*: Income from endowment for graduate student support in the Department of Chemistry.

*Norma Bugbee Memorial Scholarship Fund*: Income from endowment for scholarships for deserving upperclass students in the University's food sciences and nutrition, textiles, and music programs in loving memory of Norma Bugbee Starr, Class of 1944. Award of scholarships to be based upon candidate's scholastic achievements and ability without reference to financial resources of the candidate or his or her parents.

*R. Craig Caldwell Memorial Scholarship*: Income from endowment for a scholarship awarded annually to a student majoring in computer science on the basis of scholastic ability alone. Recipient selected by the College of Arts and Sciences.

*Roderick Caldwell Endowment Scholarship in Mathematics*: Income from endowment awarded annually to an undergraduate student majoring in mathematics who has demonstrated above-average academic promise and genuine financial need. Recipient selected by the Student Financial Aid Office and the Department of Mathematics.

*Bruce D. Campbell Scholarship*: Income from endowment for a scholarship awarded annually to an undergraduate student in the Physics Department on the basis of academic merit with preference given to Rhode Island residents. Recipient selected by the chairperson of the Physics Department.

*Eleanor M. Carlson Trust Scholarship*: Income from endowment for scholarships awarded annually to students in the women's studies program. Recipient selected by the director of the women's studies program.

*Eleanor M. and Oscar M. Carlson Scholarship Fund*: Income from endowment for scholarships awarded annually to women students who are single-parent heads of household and who have one or more dependent children. Preference will be given to students who meet one or more of the following criteria: 1) choice of a nontraditional education track, 2) financial need, 3) good academic standing, 4) Rhode Island resident, and 5) a major or minor in women's studies. Recipients selected in consultation with the Student Financial Aid Office by a committee comprised of the head of the women's studies program, URI faculty members (three women and one man) associated with the women's studies program, and, if it exists, one member of the Women's Studies Council. One scholarship will generally be equal to in-state tuition plus a book allowance.

*Robert A. DeWolf Scholarship*: Income from endowment for a scholarship in zoology awarded annually. Recipient selected by the Department of Zoology.

*Dodd Family Scholarship*: Income from endowment awarded annually to a student with junior standing majoring in biology or an ocean-related field. The recipient should be from Rhode Island, have demonstrated financial need, and have at least a 3.00 grade point average.

★ *Catharine and Walter Eckman Memorial Scholarship*: Income from endowment awarded annually to a graduate student in the humanities (including English, comparative literature, languages, history, philosophy, music, and political science). Recipient selected by the Graduate School Committee on Scholarships and Fellowships.

*Thomas V. Falciglia Honorary Scholarship*: Income from endowment awarded annually to a music major concentrating in piano, organ, orchestral instrument, or voice on the basis of musical achievement or contribution to the music program, or to a musically talented freshman, with preference to students with financial need. Selection made by the Department of Music.

★ *Robert H. '35 and Marjorie P. Fillmore '36 Memorial Scholarship*: Income from endowment, established by Judith Ann Fillmore in memory of her mother and father, awarded annually to an undergraduate or graduate student on the basis of good scholastic standing who demonstrates financial need and is enrolled in an ocean science program. First consideration is given to sons and daughters of the URI Washington Alumni Club, Washington, D.C.

*Fine Arts Scholarship*: Scholarship awarded annually to a music major demonstrating financial need.

*Lillian and Benjamin Fine Memorial Scholarship*: Income from endowment awarded annually to an undergraduate in journalism with financial need.

★ *R. Ken Forcé Graduate Fellowship in Analytical Chemistry*: Income from endowment for a fellowship awarded annually to a graduate student studying analytical chemistry. Recipient selected by the Department of Chemistry.

★ *Alex V. and Elli A. Fricke Memorial Scholarship*: Income from endowment for scholarships awarded annually to students majoring in ecology-related programs on the basis of good academic standing and financial need. First preference to students from Cranston, R.I. or Rhode Island. Recipients selected by the Student Financial Aid Office.

★ *Elizabeth D. Futas Scholarship*: Income from endowment for a scholarship awarded annually to a student in the Graduate School of Library and Information Studies. Recipient selected by the GSLIS.

*Elia and Roberto Germani Scholarship*: Income from endowment for a scholarship awarded annually to an undergraduate in the College of Arts and Sciences on the basis of academic merit with preference given to Rhode Island residents. Recipient selected by the Dean of the College of Arts and Sciences.

★ *Graduate Library School Scholarship*: Income from endowment awarded annually to a student enrolled in the Graduate School of Library and Information Studies. Recipient selected by the GSLIS.

*Dr. Adolphus C. Hailstork III Music Scholarship for Minority Students*: Income from endowment for a scholarship awarded annually on the basis of merit to minority students entering the Department of Music. Selection made by the Department of Music.

*John I. Hardy Scholarship*: Income from endowment for a scholarship awarded annually to a student majoring in biology. Recipient selected by the Student Financial Aid Office.

*Frederick and Katherine Jackson Scholarship Endowment*: Income from endowment for a scholarship awarded annually to a student with financial need in the College of Arts and Sciences who is enrolled in the physical, biological, or social sciences or in the humanities.

*June Rockwell Levy Memorial Scholarship*: Income from endowment for a scholarship awarded annually to music students with financial need.

*John T. McCarthy '36 Memorial Scholarship*: Income from endowment for a scholarship in zoology awarded annually to a deserving junior or senior, with preference to a student planning to attend a veterinary school.

*Mother Jones Endowed Scholarship*: Income from endowment for a \$500 scholarship in women's studies awarded annually on the primary basis of financial need and the secondary basis of scholarly excellence. Selection made by the Women's Studies Program Committee.

*Nautilus Nest Scholarship*: Awarded annually to a junior or senior enrolled in electrical engineering, physics, or computer science, on the basis of academic achievement and financial need. Recipients must be residents of Rhode Island or Connecticut and citizens of the United States.

*E.A. Palmietier Memorial Award in Biological Sciences*: Income from endowment for an award given annually to an undergraduate student in the Department of Biological Sciences who demonstrates academic excellence. Recipient selected by the chairperson of the Department of Biological Sciences.

*Thomas R. Pezzullo Memorial Scholarship*: Income from endowment awarded to an undergraduate student on the basis of talent in theatre and on financial need. Recipient selected by the Theatre Department and the Student Financial Aid Office.

*Nancy Potter Endowment*: Income from endowment awarded to a high-ranking junior majoring in English. Recipients selected by the Department of English.

*Presser Scholarship:* Award given to an outstanding music major at or after the end of his or her junior year. Recipient selected by the Department of Music.

*W. Donald and Jane Rankin Scholarship in Music:* Income from endowment for a scholarship awarded annually to an undergraduate music student. Preference given to a student with financial need. Recipient selected by the chairperson of the Department of Music and the Student Financial Aid Office.

*Mary A. Silverman Ravin, M.D., '44 Scholarship:* Income from endowment for a \$250 scholarship given annually to the highest-ranking female pre-medical student at the close of her junior year.

*Harold A. Riemenschneider Award:* Income from endowment for an award given annually to a student pursuing studies in radiation either in the Department of Biological Sciences or the Department of Chemistry. Recipient selected by the Student Financial Aid Office in consultation with these departments.

*Max Rosen Memorial Scholarship:* Income from endowment awarded annually to a student with financial need, preferably a junior, majoring in history with emphasis on American history. Selection made by the Department of History.

*Mark Ross Endowed Scholarship:* Income from endowment for annual awards to undergraduate Arts and Sciences students. Recipients selected by the College of Arts and Sciences.

*Edna L. Steeves Memorial Scholarship:* Income from endowment for a scholarship awarded annually to an English major with high academic achievement. Recipient selected by the Department of English.

*Donald Strauss Legislative Internship Endowment:* Income from endowment given to a member of the junior class to finance a summer at the Rhode Island Legislature, serving either a state senator or a state representative. Recipient selected by Department of Political Science designee.

★*Department of Theatre Scholarship Endowment:* Income from endowment to be used for the benefit of the undergraduate and graduate students in the Department of Theatre. Scholarships will be awarded by the chair of the department, in consultation with the Student Financial Aid Office and will be based on financial need and/or academic qualifications.

*Mildred C. Thelen Scholarship in Spanish:* Income from endowment for a scholarship awarded annually to students majoring in Spanish on the basis of meritorious performance and financial need.

*Ruth E. Trexler Scholarship:* Income from endowment for a scholarship in music. Recipient selected by the Department of Music.

*URI-Fleet Scholarship:* Annual scholarship awards of \$2,000 for academically talented Rhode Island high school students with demonstrated financial need. The recipients must major either in economics or in business administration and maintain an overall 3.00 grade point average to retain the scholarship. Recipients selected by a committee of faculty from the Department of Economics and the College of Business Administration.

★*Milton Waltcher '41 Memorial Endowment:* Income from endowment for annual awards to go to a deserving chemistry graduate student during summer months and to a deserving undergraduate student in mechanical engineering.

*David Warren Scholarship:* Income from endowment awarded annually to a student majoring in political science. Recipient selected by the Department of Political Science.

*Frank L. Woods Memorial Scholarship:* Established by family and friends as a permanent memorial in honor of Dr. Woods, URI professor of German and linguistics, the scholarship provides for support for a junior or senior majoring in German or German linguistics. Recipients will be chosen by members of the German faculty. Awards for tuition, fees, and other University expenses will be made by the Student Financial Aid Office.

#### **Business Administration**

*American Production and Inventory Control Society, Providence Chapter (APICS) Award:* Awarded annually to a senior with a major or minor in production and operations management who is also a member of APICS.

*AMICA Mutual Insurance Scholarship:* Income from endowment for scholarships to students in the College of Business Administration. Recipients selected by the Student Financial Aid Office and the college.

*Anderson Family Trust:* Income from endowment for a scholarship awarded to a student majoring in insurance.

★*David Beretta '49 Endowment:* Income from endowment for a scholarship awarded annually to provide support for either a student enrolled in the College of Engineering with a minor in business or for a graduate in engineering who wishes to pursue full-time study for a master's degree in the College of Business Administration. Recipient selected by a joint decision of the deans of both colleges.

*Dr. Winfield S. Briggs Memorial Scholarship:* Income from endowment available to students in accounting with financial need.

*Saul Fern Marketing Scholarship:* Income from endowment to a junior majoring in advertising and/or marketing with preference to members of the Rho Iota Chapter of Zeta Beta Tau Fraternity. Recipient selected by the Student Financial Aid Office.

*Warren Ferriter Memorial Scholarship:* Income from endowment awarded annually to majors in the College of Business Administration with outstanding academic records and demonstrated financial need. Recipients selected by the Student Financial Aid Office.

*Fleet Scholarship Endowment:* Income from endowment for scholarships awarded annually. Recipients selected by the College of Business Administration.

*James '76 and Nancy '77 Forte Scholarship in Business and Nursing:* Income from endowment for a scholarship awarded annually in the College of Business Administration and the College of Nursing. Recipient selected by the Student Financial Aid Office.

*Jack Fradin Scholarship:* Income from endowment awarded annually to a junior-year accounting major based on academic performance and financial need. Recipient selected by the Student Financial Aid Office.

*Peter M. and Mildred J. Galanti Business Award in Accounting:* Income from this endowment will be given to a student based on financial need and academic performance.

*Peter M. and Mildred J. Galanti Scholarship:* Income from endowment awarded annually to a student from New Jersey enrolled in the College of Business Administration. Recipient selected by the Student Financial Aid Office.

*Geiger Family Minority Scholarship:* Annual scholarship support for a Rhode Island student of African-American descent (including biracial) majoring in business. The student must maintain good academic standing according to the policy of the University and the College of Business Administration, with demonstrated financial need.

*Francis S. Goff Jr. '35 Scholarship:* Income from endowment awarded annually to undergraduate students majoring in business on the basis of good academic standing and genuine financial need. First preference to employees or children of employees of Providence Mutual Fire Insurance Company. Second preference to students from Rhode Island.

*Saul and Alfred Goldstein Scholarship:* Income from endowment available to a student with financial need, with preference to College of Business Administration students.

★*George and Lois Graboys Minority Student Endowment:* Awarded annually to minority students with financial need wishing to pursue a business degree. First preference to undergraduates, but graduate students will be considered. The minimum grade point average for an undergraduate recipient is 2.70 and for a graduate student 3.00. Scholarships will be awarded to eligible students with the highest grade point average. Recipient selected by the Student Financial Aid Office.

*Hospital Trust Minority Scholarship:* Income from endowment for four-year scholarships awarded annually to one male and one female minority student enrolled in the College of Business Administration who are graduates of a Rhode Island high school and are Rhode Island residents. Candidates must demonstrate academic and leadership potential, as well as financial need, as determined by the Student Financial Aid Office. Recipients may retain the scholarship for four years if they maintain a 2.50 grade point average. Recipient selected by the Dean of the College of Business Administration.

*Independent Insurance Agents of Rhode Island Scholarship:* \$2,500 awarded annually to deserving students in risk management and insurance. Selection made by the Department of Finance and Insurance.

*Carl W. Kaiser Memorial Scholarship:* Income from endowment for a scholarship awarded annually to a senior majoring in management with financial need. Recipient selected by the Student Financial Aid Office.

*George B. and Mildred L. McKowen Scholarship:* Income from endowment to a student from New Jersey who is enrolled in the College of Business Administration.

*Anne O'Connell Memorial Scholarship:* Income from endowment for the support of an undergraduate business student studying in a German-speaking country, or if there is no such student, an undergraduate student attending the German Summer School of the Atlantic at URI. Recipient selected by the College of Business and the German Department.

*Everett Picchione Memorial Scholarship:* Income from endowment for a scholarship in accounting awarded annually to a deserving student from Rhode Island. Recipient selected by the Student Financial Aid Office and the Department of Accounting.

*Ralph C. Potter Scholarship:* Income from endowment available to a student in the College of Business Administration with financial need.

*Rhode Island Society of Certified Public Accountants Scholarship:* An annual scholarship award of \$200 to a sophomore or junior majoring in accounting who has a good scholastic record. Selection made by the Department of Accounting.

*Brooksby A. Sanderson Memorial Scholarship:* Income from endowment for a scholarship awarded annually to a worthy student with financial need who is majoring in accounting.

*Timothy J. and Mary English Sullivan Scholarship:* Income from endowment for scholarships awarded annually to students majoring in accounting with preference given to children of employees of Sullivan and Company. Recipients selected by the Student Financial Aid Office.

*URI-Fleet Scholarship:* Annual scholarship awards of \$2,000 for academically talented Rhode Island high school students with demonstrated financial need. The recipients must major either in business administration or in economics and maintain an overall 3.00 grade point average to retain the scholarship. Recipients selected by a committee of faculty from the College of Business Administration and the Department of Economics.

### Engineering

*James L. Baldwin Memorial Scholarship:* Income from endowment for a scholarship awarded annually to a civil engineering student. Recipient selected by the Student Financial Aid Office.

*A.J. Beaudoin Memorial Scholarship (Electrical League of Rhode Island):* Two \$1,000 grants awarded annually to Rhode Island residents who are majoring in electrical engineering and who have financial need.

★ *David Beretta '49 Endowment:* Income from endowment for a scholarship awarded annually to provide support for either a student enrolled in the College of Engineering with a minor in business or for a graduate in engineering who wishes to pursue full-time study for a master's degree in the College of Business Administration. Recipient selected by a joint decision of the deans of both colleges.

*Norman H. Borden Memorial Scholarship:* Income from endowment established in the memory of Norman H. Borden awarded annually to a student majoring in chemical engineering with genuine financial need.

*Ronald and Lillie Bowden Memorial Scholarship:* Income from endowment for a scholarship to a student enrolled in the College of Engineering.

*George A. Brown Memorial Scholarship:* Income from endowment for a scholarship awarded annually to a student majoring in mechanical engineering.

*Daniel O. Cargill Scholarship:* Income from endowment for a scholarship awarded annually to a student in civil engineering. Recipient selected by the Student Financial Aid Office.

*Peter M. Carley '79 Memorial Scholarship:* Income from endowment for a scholarship awarded annually on the basis of financial need, academic performance, or a combination of both, with preference to civil engineering students.

★ *Albert E. Carloti Endowment:* Income from endowment for undergraduate and graduate students enrolled in the College of Engineering.

*Cherry Semiconductor Scholarship Endowment:* Income from endowment for scholarships awarded annually in engineering. Preference to students who are Rhode Island residents with financial need and of high academic caliber. Recipients selected by the Dean of the College of Engineering.

*Dr. David J. Chronley Fund in Chemical Engineering:* Income from endowment for annual creativity awards for junior or senior undergraduate students in chemical engineering and need-based undergraduate scholarships in chemical engineering. Awards and scholarships awarded at the discretion of the department chairperson.

*Francis J. Connell '49 Memorial Endowment:* Income from endowment for a scholarship awarded annually to a junior or senior majoring in civil engineering on the basis of genuine financial need and acceptable academic performance. First preference to a student from Newport; second preference to a student from Rhode Island.

*Day Family Scholarship:* Annual scholarship awarded to a minority student entering as a full-time freshman who shows academic promise in the field of engineering and has demonstrated financial need. This scholarship will be renewed annually if a grade point average of 3.00 or higher is maintained and other criteria are met, as outlined by the donor. Preference will be given to (in the following order): graduates of Middletown High School, residents of Newport County, and Rhode Island residents.

*Kenneth A. Epstein Engineering Scholarship:* Annual grant for a scholarship to a student enrolled in the College of Engineering.

*Kam Esmail Endowed Scholarship Fund:* Income from endowment for annual, recurring scholarship awards for undergraduate students majoring in one of the traditional civil engineering areas of concentration. Criteria includes evidenced financial need, a Rhode Island resident, a graduate of a Rhode Island high school, and a U.S. citizen. Recipient selected by the College of Engineering.

*Matthew Flores Memorial Fund:* Income from endowment for a scholarship for a deserving student in mechanical engineering. Recipient selected by the College of Engineering.

*George Geisser Sr. Scholarship:* Income from endowment awarded annually to civil engineering student(s) in good standing and with financial need.

★ *Gray Family Scholarship:* Income from endowment for a scholarship awarded annually to a graduate student in the Department of Chemical Engineering doing research in the field of efficient supply and use of energy and its impact on the environment. Recipient selected by the College of Engineering.

*Louis Raymond Hampton '42 Scholarship:* Income from endowment for a scholarship awarded annually on the basis of genuine financial need and academic performance. First preference given to engineering students who are dependent children of Providence Gas Company employees.



*International Engineering Program Scholarship:* Scholarships awarded annually to students in the International Engineering Program. Recipients selected by the College of Engineering.

*Ronald C. Jalbert Scholarship Endowment:* Income from endowment for a scholarship for a declared undergraduate civil engineering major and a Rhode Island resident. Preference to be given to qualifying children from the Maguire Group, Inc. Scholarship award to be determined by the chair of the Civil Engineering Department.

*Amos Kent, P.E., Memorial Scholarship:* Income from endowment created by the National Council of Engineering Examiners. Awarded to a student in engineering who is entering the junior year on the basis of financial need. Selection made by the College of Engineering.

*Dean Thomas Kim Scholarship:* Income from endowment to be awarded to the most noteworthy freshman in the College of Engineering who has financial need. Recipient selected by the College and the Student Financial Aid Office.

*Mason B. Kingsbury Memorial Scholarship:* Income from endowment for a scholarship in engineering awarded annually. Recipient selected by the College of Engineering.

*Leonard '43 and Elena Lanni Family Endowment:* Income from endowment awarded annually to a major in mechanical or chemical engineering. Preference to a first-generation American who graduated from a Rhode Island high school and has genuine financial need and an acceptable academic performance. Recipient selected jointly by the Student Financial Aid Office and the College of Engineering.

*James M. Lenahan Memorial Scholarship:* Income from endowment for a scholarship awarded annually to a student in the College of Engineering with academic ability and financial need. First preference given to a student majoring in mechanical engineering whose practical experience or schooling and activities demonstrate that the student is a self-starter likely to become a manager of engineers.

★ *Gabriel Lengyel Fellowship in Electrical Engineering:* Income from endowment established by the late Ruth Braun for a fellowship awarded annually to the graduate student in electrical engineering with the most outstanding scholastic achievement.

*Rudolph and Dorothy Nolan Lux '49 Scholarship for Academic Excellence:* Income from endowment awarded annually to students in the sophomore, junior, or senior year majoring in one of the engineering disciplines on the basis of high academic achievement and financial need. Recipients selected by the Dean of the College of Engineering.

*Charles A. Maguire and Associates Scholarship:* Income from endowment awarded annually to students in the field of engineering with financial need.

*Carleton Maine Scholarship:* Income from endowment for a scholarship awarded annually to a deserving student in environmental, civil, or related engineering specialties who is in need of financial assistance. Recipient selected by the Student Financial Aid Office.

*Angelo A. Marcello Memorial Scholarship:* Income from endowment for a scholarship in civil engineering awarded annually to a junior or senior based on financial need with consideration given to academic excellence. Minimum award \$350; maximum, 50 percent of tuition. Selection made by the Department of Civil and Environmental Engineering.

*Messinger Family Scholarship:* Income from endowment awarded annually in engineering to a Rhode Island resident with financial need and at least a B average. The award will be made to an incoming freshman student and continue to the same student for the four years, assuming the criteria are continually met. Selection made by the Dean of the College of Engineering.

*Arthur J. Minor Memorial Scholarship:* Income from endowment for a scholarship in engineering awarded annually to students with financial need.

*Vincent E. and Estelle E. Murphy Scholarship:* Income from endowment established in the memory of Vincent E. Murphy for a scholarship awarded annually to a student in the College of Engineering with financial need.

*Vito A. Nacci Civil Engineering Scholarship:* Income from endowment awarded annually to a student in civil engineering.

*Henry J. Nardone Family Endowment:* Income from endowment awarded annually to a student in mechanical engineering. Preference will be given to an incoming freshman who graduated from a Rhode Island high school and has demonstrated financial need.

*Narragansett Improvement Company Scholarships:* Income from endowment for scholarships awarded annually to majors in civil and environmental engineering who are from Rhode Island. Recipients selected by the College of Engineering. Any specific criteria will be determined by the College of Engineering in conjunction with the Department of Civil and Environmental Engineering.

*Nautilus Nest Scholarship:* Awarded annually to a junior or senior enrolled in electrical engineering, physics, or computer science, on the basis of academic achievement and financial need. Recipients must be residents of Rhode Island or Connecticut and citizens of the United States.

*OSRAM SYLVANIA Scholarship:* Annual award for a scholarship to assist students whose courses of study are in technical fields related to manufacturing.

*Piacitelli Family Scholarship:* Income from endowment awarded annually to provide in-state tuition and fees to a sophomore majoring in engineering who is a Rhode Island resident. The Dean of the College of Engineering, in cooperation with the college's academic advisor, will work in concert with the donors to honor and fulfill the scholarship award and the donors' intentions on an annual basis.

*Grant H. Potter Memorial Scholarship:* Income from endowment, a bequest of Warren L. Potter, for scholarships to engineering students with financial need, with preference to residents of Rhode Island specializing in the field of electronics or aeronautics.

*Rhode Island Public Works Association Scholarship:* Income from endowment for a \$500 scholarship awarded annually to a junior who is a resident of Rhode Island with financial need and good academic standing who is majoring in civil engineering.

*Joseph G.A. Riccio Civil Engineering Scholarship:* Income from endowment awarded annually in civil engineering. Preference given to Bristol, R.I., residents who are members of Theta Delta Chi fraternity. Student must have good academic record and genuine financial need.

★ *Rose Family Scholarship:* Income from endowment for work study type awards to students who are obtaining practical experience in pollution prevention in the Department of Chemical Engineering. Recipient selected by the chair of the department.

*Halkey K. Ross '33 Scholarship:* Income from endowment awarded annually to a student in engineering on the basis of financial need and/or academic achievement.

★ *Dr. Herman E. Sheets Endowment for Ocean Engineering:* Income from endowment for scholarships and fellowships awarded annually to undergraduate and graduate students in the ocean engineering program. Recipients selected by the chairperson of the Department of Ocean Engineering.

*William F. and Pauline T. Silvia Endowment:* Income from endowment for a scholarship awarded annually to a student in the International Engineering Program in Spanish. Recipient selected by the faculty of the program.

*John L. Slocum Scholarship in Civil Engineering:* Income from endowment awarded to a deserving and worthy student in civil engineering.

*Dr. Malcolm L. Spaulding and Nicole Cornillon Scholarship in Ocean Engineering:* Income from endowment awarded annually to an undergraduate student in the ocean engineering program. Priority and preference given to students of outstanding scholastic merit and achievement, at the discretion of the chairperson of the Department of Ocean Engineering.

*Toray Plastics America, Inc., Scholarship:* Income from endowment for eight scholarships to students in engineering; specifically, in electrical, mechanical, or chemical engineering. Two scholarships will be awarded to children of Toray employees based on need and scholastic achievement. Two scholarships will be awarded to graduating seniors of North Kingstown High School, one based on need and the other on scholastic achievement. Two scholarships will be available to minority and women students who reside in Rhode Island, one based on need and the other on scholastic achievement. And two scholarships will be given to students who have demonstrated high scholastic achievement, one based on need and achievement and the other based solely on achievement.

*H. Winfield Tucker Jr. '43 Engineering Scholarship:* Income from endowment awarded annually to an undergraduate engineering student. Preference given to graduates of Washington County, R.I., high schools. Based on genuine financial need and academic performance.

*Royal Wales Scholarship:* Income from endowment awarded annually to a graduate of South Kingstown High School, in Wakefield, R.I., who is a full-time student at URI, meets minimum academic requirements, demonstrates satisfactory effort, and has demonstrated financial need. Preference given to a student enrolled in the College of Engineering. If there is no candidate from South Kingstown High School, the award will be given to a graduating senior from Rhode Island who meets, in order of preference, the above requirements.

★ *Milton Waltcher '41 Memorial Endowment:* Income from endowment for annual awards to go to a deserving chemistry graduate student during summer months and to a deserving undergraduate student in mechanical engineering.

## Environment and Life Sciences

*Anonymous Scholarship:* Income from endowment awarded annually to students in the aquaculture and fishery technology program with financial need. Preference is given to graduates of Martha's Vineyard Regional High School and then to graduates of Cape Cod High School.

*John W. Atwood Memorial Scholarship:* Income from endowment awarded annually to a junior or senior in an animal science program; students to be selected by a committee on the basis of financial need, academic performance, and interest. Selection made by the Department of Fisheries, Animal and Veterinary Science.

*Harriet G. Bird Memorial Scholarship (Merwin Memorial Free Clinic for Animals, Inc.):* \$1,000 awarded annually to Massachusetts residents with financial need who are majoring in animal science and technology and are interested in the welfare of animals.

*Barbara Bradford Brand '30 Scholarship:* Income from bequest awarded annually to an undergraduate student in the College of the Environment and Life Sciences interested in researching ways to accelerate protection of the environment.

*W. Berkley Carter Scholarship:* Income from endowment for scholarships awarded annually to students majoring in urban horticulture and turfgrass management.

*John Samuel Clapper Memorial Scholarship:* Income from endowment established by Orville O. Clapper in honor of his father, who pioneered the development of modern turf. Awards to outstanding juniors or seniors showing marked and abiding interest in turf culture. Selection made by the College of the Environment and Life Sciences.

*Dr. James W. Cobble Memorial Scholarship:* Income from endowment awarded annually to a sophomore, junior, or senior in the College of the Environment and Life Sciences primarily on the basis of financial need accompanied by evidence of satisfactory progress toward a degree.

*College of the Environment and Life Sciences Scholarship for Academic Excellence:* Income from endowment for a scholarship in the College of the Environment and Life Sciences awarded annually on the basis of merit.

*Lloyd Robert Crandall Memorial Scholarship (Ashaway Line and Twine Manufacturing Company):* Income from endowment awarded annually to students in the aquaculture and fishery technology program with financial need. Selection made by the College of the Environment and Life Sciences.

*Wayne King Durfee and Bernice Anderson Durfee Aquaculture Scholarship for Academic Excellence:* Income from endowment for a \$500 scholarship awarded annually to a junior or senior who has majored in aquaculture for at least one year. The recipient is selected on the basis of merit, as evidenced in the past academic year, with first preference given to a student with special interest in shellfish.

★ *Marjorie Ellis Endowed Scholarship:* Income from endowment for scholarship to graduate or undergraduate students on the basis of financial need. Preference to students with an interest in nutrition and dietetics. Recipients selected by the Student Financial Aid Office.

*Golf Course Superintendents Association of America Scholarships:* \$500 competitive scholarships awarded nationally on the basis of scholastic ability, professed interest in golf turf management, and recommendation of advisors. Selection made by the turf section of the Department of Plant Sciences.

*Mabel B. Goshdigian Memorial Scholarship for Academic Excellence in Dietetics:* Income from endowment awarded annually to a dietetics major on the basis of merit.

*Morton and Ruth Grossman Endowment:* Income from endowment awarded annually to students studying for the profession of turfgrass management. Recipient will be selected by faculty in the Department of Plant Sciences who serve as advisors to students majoring in urban horticulture and turfgrass management.

*Hardee's Scholarship for Academic Excellence:* Income from endowment for two scholarships awarded annually to students in the College of the Environment and Life Sciences on the basis of merit. Recipients selected by a committee of faculty representing all academic departments in the college and the Director of the Student Financial Aid Office.

*Barton Hurley Scholarship:* Income from endowment for a scholarship awarded annually to students in the Department of Natural Resources Science. Recipient must be in good academic standing, have demonstrated financial need, and be a major in natural resources science.

★ *Arthur D. Jeffrey Memorial Scholarship:* Income from endowment awarded to a graduate student in community planning with financial need.

*Cedric C. Jennings '37 Memorial Endowment:* Income from endowment awarded annually to students with financial need who are studying entomology or plant pathology. Selection made by the plant pathology and entomology section of the Department of Plant Sciences.

*Kingston Hill Gardeners Endowment:* Income from endowment awarded annually to a junior or senior majoring in the area of plant studies on the basis of academic merit and interest.

*Elizabeth C. Kinney Memorial Fund:* Income from endowment for scholarships awarded annually to students in the Department of Plant Sciences. Mrs. Kinney gave years of service to URI and the Kingston community.

*Alice P. Mayer Scholarship:* Two annual scholarships of \$1,500 each to students with interest in agriculture, horticulture, or fishery technology who reside in Newport County. Preference to juniors and seniors. Selection made by the College of the Environment and Life Sciences.

*William S. Moody III Memorial Endowment:* Income from endowment awarded for four years to an undergraduate in the College of the Environment and Life Sciences. The recipient(s) will be selected by the Dean of the college on the basis of academic merit and interest in environmental issues and studies. Established in the memory of William S. Moody III, this endowment was donated by Mr. and Mrs. William S. Moody Jr., his parents, and Mrs. William S. Moody, his widow.

*Charles Olney Food Science Scholarship:* Income from endowment for a scholarship awarded annually on the basis of merit and need to an undergraduate student majoring in food science and nutrition and committed to a career in food science. Recipient selected by a committee headed by Dr. Chong Lee from the Department of Food Science and Nutrition.

*Al Owens Scholarship:* Income from endowment for a scholarship awarded annually to a student in the College of the Environment and Life Sciences on the basis of merit.

*Jean Louise Pimental '70 Memorial Scholarship:* Income from endowment for a scholarship awarded annually to a deserving student in animal science with preference to a woman from Rhode Island. Selection made by the College of the Environment and Life Sciences.

*John E. Powell Memorial Scholarship:* Income from endowment awarded annually to juniors or seniors in resource development on the basis of worthiness and need. Selection made by the College of the Environment and Life Sciences.

*Providence Gas Environmental Scholarship:* Awarded to students preparing for careers in environmental management and residing in the household of a Providence Gas customer.

*Ralston-Purina Award:* \$650 award to an outstanding student with professional interest in food science. Selection is based on scholarship, leadership, character, citizenship, potential, and need. Selection by Ralston-Purina from applications recommended by the college.

*Rhode Island Dietetic Association Scholarship:* Income from endowment for scholarships awarded annually to seniors majoring in nutrition and dietetics who are Rhode Island residents, on the basis of financial need, academic performance, and interest, effort, and commitment to pursuing a career in dietetics.

*Rhode Island Golf Course Superintendents Association Scholarship:* \$200 awarded annually to a student studying for the profession of turfgrass management who has an expressed interest in golf course maintenance. Selection made by the turf section of the Department of Plant Sciences.

*Rhode Island Nurserymen's Association Scholarship:* \$150 awarded annually to a student who has completed at least five of the eight professional courses specified in ornamental horticulture and has attained the highest cumulative quality point average. Recipient selected by Associate Dean for Instruction. Award presented at the association's spring meeting.

*Betty and Tom Shreve '42 Scholarship:* Income from endowment awarded annually for a food science and nutrition major on the basis of financial need.

*Dr. Richard S. Skogley Scholarship Endowment:* Income from endowment for a scholarship in the area of turfgrass management in the Department of Plant Sciences. Recipient selected by the Department of Plant Sciences.

*Society of Soil Scientists of Southern New England Scholarship:* Awarded to a student majoring in soil science on the basis of scholarship, extracurricular activities, character, and need. The recipient must have completed six credits in soil science.

*Southern Rhode Island Soil Conservation District Scholarship:* \$500 awarded to a junior or senior with professional interest in soil conservation or a related area. Selection made by a committee of soils faculty and district representatives, based on scholarship, experience in soil science, extracurricular activities, character, and attitude.

*Karen Volk Memorial Scholarship:* Income from endowment awarded annually on the basis of need and merit to a female freshman majoring in animal science.

*Wantaknowhow Garden Club:* Scholarship awarded annually to a student in resource development.

#### Human Science and Services

*Glenn C. Brown Dental Hygiene Scholarship:* Income from endowment awarded annually in the clinical second semester to a junior or senior with good academic performance. Genuine financial need may also be considered. Selection made by the Department of Dental Hygiene.

*Elizabeth W. Christopher Memorial Scholarship:* Income from endowment awarded annually to students in home economics who have completed their fourth semester at the University on the basis of scholarship and evidence of potential service and concern for the welfare of others. Selection made by the College of Human Science and Services.

*Ruth E. Curran Scholarship:* Income from endowment awarded annually to a worthy student in home economics. Selection made by the College of Human Science and Services.

*Joan '86, Jennifer, and Melissa Heaton Memorial Scholarship:* Income from endowment awarded annually to students in the human services disciplines. Selection made by the College of Human Science and Services.

*Susan M. Marsella Scholarship:* Awarded to a dedicated and academically deserving student pursuing a career in fashion design who is in need of financial assistance.

*\*Dr. Dorothy Massey Scholarship:* Income from endowment for women graduate students majoring in physical education.

*Mabel Streeter Perrin Scholarship:* Income from endowment for scholarships awarded annually to Rhode Island female students majoring in human development and family studies on the basis of academic standing and financial need. Recipients selected by the Student Financial Aid Office.

*\*Dr. and Mrs. James P. Reid Scholarship:* Income from endowment for a scholarship in physical education awarded annually to a master's or doctoral student on the basis of academic scholarship, professional interest, and involvement. Preference to second-year students. Selection made by the Reid Scholarship Committee of the Department of Physical Education.

*Andrew W. Rotelli III Memorial Scholarship:* Income from endowment for a scholarship awarded annually to needy students who had formerly attended Bishop Hendricken, are enrolled in the physical education program, and are seeking a career in sports-related physiology or in physical therapy.

*Jill Sawyer Memorial Scholarship:* Income from endowment for a scholarship in merchandising or fashion design awarded annually to a sophomore, junior, or senior on the basis of financial need. Preference given to members of Alpha Xi Delta sorority. Recipient selected by the Student Financial Aid Office.

*Lt. Charles Yaghoobian Jr. '65 Memorial Scholarship:* Income from endowment available to a student with financial need, with first preference to residents of Blackstone Valley, R.I., majoring in physical education, and second preference to residents of Blackstone Valley regardless of major.

#### Nursing

*Emilie C. '16 and Norman H. Borden '15 Nursing Scholarship:* Income from endowment awarded annually to a nursing student with financial need.

*M. Adelaide Briggs Memorial Scholarship:* Income from endowment available to nursing students with financial need.

*College of Nursing Scholarship:* Awarded to undergraduate students majoring in nursing. The grant will be administered by the Student Financial Aid Office.

*James '76 and Nancy '77 Forte Scholarship in Business and Nursing:* Income from endowment for scholarships awarded annually in the College of Business Administration and the College of Nursing. Recipient selected by the Student Financial Aid Office.

*Mildred J. Galanti Scholarship:* Income from endowment for a scholarship in nursing.

*Morton and Ruth Grossman Scholarship:* Income from endowment for a scholarship awarded annually in the College of Nursing. Recipient selected by the College of Nursing.

*Kenneth and Susan Kermes Scholarship:* Income from endowment for scholarships awarded annually to undergraduate students in nursing on the basis of good academic standing and financial need. Recipients selected by the Student Financial Aid Office.

*Oscar and Lauretta LaPierre Memorial Scholarship:* Income from endowment for a four-year scholarship to a student in the College of Nursing who is from Central Falls, R.I., and has demonstrated financial need.

*Gladys N. Longo Scholarship in Nursing:* Income from endowment for a scholarship awarded to a fourth-year nursing student entering the fifth year on the basis of financial need. Recipient selected by the Student Financial Aid Office.

*Roddy Charitable Trust Scholarship:* Income from endowment available to students in the College of Nursing on the basis of financial need and academic ability.

*Sigma Theta Tau, Inc., Delta Upsilon Chapter Scholarship:* \$750 grant awarded annually to a full-time student in the College of Nursing who has completed two or more clinical nursing courses on the basis of grade point average, evidence of leadership, creativity, professional commitment, and financial need. Application forms available at the College of Nursing.

*Ella Soloveitzik '37 Memorial Scholarship:* Income from endowment awarded annually to worthy nursing students or students pursuing a teaching career. First preference to students from the South County and Pawcatuck areas.

*Catherine H. Suda/Edward S. Pratt Memorial Scholarship:* Income from endowment for a scholarship awarded annually to a student in the College of Nursing. First preference to students from North Kingstown; second, Washington County; third, Rhode Island; and fourth, other qualified students. Recipient selected by the Dean of the College of Nursing.

*Barbara Tate Scholarship in Nursing:* Income from endowment awarded annually to undergraduate or graduate nursing students in good academic standing. Award based on clinical competence. Applications available at the College of Nursing.

*Frederick '22 and Doris Louise Titchener Scholarship:* Income from endowment for a scholarship awarded annually to a student in the College of Nursing with financial need.

*Esther A. Watson Memorial Scholarship:* Income from endowment for a scholarship in nursing awarded annually on the basis of good scholastic standing, with first preference given to graduates of the Memorial Hospital School of Nursing; second preference to relatives of such graduates. Selection made by the College of Nursing.

## Oceanography

*★Davis Family Endowment for Fisheries Oceanography:* Income from endowment for the Joshua MacMillan Graduate Fellowship in Fisheries Oceanography awarded annually on the basis of financial need to master's or doctoral students at the Graduate School of Oceanography with a marked interest in research related to fisheries science. Recipient selected by GSO.

*★Farmer Family Trust—The Pacifico A. Colicci Award in Oceanography Engineering:* Income from endowment for an annual award presented at graduation to a student in the Graduate School of Oceanography who demonstrates exceptional vision and creativity in fashioning instruments for use in oceanography research.

*★Farmer Family Trust—The Henry S. Farmer Award in Biological Oceanography:* Income from endowment for an annual award to a student in biological oceanography who demonstrates exceptional creativity and interest in preserving and developing the oceans as a biological resource.

*★Robert H. '35 and Marjorie P. Fillmore '36 Memorial Scholarship:* Income from endowment, established by Judith Ann Fillmore in memory of her mother and father, awarded annually to an undergraduate or graduate student on the basis of good scholastic standing who demonstrates financial need and is enrolled in an ocean science program. First consideration is given to sons and daughters of the URI Washington Alumni Club, Washington, D.C.

*★Friends of Oceanography Fellowship:* Awarded to new oceanography students on the basis of need and merit.

*★Graduate School of Oceanography Alumni Endowment:* Income from endowment awarded annually to a Graduate School of Oceanography student on the basis of scientific proposals. Selection made by the GSO Alumni Committee.

*★Graduate School of Oceanography Alumni Fellowship:* Award provides fellowship support, based on academic record and proposed scientific research, for master's or doctoral students in any field of oceanography.

*★Greenwich Bay Power Squadron and Women's Auxilliary Award:* Awarded annually to a graduate student in biological oceanography.

*★Robert L. McMaster Scholarship in Marine Geology:* Income from endowment for a scholarship in marine geology awarded annually to a graduate student on the basis of academic performance, dedication to teaching, and modesty. Recipient selected by the Graduate School of Oceanography.

*★Thomas and Kathy J. McNiff Endowment:* Income from endowment for a scholarship awarded annually to a graduate student in the marine sciences. Selection made by the Graduate School of Oceanography.

*★Naragansett Electric Coastal Institute Fellowship:* Award provides fellowship support for a Ph.D. student in oceanography whose research interest is in coastal studies.

*★Lance A. Ricci Fellowship:* Income from endowment awarded annually to a financially deserving graduate student in the Graduate School of Oceanography. Recipients selected by the Graduate School and the Graduate School of Oceanography.

*★Ada L. Sawyer Endowment for Oceanography:* Income from endowment awarded annually to an M.S. or Ph.D. student in oceanography on the basis of financial need and/or merit. Recipient must be born in the United States and be in good standing with the University. Preference given to a woman demonstrating the spirit and ingenuity of Ada L. Sawyer.

*★Andrew D. Starr Memorial Award:* Awarded annually to a graduate student with financial need.

*★Webb Family Graduate Fellowship in Oceanography:* Income from endowment awarded annually to a master's or doctoral student in the Graduate School of Oceanography on the basis of genuine financial need and/or merit. The recipient is selected by the Dean of the Graduate School of Oceanography.

## Pharmacy

*Brooks Maxi Drugs Scholarship:* Grant awarded annually to students in the College of Pharmacy. Recipients selected by the Dean of the College of Pharmacy.

*★Dr. Young Soo Choi Scholarship in Pharmacy:* Income from endowment for scholarship to a graduate student in the Department of Pharmacology on the basis of financial need. Preference to international students. Recipient selected by the Student Financial Aid Office and the College of Pharmacy.

*Harriet A.F. Claffin Scholarship:* Income from endowment awarded to students in pharmacy with financial need.

*Sidney Cohn Memorial Scholarship:* Income from bequest awarded to a student in pharmacy with financial need. Selection made by the College of Pharmacy.

*★College of Pharmacy Centennial Student Endowment:* Income from endowment for a scholarship awarded annually in pharmacy. Recipient selected by the College of Pharmacy.

*★College of Pharmacy Graduate and Undergraduate Memorial Scholarship:* Income from endowment for a scholarship awarded annually in the field of pharmacy on the basis of merit. Recipient selected by the College of Pharmacy.

*College of Pharmacy Scholarship:* Income from endowment for scholarships in pharmacy awarded annually on the basis of financial need and, second, academic achievement. Selection made by the College of Pharmacy.

*CVS Awards:* Three \$500 awards to students who are in their fourth or fifth year with satisfactory academic standing, financial need, and interest in a career in retail (community) pharmacy, with high preference to children of CVS employees. Selection made by the College of Pharmacy.

*CVS Endowment Scholarship:* Income from endowment for scholarships in pharmacy awarded annually to deserving students. Recipients selected by the Dean of the College of Pharmacy.

*Davol Company Pharmacy Scholarship:* Income from endowment for a scholarship in pharmacy. Recipient selected by the Student Financial Aid Office.

*David R. DeFanti Memorial Scholarship:* Income from endowment for a scholarship awarded annually to a student in pharmacy.

*Hyman Fradin Scholarship Endowment:* Income from endowment awarded annually to a minority student from Rhode Island with financial need and a successful academic record (3.00 grade point average and above). First preference will be given to a student wishing to major in pharmacy; if that is not possible, the support will go to a deserving student in any academic field. The recipient must also have demonstrated leadership in nonacademic settings.

★ *William John and Joseph E. Golini Scholarship in Pharmacy:* Income from endowment for stipends awarded annually to graduate students in pharmacy. Recipients selected by the Dean of the College of Pharmacy.

*Florence Champlin Hamilton Memorial Scholarship:* Income from endowment awarded annually to a student in pharmacy on the basis of scholastic ability and financial need. Selection made by the College of Pharmacy.

*Hannaford Brothers Co. Scholarship:* Scholarship awarded annually to a student in pharmacy. Recipient selected by the Dean of the College of Pharmacy.

*La Verdiere Drug Company:* \$250 awarded annually to a student in the third, fourth, or fifth year on the basis of satisfactory scholastic standing and financial need. Selection made by the College of Pharmacy.

*Edward M. Lee Scholarship Endowment:* Income from endowment awarded annually to pharmacy students from the Woonsocket and North Smithfield areas. Selection made by the College of Pharmacy.

*Gladys N. Longo Scholarship in Pharmacy:* Income from endowment for a scholarship in pharmacy on the basis of financial need.

*National Association of Chain Drug Stores, Inc. Scholarship:* Annual grant for scholarships for pharmacy students on the basis of satisfactory academic standing, financial need, and a career interest in community pharmacy practice. Selection made by the College of Pharmacy.

*Gertrude I. and Henry Nelson Jr. Memorial Scholarship:* Income from endowment awarded annually to a student in pharmacy with financial need.

*William G. Peckham Memorial Scholarship:* Established by the will of Mary M. Peckham (Mrs. William G.), the scholarship provides funds to a first-year student enrolled in pharmacy and continues until graduation if merited by scholastic performance. Selection made by the College of Pharmacy.

*Rhode Island Pharmaceutical Association Award:* \$300 awarded annually to an upperclass student in the College of Pharmacy on the basis of scholastic ability and financial need. Selection made by the College of Pharmacy.

*Rhode Island Pharmaceutical Association Scholarship Endowment:* Income from endowment for a scholarship in pharmacy awarded annually on the basis of financial need to third-, fourth-, or fifth-year students. Recipients selected by the Student Financial Aid Office.

*Rite Aid Corporation Scholarship:* Grant awarded annually to students in the College of Pharmacy.

*Schwan Scholarship in Pharmacy:* Annual grant to a pharmacy student whose interest is in research. Recipient selected by the Dean of the College of Pharmacy.

*Southeastern Massachusetts Pharmaceutical Association Scholarship:* Income from endowment for a scholarship awarded annually to a third-, fourth-, or fifth-year pharmacy student from southeastern Massachusetts. Priority to scholastic excellence above financial need. Selection made by the College of Pharmacy.

*Stop & Shop Company Scholarship:* Scholarship awarded annually to a student in pharmacy. Recipient selected by the Dean of the College of Pharmacy.

*Mary C. Tafuri Memorial Scholarship:* Income from endowment awarded annually to a pharmacy student interested in the practice of community pharmacy.

*Walter B. Thompson Memorial Scholarship:* Income from endowment for a scholarship in pharmacy awarded annually to a deserving student. Selection made by the College of Pharmacy.

*Daniel P.N. Tsao Memorial Scholarship:* Income from endowment awarded annually to a pharmacy student.

*URI Class of 1926 Scholarship in Pharmacy:* Income from endowment for a scholarship in pharmacy. Recipient selected by the Dean of the College of Pharmacy and the Student Financial Aid Office.

*Lois Vars Scholarship:* Income from endowment for a scholarship awarded annually in the fall to a female pharmacy student who is a transfer in her third year and is at least 28 years old.

*Walgreen Award:* Scholarship awarded to a deserving student in or at completion of the first professional year.

*Wal-Mart Pharmacy Scholarship:* Grant awarded annually to students in pharmacy. Recipient selected by the Dean of the College of Pharmacy.

*Leonard R. Worthen Scholarship in Pharmacy:* Income from endowment for a scholarship in pharmacy.

*Heber W. Youngken Jr. Scholarship:* Income from endowment awarded annually to a student in the fourth- or fifth-year class who has demonstrated outstanding service in the interests of pharmacy at the state and/or national level. Recipient selected by the College of Pharmacy.

## SPECIAL AWARDS

★ *Academy of American Poets Prize:* Income from the Nancy Potter Endowment for two \$100 prizes to be awarded each year by the Academy of American Poets.

*Dennis W. Callaghan Memorial Award in Management:* Income from endowment awarded annually to the outstanding senior in management. Selection made by the College of Business Administration.

*Dr. David J. Chronley Fund in Chemical Engineering:* Income from endowment for annual creativity awards for junior or senior undergraduate students in chemical engineering. Awarded at the discretion of the department chairperson.

★ *James Corless Prize in Marine Chemistry:* Income from endowment for an award in water chemistry given annually if there is a worthy student.

*Lt. Parker D. Cramer '59 Memorial Endowment:* Income from endowment for an annual award (a saber) to outstanding students in Reserve Officers Training Corps (ROTC) having leadership qualities and high ethical standards. Selection made by the Department of Military Science.

★ *Ann Durbin Memorial Endowment:* Income from endowment for an award to a graduate student, either master's or Ph.D. candidate, in biological oceanography. Recipient selected by the Graduate School of Oceanography.

★ *John J. Fisher Memorial Award:* Income from endowment for an annual award in geology to a graduate assistant (either teaching or research) who has demonstrated superior service to the Department of Geology during the current academic year while maintaining a strong academic record.

*John B. Fraleigh Prizes in Mathematics:* Income from endowment for prizes awarded annually to undergraduates for excellence in mathematics. Selection made by the Department of Mathematics.

*Peter M. and Mildred J. Galanti Award:* Income from endowment for an award given annually to a deserving student in business administration.

*Elizabeth Holmes Outstanding Athlete Award:* Income from endowment for two awards presented annually to outstanding athletes, one male and one female, who possess good academic averages and exemplify the character, sportsmanship, and distinguished qualities URI desires in its athletes. Recipients selected from recommendations made by coaches, with final selection made by the Holmes family.

*Joseph Waite Ince Prize in Chemistry:* Income from endowment for a prize awarded annually to the most accomplished and promising chemistry student.

*David Ketner Memorial Prize:* Income from endowment for a prize(s) to art students established in the memory of David D. Ketner, former URI professor of art.

*Dr. Nicholas Locascio Prizes in Italian:* Income from endowment for prizes in Italian. Recipient selected by the Italian section of the Department of Modern and Classical Languages and Literatures.

★ *Peter Merenda Prize for Excellence in Statistics and Research Methodology:* \$1,500 to a finishing Ph.D. student in the Department of Psychology for excellent academic performance.

*William D. and Clarice Metz Scholarship:* Income from endowment for an award given annually to a graduating senior for excellence in history.

★ *L. Douglas Nolan '52 Academic Achievement Award in Science:* Income from endowment for awards given annually to worthy graduate students who excel in one of the natural, physical, biological, agricultural, oceanographic, veterinary, or medical sciences. Selection made by the Dean of the Graduate School.

★ *William C. Potter Prizes in Chemistry:* Income from endowment for an award given annually to Ph.D. students in pharmacy on the basis of academic achievement in chemistry.

*Rhode Island Association of Advertising Agencies Award:* Income from endowment for an award to outstanding advertising and/or marketing students in the College of Business Administration.

*Rhode Island Nurserymen's Association Award:* \$150 awarded annually to a student in an advanced course in landscape design who attains the highest score in competitive examination in plant identification. Award presented at the association's annual spring meeting. Selection made by the College of the Environment and Life Sciences.

*Rhode Island Tuberculosis and Respiratory Disease Association Award:* \$1,000 awarded annually in honor of the association's former president, Harry L. Gardner, to a senior accepted by an accredited medical school. Based on need. Apply to chairperson of the Premedical Advisory Committee.

*Italo and Mary Ronzio Award:* Income from endowment for an award in Italian language studies.

*Dr. Grace B. Sherrer Honors Awards:* Income from endowment for prizes awarded annually to outstanding undergraduates enrolled in the Honors Program.

*Leonard Eckerman Smith Memorial Award in Public Speaking:* Income from endowment awarded to students at the University with a major interest in public speaking on the basis of excellence in public speaking.

*A. Ralph Thompson Award in Chemical Engineering:* Income from endowment for an annual award to the student in chemical engineering who demonstrates the greatest increase in quality point average from the end of the freshman year to the end of the junior year.

★ *Norman Watkins Memorial Award:* Income from endowment for an annual award in physical oceanography. Recipients selected by the Graduate School of Oceanography.

*Richard Dawson Wood Memorial Award for Excellence in Botany:* Income from endowment awarded on the basis of scholarship, character, academic integrity, and intellectual enthusiasm to a senior entering graduate studies in botany. In addition, an independent research paper on a project previously discussed with a faculty member in botany must be submitted by April 30 of the senior year.

*Dr. Barbara Allen Woods Memorial Award for Excellence in German Studies:* Students selected by faculty members in the German section of the Department of Modern and Classical Languages and Literatures.

## Summary of Enrollment Fall Term 1997 (Nonduplicated)

### Undergraduate Students by College

Arts and Sciences	2,011
Business Administration	665
Engineering	428
Environment and Life Sciences (formerly <i>Resource Development</i> )	460
Human Science and Services	1,053
Nursing	306
Pharmacy	384
University College	4,300
Unassigned	327
Nondegree (Credit)	494
<b>Total (Male 4,640; Female 5,788)</b>	<b>10,428</b>

### Graduate Students

Degree	1,975
Degree (Continuous Registration)	61
Nondegree (Continuing)	35
Postbaccalaureate (Temporary)	1,044
<b>Total (Male 1,284; Female 1,831)</b>	<b>3,115</b>

**TOTAL ENROLLMENT 13,543**

## Historical Outline

1888 State Agricultural School established  
Agricultural Experiment Station  
established  
Watson farm purchased as site

1889 Taft Laboratory  
John H. Washburn appointed principal

1890 South Hall

1891 College Hall  
Ladd Laboratory

1892 Rhode Island College of Agriculture  
and Mechanic Arts founded  
May 19  
John H. Washburn, President

1894 First class graduated  
Alumni Association formed

1895 College Hall burned and rebuilt as  
Davis Hall

1897 Lippitt Hall  
First *Grist* yearbook published

1898 Preparatory school established

1902 Homer J. Wheeler, Acting President

1903 Kenyon L. Butterfield, President

1904 Extension Department organized

1906 Howard Edwards, President  
Greenhouse and Horticultural Building

1907 Master's degree awarded for the first  
time

1908 Preparatory school discontinued  
The *Beacon* (student newspaper)  
established as a monthly  
Rho Iota Kappa (first fraternity)

1909 East Hall  
By charter amendment, name changed  
to Rhode Island State College

1910 Theta Chi (first national fraternity)

1912 First fraternity house (Beta Phi, now Phi  
Gamma Delta)

1913 Ranger Hall  
Chapter of Phi Kappa Phi, national  
honor society

1918 Academic work suspended April 28  
Student Army Training Corps

1919 Academic work resumed January 2

1921 Washburn Hall

1924 Home Management House

1928 Memorial Gateway  
Bliss Hall  
Edwards Hall  
Rodman Hall  
East Farm acquired

1930 John Barlow, Acting President

1931 Raymond G. Bressler, President  
President's House

1932 Reorganization of college: Schools of  
Engineering, of Science and  
Business, and of Agriculture and  
Home Economics

1934 Asa Sweet and Edward Sweet lands  
purchased

1936 Narragansett Marine Laboratory  
Animal Husbandry Building  
Eleanor Roosevelt Hall  
Quinn Hall  
Central Heating Plant  
Peckham farm purchased

1937 Green Hall

1938 Meade Field

1939 Board of Trustees of State Colleges  
created

1940 John Barlow, Acting President

1941 Carl R. Woodward, President

1942 War-accelerated program with summer  
term initiated  
Reorganization of School of Science  
and Business into separate schools  
of Science and of Business  
Administration  
Engineering Experiment Station  
established  
Industrial Extension Division established

1943 Army Specialized Training Unit  
assigned to college

1944 Second Peckham farm purchased  
Industrial Extension Division replaced  
by Division of General College  
Extension

War-accelerated program ended in  
September

1945 Degree program in nursing established  
Sherman farm acquired

1946 Quonset hut colony erected as  
emergency housing project  
School of Home Economics established

1948 School of Arts and Sciences established  
Bachelor of Arts degree authorized by  
Board of Trustees

1949 Bachelor of Arts degree awarded for  
first time at June Commencement

1950 Butterfield and Bressler Halls

1951 Name changed to University of Rhode  
Island by act of General Assembly

1952 Pastore Chemical Laboratory

1953 Chapter of Sigma Xi, national scientific  
honor society  
Frank W. Keaney Gymnasium  
Laboratories for Scientific Criminal  
Investigation established

1954 Rhode Island Memorial Union

1957 College of Pharmacy established  
URI Foundation established

1958 Francis H. Horn, President  
Degree of Doctor of Philosophy  
authorized by Board of Trustees  
Child Development Center  
Hutchinson, Peck, and Adams  
Residence Halls  
Hope Dining Hall

1959 Woodward Hall  
Administration Building  
Computer Laboratory established  
Potter Infirmary  
Wales and Kelley Halls

1960 Fish Oceanographic Laboratory  
Independence Hall  
Davis Hall and East Hall remodeled  
Two-year program in dental hygiene  
established  
Bureau of Government Research  
established  
Faculty Senate established

1961 Graduate School of Oceanography  
Tucker, Merrow, and Browning Halls  
Gilbreth Hall

1962 Crawford Hall  
W. Alton Jones Campus acquired  
Research ship *Trident* commissioned

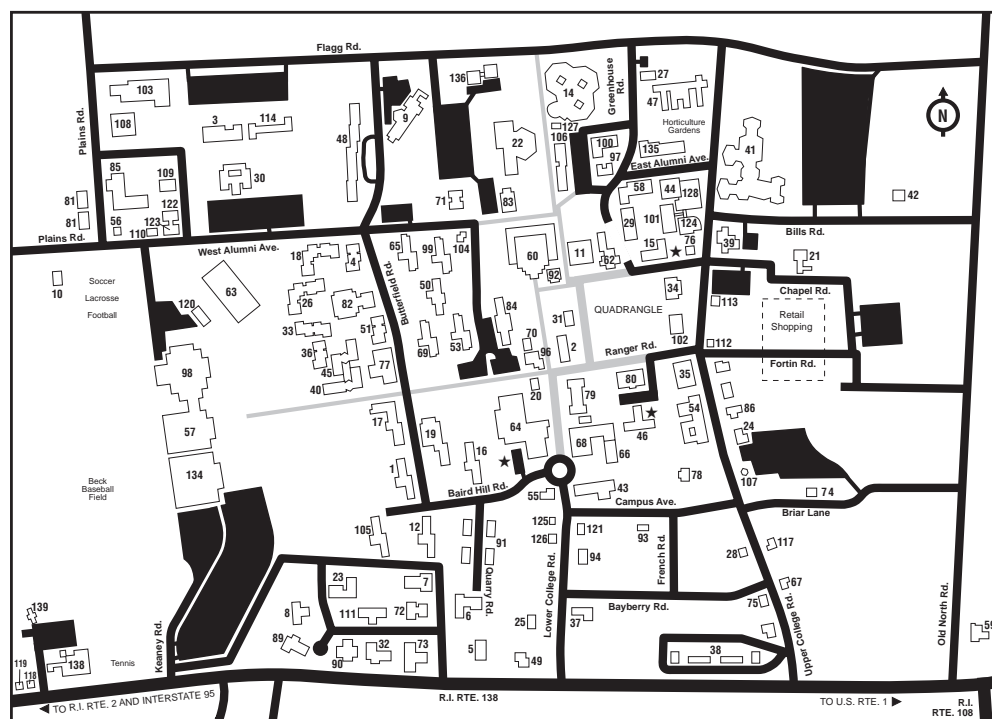
1963 Tyler Hall  
Graduate Library School established  
Weldin and Barlow Halls

1964 Fogarty Health Science Building  
Watson House restored

1965 Addition to the Memorial Union  
University Library  
Law of the Sea Institute established  
Sherman Maintenance Building

- Bachelor of Fine Arts and Bachelor of Music degrees authorized  
Research Center in Business and Economics established  
Water Resources Research Center established
- 1966 Aldrich, Burnside, Coddington, Dorr, Ellery, and Hopkins Halls, and Roger Williams Center  
Justin S. Morrill Science Building  
Fine Arts Center (Phase I)  
Institute of Environmental Biology established
- 1967 Two-year program in commercial fisheries established  
Ballentine Hall  
F. Don James, Acting President
- 1968 Kelley Hall Research Annex  
Pell Marine Science Library  
Horn Laboratory  
First Sea Grant received  
Werner A. Baum, President  
New England Marine Resources Information Program established
- 1969 Home Management Center  
Curriculum Research and Development Center established  
Heathman Hall  
Faculty Center  
Dental hygiene bachelor's program established  
International Center for Marine Resource Development established
- 1970 Fayerweather Hall  
Gorham Hall  
Consortium for the Development of Technology established  
Marine Advisory Service established
- 1971 Tootell Physical Education Center  
Fine Arts Center (Phase II)  
Conference Center, Jones Campus  
Administrative Services Center  
Board of Regents for Education (Education Act of 1969) takes over direction of higher education  
URI named one of first four Sea Grant Colleges and designated National Sea Grant Depository
- 1972 Biological Sciences Building  
Chafee Social Science Building  
University College established  
Coastal Resources Center established  
Graduate apartment complex
- 1973 William R. Ferrante, Acting President  
Research Aquarium  
Science Research and Nature Preserve Buildings, Jones Campus  
Community Planning Building
- 1974 Frank Newman, President  
Laboratory for the Study of Information Science founded
- 1975 Addition to the University Library building
- 1976 Research ship *Endeavor* commissioned
- 1977 Bachelor of General Studies established  
White Hall  
Chapter of Phi Beta Kappa, national liberal arts honor society  
Center for Ocean Management Studies established  
Center for Energy Study established  
Regional Coastal Information Center established
- 1978 College of Human Science and Services succeeds College of Home Economics  
Norman D. Watkins Laboratory
- 1979 Information Center
- 1980 Institute for Human Science and Services established  
Robotics Research Center
- 1981 Center for Atmospheric Chemistry established  
Division of University Extension name changed to College of Continuing Education  
Board of Governors for Higher Education established by act of General Assembly
- 1983 Marine Resources Building  
Small Business Development Center established  
Edward D. Eddy, President
- 1984 Labor Research Center established  
Food Science and Nutrition Research Center
- 1985 Addition to Pastore Chemical Laboratory  
Applied Engineering Laboratory
- 1986 Anatomy Laboratory  
Biotechnology Center established  
Division of Marine Resources name changed to Office of Marine Programs
- 1988 Institute for International Business established
- 1989 Fisheries and Marine Technology Building  
Pacific-Basin Capital Markets Research Center established  
Research Institute for Telecommunications and Information Marketing established
- 1990 W. Alton Jones Campus Environmental Education Center designated a National Center for Environmental Education
- 1991 Robert L. Carothers, President  
Mackal Field House  
Library addition  
Social Sciences Research Center  
Engineering Building and addition to Kirk Laboratory  
Atmospheric Chemistry Center, Narragansett Bay Campus
- 1992 URI Centennial Celebration  
New Sailing Pavilion, Point Judith Pond  
Addition to Memorial Union  
Restructuring of Keaney Gymnasium  
Residential and Conference Lodge, Jones Campus
- 1993 Dining Services Distribution Center  
Century Walk installed on the Quadrangle
- 1995 URI designated an Urban Grant Institution
- 1996 College of Continuing Education's Shepard Building restored  
Coastal Institute, Narragansett Bay Campus
- 1998 New Multicultural Center built  
CCE renamed the Alan Shawn Feinstein College of Continuing Education  
College of Resource Development renamed the College of the Environment and Life Sciences  
Ocean Technology Center opens





### Academic and Service Buildings

- \*\* Adams Hall 1
- \* Adams House 112
- \*\* Administrative Services, campus mail, printing services 109
- Agronomy Field House (Plains Rd.)
- Agronomy Greenhouse (Plains Rd.)
- Animal Care Facility (off Rte. 138 W.)
- Athletic Maintenance Facility 10
- Automotive Garage 3
- \* Ballentine Hall, business administration 11
- \* Biological Sciences Building 14
- Bliss Hall, engineering 15
- \* Carlotti Administration Building 2
- \* Catholic Center 21
- \*\* Central Receiving and Property 108
- \* Chafee Social Science Center 22
- \* Child Development Center 25
- \* Christopher House, Hillel Center, fraternity managers 126
- \* Cooperative Extension Education Center 135
- \* Crawford Hall, chemical engineering 29

- Dairy Barn (former) 30
- Davis Hall 31
- DeWolf Anatomy Laboratory 127
- \* Dining Services Distribution Center, purchasing 103
- East Farm, aquaculture and pathology (off Rte. 108)
- \* East Hall, physics 34
- \* Edwards Hall 35
- Engineering Auditorium and Instrument Shop 124
- \* Episcopal Center 37
- \* Fine Arts Center 41
- \* Fire Station 42
- \* Fogarty Health Science Building, pharmacy 43
- Food Science and Nutrition Research Center (Liberty Lane, off Rte. 138 W.)
- \* Gilbreth Hall, industrial engineering 44
- Gordon Research Center (Rte. 138 W.) 119
- \*\* Green Hall, undergraduate admissions 46
- \*\* Greenhouses, insect quarantine lab 47
- \* Hart House 28
- \* Health Promotion Partnership 74
- Housing Maintenance 122
- Housing Storage 123
- \*\* Human Resource Administration 70

- \* Independence Hall 54
- \* Independence Square II, physical therapy (Rte. 138 W.) 138
- \* Information Center 107
- \* Institute for International Sports Hall of Fame (open 4/99) 118
- International Center 121
- \*\* International Engineering Program 86
- \* Keaney Gymnasium 57
- \* Kelley Hall, electrical engineering 58
- \* Kirk Applied Engineering Laboratory 128
- \*\* Landscape and Grounds 114
- \* Lee House 117
- \* Library 60
- Lippitt Hall, administrative computer center 62
- \* Mackall Field House 134
- Meade Field House 120
- Meade Stadium 63
- \* Memorial Union 64
- \* MHRH Special Care Facility (Rte. 138 W.) 139
- \* Morrill Science Building, life sciences 66
- \* Multicultural Student Center 96
- \* Pastore Chemical Laboratory and Annex 68

- \*\* Peckham Farm Animal Center, animal science (off Rte. 138 W.)
- Planetarium 76
- \*\* Police and Traffic Division 55
- \* Potter Building, health services 77
- \* Quinn Hall, human science and services, graduate admissions 79
- \* Ranger Hall, botany 80
- Research and Grant Accounting 20
- \* Resource Development Laboratory, plant science, natural resources 27
- \*\* Rodman Hall, community planning, library school 83
- \* Roosevelt Hall, University College 84
- Ruggles House 67
- \* Safety and Health 110
- \* Sherman Building, capital projects 85
- Social Sciences Research Center 136
- Storage 81
- \*\* Taft Hall 92
- \* Tootell Physical Education Center 98
- \* Transition Center 49
- Tucker House 113
- \* Tyler Hall, academic computer center 100
- \* University Club 39

- \*\* Wales Hall, mechanical engineering 101
- \*\* Washburn Hall 102
- Watson House 104
- Weldin House (Pharmacy Conference Center) 125
- \* White Hall, nursing 9
- \*\* Women's Center 56
- \* Woodward Hall, resource development 106

### Residence and Dining Hall

- \*\* Adams Hall 1
- Aldrich Hall 4
- \*\* Barlow Hall 12
- Bressler Hall 16
- \*\* Browning Hall 17
- \*\* Burnside Hall 18
- \*\* Butterfield Hall, residence and dining 19
- Coddington Hall 26
- \*\* Dorr Hall 33
- Ellery Hall 36
- \*\* Faculty Apartments 38
- \*\* Fayerweather Hall 40
- \*\* Gorham Hall 45
- \*\* Heathman Hall 48
- \*\* Hope Hall, dining 50
- \*\* Hopkins Hall 51
- \*\* Hutchinson Hall 53
- \*\* Merrow Hall 65
- \*\* Peck Hall 69
- President's House 78
- \*\* Roger Williams Commons, housing office and dining 82
- \*\* Tucker Hall 99
- \*\* Weldin Hall 105
- University Terrace Apartments 91
- \* University Village Apartments (Rte. 138 W.)

### Fraternities and Sororities

- \*\* Alpha Chi Omega 5
- Alpha Delta Pi 6
- Alpha Epsilon Phi 7
- Alpha Pi 94
- \*\* Alpha Xi Delta 8
- Chi Omega 23
- Chi Phi 24
- Delta Zeta 32
- Phi Gamma Delta 71
- Phi Kappa Psi 72
- Phi Sigma Kappa 75
- Phi Sigma Sigma 59
- \*\* Sigma Delta Tau 89
- Sigma Kappa 90
- \*\* Sigma Phi Epsilon 111
- \*\* Sigma Pi 73
- Tau Epsilon Phi 93
- Theta Delta Chi 97

- \* Accessible to the disabled
- \*\* Partially accessible to the disabled

★ Visitor Parking